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ECONOMIC AND SOCIAL CHANGES: FACTS, TRENDS, FORECAST

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

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

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

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

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

MAIN RESEARCH DIRECTIONS

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

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

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

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VolIRC 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:

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

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

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

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

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

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

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

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

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

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

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

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

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EDITORIAL

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What Kind of State Do Russians Want to Live In? What Kind of State Has Been Built?



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Abstract. This article examines the challenge of translating the desired vision for Russia's future, shared by a majority of its citizens, into practical reality. The issue's relevance is analyzed both before and after the commencement of the special military operation in Ukraine. Drawing on nationwide and regional sociological studies, as well as expert evaluations, the authors conclude that for most citizens, the desired future for Russia is that of a strong, sovereign nation grounded primarily in traditional values – with social justice being paramount – and the principles of a social welfare state. This vision broadly aligns with the course of national development pursued by Russian President Vladimir Putin over the past 25 years. However, the authors also note a persistent skepticism among experts and the broader public regarding the feasibility of actually achieving this desired future. This problem existed both prior to and following the start of the special military operation. Its root cause is identified as the inability or unwillingness of a significant portion of the ruling elites to implement the head of state's strategic objectives aimed at

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strengthening national sovereignty. As a result, the future of Russia remains uncertain in the eyes of many of its citizens. Consequently, Russia's struggle for continued sovereign development is framed not only as a conflict with the Collective West but also as an internal battle against the nation's own protracted domestic issues. For the President, a key imperative thus becomes laying the groundwork to bring the system of state governance into alignment with the public's vision for the country's future. This entails, above all, concluding the special military operation on terms favorable to Russia and selecting a successor capable of continuing and reinforcing the quarter-century-long course of national development. The empirical foundation of the research is based on the authors' own sociological monitoring data, nationwide surveys, and assessments from a broad spectrum of experts. The authors' contribution lies in developing the theoretical and methodological framework for scholarly inquiry into defining the contours of Russia's future vision and identifying the obstacles to its practical implementation.

Key words: vision of the future, socialism, social justice, public opinion, continuity of national development policy.

The special military operation has now been underway for almost four years. For nearly that same period, Russia has been living through a historical phase where practically everything is undergoing decisive change. As A. Dugin writes, "The SMO is a ritual of transition from one state to another. When this transition ends, we will find ourselves in a new world. This will mean a different society, different people, different borders, different principles, different ideas, different institutions, and different political orientations"¹. **What exactly** these "people", "borders", "principles", and "ideas" will be is, as they say, being decided in real time. It is therefore no coincidence that V.V. Putin states that we "live in a time when everything is changing – and changing very rapidly; changing fundamentally. **None of us can fully foresee the future. However, this does not absolve us of the duty to be prepared for anything that may happen**"²...

In early 2025, we wrote that over his 25 years in the presidency, Russian President V.V. Putin had

evolved from a "Warrior" (beginning with the resolution of the Chechen conflict) to a "Creator," and that "this transformation is the result of a complex interplay of external and internal factors, which can only be analyzed within a single historical context"³.

"Putin began his presidency in the archetypal image of a 'Warrior,' over the years becoming a full-fledged 'Ruler' who in real time amends the world order, creating a new world order in the role of a 'Creator'".

*"'Warrior' – a purposeful and active fighter striving, on the one hand, to defeat enemies, on the other – to protect friends/people/voters. 'Ruler' – creates order out of chaos and maintains it, organizes processes, builds hierarchy. 'Creator' – a person who creates a new world order in which Russia will have a completely new role, and creates new rules of the game within the country and a new elite"*⁴.

¹ Dugin A. The key to Victory lies in the 1990s. Available at: https://zavtra.ru/blogs/klyuch_k_pobede_v_svo_lezhit_v_1990-h_kapitulyatsii_ukraini_budet_nedostatochno

² Vladimir Putin's speech at the Valdai Forum on October 2, 2025. Available at: <http://www.kremlin.ru/events/president/transcripts/78134>

³ Ilyin V.A., Morev M.V. (2025). Vladimir Putin's 25 years of presidential terms: "Warrior", "Ruler", "Creator". Economic and Social Changes: Facts, Trends, Forecast, 18(1), p. 11.

⁴ The dynamics of Vladimir Putin's image: From Warrior to Ruler-Creator: Report. Minchenko Consulting. October 2024. 23 p. Available at: https://minchenko.ru/news/news_235.html

This “single historical context” means that the President has had to perform all three roles simultaneously, periodically bringing one to the fore – the “Warrior,”⁵ the “Ruler,”⁶ or the “Creator”⁷ – depending on the situation on the domestic and foreign political stage. Throughout, however, his focus has remained on Russia’s future, setting objectives and defining a national development strategy for decades to come.

2008: “Today we are already formulating goals and objectives not for a month or two ahead, but for 20–30 years ahead”⁸.

2012: “A long-term state approach is necessary, one that considers the interests of both regions and virtually all sectors of the economy, geopolitical and social factors. We need to look 10, 20, 30 years ahead”⁹.

2022: “Always – when making any decisions – it is necessary to single out the main thing. What is the main thing for us? To be independent, self-sufficient, sovereign and to ensure development for the future, both now and for future generations...”¹⁰.

2023: “The country has always thought about the future. And we, of course, must act in exactly the same way. Always, under any circumstances, think about the future of the people and our state. That is what we do”¹¹.

2025: “...the very idea [of building the Trans-Siberian Railway across the country to the Pacific Ocean] serves as an example for us of strategic vision for the future, where not only current needs and circumstances are taken into account, but also the interests of the country for centuries to come...”¹².

⁵ For example, at the beginning of his presidential activity during the resolution of the Chechen conflict, during the “Five-Day War” in Georgia in 2008, and in the period (especially at the very start) of the SMO.

⁶ For example, in 2000, when V. Putin announced the principle of “equal distancing of all market entities from power,” effectively beginning the fight against oligarchs within the state governance system; during the resolution of the domestic situation amid the “Bolotnaya protests” of 2011–2012; as well as during the 2008 global financial crisis, the COVID-19 pandemic, and the SMO, when intensive and rapid management decisions were required to organize the country’s life under crisis, fast-changing conditions.

⁷ For example, during the “Munich Speech” in 2007, when the President of the Russian Federation outlined the contours of the future world order and clearly defined Russia’s place and role in it, setting the country’s development strategy for decades ahead. Also, during the discussion and adoption of the 2020 constitutional amendments, and at present, during the SMO, when the foundation of Russia’s future is being laid – its values are being defined, the vector of the educational and upbringing process for younger generations is being set, the emphases of national policy in the economy and other spheres of life are being arranged, and mechanisms for renewing personnel within the state governance system are being tested.

⁸ Vladimir Putin’s speech at Dmitry Medvedev’s inauguration ceremony as President of the Russian Federation on May 7, 2008. Available at: <http://www.kremlin.ru/events/president/transcripts/2>

⁹ Opening remarks by Vladimir Putin at a meeting on the development of railway infrastructure and high-speed traffic on April 26, 2012. Available at: <http://archive.premier.gov.ru/events/news/18783/>

¹⁰ Vladimir Putin’s speech at the Plenary Session of the St. Petersburg International Economic Forum on June 17, 2022. Available at: <http://www.kremlin.ru/events/president/transcripts/speeches/68669>

¹¹ Vladimir Putin’s speech at the Plenary Session of the World Russian People’s Council on November 28, 2023. Available at: <http://www.kremlin.ru/events/president/transcripts/copy/72863>

¹² Vladimir Putin’s speech at the Plenary Session of the VI International Arctic Forum “The Arctic – the Territory of Dialogue” on March 27, 2025. Available at: <http://www.kremlin.ru/events/president/transcripts/copy/76554>

The President's ability to effectively combine all three roles has so far ensured (and continues to ensure) the continuity of the country's national development course over the last 25 years. Over time, this has led (as experts note) to significant geopolitical and even civilizational consequences. On December 5, 2025, the new U.S. National Security Strategy was published, in which Russia, for the first time, was not named an enemy. Some experts called this event **"revolutionary"**¹³; "it states in black and white what was unthinkable until recently: **'NATO should not be an organization for endless expansion'**"¹⁴.

During the special military operation (SMO), the President faces the necessity of undergoing the same transformation of the three roles (from "Warrior" through "Ruler" to "Creator") as he did throughout his presidencies, **but now in an "accelerated" mode, under force majeure conditions, and with a sharply increased cost for any managerial error.**

Thus, in the initial months of the SMO, the President's primary task was to protect Russian statehood against the consolidated threat from the

NATO bloc and the "Kiev regime" (hostilities in the SMO zone, the sanctions "blitzkrieg," international and domestic terrorist acts).

"The White House has published an updated U.S. National Security Strategy. The appearance of this document had been awaited for several months, but the Trump administration kept delaying – making edits. And here is the result: the strategy looks revolutionary regarding Russia, Ukraine, and Europe. The Russian Federation is not an enemy of America, talk of supporting the 'nezalezhnaya' ['independent' – referring to Ukraine] 'until victory' is no more. The EU leadership 'undermines political freedom' and is generally capable of leading the Old World into the abyss. And NATO should not 'expand endlessly'"¹⁵.

"If we discard diplomatic formulations, we see a **radical, revolutionary turn** in views on national security in the USA... The de facto removal of the 'main threat' status and a call for strategic stability – this is a recognition of the strength of the Russian position"¹⁶.

"The new U.S. National Security Strategy marks a 180-degree turn in American politics"¹⁷.

¹³ Fedorova O. "A window of opportunity for the Kremlin": What the new U.S. National Security Strategy holds for us, revealed (opinion of political scientist E. Uvarov). Available at: <https://www.mk.ru/politics/2025/12/08/okno-vozmoghnostey-dlya-kremlya-vskrylos-chto-sulit-nam-novaya-strategiya-nachezopasnosti-ssha.html?ysclid=mj6wgofmdl721169539>

¹⁴ Opinion of F. Lukyanov, Director of Research at the International Discussion Club "Valdai" (source: "Unthinkable changes". Trump is preparing a revolution in American politics. RIA Novosti. 06.12.2025. Available at: <https://ria.ru/20251206/strategiya-2060230804.html?ysclid=mj9lfb2hed78565126>)

¹⁵ Rinaeva I. Russia is no longer an enemy: The U.S. National Security Strategy has changed revolutionarily. Available at: <https://www.kp.ru/daily/27752.5/5180672/?ysclid=mj6vlr37vb44912633>

¹⁶ Fedorova O. "A window of opportunity for the Kremlin": What the new U.S. National Security Strategy holds for us, revealed (opinion of political scientist E. Uvarov). Available at: <https://www.mk.ru/politics/2025/12/08/okno-vozmoghnostey-dlya-kremlya-vskrylos-chto-sulit-nam-novaya-strategiya-nachezopasnosti-ssha.html?ysclid=mj6wgofmdl721169539>

¹⁷ "Unthinkable changes". Trump is preparing a revolution in American politics. Available at: <https://ria.ru/20251206/strategiya-2060230804.html?ysclid=mj9lfb2hed78565126>

On December 9, 2025, speaking at a plenary session of the State Duma of the Russian Federation, the Chairman of the State Duma, V. Volodin, noted that **“since 2022, 152 federal laws on support measures for participants of the special military operation and their families have been adopted”**. On December 9, four more federal laws were adopted, providing for:

- ✓ Free travel for a serviceman and two of his close relatives to and from the location of the military medical commission;
- ✓ Extension of benefits for adult children of SMO participants after graduation from school until September 1;
- ✓ Granting regions the authority to establish additional measures of housing provision for families of servicemen killed during their service;
- ✓ Priority right to housing provision for SMO fighters who have the status of orphans and performed tasks to repel the invasion on the territory of the Russian Federation;
- ✓ The right to receive housing or a subsidy out of turn for servicemen: raising disabled children over 18 years of age; those who decided to continue military service under contract after certain wounds and injuries”¹⁸.

As the system of state governance (society, the economy, the military-industrial complex) adapted to these challenges, the President’s role as “Ruler” grew increasingly prominent. This is associated with intensive, almost daily legislative activity across the entire system of state administration, all subordinated to the goal of organizing the country’s life under the conditions of the SMO. This includes socio-economic support for SMO participants, their families, and other categories of citizens; reorienting

the economy toward cooperation with partners from friendly countries; tightening accountability for disciplinary violations in the military-industrial complex, the army, and at systemically important facilities; combating foreign agents; and reforming the system of education and upbringing for the younger generations, etc.

As noted by V. Fedorov, General Director of VCIOM¹⁹ (the Russian Public Opinion Research Center), “in a sense, the SMO has already become routine”. This is evidenced, in particular, by data from FOM²⁰ (the Public Opinion Foundation), which shows a decline in public interest in news from the special military operation zone (by 20 percentage points over 4 years, from 35 to 15%).

V. Fedorov: “The SMO is already in its fourth year, and in a sense, it has become routine. The question arises: how will we get used to living without the SMO? A serious question, by the way. Because during this time, the economy, the market, people’s mindset, their behavior, and international ties have all been restructured. And what will happen the day after the SMO ends? Clearly, new changes are coming, also quite profound”²¹.

According to FOM data²²:

In December 2022, among the events covered in the media that generate the greatest interest, **35% of Russians** named events related to the SMO (namely the situation on the battlefield, advances of Russian troops, drone attacks, etc.);

In December 2023, their share was **26%**;

In December 2024 – **28%**;

In December 2025 – **15%**.

That is, over almost 4 years, interest in the SMO topic has halved (from 35 to 15%), although, undoubtedly, it was and remains the “number one topic” in public perception.

¹⁸ Support measures for SMO participants and their families expanded. Available at: <http://duma.gov.ru/news/62611/>

¹⁹ All-Russian Center for Public Opinion Research (VCIOM).

²⁰ Public Opinion Foundation (FOM).

²¹ Yakovleva E. We Are entering an acute phase of competition for the new image of the country and the world (Interview with V. Fedorov). Available at: <https://rg.ru/2025/12/01/dorogoe-vremia.html?ysclid=mjlcioyl9m924994387>

²² Dominants. Opinion Field: Sociological Bulletin. Available at: <https://fom.ru/Dominanty#page=13>

For reference: From 2022 to 2025, public interest in the activities of the President of the Russian Federation (meetings, trips, speeches, etc.) increased (from 1 to 8%), as did interest in issues of geopolitical relations with the West (from 1 to 10%).

This public “habitation” to life during the SMO indicates that **people are once again beginning to be concerned about the future – “what will happen the day after the SMO ends?” – which, in turn, means it is time to bring to the fore the President’s third “public image”²³: that of the “Creator” of the future.**

Thus, for Russia, two historical processes have currently converged at a single critical point: a global one – the era of nearly 25 years of the country’s development under conditions of a “liberal fog” – and, in historical terms, a relatively concrete one – the period of the SMO. As V. Fedorov remarked, during this period *“Russians are starting to talk about the future again... What exactly that future will be is the main question”²⁴.*

What does the desired future image of Russia look like in people’s minds? How realistically can this image be realized given the existing external and internal challenges facing the Russian Federation? And, perhaps most importantly, to what extent does the state, led by V.V. Putin for the last 25 years, align with the vision of Russia’s desired future held by the majority of the population?

First of all, we should note that the image of the future is a topic of growing relevance in our country. Recall that back in 2015 (long before the start of the special military operation in Ukraine), an expert study²⁵ was conducted by the Institute of Sociology of the Russian Academy of Sciences (IS RAS). Its results showed that **“the desired future of Russia and the realistically forecasted situation in the country in the medium term (for the next 5 years) are not simply different but are in many ways opposite.**

Unfortunately, the situation experts predicted for the country in the near future was distinctly pessimistic”²⁶.

As experts noted in 2015, Russia needed above all in the coming 5 years: “rotation of the political elite at the center and in the regions,” “transparent and legitimate elections at all levels of government,” “stability of legislation,” “a change in the state’s attitude toward the spheres of culture, education, and science, moving away from their commercialization”, etc. However, in reality (according to the experts), something quite different would happen in the country: “a decline in public incomes, rising prices, and a falling standard of living”, “a prolongation and tightening of Western sanctions against Russia”, “a sharp drop in oil and gas prices”, “the degradation of social infrastructure (healthcare, education, culture)”, etc. (including “a large-scale war in Ukraine with the direct or indirect participation of Russia and NATO countries”; *Insert 1*). It is worth noting that many of these expert predictions have indeed materialized: Russia has become embroiled in a large-scale war in Ukraine, Western sanctions have continued and intensified, and a business-oriented approach still prevails in the state’s treatment of culture. As for the “rotation of the political elite at the center and in the regions,” by and large, it has not occurred (with the exception of a number of “targeted,” though very important, personnel appointments initiated personally by the President – such as the introduction of figures like M.V. Mishustin, A.R. Belousov, I.V. Krasnov, etc., into the system of state governance).

²³ The dynamics of Vladimir Putin’s image: from Warrior to Ruler-Creator: Report. Minchenko Consulting. October 2024. 23 p. Available at: https://minchenko.ru/news/news_235.html

²⁴ Interview with V. Fedorov, 19.09.2025. Available at: <https://mash.ru/longread/208400/?ysclid=mj0zupqr7k735339624>

²⁵ The expert survey was conducted by the Institute of Sociology of the Russian Academy of Sciences (IS RAS) with the participation of the ZIRCON Research Group from July to October 2015. The survey involved 154 experts: 94 from Moscow and 60 from various regions of the country. Five types of specialists were invited to participate: 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, NPOs, independent intellectual organizations, clubs, etc.; journalists, publicists actively publishing materials on the research topic in the media; researchers, scientists, specialists from analytical centers professionally engaged in studying the problems and prospects of the country’s development (source: Gorshkov M.K. et al. Russian Society and the Challenges of Time. Book Four. Moscow: Ves’ Mir, 2016. 400 p.).

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), 9–29.

*Insert 1***Data from the all-Russian survey (IS RAS, 2015)**

Distribution of assessments regarding the necessity of various factors (conditions) for achieving a desirable situation in Russian society by 2020 (average score on a scale from 1 (not necessary) to 10 (absolutely necessary) points)		Distribution of assessments regarding the probability of factors (conditions) under which Russian society will develop in the next five years (average probability score on a scale from 1 (highly unlikely) to 10 (most likely) points)*	
1. Rotation of the political elite at the center and in the regions	8.5	1. Reduction in population incomes, rising prices, falling standard of living, unemployment	7.7
2. Conducting transparent (with public oversight) and legitimate elections at all levels of government	8.1	2. Prolongation of Western countries' sanctions against Russia; loss of the ability to import critically important goods, resources, technologies, ideas	7.6
3. Stability of legislation, "rules of the game"	8.0	3. Sharp drop in oil and gas prices, crisis in the Russian oil and gas industry, reduction in budget revenues	6.7
4. Change in the state's attitude toward the spheres of culture, education, and science, moving away from their commercialization	7.7	4. Destruction of "social" infrastructure (healthcare, education, culture), departure of professionals, reduction in staff and institutions, collapse of intra-sectoral communications	6.5
5. Strengthening the role of representative government bodies, development of a multi-party system	7.2	5. Tightening of domestic policy, reduction of citizens' rights and freedoms, introduction of formal and/or informal censorship in the media, etc.	6.4
6. Lifting of sanctions by Western countries, restoration of dialogue and relations with the West	6.7	6. Mass spread of technologies for monitoring citizen behavior, total loss of privacy	6.3
7. Preservation of the foreign policy course aimed at restoring Russia's strong role in world politics and independence, active protection of national interests	6.4	7. Technological and other catastrophes, major accidents, including those caused by human factors	5.9
8. Strengthening the influence of the Russian Orthodox Church, expanding its parish network	3.6	8. Increased terrorist pressure on Russia (terrorist attacks, sabotage, intimidation)	5.1
9. Continued priority development of the raw materials sector of the economy, considering Russia's competitive advantages in the international division of labor; maintaining relatively low prices for labor and raw materials	3.0	9. Sharp increase in demand for engineering and technical professions and specialties, demand for engineers and technicians, reorientation of the labor market from the service sector to the production sector	4.6
		10. Large-scale war in Ukraine with the direct or indirect participation of Russia and NATO countries	4.5
		11. Decrease in the influx of migrants from Asian countries into Russia, increase in migration (workers, specialists) from European countries	3.7
		12. Successful import substitution, development of non-resource sectors of the economy, improvement of the investment climate	3.7
* Cells highlighted in green indicate factors that scored more than 5 points on the scale from 1 to 10, i.e., considered the most necessary by experts.		* Cells highlighted in green indicate factors that scored more than 5 points on the scale from 1 to 10, i.e., considered the most probable by experts.	

Source: Gorshkov M.K. et al. (2016). Russian Society and the Challenges of Time. Book Four. Moscow: Ves' Mir. 400 p.

“On the one hand, the state proclaims the necessity of preserving and strengthening traditional Russian spiritual and moral values, and on the other – through its directive instructions, *it pushes the sphere of culture into market-based operating conditions with the demand for non-profit cultural organizations to ‘earn more’...*

“In the economics of culture, a business approach to evaluating cultural activity still prevails, and concepts such as ‘economic efficiency,’ ‘investment,’ ‘labor productivity,’ ‘profit,’ ‘competition,’ etc., continue to be used. Meanwhile, the mechanical transfer of standard economic categories to the sphere of culture risks underestimating its social significance and also creates false expectations regarding the commercial potential of cultural goods... The market as a system of economic relations is one of humanity’s greatest achievements; however, not all spheres of public life fit into the market mechanism of economic management. And the sphere of culture is one of them»²⁷.

In 2018, three years after the IS RAS expert survey and following the Russian President’s Address to the Federal Assembly, in which he announced a course toward “a decisive breakthrough... in preserving the people of Russia and ensuring the well-being of our citizens”²⁸, similar studies were conducted by VCIOM and FCTAS RAS²⁹. These studies likewise revealed a discrepancy between the desired image of Russia’s future and the future perceived as realistically achievable – this time according to the broader population, not just experts.

According to VCIOM data³⁰ (Tab. 1):

✓ **53% of Russians** expressed the view that the president’s promises would not be fulfilled; of these, **47%** cited “corruption and bureaucracy within the government” as the reason, while another 6% believed “the president’s proposals are too vague, non-specific, and therefore impossible to implement”;

✓ confidence that “the President outlined specific, realistic tasks that will most likely be completed in the shortest possible time” was demonstrated by **34% of citizens**.

Table 1. In your opinion, how realistic are the tasks the president outlined in his Address to the Federal Assembly of Russia, and will they be fulfilled or not? (closed-ended question, one answer), % of those who followed the Address or learned its contents from the news

Answer option	2009	2010	2011	2012	2013	2014	2018
The President outlined specific, realistic tasks that will most likely be completed in the shortest possible time	28	31	31	36	29	49	34
The President outlined specific, realistic tasks, but they will not be fulfilled due to corruption and bureaucracy within the government	49	47	40	42	46	31	47
The president’s proposals are too vague, non-specific, and impossible to implement	11	12	17	16	20	8	6
Difficult to answer	12	10	12	6	5	12	13

The question was asked from 2009 to 2018. Subsequently, the wording was changed (“In your opinion, will the majority of the tasks set by Vladimir Putin in his speech be implemented in full, implemented partially, or will the majority of tasks not be implemented?” Answer options: “Will be implemented in full”, “Will be implemented only partially”, “The majority of tasks will not be implemented”, “Difficult to answer”). Source: Address of the President to the Federal Assembly: First Impressions. VCIOM Press Release. No. 3602. 2018. March 13. Available at: <https://wciom.ru/index.php?id=236&uid=116743>

²⁷ Muzyychuk V.Yu. (2025). Culture in the Logic of the Market: Facts VS Myths: Monograph. Saint Petersburg: Aletheia. P. 13.

²⁸ The exact quote from V. Putin: “...everything is based on preserving the people of Russia and the well-being of our citizens. It is here that we need to make a decisive breakthrough” (source: Presidential Address to the Federal Assembly of the Russian Federation, 01.03.2018. Available at: <http://www.kremlin.ru/acts/bank/42902>).

²⁹ Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences (FCTAS RAS).

³⁰ Presidential Address to the Federal Assembly: First Impressions. VCIOM Press Release No. 3602. 2018. March 13. Available at: <https://wciom.ru/index.php?id=236&uid=116743>

According to FCTAS RAS data, the most important tasks announced by the President in the 2018 Address to the Federal Assembly were “growth of real incomes,” “creating accessible and high-quality healthcare,” “bringing regional and local roads into good condition,” “increasing pension sizes and indexing them above inflation rates,” etc. **However, Russians believed that 8 out of 10 of the listed tasks would most likely not be fulfilled.** All of them (except for “securing Russia’s place among the world’s five largest economies” and “the emergence of affordable mortgage lending”) **were among the “top ten” of the head of state’s target objectives that, in the view of citizens, would not be realized** (*Insert 2*).

Thus, the question of Russia’s future image existed even before February 2022. After the

start of the SMO, which became the culmination of an almost 20-year period of escalating geopolitical tensions between Russia and the NATO bloc³¹, the issue of the future image and a new Social Contract in Russia became even more acute. As experts note, “the global transformation of the geopolitical system in 2022 created a problem of *fundamentally revising the social contract...*”³². The expert community raised the question: “**if we no longer want to become part of the West, then what do we want to become?**”³³. This is precisely what is evidenced by numerous attempts after the start of the SMO to create a desired image of the future, to outline its contours, and to formulate development benchmarks for the next 20, 30, or 40 years³⁴.

³¹ Let us briefly recall the main chronology of the escalating tensions in geopolitical relations between Russia and the NATO bloc:

February 10, 2007 – V. Putin’s “Munich Speech”, where he first addressed the Western political community, openly stating that Russia is a sovereign country and will pursue sovereign, independent domestic and foreign policy.

February 22, 2014 – The state coup in Ukraine.

March 21, 2014 – Federal Constitutional Laws on the accession of Crimea and Sevastopol to the Russian Federation (“Crimean Spring”). This was followed by de facto 8 years of shelling in Donbas.

December 17, 2021 – Russia presented official demands to the NATO bloc for security guarantees. However, the key ones were rejected.

February 22, 2022 – Treaties on Cooperation and Mutual Assistance between Russia and the DPR, LPR, Kherson, and Zaporozhye regions.

And only after all these events – on February 24, 2022, the start of the SMO was announced, which became a forced measure to protect the population of Donbas and, in essence, to ensure Russia’s own national security.

October 5, 2022 (already during the SMO) – Laws on the admission of the DPR, LPR, Zaporizhzhia, and Kherson regions into the Russian Federation.

³² Balatsky E.V., Ekimova N.A. (2022). Social contract in Russia: Before and after 2022. *Journal of Institutional Studies*, 14(3), 74–90.

³³ Interview with V. Fedorov for “Rossiyskaya Gazeta”, June 20, 2025. Available at: <https://wciom.ru/sobytie/intervju-valerija-fedorova-rossiiskoi-gazete-na-poljakh-pmehf-2025?ysclid=mj1035zs58343855852>

³⁴ See, for example:

1. “Horizon 2040” – a project launched by the Agency for Strategic Initiatives (ASI) and the Russian Export Center in November 2022. The project’s goal is to define Russia’s position on the international stage in 2040 and propose scenarios for long-term internal development in key areas. The highest collegial governing body of ASI is the Supervisory Board, headed by the President of the Russian Federation, V.V. Putin. The state Agency for Strategic Initiatives was essentially created and overseen from the presidential administration by A.R. Belousov.

2. The project “Worldview of Russian Civilization” (authors – A. Prokhanov, V. Averyanov, M. Maslin, et al., first presented on December 9, 2023, at a conference of the Izborsk Club at St. Petersburg State University).

3. Kharichev A.D. (2025). Civilization “Russia”. *Civil Enlightenment Notebook*. No. 7. March–April.

Insert 2

Respondents' assessment of the importance and feasibility of tasks set in the annual Presidential Address to the Federal Assembly of the Russian Federation on March 3, 2018 (data from FCTAS RAS³⁵), %

Top ten most important tasks announced by the President		Top ten tasks unlikely to be implemented	
Growth of real incomes of the working population	98%	An increase in the average life expectancy of Russians to 80 years	46%
Creating affordable and high-quality medical care	98%	Putting regional and local roads in order	41%
Putting regional and local roads in order	98%	Creation of modern infrastructure in rural areas	39%
The increase in pensions, their indexation is higher than the rate of inflation	96%	The increase in pensions, their indexation is higher than the rate of inflation	38%
Creation of modern infrastructure in rural areas	95%	Growth of real incomes of the working population	37%
Creating equal educational opportunities	94%	Creating affordable and high-quality medical care	37%
Renovation and development of Russian cities, taking into account the opinions of their residents	93%	Creating equal educational opportunities	36%
An increase in the average life expectancy of Russians to 80 years	91%	Renovation and development of Russian cities, taking into account the opinions of their residents	34%
Russia's consolidation in the "five" largest economies in the world	91%	The formation of a massive middle class in the country	31%
The appearance of an affordable mortgage (with an average rate of 7%) for the majority of Russian citizens and their families	90%	Reduction of the state's share in the economy	27%
<i>Ranked in descending order within the "top ten" most important tasks.</i>		<i>Ranked in descending order within the "top ten" tasks unlikely to be implemented.</i>	

³⁵ Without illusions. Available at: <https://www.kommersant.ru/doc/3638493?ysclid=mjb36kyd39147525926>

“We cannot move forward while constantly looking back. And deciding who was right – the Reds or the Whites ... 100 years ago? Or – how did we come to the collapse of the USSR 35 years ago?!... We must argue not about the past, but about the future. And set landmarks – where should we be in 5–10–20 years? What needs to be done for that?

In the late Soviet Union, there was its own quite strong futurological school and tradition, its own vivid science fiction. Alas, with the collapse of the USSR, it all disappeared. We were told: there’s no need to invent anything of our own, everything has already been invented – in the West! And if we dream, then only of building a society of the Western type here in Russia. Well, what’s the need for futurology here?! So it vanished; our future became today’s West.

And so it continued for several decades, until it became clear that this goal is both unattainable and does not inspire us... A vacuum of goal-setting emerged: if we no longer want to become part of the West – then what do we want to become? A good, substantive answer to this question has not yet been found; instead, there are only pseudo-historical fantasies...

We need our own vivid image of the future, not reducible to either our own previous experience or the experience of Western or Eastern countries. Such an image can only be invented, created, brought to life. This is our most urgent task today. Solve it – and many problems that seem unsolvable today will either be solved or simply disappear from the agenda”³⁶.

During this period (after the start of the SMO), research by FCTAS RAS showed a sharp increase in the share of Russians who would prefer to live in a socialist rather than a capitalist society.

Thus, in 2020 (before the SMO), the share of Russians who wanted to live under socialism was 26%, while in 2022 (the first year of the SMO) it increased to 48% (a rise of 22 percentage points; *Tab. 2*).

For comparison, the proportion of those who wanted to live in a capitalist society decreased from 21 to 12% over the same period (a drop of 9 p.p.).

Overall, during the period of V.V. Putin’s presidencies (from 2000 to 2025), the share of those wishing to live under socialism increased from 31 to 44% (+13 p.p.), while the share for capitalism decreased from 21 to 14% (–7 p.p.).

Table 2. What kind of society would Russians prefer to live in?
(Data from FCTAS RAS), % of respondents

Answer option	Years											Dynamics (+/-)		
	1998	2000	2004	2008	2012	2018	2020	2022	2023	2024	2025	2025 to 2000	2022 to 2020	2025 to 2022
												Period of V. Putin’s presidencies	First SMO year vs. last* pre-SMO year	Period of the SMO
In a socialist one	38	31	34	33	39	29	26	48	48	43	44	+13	+22	-4
In a capitalist one	22	21	22	18	18	24	21	12	5	15	14	-7	-9	+2
In some other	10	12	8	10	7	6	4	6	10	7	6	-6	+2	0
Difficult to answer	30	36	36	39	36	41	49	34	37	35	36	0	-15	+2

*Data for 2021 are not available.
Calculated from: Levashov V.K., Velikaya N.M., Shushpanova I.S. et al. (2025). “How Are You, Russia?” Express Information. 55th Stage of the All-Russian Sociological Monitoring, May 2025: Bulletin. FCTAS RAS. Moscow: FCTAS RAS. P. 56.

³⁶ Interview with V. Fedorov for “Rossiyskaya Gazeta”, June 20, 2025. Available at: <https://wciom.ru/sobytie/intervju-valerija-fedorova-rossiiskoi-gazete-na-poljakh-pmehf-2025?ysclid=mj1035zs58343855852>

The reason for the growing public demand specifically for socialism in Russia's future image is largely connected to an acute deficit of social justice, which has long been noted in Russian society. As early as 2013, RAS Academician M.K. Gorshkov wrote: *“Russia, for the most part, does not accept an unjust society... Successful people today reason like this: ‘Alright, I’m on my feet. But I have children, grandchildren. Will there be a place for them in an unjust society? Where is the guarantee that tomorrow they won’t find themselves in the same place as my low-income neighbors? Today I buy my way out of problems. But I am not eternal...’. Society has matured. People have become more measured in their assessments; they are not against innovations, but on one condition: the foundation of society must remain traditional values, in which lies Russia’s strength”*³⁷.

According to data from VoIRC RAS, the majority of people (50–60%) note that “Russian society is structured, on the whole, unfairly” (Fig. 1). This is largely due, as experts note, to “radically liberal reforms guided by far from the best examples of Western economic thought”.

“The stubborn continuation of radically liberal reforms, guided by far from the best examples of Western economic thought. The avalanche-like breakdown of property relations and the unregulated, uncontrolled privatization of state property and national natural resources essentially opened the floodgates for unlimited and unjustified growth of social inequalities.

As a result, in just 10–15 years, the country received enormous differentiation in the social status of various groups of the Russian population, and social inequalities acquired sharper forms than ever before”³⁸.

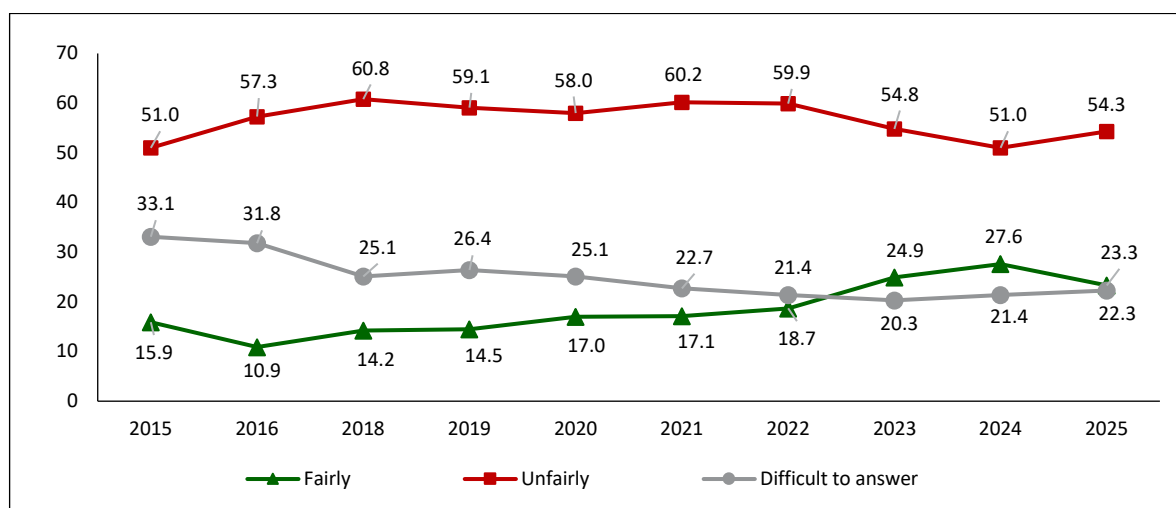


Figure 1. Distribution of answers to the question: “In your opinion, is modern Russian society structured fairly or unfairly on the whole?”*, % of respondents

* The question has been asked since December 2015.

Source: VoIRC RAS data.

³⁷ Gorshkov M.K. What is justice like? Available at: <https://aif.ru/society/42337?ysclid=mj9mbkg3f3757810455>

³⁸ Gorshkov M.K. (2021). The problem of equality and justice in Russia. In: Gorshkov M.K., Kozyreva P.M., Li Peilin, Chernysh M.F. (Eds). Problems of Social Equality and Justice in Russia and China: Monograph. Moscow: Novy Khronograf. P. 10. (Source: <https://www.isras.ru/publ.html?id=10458&ysclid=mj9mphich256843524>).

With the start of the SMO, the share of those who note the unfairness of modern Russian society's structure began to gradually decline (by 9 p.p., from 60% in 2021–2022 to 51% in 2024). This was most likely related to the “rally ‘round the flag” effect amid a sharp aggravation of national security threats and the consolidation of society around the President of the Russian Federation, who declared a strategic course toward strengthening national sovereignty based on traditional Russian values³⁹.

However, according to the latest data (for 2025), the proportion of people who consider Russian society to be unfair has increased again (from 51 to 54%).

“What do people expect from the state? Above all, social justice”⁴⁰, noted M.K. Gorshkov, Director of the Institute of Sociology FCTAS RAS, in one of his 2025 interviews. Social justice is the foundation of a social state and is included in the list of traditional Russian spiritual and moral values⁴¹, which have been proclaimed “**the foundation of Russian society, allowing for the protection and strengthening of Russia’s sovereignty**”⁴².

“The state is obliged to promote the economic and social progress of **all its citizens**, for ultimately the development of one is the condition for the development of the other, and it is in this sense that we speak of a social state... **The function of the state** is to maintain **absolute equality in rights for all different social classes**, for each private self-determining individual, through its power”⁴³. (Lorenz von Stein – author of the term “social state”, German historian, philosopher, and economist).

However, as experts note, among citizens, “the dominant opinion is that the creation of a just society in Russia is unlikely even in the medium term”⁴⁴. This forces us to recall once again the words of VCIOM Director V. Fedorov: “**Russians are starting to talk about the future... What exactly that future will be is the main question**”⁴⁵.

The significant role of social justice in the desired image of Russia’s future is also evidenced by the fact that, in people’s opinion, “justice” (44%) and “collectivism” (48%) are the key characteristics of socialism (and by a large margin over any other answer options; *Tab. 3*).

³⁹ See, for example: Presidential Decree 809 “On the Approval of the Fundamentals of State Policy for the Preservation and Strengthening of Traditional Russian Spiritual and Moral Values” dated November 9, 2022.

⁴⁰ Chetverikova A. For Russian citizens, justice and law are more valuable than money (interview with M.K. Gorshkov). Available at: <https://rg.ru/2025/05/21/kak-reshit-neravenstva.html>

⁴¹ See Clause 1.5 of Presidential Decree 809 dated November 9, 2022 “On the Approval of the Fundamentals of State Policy for the Preservation and Strengthening of Traditional Russian Spiritual and Moral Values”.

⁴² See Clause 1.7 of Presidential Decree 809 dated November 9, 2022 “On the Approval of the Fundamentals of State Policy for the Preservation and Strengthening of Traditional Russian Spiritual and Moral Values”.

⁴³ Roik V.D. Conceptual foundations for the formation of a social state in Russia: Issues of population incomes and social budgeting. Available at: <http://viperson.ru/>

⁴⁴ Gorshkov M.K. (2021). The problem of equality and justice in Russia. In: Gorshkov M.K., Kozyreva P.M., Li Peilin, Chernysh M.F. (Eds). Problems of Social Equality and Justice in Russia and China: Monograph. Moscow: Novy Khronograf. P. 30.

⁴⁵ Interview with V. Fedorov, 19.09.2025. Available at: <https://mash.ru/longread/208400/?ysclid=mj0zupqr7k735339624>

However, while “collectivism” has become a less significant criterion reflecting the essence of socialism over the period from 1998 to 2025 (down 10 p.p., from 58 to 48%), “social justice”, **on the contrary, has come to be assessed significantly more often by Russians as the main characteristic of a socialist society (up 15 p.p., from 29 to 44%; Tab. 3). Ultimately, this indicates that the “deficit” of social justice is one of the system-forming, essential characteristics of the state under the leadership of V.V. Putin over the past 25 years.**

Thus, to date, Russians’ conception of Russia’s future image is quite clear: **a strong,**

sovereign state oriented primarily toward the values of socialism (a social state), the most significant of which is social justice. It is important to note that this conception did not arise solely against the backdrop of national security threats during the SMO but was largely shaped by the **targeted, methodical long-term policy of the head of state** (specific steps and managerial decisions by the President, the Government, and the State Duma of the Russian Federation in this direction are presented in *Insert 3* (over 25 years) and *Insert 4* (for the period from October to December 2025)).

Table 3. Dynamics of respondents’ opinions on what the concept of “socialism” means to them, % of respondents

Answer option*	Year											Dynamics (+/-)		
	1998	2000	2004	2008	2012	2018	2020	2022	2023	2024	2025	2025 to 1998	2022 to 2020	2025 to 2022
												Entire measurement period	First SMO year vs. last pre-SMO year**	Period of the SMO
Collectivism	58	55	53	44	45	39	38	39	43	49	48	-10	+1	+9
Justice	29	25	25	34	34	30	29	44	44	46	44	+15	+15	0
Patriotism	40	40	38	36	36	41	48	39	38	38	33	-7	-9	-6
Order	43	39	41	38	40	38	44	35	35	38	31	-12	-9	-4
Morality	23	20	21	25	21	17	25	24	25	27	24	+1	-1	0

*The table presents the first “top five” most common answer options (out of 23).

**The question was not asked in 2021.

Calculated from: Levashov V.K., Velikaya N.M., Shushpanova I.S. et al. (2025). “How Are You, Russia?” Express Information. 55th Stage of the All-Russian Sociological Monitoring, May 2025: Bulletin. FCTAS RAS. Moscow: FCTAS RAS. P. 56.

Insert 3

Key steps and managerial decisions by the President that have influenced Russians' perception of the country's desired future image

- ✓ February 28, 2000 – The principle of “equal distancing of all market players from power” (During a meeting with oligarchs, V. Putin informed them that their work should center around the national idea, not any specific political figure. This marked the beginning of an active policy to reduce the influence of oligarchs on political decision-making in the state).
- ✓ April 4, 2005 – Federal Law 32 “On the Public Chamber of the Russian Federation”.
- ✓ May 6, 2011 – At an interregional conference of the “United Russia” party in Volgograd, V. Putin proposed the establishment of the All-Russian Public Movement “People's Front ‘For Russia’” (People's Front) or the All-Russian People's Front (ONF).
- ✓ December 12, 2012 – Subjective assessment of public opinion was introduced into the list of criteria for evaluating the effectiveness of government bodies⁴⁶.
- ✓ March 21, 2014 – Federal Constitutional Law 6 «On the Admission of the Republic of Crimea into the Russian Federation and the Formation of New Subjects within the Russian Federation – the Republic of Crimea and the Federal City of Sevastopol».
- ✓ March 3, 2018 – Presidential Address to the Federal Assembly of the Russian Federation (which announced a course toward «breakthrough development in preserving the people and ensuring the well-being of our citizens»).
- ✓ July 1, 2020 – All-Russian vote on approving amendments to the Constitution of the Russian Federation.
- ✓ February 24, 2022 – Start of the Special Military Operation (SMO).
- ✓ October 5, 2022 – Federal Constitutional Laws 5–8 «On the Admission into the Russian Federation of the Donetsk People's Republic, the Lugansk People's Republic, the Zaporozhye Region, and the Kherson Region».
- ✓ November 9, 2022 – Presidential Decree 809 «On the Approval of the Fundamentals of State Policy for the Preservation and Strengthening of Traditional Russian Spiritual and Moral Values».
- ✓ March 31, 2023 – Decree 229 «On the Approval of the Concept of the Foreign Policy of the Russian Federation» (where Russia was for the first time proclaimed a «distinct state-civilization»).
- ✓ May 8, 2024 – Decree 314 «On the Approval of the Fundamentals of State Policy of the Russian Federation in the Field of Historical Enlightenment».
- ✓ November 25, 2025 – Decree of the President of the Russian Federation 858 «On the Strategy of the State National Policy of the Russian Federation for the Period until 2036».

⁴⁶ On Assessing Citizens' Evaluation of the Effectiveness of Heads of Territorial Bodies of Federal Executive Authorities (Their Structural Subdivisions) and Territorial Bodies of State Extra-Budgetary Funds (Their Regional Branches) Taking into Account the Quality of Public Service Delivery, Heads of Multifunctional Centers for Providing State and Municipal Services Taking into Account the Quality of Organizing the Provision of State and Municipal Services, as well as on Using the Results of the Said Assessment as Grounds for Decisions on the Early Termination of the Performance of Official Duties by the Relevant Heads: RF Government Resolution 1284.

Monitoring of regulatory legal acts (laws, decrees) signed by the President of the Russian Federation from October 25 to December 18, 2025⁴⁷

MEASURES TO SUPPORT SMO PARTICIPANTS AND THEIR FAMILIES, TO DEVELOP THE MILITARY-INDUSTRIAL COMPLEX, MOBILIZATION, ORGANIZATION OF MARTIAL LAW, AND ENHANCE ANTI-TERRORISM PROTECTION OF FACILITIES

October 27 – Federal Law 387 “On Amendments to the Federal Law ‘On Veterans’”. It was decided to include, among combat veterans and war invalids, individuals who, from October 1, 2022, to September 1, 2023, concluded agreements (or had other legal relationships) with the Ministry of Defense and performed tasks as part of special units of military formations during the SMO.

October 27 – Federal Law 392 “On Amendments to Articles 458 and 459 of the Criminal Procedure Code of the Russian Federation.” The procedure for sending criminal case materials abroad and executing foreign requests has been revised. If procedural actions involving a suspect or accused are impossible during pre-trial or trial proceedings due to their location abroad, the criminal case materials are transferred to the Prosecutor General’s Office of the Russian Federation, which, if grounds exist, applies to the competent authorities of a foreign state with a request for criminal prosecution. Thus, the possibility of sending criminal case materials for criminal prosecution abroad will no longer depend on the citizenship of suspects and accused persons, the stage of criminal proceedings, or the location of the crime falling under Russian jurisdiction. The mechanism for executing requests for criminal prosecution or initiation of a criminal case in Russia has been similarly changed.

November 4 – Federal Law 404 “On Amendments to the Code of the Russian Federation on Administrative Offenses”. Introduces administrative liability for failure to comply with a decision of the interdepartmental body ensuring coordination of the activities of federal executive authorities, executive authorities of constituent entities of the Russian Federation, and local self-government bodies in countering extremist activity and implementing state policy in the field of countering extremism.

November 5 – Decree of the President of the Russian Federation 818 “On Amendments to Decree of the President of the Russian Federation 554 of June 28, 2024, ‘On Monthly Compensation Payments to Certain Categories of Military Servicemen Performing Military Service under Contract’”. Contract servicemen participating in the SMO who previously received a pension for long service are entitled to an additional payment equal to 100% of their pension. This compensation now also applies to servicemen repelling an invasion on the state border, as well as in regions adjacent to the zones of the special military operation.

November 17 – Federal Law 420 “On Amendments to the Criminal Code of the Russian Federation”. It was decided to prosecute from the age of 14, inter alia, for facilitating terrorist activity, organizing a terrorist community and participating in it, sabotage, facilitating sabotage activity, undergoing training for sabotage purposes, organizing a sabotage community and participating in it. The list of cases where a suspended sentence is impossible has been expanded. Statutes of limitations for all sabotage-related crimes have been abolished.

November 28 – Federal Law 439 “On Amendments to Certain Legislative Acts of the Russian Federation”. Provides for the granting of state social assistance on the basis of a social contract to combat veterans who took part in the SMO and some other categories of combat veterans, in order to stimulate their active steps to engage in individual entrepreneurial activity.

December 15 – Federal Law 490 “On Amendments to Article 68 of the Federal Law ‘On Education in the Russian Federation’”. SMO participants, after receiving secondary vocational education, have the right to receive secondary vocational education again in another profession or specialty at the expense of budgetary allocations from the federal budget, budgets of constituent entities of the Russian Federation, and local budgets.

⁴⁷ The insert is a continuation of the monitoring of the most important regulatory legal acts signed by the President of the Russian Federation, which has been conducted since June 2022 (the first issue of monitoring is presented 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.

MEASURES FOR INFORMATION SECURITY, REGULATION OF FOREIGN AGENTS' ACTIVITIES, AND EDUCATION/UPBRINGING OF YOUNGER GENERATIONS

October 27 – Federal Law 385 “On Amendments to Article 4 of the Federal Law ‘On Countering Extremist Activity’”. Decisions of the Interdepartmental Commission on Countering Extremism become mandatory for execution by federal, regional, and municipal authorities.

November 4 – Decree of the President of the Russian Federation 798 “On the Day of the Languages of the Peoples of the Russian Federation.” To preserve and support the languages of the peoples of the Russian Federation, the Day of the Languages of the Peoples of the Russian Federation is established (September 8).

November 4 – Decree of the President of the Russian Federation 799 “On the Day of the Indigenous Small-Numbered Peoples of the Russian Federation.” To preserve the traditional way of life, economic activities, crafts, and unique culture of the indigenous small-numbered peoples of the Russian Federation, the Day of the Indigenous Small-Numbered Peoples of the Russian Federation is established (April 30).

November 17 – Federal Law 422 “On Amendments to the Federal Law ‘On Objects of Cultural Heritage (Historical and Cultural Monuments) of the Peoples of the Russian Federation’.” Amendments have been introduced regarding the preservation and integration of cultural heritage sites into economic circulation. Information about them will be included in the unified housing construction information system (type of cultural heritage object, its protected attributes, location, registration and cadastral numbers, category of historical and cultural significance, information about the owner's preservation obligation, the object's condition, etc.). The procedure for placing this data in the system is defined. It will be disclosed on a website designated by the Government.

November 25 – Decree of the President of the Russian Federation 858 “On the Strategy of the State National Policy of the Russian Federation for the Period until 2036.” For the first time, the Strategy introduces specific performance indicators. By 2036, the level of all-Russian civic identity should be no less than 95%, the share of Russians positively assessing relations between representatives of various nationalities – no less than 85%, and those noting the absence of discrimination against themselves on national or linguistic grounds – no less than 90%. The results of implementing the Strategy should be the cohesion of the people, strengthening the status of the Russian language, and a reduction in the number of conflicts.

November 28 – Federal Law 441 “On Amendments to the Federal Law ‘On Education in the Russian Federation’.” Starting January 1, 2026, ninth-graders who have not passed the State Final Attestation (GIA) will be able, while preparing for a retake, to simultaneously receive free training in vocational programs for workers and employees. The list of relevant professions and organizations where such training can be completed will be determined by the regions.

December 8 – Decree of the President of the Russian Federation 901 “On the Establishment of the International Fund ‘International Projects of the Presidential Grants Fund’.” The Fund's goals are to develop and implement programs and projects in the field of social development (including assistance to persons in need), healthcare, culture, art, science, education, enlightenment, preservation of historical memory, physical culture, sports, tourism, ecology, development of non-profit organizations, charity, and volunteerism on the territories of foreign states, as well as comprehensive support, monitoring, and evaluation of the results of such programs and projects; participation in the development and implementation of international programs and projects, and in international cooperation in humanitarian, environmental, cultural, and other areas based on decisions of the President of the Russian Federation.

December 15 – Federal Law 462 “On Amendments to the Federal Law ‘On Countering the Legalization (Laundering) of Proceeds from Crime and the Financing of Terrorism’ and Articles 41 and 51 of the Federal Law ‘On Special Economic Measures and Forcible Measures’.” Individuals for whom there is information about involvement in extremism, terrorism, or sabotage will be required to coordinate financial transactions with Rosfinmonitoring (the Federal Financial Monitoring Service). Not only the salaries of these individuals will come under control but also other incomes to be determined by the Government. Banks will be required to block transactions of individuals who are wanted and included in the list of terrorists and extremists.

MEASURES FOR SOCIO-ECONOMIC SUPPORT OF BROAD SEGMENTS OF THE POPULATION, STRENGTHENING THE COUNTRY'S ECONOMY, INCLUDING ON THE INTERNATIONAL ARENA

November 28 – Federal Law 429 “On Amending Article 1 of the Federal Law ‘On the Minimum Wage’.” Starting January 1, 2026, the minimum wage will increase by 20.7% to reach 27,093 rubles.

November 28 – Federal Law 432 “On Amendments to the Budget Code of the Russian Federation and Certain Legislative Acts of the Russian Federation.” Starting January 1, 2026, 100% of revenues from the gambling tax will be allocated to the federal budget instead of regional budgets. The base price for oil will be gradually reduced from 2026 by \$1 per barrel by 2030, with subsequent annual indexation of 2% starting in 2031. Revenues from the technological levy will be directed to support and finance initiatives in the electronic and radio-electronic industry.

November 28 – Federal Law 435 “On Granting Social Guarantees to Women Awarded the Title ‘Mother-Heroine’.” Women awarded the title “Mother-Heroine” (after 2022) are granted the rights and benefits established for Heroes of Socialist Labor and Heroes of Labor of the Russian Federation.

November 28 – Federal Law 443 “On Amendments to Articles 1 and 2 of the Federal Law ‘On Additional Monthly Material Support for Citizens of the Russian Federation for Outstanding Achievements and Special Merits to the Russian Federation’ and the Federal Law ‘On Insurance Pensions’.” Women awarded the title “Mother-Heroine” (after 2022) are granted the right to receive additional material support provided for by the Federal Law “On Additional Monthly Material Support...” for Heroes of Socialist Labor and Heroes of Labor of the Russian Federation. Furthermore, amendments are made to the Federal Law “On Insurance Pensions,” removing limitations when calculating periods of childcare up to the age of one and a half years for inclusion in the insurance record for pension eligibility.

December 8 – Decree of the President of the Russian Federation 896 “On the Strategy for the Development of Healthcare in the Russian Federation for the Period until 2030.” It provides for the development of medical rehabilitation for persons with disabilities, including SMO participants; ensuring independence in the production of domestic high-tech medicines; full integration of healthcare systems in new regions with the country's national healthcare system; and the development of clinical decision support systems using artificial intelligence.

- ✓ The share of citizens leading a healthy lifestyle should increase to 13.6%;
- ✓ Alcohol consumption should decrease to 7.8 liters of ethanol per capita per year;
- ✓ The share of medicines produced in Russia in the total volume of vital and essential drugs will increase to 90%;
- ✓ The level of technological independence in healthcare should reach 80%;
- ✓ The staffing level of doctors in institutions providing free medical care will be 43.46 per 10,000 population.

Nevertheless, in 2025 (just as in the IS RAS expert survey conducted 10 years ago, in 2015), the question arises: **how realistic is this desired future image?** It is important to note that the conclusions reached by IS RAS experts in 2015 remain quite valid today:

- ✓ “the only actors in Russia are the President and his inner circle”;
- ✓ “there are no other serious subjects capable of influencing the future”;
- ✓ there is a “high probability” of the continuation of processes assessed by experts as “undesirable for the country”;
- ✓ “the most likely scenario for the development of Russian society is a pessimistic (negative) one – but with the preservation of the dominant role of the state”⁴⁸.

A. Dugin: “In essence, **it is he [V. Putin] who is the main load-bearing structure of our entire state-civilization.** A significant part of the elites clearly lags behind the President, his will, and instructions. Even those representatives of power completely loyal to Putin and oriented towards Victory often turn out to be incompetent and unsuitable for this activity. And that is why the head of state turned to the necessity of recruiting a new elite from SMO participants... **That is, the unhurried, unawakened, internally unmobilized old elites are now letting our President down**”⁴⁹.

“In the summer of 2022, after the start of the SMO, we outlined new forks:

- 1) Continuation of the inertial model of Russia’s adaptation to the world economy as a raw material semi-periphery... Result – stagnation and sliding into a protracted crisis for many years.
- 2) Support for costly mega-infrastructure projects, increased etatization of the economy, elimination of private initiative, price regulation, increasing closure from the external world. Result – sliding into a pseudo-USSR with all the ‘charms’ of an inflexible planned economy.
- 3) A model of stimulating economic growth through realizing the potential of both internal and external development drivers. The main feature – orientation towards rapid economic growth rates.

Today it can be stated that a combination of the first and second options was chosen – an inertial scenario of economic development with a parallel strengthening of the trend towards etatization and economic isolation”⁵⁰.

Why do these sociologists’ conclusions remain relevant? Because **there is still no answer to the question “What kind of state are we building, and what have we built up to the present moment?” – neither from the state itself nor, consequently, from the broader population.**

Many experts point to the emergence of a “*dangerous vacuum*” in the country. As S.A. Karaganov notes, “the ruling stratum of the state is dominated by economist-technocrats”, who are “*incapable of leading the country and the people to new horizons*”. It is therefore no coincidence, as RAS Corresponding Member Zh.T. Toshchenko emphasizes, that many Russians “*still do not understand what kind of state, what kind of society they are building*”.

⁴⁸ Gorshkov M.K. et al. (2016). Russian Society and the Challenges of Time. Book Four. Moscow: Ves’ Mir. P. 346.

⁴⁹ Dugin A.G. Where the elites are pulling Putin. Available at: https://tsargrad.tv/articles/dugin-molchat-ne-stal-i-raskryl-karty-kuda-jelity-tjanut-putina_1057108?ysclid=mjbbpe421361535526

⁵⁰ Politburo 2.0 Report. The Besieged Fortress. An Analytical Review of the State of Russian Elites. Official Website of “Minchenko Consulting”. 25.11.2025. Available at: https://minchenko.ru/analitika/analitika_139.html

S.A. Karaganov: “A dangerous vacuum has now formed... today, facing a new major challenge, we feel the need to comprehend our place in the world and, most importantly, to comprehend who we are and what is valuable to us.

In the speeches of the President, in the statements of the Minister of Foreign Affairs, in the latest Foreign Policy Concept of Russia, many ideas have increasingly begun to sound which, it seems, could form the basis of Russia’s ideological platform, its society and true elite, returning the country to its roots while powerfully propelling it towards a triumphant future. **But a more or less clear outline, let alone one approved at the state level and purposefully, yet naturally creatively (through discussions and probable adjustments) offered to broad circles of the elite and introduced into public consciousness, does not yet exist...**

In the ruling stratum of the state, economist-technocrats, ‘political technologists’ still predominate. They are useful for current management, they do much that is needed, **but they are incapable of leading the country and people to new horizons, ensuring deep, ideological unity of the people and the government in the difficult, fateful struggle into which the country and the world have entered**”⁵¹.

Zh.T. Toschenko: “**To this day, it is not clear to many Russians what kind of state, what kind of society they are building.** The social state proclaimed in the Constitution of the Russian Federation, whose policy is aimed at creating conditions ensuring a dignified life and free development of the individual (Article 7.1), denotes a certain general guideline which has not been sufficiently specified for understanding and embodiment in current socio-economic, socio-political, and everyday life”⁵².

Furthermore, data from monitoring sociological studies by Vologda Scientific Center of the RAS (VolRC RAS) show that even with the obvious “preponderance” of socialism (34%) over capitalism (19%) in people’s ideas about Russia’s desired future, the most common answer to the question “In what kind of society would you like to live?” is “**in some other, difficult to answer**” (46%; Tab. 4).

This answer option predominates across all major socio-demographic categories of the population – among men and women (46–47%), among representatives of different age groups (from 43 to 53%, especially among those under 30), among people with different income levels

(40–48%) and levels of education (44–48%), living both in cities (37–49%) and in rural areas (50%; Tab. 4).

The cited expert assessments and sociological survey data directly indicate that Russia’s desired (socialist and sovereign) future appears weakly attainable to its citizens; as it was 10 years ago, it remains “in a fog”. Recall that the proportion of people uncertain about the future, although declining in recent years (from 56% in 2023 to 51% in 2025), **still constitutes more than half of citizens.** According to survey data, **they state that they “face the problem of uncertainty about the future”** (since 2021, their share has been 51–57%; in 2015 it was 55%; Fig. 2).

⁵¹ Karaganov S. (2025). The Living Dream-Idea of Russia, The Code of the Russian in the 21st Century: A Report within the Project “The Russian Dream-Idea and the Code of the Russian in the 21st Century” under the Auspices of the Council on Foreign and Defense Policy and the Faculty of World Economy and International Affairs of the National Research University “Higher School of Economics”. July 2025. P. 17.

⁵² Toshchenko Zh.T. (2025). The Fates of the Social Contract in Russia: Evolution of Ideas and Implementation Lessons: Monograph. Moscow: FCTAS RAS.

Table 4. What kind of society would you like to live in?, % of respondents

Indicator	In a socialist one	In a capitalist one	In some other; difficult to answer
Gender			
Male	34.4	19.5	46.1
Female	34.2	19.2	46.6
Age			
under 30	29.2	17.7	53.1
30-55	33.8	18.9	47.4
over 55	36.7	20.5	42.8
Education			
Secondary and incomplete secondary	33.1	20.1	46.8
Secondary vocational	34.8	17.4	47.9
Higher and incomplete higher	34.9	20.8	44.2
Income groups			
Bottom 20%	33.0	18.7	48.3
Middle 60%	34.9	19.0	46.1
Top 20%	38.5	22.0	39.6
Territories			
Vologda	34.1	17.4	48.6
Cherepovets	40.2	22.7	37.1
Districts	31.0	18.5	50.4
Region	34.3	19.3	46.4

Source: data from VolRC RAS.

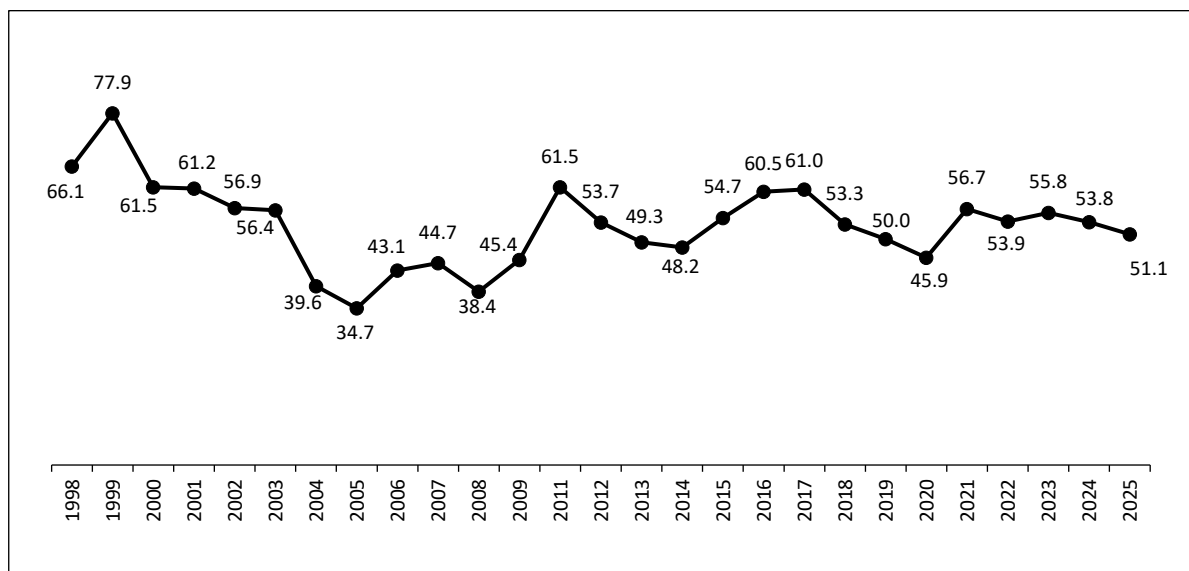


Figure 2. Share of people facing the problem of a lack of confidence in the future*, % of respondents

*The question is asked once a year, in February. Wording: "Which of the following problems did you personally encounter last year?" Answer option: "Lack of confidence in the future." Data dynamics for the entire measurement period are presented. The question was not asked in February 2010.

Source: VolRC RAS data.

The reason lies precisely in what we discussed at the beginning of the article: today, in the President's role as "Creator", two temporal lines converge simultaneously – the line of Russia's entire historical development path in the 21st century and the line of the last four years of the new path Russia began in February 2022. **Therefore, the realism of achieving Russia's desired future image upon "exiting" the SMO (or, more broadly – the civilizational conflict with the West) directly depends on a historical assessment and acknowledgment of the country's own accumulated mistakes throughout the entire post-Soviet period.** As A. Dugin writes, *"We will not be able to win in Ukraine if we do not defeat the 1990s within ourselves, if we do not put on trial that historical reality, those mistakes and those crimes that we ourselves committed by destroying a great power"*⁵³.

And first and foremost, the state itself must do this. Because (as V.V. Putin himself noted in his first programmatic article, "Russia at the Turn of the Millennium") "in our country, the state, its institutions and structures *have always played an exceptionally important role in the life of the country and the people*. For a Russian, a strong state is not an anomaly, not something to be fought against, but on the contrary, *the source and guarantor of order, the initiator and main driving force of any change*"⁵⁴.

Nevertheless, the necessary historical assessment of the past (which includes not only public acknowledgment of mistakes but also "corrective

work" and the adoption of appropriate management decisions) has still not been carried out. And, apparently, will not be implemented, at least until the SMO is concluded, until an agreement is reached between Russia and the NATO bloc that ensures our country the possibility of peaceful, long-term, sovereign development.

Over the past 25 years (since the beginning of V.V. Putin's first presidential term), Russia has still not adopted an official state ideology. This has de facto meant one thing: *"a prohibition on revising the ideological postulates of liberalism"*; the establishment of a latent ideology that ignores Russian traditional values and morality and is based on the recognition of *consumerism and money as leading values in people's lives..., an understanding of profit as the only driving force of social development*"⁵⁵.

"Our national idea should not be directed against anyone, most often this 'anyone' being the West. Anti-Westernism is a sign of dependence on it, of limited intellectual sovereignty. It, like all social thought and social sciences, must be emphatically sovereign. Not negating, but incorporating the intellectual achievements of all civilizations. After all, Russia is a true civilization of civilizations»⁵⁶.

One of the reasons for this (as noted, for example, by S.A. Karaganov) is "the current unreadiness of the country's leader (and in Russia, much depends on him) to abandon the illusions of the past – the 1980s–1990s"⁵⁷.

⁵³ Dugin A. The key to Victory lies in the 1990s. Available at: https://zavtra.ru/blogs/klyuch_k_pobede_v_svo_vezhit_v_1990-h_kapitulyatsii_ukraini_budet_nedostatochno

⁵⁴ Putin V. Russia at the turn of the millennium. Available at: https://www.ng.ru/politics/1999-12-30/4_millennium.html?ysclid=mj70po83ih132547491

⁵⁵ Radikov I.V. (2019). The search for ideological landmarks in post-Soviet Russia. Vestnik Moskovskogo gosudarstvennogo lingvisticheskogo universiteta. Obshchestvennye nauki, 1(834), 54–75.

⁵⁶ Karaganov S. (2025). The Living Dream-Idea of Russia, The Code of the Russian in the 21st Century: A Report within the Project "The Russian Dream-Idea and the Code of the Russian in the 21st Century" under the Auspices of the Council on Foreign and Defense Policy and the Faculty of World Economy and International Affairs of the National Research University "Higher School of Economics". July 2025. P. 14.

⁵⁷ Ibidem. P. 16.

In previous articles⁵⁸, we have cited expert opinions confirming the view that “large and great countries are not built without big, forward-leading ideas, and having lost them, they collapse with a thunderous crash”⁵⁹. We have not only cited expert assessments but also corroborated them with real “numbers” – sociological research data demonstrating a decline in the creative, intellectual, and moral-ethical potential of Russian society in the absence of an official state ideology, or more precisely – under the influence of the “latent” ideology of liberalism (some specific empirical data are presented in *Insert 5*⁶⁰).

Perhaps it is also appropriate here to mention an important observation recently voiced by N. Mikhalkov in his program “Besogon TV”. The regularly introduced measures of a “prohibitive-protective” character by the State Duma (aimed at regulating the functionality of the state mechanism in the spheres of migration, culture, etc.) indicate not only that the authorities are concerned with this issue.

N. Mikhalkov's reaction to the draft law “On Amending the Law on the State Emblem of the Russian Federation” dated November 20, 2025 (the bill aims to prevent distortion of the state emblem of the Russian Federation):

“How strange, is it really necessary to legislatively enshrine such a simple thing – respect, preservation of the images of the country's state symbols. Surely this is an absolutely natural thing that should not require anything but real, sober understanding?!”

Well, okay, for some reasons there is a need to introduce such a law... ***and who could be against it? And this is precisely where the most interesting part arises.*** Instead of this law being simply adopted immediately in the 1st, 2nd, and 3rd readings, these familiar laments about ‘delicacy,’ ‘sensitivity,’ ‘possible infringement of religious feelings’ began to be heard... Who is saying this? ***And is it not clear to us that a state's symbols change only when that state is enslaved by another state, with different symbols. And enslavement by other countries, this is not necessarily military action, bombing, tank attacks... no, it can happen from within, covertly, almost imperceptibly?”***⁶¹.

⁵⁸ See, for example:

Ilyin V.A., Morev M.V. (2025). What the 30-year absence of a state ideology leads to: “The enemy is not only on the other side of the frontline”. *Economic and Social Changes: Facts, Trends, Forecast*, 18(2), 9–38.

Ilyin V.A., Morev M.V. (2025). “The constitutional ban on state ideology means a ban on revising the ideological tenets of liberalism”: What the 30-year absence of a state ideology leads to. *Economic and Social Changes: Facts, Trends, Forecast*, 18(3), 9–39.

Ilyin V.A., Morev M.V. (2025). What a 30-year absence of state ideology leads to: “Great nations are not built without great, guiding ideas, and having lost them, they collapse with a thunderous crash”. *Economic and Social Changes: Facts, Trends, Forecast*, 18(4), 9–45.

⁵⁹ Karaganov S. (2025). The Living Dream-Idea of Russia, The Code of the Russian in the 21st Century: A Report within the Project “The Russian Dream-Idea and the Code of the Russian in the 21st Century” under the Auspices of the Council on Foreign and Defense Policy and the Faculty of World Economy and International Affairs of the National Research University “Higher School of Economics”. July 2025.

⁶⁰ For more information, see: Ilyin V.A., Morev M.V. (2025). “The constitutional ban on state ideology means a ban on revising the ideological tenets of liberalism”: What the 30-year absence of a state ideology leads to. *Economic and Social Changes: Facts, Trends, Forecast*, 18(3), 9–39.

⁶¹ BesogonTV “Who Wants to Be Holier Than the Pope?” Episode from 05.12.2025. Available at: <https://besogontv.ru/?ysclid=mj77xyei9523577182>

For reference: On December 9, 2025, a bill mandating the depiction of crosses atop the scepter and orb in the description of the state coat of arms of the Russian Federation was adopted by the State Duma in its first reading. The bill's authors were 412 deputies headed by Parliament Speaker V. Volodin, who expressed confidence in the need to “do everything to prevent distortion of our statehood symbols” (source: Kondratyev A. Deputies halted the ‘cross-fall’: The State Duma specified the image of Russia's coat of arms). Available at: <https://www.gazeta.ru/politics/2025/12/09/22155571.shtml?ysclid=mj4e1e6p2z885796718>

Some trends in public opinion reflecting the dynamics of society's development in the absence of an official state ideology in the country⁶²

Population group	%			People		
	Average annual data		Dynamics, 2018–2024 to 1996–1999	Average annual data		Dynamics, 2018–2024 to 1996–1999
	1996– 1999	2018– 2024		1996– 1999	2018– 2024	
1. Dynamics of self-assessments reflecting people's attitudes toward Knowledge and Education						
the proportion of people who believe that it is important to “have a good education”	86.7	64.4	-22	1301	966	-335
the proportion of people who agree that “one should make full use of one’s learning abilities”	86.7	67.0	-20	1301	1005	-296
the proportion of people who are interested in the topic of “parenting and education of children”	71.5	59.0	-13	1073	885	-188
the proportion of people who are interested in the topic of “morality, morals, rules of human behavior in society”	67.8	55.5	-12	1017	833	-185
the proportion of people those who are interested in “the life of society, the state; history”	74.5	62.8	-12	1118	942	-176
the proportion of people who believe that “knowledge beautifies a person’s life, makes them happier”	77.1	67.6	-10	1157	1014	-143
2. Dynamics of self-assessments reflecting people’s attitude toward Creativity						
the proportion of people who believe that the process of creating new things brings joy in everyday life	63.2	38.2	-25	948	573	-375
the proportion of people who believe that “creativity must be fully realized”	80.9	63.2	-18	1214	948	-266
the proportion of people who are positive about being the author of the results of creative work	63.8	49.5	-14	957	743	-215
the proportion of people who believe that “creativity beautifies a person’s life, makes them happier”	75.0	63.0	-12	1125	945	-180
the proportion of people, who believe that a creative person causes distrust of others	14.7	20.3	+6	221	305	+84
the proportion of people who believe that “a creative person limits their own life, loses a lot”	20.5	23.1	+3	308	347	+39
3. Dynamics of self-assessments reflecting people’s attitudes toward the norms of morality						
the proportion of people who feel remorse in the case of an “unfulfilled promise”	73.9	58.2	-16	1109	873	-236
the proportion of people who feel remorse in the case of an “insult or rudeness”	81.6	65.8	-16	1224	987	-237
the proportion of people who feel remorse in the case of an “unfair act”	72.8	60.5	-12	1092	908	-185
the proportion of people for whom “mutual assistance and mutual assistance”	86.2	78.0	-8	1293	1170	-123
are important the proportion of people for whom “responsiveness to other people”	84.0	76.0	-8	1260	1140	-120
the proportion of people for whom “decency” is important	90.6	84.6	-6	1359	1269	-90

⁶² Source: Data from the VoISC RAS. Changes are shown for the period from 1996–1999 (B. Yeltsin's last presidential term) to 2018–2024 (V. Putin's fourth presidential term). More detailed data are presented in the article: Ilyin V.A., Morev M.V. (2025). "The constitutional ban on state ideology means a ban on revising the ideological tenets of liberalism": What the 30-year absence of a state ideology leads to. Economic and Social Changes: Facts, Trends, Forecast, 18(3), 9–39.

If harsh restrictions “from above” are required to minimize the opportunities for foreign agents, representatives of the state administration system parasitizing on the migrant issue, representatives of show business transmitting spiritual and moral values and a lifestyle contrary to the national development course to the broad population, etc., **it means that in Russian society, “those layers that would like to continue the sweet-for-them but ruinous-for-the-country-and-people 1990s** are still present and resisting – when ‘cash conquered evil,’ personal enrichment was considered the main goal in life, and the ideology of mass theft and plunder of the country reigned instead of the ideology of serving the people and the State⁶³; therefore, society *acutely needs “for all of us, from the President to the farmer, worker, engineer, officer, scientist, entrepreneur, civil servant, to understand what we want to be and what we want our country to be”*⁶⁴.

In other words, Russian society (effectively an entire generation that grew up in a country without its own, sovereign national ideology) finds itself in a state where **the state must legislate from above the most basic, utterly natural things, which (as N. Mikhalkov says) in reality “should not require anything but real, sober understanding”...**

By and large, over the past 25 years, the principle of oligarchic capitalism has not disappeared anywhere, as evidenced by **the entire financial system built in the country: from national accounts and the activities of the Central Bank (Insert 6) to the capital circulating within the marketplace systems that Russian citizens encounter practically every day in their daily lives.** The sums are enormous, but they

circulate through financial channels so concealed that even experts can only make approximate calculations.

*“That oligarchic capitalism has been established in Russia today is not disputed by anyone. Oligarchic capitalism is a socio-economic model of societal and state development based on the total control of the production of goods and services by **private owners** of the means of production, on legalized exploitation, i.e., the unfair appropriation of practically all the results of hired labor. Policy in all spheres of life is aimed **at obtaining super-profits in the shortest period, even to the detriment of national security.** Control over the financial and monetary systems is exercised by **a narrow circle of individuals.** Merging occurs, including through the development of kinship relations, of **the financial-industrial elite (oligarchy) with representatives of state power.** The state begins to serve **not society, but oligarch-billionaires...***

One might only add that capitalism in Russia is not simply oligarchic. Such is capitalism today in the USA, Europe, Canada, and other so-called ‘developed countries.’ In Russia, it is an oligarchic capitalism of a dependent, or comprador, type. **That is, Russian oligarchs are under external management. And if so, the entire Russian Federation finds itself under external management. No signs of national sovereignty are visible, despite the loud declarations by officials about its restoration after February 24 of last year”**⁶⁵.

⁶³ Karaganov S. (2025). The Living Dream-Idea of Russia, The Code of the Russian in the 21st Century: A Report within the Project “The Russian Dream-Idea and the Code of the Russian in the 21st Century” under the Auspices of the Council on Foreign and Defense Policy and the Faculty of World Economy and International Affairs of the National Research University “Higher School of Economics”. July 2025. P. 13.

⁶⁴ Ibidem.

⁶⁵ Katasonov V. “‘Oligarchic collectivism’ from the novel ‘1984’ and today’s world”. Available at: <https://reosh.ru/valentin-katasonov-oligarxicheskij-kollektivizm-iz-romana-1984-i-segodnyashnij-mir.html?ysclid=mj14kbi85w899643298>

Even with such an approximate examination of the financial system, some experts conclude that **the policy of the Central Bank, for example, “contradicts what is written in the Constitution”** (*Insert 6*), while marketplaces **operate to the detriment of the state, “underpaying taxes by 1.5 trillion rubles”**, and do not legally formalize their employees, thereby contributing to the development of “shadow” employment and the growth of the precariat – a stratum of people who are “alienated from labor and from society”, meaning they “**lack confidence in their necessity to**

their country, their state, their society; they are not only limited but often deprived of the right to claim employment in their own or a related profession, social security, or hope for a guaranteed future for their family and loved ones”⁶⁶.

We should also note that the critical assessments by experts regarding the Bank of Russia and the management of the country’s economy presented in *Insert 6* did not appear in recent years or in connection with the start of the special military operation, but much earlier. **In fact, they were voiced as early as the beginning of the 2000s.**

1. V. Katasonov: “Take, for example, the current policy of the Central Bank. It is called inflation targeting. The guys have really gotten too brazen! **They don’t even bother to translate into Russian what they receive from Washington**, from the International Monetary Fund. **I’m not even mentioning that inflation targeting contradicts what is written in the Constitution of Russia”**⁶⁷.

“If, on the eve of the SMO, all that currency which was stolen in late February 2022 [referring to the freezing of Russian currency reserves by the EU and G7 countries] had been used to purchase precious metal, **Russia’s gold reserve would have increased by almost 5,000 tons of gold.** And if, on top of that, the Bank of Russia had been purchasing all the gold mined in the country in recent years, **the total amount of the Russian Federation’s gold reserve would have approached 8,000 tons. We could have become the world’s No. 1 gold power**”⁶⁸.

2. On November 18, 2025, at the Bank of Russia conference “Focus on the Client,” G. Gref stated that “marketplaces this year **underpaid taxes by 1.5 trillion rubles.** That is, all those discounts they give are at our expense. And I don’t feel the slightest bit sorry for physical retail networks, but it is unpleasant to me when marketplaces illegitimately take market share from physical networks **due to non-market competitive conditions created by the state**”⁶⁹.

3. S. Anureev: “Order pickup points [of marketplaces] mostly belong to individual entrepreneurs working under a simplified taxation system. **In 90% of pickup points, employees are not formally registered because if people are officially registered and all 47% of taxes are paid for them [13% personal income tax, 30% social contributions], the activity of 80% of pickup points would become unprofitable, and they would close...** Business media cite the number of pickup points for ‘Ozon’ as up to 75,000, for ‘Wildberries’ – up to 87,000. The total number of people working at pickup points would be 326,000, and their total annual wage bill – 258 billion rubles. **The individual entrepreneur-owners simply withdraw cash as their own income, paying 6% tax instead of the aforementioned 47%, thus underpaying wage taxes by 106 billion rubles per year**”⁷⁰.

⁶⁶ Toshchenko Zh.T. (2018). The Precariat: From a Proto-Class to a New Class: Monograph. Moscow: Nauka. P. 253.

⁶⁷ Valentin Katasonov on the Central Bank’s actions: “The guys have really gotten too brazen”: Interview for “Tsargrad” publication. 30.11.2025. Available at: <https://reosh.ru/valentin-katasonov-o-dejstviyax-cb-rebyata-sovsem-uzhe-obnagleli.html?ysclid=mj0005afk5541099434>

⁶⁸ Katasonov V. Once again on Russia’s international reserves. Available at: https://zavtra.ru/blogs/eshe_raz_o_mezhdunarodnih_rezervah_rossii_kommentarij_k_tcifram_ria_novosti_kak_informatciya_dlya_razmishleniya

⁶⁹ Marketplaces underpaid 1.5 trillion rubles in taxes due to discounts. Available at: <https://tass.ru/ekonomika/25653461>

⁷⁰ Anureev S. Gref is right about marketplaces and 1.5 trillion rubles in taxes. Available at: https://zavtra.ru/blogs/gref_prav_naschyot_marketplejsov_i_15_trln_rub_nalogov

For example:

Delyagin M.G. Can the new Russian authoritarianism become effective? *Mir Rossii*. 2000. No. 1. P. 114–138.

Polterovich V.M. The root of problems – state inefficiency. *Ekonomicheskaya Nauka Sovremennoy Rossii*. 2000. No. 1 (5). P. 41–44.

Glazyev S.Yu. The choice rests with the country's president. *Nezavisimaya Gazeta*. 28.04.2001. Available at: https://nvo.ng.ru/economics/2001-04-28/4_glazyev.html?ysclid=mj8krvc5x4487860748

Glazyev S.Yu. No need to wait for favors from the authorities. *Zavtra*. 13.05.2002. Available at: <https://zavtra.ru/blogs/2002-05-1421>

Lvov D.S. What kind of economy does Russia need? *Ekonomicheskkiye i Sotsial'nyye Peremeny v Regione*. 2003. Issue 20. P. 3–15.

Delyagin M.G. Rehearsal for a catastrophe. *Zavtra*. 21.07.2004. Available at: <https://zavtra.ru/blogs/2004-07-2132>

Glazyev S.Yu. We have never had such a destructive government (interview with the newspaper 'Izvestia'). *Izvestia*. 14.12.2004. Available at: <https://iz.ru/news/297574>

Under these conditions, seemingly unexpected facts uncovered by the Accounts Chamber of the Russian Federation and alarming expert forecasts regarding the present and future of the Russian economy become quite explainable: **“Russian authorities with one hand raise the profit tax, and with the other – suppress economic activity in the country.** And these contradictory actions, naturally, do not ensure a proportional growth in federal budget revenues. The general deterioration of economic prospects for 2026 suggests that federal budget revenues from profit tax are more likely to decrease”⁷¹.

Furthermore, representatives of government bodies at all levels (federal, regional, municipal) continue to become subjects of criminal cases on a daily basis. Over 2024–2025 (during which we have been monitoring arrests and detentions of representatives of the ruling elites), one can speak of **more than 90 such cases**. And this – only according to open sources of information (the latest data, for October 25 – December 18, 2025, are presented in *Insert 7*).

“The Accounts Chamber presented **sensational** results on the collection of profit tax, the rate of which for the federal budget was increased this year from 3% to 8%. **Accounting for inflation, profit tax revenues to the treasury, all else being equal, should have increased almost threefold. But in fact, the nominal increase in federal budget revenues turned out to be around 75%.** This conditional shortfall is explained by a growing number of loss-making companies and a general reduction in the total profit of enterprises...”

Besides surprises with the profit tax, the SP auditors discovered **a rapid growth of the state debt, which increased by almost 10% in one year**. Such rapid growth of the state debt worries many economists... Expenditures on servicing the Russian Federation's state debt amounted to 2.3 trillion rubles.

The rapid increase in budget expenditures for servicing the state debt is explained by the Central Bank's high key rate, but the possibility for the Accounts Chamber to verify the economic rationale of the Central Bank's key rate is not directly enshrined in Russian legislation”⁷².

⁷¹ Ibidem.

⁷² Sergeev M. The Accounts Chamber showed the other side of the 2025 budget. Available at: https://www.ng.ru/economics/2025-12-09/4_9397_budget.html?ysclid=mj1793snmz601548006

Insert 6

Experts on the activities of the Bank of Russia

S. Yu. Glazyev (scientist, economist, politician; since April 17, 2025 – State Secretary of the Union State of Russia and Belarus)	<i>“Contemporary Russia’s monetary policy, based on a high key rate, essentially blocks economic development, creating a vicious cycle of stagnation. Commercial banks, instead of lending to the real sector, prefer to deposit funds with the Central Bank, receiving stable, risk-free income. However, the root of the problem lies deeper: the Central Bank, contrary to its mission to create and distribute money to stimulate the economy, is essentially draining liquidity, accumulating losses. This is a paradox: the institution that creates money itself becomes loss-making...”</i> <i>Such a model of the banking system not only hinders economic development but also contributes to wealth concentration, reduced competitiveness, and the gradual degradation of the manufacturing sector. A solution could be tightening control over banking activities: they should report on the share of investments in the real economy rather than chasing speculative income. However, as long as the model remains unchanged, banks transform from creditors into the main players in the field of property redistribution, exacerbating socio-economic disparities”⁷³.</i>
A. M. Babakov (political figure, entrepreneur. Deputy Chairman of the State Duma of the VIII convocation)	<i>“I believe that at this point, we still need to ensure that the state exercises real management over the financial sector. Either the financial system manages the state, or the state manages the financial system. Banks should not be mere analogs of commercial enterprises; they should be institutions of development and report on outcomes, including improvements in quality of life and other criteria, not just on the amount of profit they generate”⁷⁴.</i>
M. G. Delyagin (economist, politician, publicist, deputy of the State Duma of the Russian Federation)	<i>“The Russian banking system is today the largest, institutionally recognized speculator. Essentially, the entire liberal segment of state administration works in its interests, consciously or unconsciously facilitating the siphoning of resources from the real economy into the banking sphere. As a result, despite sanctions, depressions, and wars, the profits of the largest banks are only growing: according to O. Deripaska’s forecasts, by the end of 2025, the banking sector will post up to 4.5 trillion rubles in profit ⁷⁵ – a phenomenal result, exceeding the 2022 figures by 22 times...”</i> <i>Bank of Russia Head E. Nabiullina promotes the idea of structural adjustment, emphasizing the need to get rid of ‘inefficient’ enterprises. At first glance, the reasoning seems sound – why support loss-makers? But if one analyzes the very structure of profitability, it becomes clear: this slogan hides a desire to squeeze out the entire real sector. After all, most of the ‘inefficient’ are precisely the knowledge-intensive, manufacturing, technological companies that ensure the country’s strategic security...”</i>

⁷³ Sergei Glazyev on the Central Bank’s key rate and real estate. Available at: <https://smarent.com/tpost/jzyje1rka1-sergei-glazev-pro-stavku-tsb-i-nedvizhim?ysclid=mj025ng0t5809690879>

⁷⁴ “Sunday Evening with V. Solovyov”. 25.05.2025. Available at: <https://smotrim.ru/article/4517705?ysclid=mj01zv9heg609035726>

⁷⁵ For reference: By the end of 2025, the forecast changed: On December 2, 2025, speaking at the VTB forum “Russia Calling!”, the President of the Russian Federation V. Putin noted that “according to the Bank of Russia’s forecast, by the end of 2025 the banking sector will post a profit of around 3.2–3.5 trillion rubles” (source: Official website of the President of Russia. Available at: <http://kremlin.ru/events/president/news/78631>). On December 10, 2025, some experts pointed out that “the sector’s net profit in 2025 will amount to 3.5–3.6 trillion rubles”. (source: Belikov Yu. Easing will be smooth and cautious. Available at: <https://www.kommersant.ru/doc/827055?ysclid=mjb6kkaso0715062417>)

	<i>All this underscores a fundamental problem: the real economy and national interests become hostages to banking logic, oriented primarily toward quick financial results. Instead of supporting strategic production, banking policy often stimulates the flow of resources into the speculative sphere, and the liberal administrative apparatus facilitates this transit, turning a blind eye to the long-term consequences”⁷⁶.</i>
V.Yu. Katasonov (chairman of the S.F. Sharapov Russian Economic Society, Dr.Sc. (Econ.), Corresponding Member of the Academy of Economic Sciences and Entrepreneurship)	<i>After the start of the special operation, the European Union and G7 countries blocked about half of Russian currency reserves... If, on the eve of the SMO, all that currency which was stolen in late February 2022 had been used to purchase precious metal, Russia's gold reserve would have increased by almost 5,000 tons of gold. And if, on top of that, the Bank of Russia had been purchasing all the gold mined in the country in recent years, the total amount of the Russian Federation's gold reserve would have approached 8,000 tons. We could have become the world's No. 1 gold power...”⁷⁷.</i> <i>“The Bank of Russia, to put it mildly, distorts the statistics of Russia's international reserves. It will soon be four years since the Collective West ‘froze’ a significant portion of Russia's currency reserves..., four years since the Bank of Russia has had no access to the stolen currency reserves. It is more than dubious to include such currency reserves in the composition of the international reserves of the Russian Federation today. Yet the Bank of Russia includes them, and without any reservations... The exact amount of Russian currency reserves stolen in late February is now known – 311 billion dollars... If Russian monetary authorities had acted proactively, we could have a completely different volume of international reserves today... If, on the eve of the SMO, Russia's monetary authorities had converted ‘toxic’ currencies amounting to 311 billion dollars into gold, that gold would now be valued at approximately 718 billion dollars... This figure can be considered the real cost of the damage Russia suffered because the monetary authorities ignored gold. Current record gold holdings in the international reserves are something Russia's monetary authorities tend to credit themselves with. Meanwhile, the current record value of gold merely masks the inaction of the monetary authorities...”</i> <i>As of January 1, 2022, gold in reserves amounted to 74.0 million ounces, or 2,301.66 tons... as of October 1, 2025, the physical volume of gold was 74.9 million ounces (2,329.65 tons). Over the entire period, gold in Russia's reserves increased by only 28 tons! Russia's gold reserve turned out to be almost frozen. On an annual basis, the average increase in gold reserves was a mere 7 tons! While gold production in Russia in recent years has been approximately 330 tons per year”⁷⁸.</i>

⁷⁶ Delyagin M. The banking “diaspora” is destroying the Russian economy. Available at: <https://argumenti.ru/economics/2025/09/966797>

⁷⁷ Katasonov V. Once again on Russia's international reserves. Available at: https://zavtra.ru/blogs/eshe_raz_o_mezhdunarodnih_rezervah_rossii_kommentarij_k_tcifram_ria_novosti_kak_informatciya_dlya_razmishleniya

⁷⁸ Katasonov V. A New gold record in Russia's international reserves, but the Bank of Russia, to put it mildly, distorts statistics. Available at: https://zavtra.ru/blogs/novij_rekord_zolota_v_mezhdunarodnih_rezervah_rf

Facts of detentions and arrests of representatives of the ruling elites (October 25 – December 18, 2025)⁷⁹

December 9 – The former head of Ivanovo was detained on suspicion of abuse of power. According to the investigation, while serving as deputy chairman of the government of the Ivanovo region from 2020 to 2024, the detainee used his official position to create favorable conditions and provide patronage to commercial companies. In total, over 30 contracts worth more than 500 million rubles were concluded as part of the scheme.

December 3 – Officers of the FSB Directorate for Tatarstan detained the head of a military procurement office of the Ministry of Defense, suspected of taking a bribe on an especially large scale. The individual is alleged to have received monetary rewards for facilitating the approval of work acceptance certificates and for not applying penalties when violations of a state contract for technical oversight of general-purpose military vehicles in Crimea and the SMO zone were identified. Based on the collected materials, a criminal case has been initiated under articles for bribe-taking and abuse of power in the execution of a state defense order.

December 3 – First Vice Mayor of Nizhny Novgorod, S. Yegorov, was detained on suspicion of taking a bribe for facilitating illegal commercial activity. The suspect is alleged to have received, through an intermediary, a bribe of a substantial amount from February to August 2025 for assistance in organizing illegal commercial activity in Nizhny Novgorod.

December 1 – The head of the department for investigating particularly important cases of the Investigative Committee's Directorate for the Kemerovo Region, L. Kharitonov, was detained. It is noted that Kharitonov was involved in a number of major criminal cases in the region.

November 28 – In Dagestan, 17 employees of a branch of the Social Fund of Russia were charged in a corruption case, including the head of the regional division's administration. The damage from their activities exceeds 1.4 billion rubles.

November 14 – The first deputy head of the Federal Penitentiary Service Directorate for the Chelyabinsk Region, the head of the service's internal security department, and the chief accountant were detained on suspicion of corruption. It is specified that the suspects, among other things, used the production capacities and convict labor of penitentiary institutions for personal enrichment.

November 12 – In Saint Petersburg, an Interior Ministry employee was detained for taking a bribe from a media representative. It is specified that "since 2022, the administrator of the news channel 'Konkretno.ru' systematically transferred bribes to the head of the information and public relations department of the Main Directorate of the Ministry of Internal Affairs for Saint Petersburg and the Leningrad Region in exchange for daily incident reports from the department."

November 12 – In Yalta, Deputy Mayor I. Belomestnova was detained. She oversaw construction and urban improvement issues. According to the press service of the FSB Directorate for the Republic of Crimea and the city of Sevastopol, in 2022, the official received a bribe of 2.5 million rubles from the director of a commercial firm.

November 10 – In Moscow, former advisor to the Prime Minister of Dagestan and former deputy of the Dagestan parliament, D. Abuev, was detained. He is suspected of state treason and cooperation with Ukrainian special services, including preparing sabotage and intending to fight against the Russian Federation.

November 7 – In Moscow, the director of the Department of Mechanical Engineering for the Fuel and Energy Complex at the Ministry of Industry and Trade of Russia, M. Kuznetsov, was detained on suspicion of corruption.

November 6 – In Udmurtia, the head of Zavyalovsky District was detained on suspicion of taking a bribe on a large scale.

October 30 – Former deputy of the Legislative Assembly of the Perm Krai, K. Okunev, was detained. He is suspected of committing a crime under Article 205.2 of the Criminal Code of Russia, i.e., public calls for terrorist activities.

October 29 – The head of Askizsky District of Khakassia was detained on suspicion of abuse of power in the execution of a contract for the construction of a school worth over 1.1 billion rubles.

⁷⁹ Source: RT in Russian. Latest news on detentions. Available at: <https://russian.rt.com/tag/zaderzhanie?ysclid=mdzkzhnns147444962>

In May 2025, at the instruction of the acting governor of the Kursk Region, A. Khinshtein, a list of **more than 70 officials** who had previously been exempted from criminal liability or had their convictions expunged was prepared⁸⁰. In November 2025, A. Khinshtein noted that he was “extremely dissatisfied with the results of the work carried out: **only 9 people ceased their official activities**, despite the fact that the list of individuals, for example, who were held liable for taking or giving bribes or for robbery, is quite substantial”⁸¹.

In our view, it is difficult to disagree with the head of the Kursk Region when he says that “individuals who have been subject to criminal liability for taking or giving bribes (even if not subsequently convicted)... with such a past have no place in government bodies”⁸². The very fact of their presence in the system of state governance is, at the very least, perplexing. Therefore, such work should undoubtedly be carried out intensively across the entire country, in every region, in every municipality; through the All-Russian People’s Front, political parties, the State Duma, or any other mechanism capable of most effectively and swiftly “cleansing” the state governance system of people with a “dark” past.

Expert assessment:

“Khinshtein voiced the problem openly – meaning he wanted to solve it, not hide it. This adds credibility: if it were a showcase campaign, no one would publicize the formulation ‘there are former robbers in government.’ **Their very presence indicates that the personnel selection system is essentially non-functional. Background checks are formal, official references substitute for real filters. People whose biography itself precludes trust end up in positions where budget funds are distributed and contracts are signed. And if they have reached leadership posts – it means someone promoted them there, and not just once.**

This is no longer an isolated mistake but a system failure. It means there are those within the system itself who cover up, turn a blind eye, sign the necessary papers. The personnel vertical has ceased to be a filter and turned into a pipe: whatever goes in, flies out at the top. Therefore, the Kursk region case is not a local story but a symptom that the system fundamentally cannot recognize risks and does not want to see its own flaws”⁸³.

⁸⁰ Kursk officials will have their past remembered. Available at: <https://www.kommersant.ru/doc/7713366?ysclid=miy9ts272521996872>

⁸¹ Khinshtein demanded the dismissal from government bodies of all previously convicted employees. Available at: https://www.ng.ru/politics/2025-11-05/2_9373_news2.html?ysclid=miy9jc1w1u743954955

⁸² Khinshtein demanded the dismissal of all officials with a criminal past. Available at: <https://life.ru/p/1806740?ysclid=mj5u2cy7gd862838518>

⁸³ Prokhorov I. Robbers in power: Khinshtein uncovered the “Augean stables” of officials. The scale is staggering. Available at: https://spb.tsargrad.tv/articles/grabiteli-vo-vlasti-hinshtejn-vskryl-avgievy-konjushni-chinovnikov-masshtaby-porazhajut_1431154?ysclid=miy9ti4opy301345892

And, speaking of this – in November 2025, the Supreme Qualification Collegium of Judges of Russia (VKKS of Russia) granted the petitions of the Chairman of the Investigative Committee of Russia, A. Bastrykin, giving consent **to bring criminal charges and/or arrest six judges**⁸⁴... **In all cases, the crimes were of a corrupt nature**... “The most principled and slippery issue – concerning the termination of the status of judge in retirement of the former chairman of the Krasnodar Territory Court, A. Chernov – was considered on November 27. As experts noted, this is not equivalent to the VKKS’s consent to initiate a criminal case against Chernov, **but along with the status, the judge also loses guarantees of immunity**”⁸⁵.

Expert assessment:

“The situation addressed by the Chairman of the Supreme Court of the Russian Federation **has actually been wrong for a long time**... Judges are now given a guideline: what matters are real efforts, not symbolic gestures for a checkmark. **But why hasn’t the practice become uniform over so many years? Because the system itself is structured so that every decision is made manually, without common methodologies and with a huge caseload per judge**. Different regions live by different legal traditions, personnel come from different agencies, and regulatory wording leaves too much room for interpretation”⁸⁶.

On December 2, 2025, at a meeting of the Council of Judges of the Russian Federation, the

Chairman of the Supreme Court of the Russian Federation, I. Krasnov, noted that judicial decisions *“should not contain hints, unsubstantiated evaluative judgments, give rise to ambiguous interpretations, and especially should not be a catalyst for fraudulent and other illegal schemes. Unfortunately, such facts exist. Making decisions to please regional and local authorities, serving the interests of corporations and commercial structures is unacceptable. The reaction to any actions of a corrupt nature – regardless of the level at which they are committed – will be uncompromising”*⁸⁷.

The cited facts from the real activities of the state governance system, the financial and judicial systems, answer the question of **why the desired image of the country’s future, both 10 years ago and today in 2025, appears extremely difficult for Russians to achieve: because over 25 years, the state, by and large, has not changed**. And, judging by expert forecasts, it is not aiming to change in the near future. This is precisely what is evidenced by the “cosmetic” changes in “Politburo 2.0”, which essentially amount to preserving this system in the condition it was in even before the start of the SMO.

Of course, we should note that deep, systemic changes in state governance are associated with risks, making them undesirable and unsuitable during an ongoing SMO. **However, the problem is that experts from “Minchenko Consulting” do not link the prolongation of the “Politburo 2.0” model (which they characterize as a “conglomerate of clans and groups competing with each other**

⁸⁴ “Two judges from Saint Petersburg are former chairman of Smolninsky District Court, V. Tarasov, and a judge of the same court, K. Golikova. In total, the agenda includes permits for the involvement of six judges from different regions of Russia. In addition to our Saint Petersburg colleagues, we are talking about representatives of the courts of Adygea, Kursk, Kabardino-Balkaria and Mordovia. The board will also consider the issue of giving consent to the detention of the former chairman of Yurgomyzhsky District Court of the Kurgan Region, V. Kozlov” (source: Chulkov A. Two judges from Saint Petersburg may be prosecuted. Available at: <https://www.kommersant.ru/doc/8213028?ysclid=mj5t2ry99y635207201>).

⁸⁵ Nikitsky L. Solo of the new broom. Available at: <https://novayagazeta.ru/articles/2025/11/28/solo-novoi-metly>

⁸⁶ Trifonova E. Krasnov will complete the vertical of leadership of the third branch of power. Available at: https://www.ng.ru/politics/2025-12-02/1_9392_krasnov.html?ysclid=miyblmaycw681886806 (opinion of lawyer A. Gavrishev).

⁸⁷ Trifonova E. Krasnov will complete the vertical of leadership of the third branch of power. Available at: https://www.ng.ru/politics/2025-12-02/1_9392_krasnov.html?ysclid=miyblmaycw681886806

for resources...”⁸⁸) to the timeline for resolving the “Ukrainian conflict” (we note that at least 7 members of “Politburo 2.0” as of 2025 are listed in the Forbes ranking of Russia’s largest billionaires⁸⁹).

In other words, **there are no signs that the ongoing hostilities are the sole obstacle preventing the President and his close associates from the patriotic (power) bloc from making any substantial adjustments to the functioning of the state governance system...** This means that in the near future, it is

difficult to expect the emergence within the Russian system of state governance of **a mechanism of checks and balances** like, for example, the one in China, which “has determined the country’s success over the past few decades”⁹⁰.

As E.V. Balatsky rightly writes, the elements of the Chinese mechanism for elite self-organization are something “Russia, like most other countries, should scrutinize most attentively... **and begin work on adapting them to its own political and economic system**”⁹¹.

Some key elements (institutions, principles) of elite self-organization in the Chinese governance model⁹²

1. “The hierarchy of the CPC [Communist Party of China] cadres is based on a system of ranks, which are awarded **based on performance** and serve as the basis for further career advancement,” and also “**the principle of meritocracy**, according to which any promotion in position and rank **must be earned through success in the previous role**. And again, in Russian management practice, there are numerous examples of appointing people to high positions with no significant positive achievements to their name. **Thus, strict regulation of careers in government bodies and the CPC acts as a guarantee against personnel chaos and future managerial errors**”.

2. “**The CPC’s system of self-control**, with the National Supervisory Commission serving as its institutional element. The foundation of this system of self-control rests on two interconnected principles – **the total absence of immunity from criminal prosecution and the existence of the death penalty. The Chinese governance system categorically rejects the principle of irresponsibility**”.

3. “The main difficulty [in the economy] lies in coordinating all parts of a vast and extremely heterogeneous economy to give them a unified vector of movement and development. For this, China has created a special coordinating economic body – the National Development and Reform Commission (NDRC), which is part of the structure of the PRC’s State Council and was originally called the State Planning Commission of the PRC... The peculiarity of the NDRC’s work lies in the **heterogeneity of its functions**, which allows it to achieve a new level of coordination for the economic life of a huge country... The NDRC’s activities are guided by two informal principles – **the primacy of social stability and economic development, and the principle of delicacy and prudence**”.

⁸⁸ Minchenko E.N. Vladimir Putin’s Big Government and “Politburo 2.0”: A Report by “Minchenko Consulting”. August 2012. Available at: <https://minchenko.ru/analitika/?curPos=65>

⁸⁹ Among them: A. Rotenberg, G. Timchenko, R. Abramovich, V. Vekselberg, Yu. Kovalchuk, V. Alekperov, A. Mordashov (source: 146 Billionaires of Russia. Forbes Ranking – 2025. Available at: <https://www.forbes.ru/milliardery/535280-146-milliardero-rossii-rejting-forbes-2025?ysclid=mj9y71i97k216827885>).

⁹⁰ Balatsky E.V. (2025). Institutions of elite self-organization in the Chinese management model. Problems of Territory’s Development, 29(6), p. 26.

⁹¹ Ibidem.

⁹² For more information, see: Balatsky E.V. (2025). Institutions of elite self-organization in the Chinese management model. Problems of Territory’s Development, 29(6), 10–29.

Excerpts from the “Minchenko Consulting”⁹³ report, indicating the preservation of the “Politburo 2.0” in the state governance system:

1. A hostile environment and risks of military confrontation with NATO **make an inertial scenario in domestic politics most comprehensible to the elite, with system stability coming to the fore as the key parameter.**
2. **The composition of “Politburo 2.0” remains unchanged** (Yu. Kovalchuk, S. Kiriyeiko, N. Patrushev, M. Mishustin, S. Chemezov, I. Sechin, D. Medvedev, S. Sobyenin, G. Timchenko, A. Rotenberg, S. Shoigu), even despite an unfavorable socio-economic context and, consequently, a narrowing resource base: amid a growing budget deficit, increasing tax burden, and strengthening sanctions pressure, the highest echelon of the elite retains its positions.
3. Maintaining the current composition of “Politburo 2.0” and their confidants is largely achieved through the redistribution of assets as part of a large-scale property confiscation campaign, **which most significantly affects resource-rich representatives of the regional elite.**
4. **The key strategy for resource-rich elites is not proactive actions, but strategic waiting and supporting the status quo established in recent years.**
5. In 2021 [i.e., even before the start of the SMO], we described scenarios for the dynamics of the Politburo itself, among which the most probable was named **“stabilization of the Politburo 2.0 composition for the next few years**, made possible by applying administrative resources to redistribute rents in new economic sectors and through the creation of enlarged elite coalitions.” **Currently, this scenario is being implemented**, with the caveat that the redistribution process now includes old economic sectors as well.

Let us recall that experts from “Minchenko Consulting” began noting the existence of the “Politburo 2.0” system itself as early as 2012, long before the special military operation.

Thus, Russia has now been waging a war for its future for almost four years, and how long this war will last remains unknown. At the very least, at the

latest Board of the Ministry of Defense of the Russian Federation on December 17, 2025, A.R. Belousov set tasks not only for 2026 but also “outlined parameters for longer-term planning, taking into account the course of the special military operation and the development of the military-political situation around Russia”⁹⁴.

Excerpt from A.R. Belousov’s speech at the expanded meeting of the Defense Ministry Board on December 17, 2025:

“... the priority direction for the Ministry of Defense is the **modernization of the Armed Forces in the long term**, considering external threats and the development of innovative technologies.

An analysis of the military-political situation shows that **military security threats have changed significantly over the past three years**. The North Atlantic Alliance continues to build up coalition forces, active preparations are underway for the deployment of intermediate-range missiles, the nomenclature of nuclear munitions has been updated, air and missile defense systems are being modernized, and the mobilization deployment system is changing. The operational speed of transferring alliance troops to the eastern flank is increasing... Military expenditures are increasing substantially...

All this indicates NATO’s preparations for a military clash with Russia. The alliance’s plans provide for achieving readiness for such actions by the turn of the 2030s. This has been repeatedly stated openly by official representatives of the NATO bloc”⁹⁵.

⁹³ Politburo 2.0 Report. The Besieged Fortress. An Analytical Review of the State of Russian Elites. Available at: https://minchenko.ru/analitika/analitika_139.html

⁹⁴ Sotak D. The army is entering a long-distance race. Available at: <https://www.kommersant.ru/doc/8294543?ysclid=mjb7k76fup74499157>

⁹⁵ Speech by the Minister of Defense of the Russian Federation, A.R. Belousov, at the expanded meeting of the Defense Ministry Board on December 17, 2025. Available at: <http://kremlin.ru/events/president/news/78801>

However, it must be emphasized that Russia's war for the future is not only a military conflict with the "Kiev regime" (which was clear from the very beginning of the SMO). Nor is it only a civilizational conflict with Western civilization (the NATO bloc, the Collective West) for a worthy place in the emerging multipolar world...

It is, first and foremost, Russia's war with its own self from the 1990s: with the "liberal fog" that enveloped almost all spheres of our life for decades; with the deep social and mental "trauma" inflicted on our country by the collapse of the Soviet Union.

All three aspects (or rather, incarnations) of the conflict in which Russia is involved are inextricably linked. As A. Dugin rightly notes, *"the key to Victory in the SMO lies in the 1990s... The abolition of Ukraine implies the simultaneous abolition of the Russian Federation of the 1990s. These two inauthentic, caricature realities are the result of the disintegration of an organic state, an Empire [the Soviet Union]"*⁹⁶.

*"...any absurd action we can think of will inevitably be carried out by the European Union. We are dealing with a clear illustration of the ratchet mechanism of degeneration. And if we ourselves do not revive our state, our political system with higher meanings, lofty ideals, sacredness, spirit, then we will come to the same point"*⁹⁷.

In this struggle of Russia with its own 1990s self, Russian society continues to place its hopes in the President. This is evidenced by the support Russians show for the head of state's activities, as reflected both in the official results of federal, regional, and municipal elections⁹⁸ and in data from monitoring sociological measurements⁹⁹.

Probably aware or sensing this burden of historical responsibility before the country and its people, the President is increasingly (or rather, "constantly", in his own words) thinking about choosing a successor and identifies as a key task of national development *"ensuring reliable continuity in the country's development for decades to come"*¹⁰⁰.

⁹⁶ Dugin A. The key to Victory lies in the 1990s. Available at: https://zavtra.ru/blogs/klyuch_k_pobede_v_svo_vezhit_v_1990-h_kapitulyatsii_ukraini_budet_nedostatochno

⁹⁷ Dugin A. Russia received a clear lesson – this is where migration licentiousness leads. Available at: https://zavtra.ru/blogs/vsyo_ruhnulo_rossiya_poluchila_naglyadnij_urok_vot_kuda_privedyot_migratsionnaya_vol_nitca?ysclid=miyajaxwp50260698

⁹⁸ According to official data from the Central Election Commission of the Russian Federation (CEC RF), in the Presidential election on March 17, 2024, V.V. Putin was supported by over 76 million voters (87% of those who participated in the election).

Analysis of CEC data for all presidential elections held in Russia from 2000 to 2024 shows that over the 24 years since V.V. Putin was first elected head of state, his support level nationwide has practically doubled (by almost 37 million people): from 39.74 to 76.28 million voters (for details, see the article: Ilyin V.A., Morev M.V. (2024). A solid "mandate of trust": 76 million people voted for Vladimir Putin's fifth presidential term. *Economic and Social Changes: Facts, Trends, Forecast*, 17(2), 9–42.

Following the results of the Single Voting Day held in Russia on September 14, 2025, "in the elections for the heads of 20 regions of the Russian Federation, 19 nominees from 'United Russia' and one self-nominated candidate – the incumbent head of the Chuvash Republic, O. Nikolaev – won. None of the winners received less than 60% of the vote. Eight newly elected regional heads, including the new governor of the Kursk region, Alexander Khinshtein, received over 80% of the vote" (source: On the elections of regional heads and the costs of verticalization. https://www.ng.ru/editorial/2025-09-16/2_9339_red.html). As experts noted, "by entrusting all candidates for regional heads supported by him [the President] and representatives of the 'United Russia' party, citizens essentially, as if in a referendum, approved Vladimir Putin's policy" (assessment by K. Kostin, Chairman of the Board of the Civil Society Development Foundation. Source: Kostin K. Right and choice. Available at: <https://iz.ru/1954805/konstantin-kostin/pravo-i-vybor>).

⁹⁹ According to VCIOM data, throughout the entire period of the SMO (2022–2025), the approval rating for the activities of the President of the Russian Federation consistently ranged from 75 to 77%. This is significantly higher than the support level for V.V. Putin before the start of the SMO (60% in 2021) and "an order of magnitude" higher than the support level for the previous head of state, B. Yeltsin (9% in 1999). Source: VCIOM Ratings. Available at: <https://wciom.ru/ratings/dejatelnost-gosudarstvennykh-institutov/>

¹⁰⁰ Speech by V. Putin at the Ceremony for the Inauguration of the President of the Russian Federation, 07.05.2024. Available at: <http://www.kremlin.ru/events/president/news/73981>

“When I think about this [choosing a successor], **and I think about it constantly**, of course, I think that a person must emerge, or better yet several people, so that people have a choice, who could earn **the trust of the country’s citizens**”¹⁰¹.

However, building the desired image of the future – that very strong, sovereign, and social state in which Russians would like to live – is a question of a strategic perspective spanning 30–40 years ahead. But “here and now”, it is precisely in the hands of the President (and only his) lies the opportunity to create the foundation of this Future: to conclude the SMO, to reach agreements with the Collective West that would allow Russia to focus on

solving internal problems, and to choose a successor who would be a true (and not a “kvass” or shallow) patriot, “who could earn the trust of the country’s citizens”¹⁰², and who would possess sufficient political will to continue and strengthen the course of national development that the country has been on for a quarter of a century (including conducting timely and effective “corrective work”).

V. Putin: “{The national idea of the country} lies in patriotism. I think nothing else can be. Patriotism should not be of the ‘kvass’ kind (shallow, blind and flag-waving)... This does not at all mean that one must constantly cling only to our heroic past; one must look towards our no less heroic and successful future. In this lies the key to success”¹⁰³.

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¹⁰¹ Direct quote from V. Putin from an interview with P. Zarubin on May 4, 2025. Available at: <https://tvzvezda.ru/news/2025541413-VuPoL.html?ysclid=mj72qe20nb300469656>

¹⁰² Direct quote from V. Putin from an interview with P. Zarubin on May 4, 2025. Available at: <https://tvzvezda.ru/news/2025541413-VuPoL.html?ysclid=mj72qe20nb300469656>

¹⁰³ V. Putin’s interview with P. Zarubin. Available at: <https://www.kommersant.ru/doc/4341435?ysclid=mj9rtn5mdu22293906>

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Trends in the Economic Development of Russia's Northwest Regions: A Structural Approach to Monitoring



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Abstract. The study is devoted to the systematic monitoring and analysis of key trends in the economic development of the Northwestern Federal District under the conditions of unprecedented sanctions pressure that began in 2022. Based on an analysis of operational statistics from Rosstat for the period 2022–2024, key trends in the development of the regional economies of the constituent entities in Northwestern Russia under external pressure are identified. Achieving the study's objective required solving such tasks as aggregating and critically reviewing the experience of monitoring economic growth in territories, forming a system of indicators for monitoring short-term economic development at the regional level, and testing the proposed indicator system. The analysis of the economy is conducted at the key stages of the economic process (production, generation of income, and its use). It is revealed that in the production of gross product in the regions of the Northwestern Federal District, trends of regional

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specialization are intensifying – the locomotives of positive dynamics in industry and agriculture are the leading regions in these types of activities, while in other regions the dynamics are either insignificant or negative. A transformation in the structure of income distribution in the economy of the Northwestern Federal District is observed: business and state incomes are shifting in favor of household incomes against the backdrop of a labor market shortage and an incomplete adaptation to external pressure. Due to rising household incomes, consumer demand shows sharp positive dynamics and becomes a key factor for economic growth. To address the identified problems, directions for economic policy are proposed, which could contribute to accelerating and improving the quality of economic growth in the regions of Northwestern Russia.

Key words: economic development, region, monitoring, system of national accounts, Northwestern Russia, trends.

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Introduction

The intensification of sanctions pressure on the Russian economy has brought to the forefront the issue of researching measures to mitigate its negative impact (Ilyin, Morev, 2022). Northwest Russia has been one of the country’s macro regions most economically affected due to its geographical location and significant economic orientation toward the markets of unfriendly countries (Babich, 2024). Since the beginning of 2022, with the shift in the geopolitical situation, the economies of the subjects (constituent entities) of the Northwestern Federal District (NWFD) have undergone a transformation of foreign trade ties, changes in enterprise behavior, and established production and supply chains (Kuvalin et al., 2023).

The need for public authorities to respond to the external and internal challenges facing the country (demographics, declining quality of life and rising inequality, increasing complexity and structural changes in the economy, the necessity for technological development, etc.) requires a modern, flexible, and effective management system. It

appears that the formation and implementation of effective economic policy would be facilitated by scientific-methodological and informational-analytical support for government bodies provided by research organizations.

The analysis of economic dynamics conducted at the federal level only partially reflects the real state of affairs, largely because it essentially presents the national economy as a sum of regional economies. Researchers’ attention in the field of developing quality-of-growth monitoring systems is also predominantly focused on the macro level, while the essence of socio-economic phenomena is reflected in the processes occurring within the country’s regions.

The aim of the study is to monitor the state and key trends in the economic development of the regions of the Northwestern Federal District at the present stage. Achieving this aim requires solving the following tasks: aggregating and critically reviewing the experience of monitoring the economic development of territories, forming a

system of indicators for monitoring short-term economic development at the regional level, and testing the proposed system of indicators¹.

Theoretical and methodological framework of the research

In Russia, monitoring the socio-economic development of regions is conducted by both public authorities and a wide range of research institutes, as well as by a number of rating agencies. Such works include the monitoring of the socio-economic development of the Russian Federation in the context of federal districts and constituent entities, carried out by Rosstat² (Russian Federal State Statistics Service); monitoring by regional executive authorities³; the automated monitoring system “Region,” developed within the framework of the state automated information system “Upravlenie”⁴ (Management). The Bank of Russia regularly publishes a report on the state of the regional economy. Among research organizations, continuous monitoring of the socio-economic development of Russian regions is conducted by experts from the Institute of Economic Forecasting of the Russian Academy of Sciences (IEF RAS) (Mikheeva, 2024), Plekhanov Russian University of Economics⁵, the Center for Spatial Economics

at the Institute of Applied Economic Research of RANEPA (Zubarevich, 2021), the Institute of Economics of the Ural Branch of the Russian Academy of Sciences⁶, and a number of others.

However, it should be noted that the aforementioned works do not always fully cover regional issues: many studies reveal only certain aspects of the socio-economic development of the country's territories. Furthermore, no separate, ongoing monitoring of the economic development of Northwest Russia is conducted. An analysis of works on monitoring the socio-economic development of Russian regions indicates that such research should be comprehensive, systematic, and timely.

In this regard, we are developing a system for monitoring the development trends of the economies of Russia's Northwest regions. This system includes: an assessment of the internal macroeconomic situation within the constituent entities, presented within this study; a system of indicators for the qualitative development of the national economy; analysis and forecasting of promising types of economic activity⁷; an annual survey of executives at manufacturing sector enterprises in the NWFD (Shirokova, Lukin, 2024). This system involves conducting annual monitoring studies to assess territorial development over the past calendar year, which corresponds to short-term analysis. Indicators from the years preceding the analyzed one are provided to assess ongoing trends. A promising direction for research into analyzing the economic situation, aimed at developing the monitoring system, is the creation of modeling tools for short-term forecasting.

This study employs a structural approach to monitoring the development of Russia's Northwest regions. This approach involves analyzing economic processes through the lens of three successive

¹ At Vologda Research Center of the Russian Academy of Sciences, under the guidance of RAS Corresponding Member, Doctor of Sciences (Economics), Professor V.A. Ilyin, a system for monitoring various aspects of the development of the Northwestern Federal District regions (demography, economy, spatial development, scientific and technological development, etc.) is currently being developed. This study is devoted to monitoring the economic development of Northwest Russia.

² Information for monitoring the socio-economic situation of the constituent entities of the Russian Federation: Statistical bulletin. Rosstat. Available at: <https://rosstat.gov.ru/folder/11109/document/13259>

³ Indicators of socio-economic development of the Vologda Region in comparison with the Russian Federation. Analytical Center of the Vologda Region. Available at: https://vologda-oblast.ru/o_regione/ekonomika/sotsialno-ekonomicheskoe_razvitie/soc2024_2.pdf

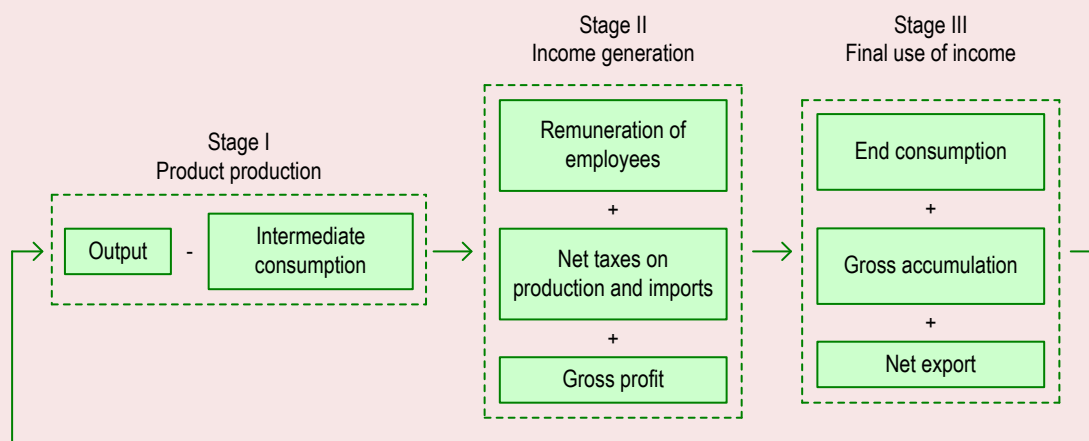
⁴ Automated System “Monitoring”. Available at: <https://gasu.gov.ru/opendata>

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⁷ Ilyin V.A., Uskova T.V., Lukin E.V. (Eds). (2024). Northwest Russia: Prospects for Structural Transformation of the Economy: Analytical Atlas. Vologda: FSBIS VolRC RAS. 96 p.

Figure 1. Scheme of the formation and use of gross value added in the economy



Source: (Pogosov, 2014).

stages of the reproduction cycle⁸. The conceptual basis of the conducted monitoring is the theory of national accounting. According to this theory, the foundation for the formation of an economy's resources is production (Stage I, *Fig. 1*). In the production process, on the one hand, goods and services are produced in their physical form; on the other hand, their value and added value are created, which correspond to the primary incomes generated in production (Stage II). After distribution and redistribution, these primary incomes form the disposable incomes of economic agents and are expended on final demand – final consumption and gross capital formation (Stage III).

The relationships between these indicators constantly change due to complex reproduction processes. They reflect the outcomes of economic development, shaped by economic patterns, implemented economic policies, and the economic conjuncture both domestically and internationally.

The selection of indicators for monitoring was carried out taking into account the principles of their accessibility (the selected indicators are present in the main publications issued by Rosstat), timeliness (indicators are published in the shortest possible timeframes), and relevance to the research concept (the indicators allow for characterizing the stages of the reproduction process, *Tab. 1*).

Table 1. Indicators for monitoring the socio-economic development of regions

Stage of the reproduction process	Indicator	Explanation
Product production	Dynamics of industrial production Dynamics of agricultural production	Characterize the dynamics of the major part of output in the economy. Estimating intermediate consumption using operational data is difficult
Income generation	Dynamics of population monetary income Dynamics of consolidated budget revenues Profits of profitable organizations	Allow for assessing the dynamics of income for all three groups of economic agents
Final use of income	Dynamics of retail trade turnover Dynamics of housing construction Dynamics of investment in fixed capital	Characterize the key directions of income use (final consumption and gross capital formation). Foreign trade statistics are temporarily unavailable
Source: own compilation.		

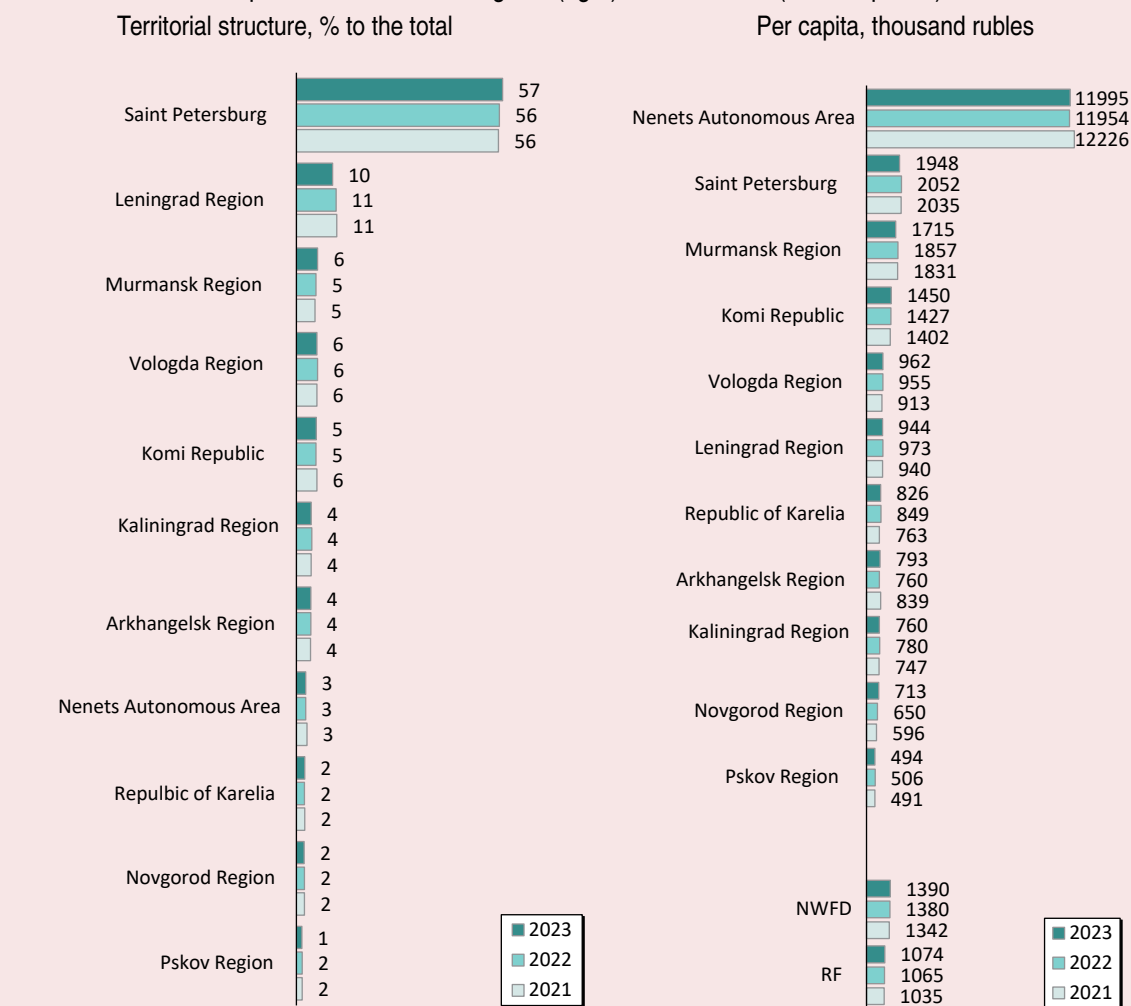
⁸ More detailed sectoral breakdown of structural changes at the production stage of the reproduction process is presented in the extended version of the monitoring. Available at: <http://www.volnc.ru/activity/view?id=10187>.

In addition, a review of changes in the rankings of the NWFD regions based on per capita economic development indicators among all Russian constituent entities is provided. Its goal is to demonstrate the economic position of the District's regions within the all-Russian context. The use of per capita indicators helps to mitigate territorial disparities caused by uneven population distribution and brings the indicator values to a comparable form.

The information base of the study comprises statistical data from Rosstat, the Federal Treasury, as well as materials from specialized websites and periodicals. The analysis uses data from the last three

years (2022–2024). The tables show the rankings of the regions and the federal district among 85 constituent entities of the Federation (excluding information on the DPR, LPR, Zaporozhye, and Kherson regions) and eight federal districts based on the growth rate of indicators in 2024 and their per capita average for 2022–2024. Value indicators are recalculated in 2024 prices. Statistics are provided as of July 2025. Appendices 1 and 2 to the article present the rankings of the NWFD regions among 85 Russian constituent entities based on the values of key economic development indicators in 2024 and their average value for 2022–2023.

Figure 2. Structure of the macro-regional GRP (left) and per capita GRP production in NWFD regions (right) in 2021–2023 (in 2023 prices)



Compiled based on: Rosstat data.

Research results⁹

Production of gross product in the economy

The NWFD is one of the leaders in economic development among the federal districts. Its GRP growth rates throughout the study period have been ahead of the national averages. In terms of per capita GRP in 2023, the district ranked second in Russia with an indicator of 1,390 thousand rubles (29.5% above the national average), second only to the Ural Federal District (*Fig. 2*).

The territorial structure of GRP formation in the macro region has remained unchanged throughout the study period. Concentration of produced GRP is observed in the city of Saint Petersburg and the Leningrad Region (approximately 2/3 of the total GRP volume), while the shares of the other regions have also remained stable, fluctuating within 1 percentage point. This is largely due to the established sectoral structure of the economy and the population distribution across Northwest Russia. The leading regions in terms of average per capita GRP are the Nenets

Autonomous Area, Saint Petersburg, Murmansk Region, and Komi Republic. The core of their economies is a developed extraction sector (with the exception of Saint Petersburg, whose economy is largely diversified).

Following a slowdown in 2022 caused by foreign trade restrictions, industrial production in the NWFD has been experiencing accelerating growth, with rates slightly exceeding the national average (*Tab. 2*). The primary contributors to the District's industrial development are Saint Petersburg and the Leningrad Region, which are both the largest regional economies in the Northwest and the industrial centers of the macro region. However, their development trends differ: for instance, 2022 had a minimal impact on the growth rate of industrial output in Saint Petersburg, which made a powerful leap forward (+33.1% over 2022–2024), whereas the trend in the Leningrad Region aligned with the general regional pattern – a decline in 2022 followed by explosive growth in 2023–2024.

Table 2. Dynamics of industrial production in NWFD regions, 2022–2024

Territory	% to the previous year			Rank*, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank**		
	2022	2023	2024				2022	2023	2024
RF	100.7	104.3	104.6	-	RF	851	-	-	-
NWFD	100.5	105.3	105.3	4	NWFD	1022	2	2	2
1. Saint Petersburg	106.1	113.1	110.9	11	1. Nenets Autonomous Area	15871	1	1	1
2. Leningrad Region	96.8	107.7	108.2	20	2. Murmansk Region	1588	8	8	8
3. Pskov Region	99.4	112.6	107.7	22	3. Komi Republic	1461	9	9	9
4. Arkhangelsk Region	95.5	98.8	107.2	23	4. Vologda Region	1223	12	13	14
5. Kaliningrad Region	77.3	96.7	103.5	44	5. Leningrad Region	1170	15	17	16
6. Novgorod Region	92.5	102.7	101.2	58	6. Saint Petersburg	998	27	26	23
7. Vologda Region	96.6	106.2	100.0	64	7. Novgorod Region	712	34	34	34
8. Komi Republic	104.6	100.3	99.5	68	8. Republic of Karelia	635	37	40	42
9. Republic of Karelia	93.1	100.2	99.3	70	9. Kaliningrad Region	620	38	45	46
10. Nenets Autonomous Area	112.1	93.7	97.4	74	10. Arkhangelsk Region	441	54	62	60
11. Murmansk Region	95.9	97.5	97.3	75	11. Pskov Region	400	68	67	67

* Here and elsewhere: the rank of the corresponding region and federal district based on the indicator's dynamics in 2024 among 85 federal subjects (excluding the Donetsk People's Republic, the Lugansk People's Republic, Zaporozhye and Kherson regions) and eight federal districts.

** Here and elsewhere: the rank of the corresponding region and federal district based on production volume per capita among 85 federal subjects and eight federal districts.

Compiled from: Rosstat data.

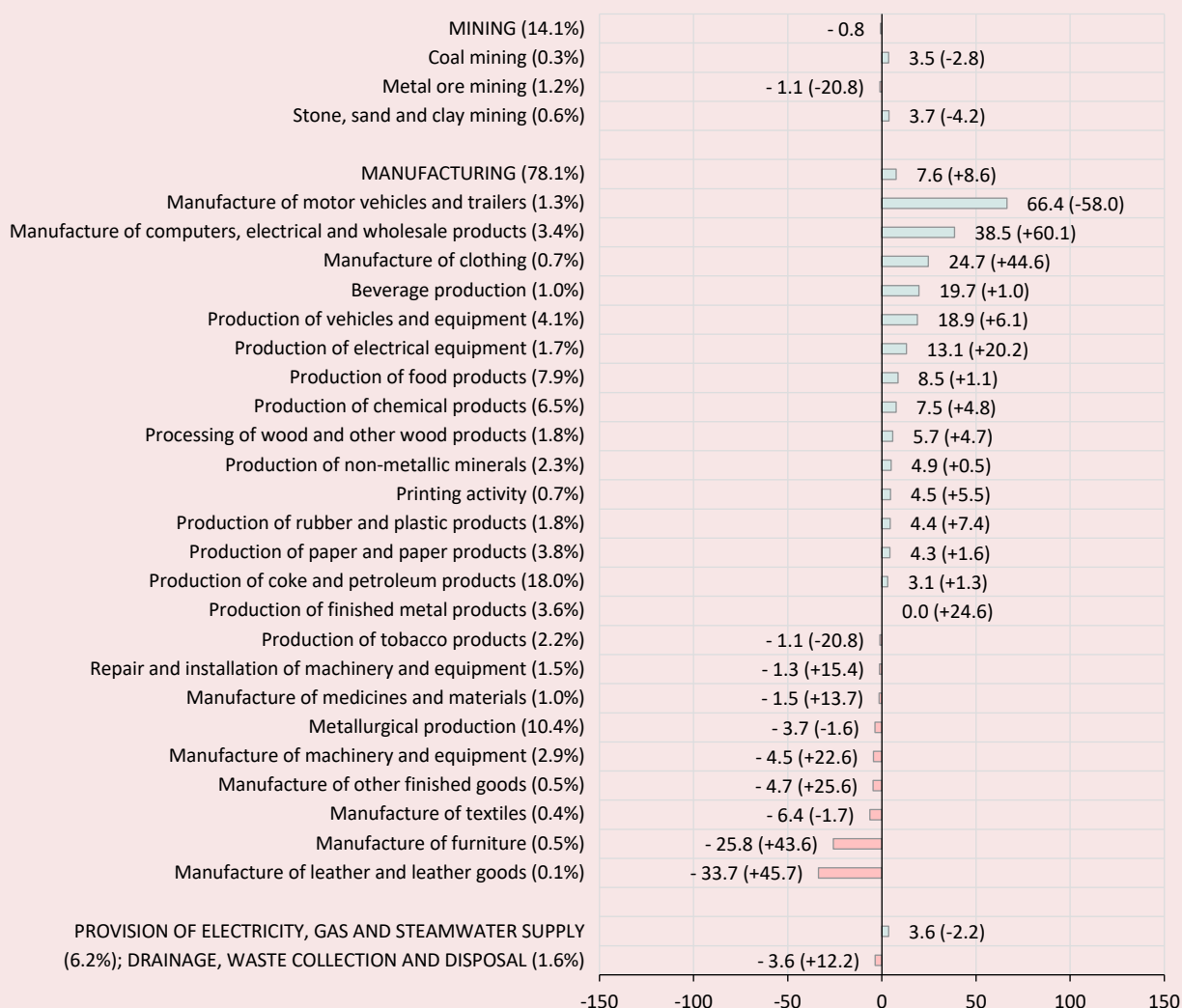
⁹ A more detailed analysis is presented in the analytical bulletin: Trends in the Economic Development of Russia's Northwest Regions. Issue 5. Available at: http://www.volnc.ru/publishing/trends_in_economic

The remaining regions exhibited divergent development paths. For example, due to a sharp increase in demand for energy resources in 2022, high growth rates were recorded in extractive regions; however, in 2023–2024, their growth stagnated because of sanctions on Russian oil and gas. In the Pskov and Arkhangelsk regions, a trend of accelerating industrial growth was observed after the 2022 decline, primarily driven by increased output in manufacturing. In the Novgorod and

Vologda regions, as well as the Republic of Karelia, industrial production has stagnated at around 2021 levels.

The lagging regions were the Murmansk and Kaliningrad regions, where the overall decline in industrial production over the study period amounted to 9 and 22.6%, respectively. The primary negative factor in the development of Northwest Russia's industry was the unfavorable external economic environment, which led to a sharp

Figure 3. Growth in industrial production volumes in the NWFD in 2024, % year-on-year



Note: The parentheses after the industry name indicate its share in the structure of industrial product shipments in the NWFD in 2024; the parentheses after the value indicate the industry's production growth (decline) in 2023.

Compiled based on: Rosstat data.

contraction in external demand against a backdrop of insufficient domestic consumption.

The growth in the NWFD's industrial output is largely explained by increased production volumes in a number of key manufacturing industries (*Fig. 3*). The highest output growth rates were shown by engineering industries (manufacture of motor vehicles, trailers, and semi-trailers, as well as computers, electronic, and optical products). An increase in output was also recorded in the manufacture of clothing, food products, and beverages.

Positive dynamics were also observed in the production output of several industries catering to intermediate demand (chemical and wood processing industries). At the same time, a decline was recorded in the production of certain light industry sectors (furniture, leather and leather products, textiles), metallurgy, and other finished products. Based on the aggregate index for the extraction of fuel minerals (oil and gas account for approximately 60% of total extraction in the NWFD), it can be assumed that their production decreased slightly. Coal extraction increased by 3.5% following a 2.8% decline the previous year.

The negative trend in metal ore extraction slowed down (-1.1% compared to -20.8% in the previous year).

In the agriculture of the NWFD, 2024 saw a reversal of the stagnation trend of previous years: after near-zero growth in 2022–2023, agricultural output increased by 7.5%. This exceeds the national average by more than 10 percentage points and is the highest value among all federal districts (*Tab. 3*).

This trend is largely determined by the situation among the leading agricultural regions in Northwest Russia: the Pskov Region, which ranks 7th in per capita agricultural output (agricultural production in this region increased by 32.8%, also the best result in the country), and the Kaliningrad Region, which showed output growth of 7.4% (7th in the country).

This creates a certain threat because, if these regions are excluded from the calculation for the NWFD as a whole, the agriculture of Northwest Russia stagnates. No other growth points are observed in agricultural production: the remaining regions show divergent trends, mostly negative. Positive dynamics over the study period are observed in Vologda Region and the Republic of Karelia;

Table 3. Dynamics of agricultural production in NWFD regions, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	111.3	100.2	96.8	-	RF	35	-	-	-
NWFD	100.8	100.8	107.5	1	NWFD	23	7	7	6
1. Pskov Region	93.3	98.7	132.8	1	1. Pskov Region	124	10	10	7
2. Kaliningrad Region	101.9	103.2	107.4	7	2. Leningrad Region	55	20	18	18
3. Komi Republic	97.5	94.6	102.8	17	3. Kaliningrad Region	47	25	23	22
4. Nenets Autonomous Area	95.9	102.8	102.8	17	4. Novgorod Region	37	29	28	29
5. Leningrad Region	103.4	101.1	102.4	21	5. Vologda Region	32	35	33	32
6. Novgorod Region	100.4	99.6	100.6	30	6. Nenets Autonomous Area	15	59	59	58
7. Vologda Region	104.4	101.7	100.5	32	7. Komi Republic	13	60	62	60
8. Arkhangelsk Region	98.9	101.5	99.4	37	8. Arkhangelsk Region	6	67	67	67
9. Republic of Karelia	104.7	99.9	98.1	41	9. Republic of Karelia	5	72	72	71
10. Murmansk Region	89.6	106.1	93.4	63	10. Murmansk Region	2	80	80	80
Compiled from: Rosstat data.									

however, despite overall growth of 6.7 and 2.6% over the last three years, the growth rates have slowed to near-zero or even turned negative.

In summary, it is worth noting that in the production of gross product in the NWFD regions, trends of regional specialization are intensifying – the locomotives of positive dynamics in industry and agriculture are the leading regions in these types of activities, while in other regions the dynamics are either insignificant or negative. A reduction in interregional diversification may lead to increased vulnerability to sectoral threats and a decrease in the overall GRP growth rate of the NWFD.

Income formation in the economy

Population incomes

Throughout the study period, a steady trend of increasing real population incomes has been observed. The cumulative increase for the NWFD amounted to 18.2% over three years, with the largest growth recorded in 2024 at 8.7%, slightly exceeding the national result (*Tab. 4*).

In general, most regions correspond to this trend. The weakest growth in real monetary incomes of the population was noted in the Murmansk Region, Komi Republic, and Arkhangelsk Region,

which occupy the lowest positions in the ranking of Russian regions for this indicator.

Per capita incomes in the NWFD in 2024 were higher than the Russian average. On this indicator, the District ranked second in the country after the Central Federal District. At the same time, in eight constituent entities of the District, average per capita incomes were below the national average, indicating a slowdown in the improvement of the quality of life for the population residing there. With the exception of the Leningrad and Arkhangelsk regions and the Komi Republic, the positions of these entities in the regional ranking for per capita income have deteriorated over the last three years.

Corporate incomes

The dynamics of profits of profitable organizations in Northwest Russia in 2024 significantly surpass the results of 2023. The overall trend can be described as positive, showing adaptation and recovery of financial performance following the imposition of foreign trade restrictions. A noticeable increase in profits was recorded (double-digit in more than half of the regions, and twofold in the Kaliningrad Region). However, not in all subjects is the increase attributable to a low base in previous

Table 4. Dynamics of real monetary incomes of the population in NWFD regions, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	104.0	106.5	108.4	-	RF	63	-	-	-
NWFD	103.2	105.4	108.7	4	NWFD	69	3	2	2
1. Saint Petersburg	103.6	104.2	111.7	6	1. Nenets Autonomous Area	143	3	3	3
2. Kaliningrad Region	105.6	106.9	109.1	21	2. Saint Petersburg	86	9	9	8
3. Novgorod Region	102.1	106.5	109.1	21	3. Murmansk Region	85	8	8	9
4. Republic of Karelia	99.2	107.9	108.4	30	4. Republic of Karelia	63	20	20	18
5. Leningrad Region	104.5	107.3	108.4	30	5. Komi Republic	62	15	15	19
6. Pskov Region	100.9	106.8	107.9	40	6. Arkhangelsk Region	61	17	14	21
7. Vologda Region	100.5	107.4	107.0	50	7. Leningrad Region	53	34	31	30
8. Nenets Autonomous Area	110.2	105.0	106.2	57	8. Kaliningrad Region	52	37	37	36
9. Komi Republic	103.7	103.4	102.0	81	9. Vologda Region	50	43	40	45
10. Murmansk Region	101.6	107.3	101.9	82	10. Pskov Region	47	59	54	54
11. Arkhangelsk Region	102.1	105.9	100.3	84	11. Novgorod Region	46	63	62	59

Compiled from: EMISS data.

Table 5. Dynamics of profits of profitable organizations in NWFD regions, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	96.4	124.1	99.2	-	RF	257	-	-	-
NWFD	78.2	106.9	103.4	3	NWFD	422	2	2	2
1. Kaliningrad Region	119.0	143.3	195.0	6	1. Kaliningrad Region	1118	11	8	6
2. The Komi Republic	75.6	104.5	176.7	8	2. Saint Petersburg	524	8	7	9
3. Arkhangelsk Region	73.9	100.5	136.4	12	3. Vologda Region	454	4	9	10
4. Republic of Karelia	42.2	75.4	134.5	13	4. Leningrad Region	357	18	17	11
5. Leningrad Region	131.2	107.0	131.4	16	5. Murmansk Region	207	6	11	22
6. Pskov Region	149.3	153.2	115.7	33	6. Nenets Autonomous Area	192	3	10	23
7. Saint Petersburg	62.0	121.3	90.9	62	7. Komi Republic	154	46	47	29
8. Vologda Region	145.3	75.2	82.2	75	8. Republic of Karelia	125	30	41	35
9. Novgorod Region	91.0	36.2	69.0	80	9. Novgorod Region	106	10	28	42
10. Murmansk Region	85.0	92.1	41.8	83	10. Arkhangelsk Region	91	53	54	46
11. Nenets Autonomous Area	4.7-fold	57.9	35.5	84	11. Pskov Region	66	64	60	57
Compiled from: Rosstat data.									

years: for example, the Kaliningrad Region has demonstrated active growth in financial results throughout all three years of the study period (+95%, *Tab. 5*).

In a number of regions, the trend is the opposite: the Vologda, Novgorod, and Murmansk regions, as well as the Nenets Autonomous Area, are characterized by negative changes in the profits of profitable organizations (ranging from -3.4% to -77.2% over the entire study period). This is

explained by a reduction in export earnings amid insufficient domestic demand and an incomplete reorientation to friendly markets.

State budget revenues

State revenues in the NWFD grew at a faster rate than the national average (2.2 vs 0.7%, *Tab. 6*). The overall trend is rather positive, but with a dip in 2023 caused by a decrease in revenues in key donor regions – the Nenets Autonomous Area (-21.8%) and the city of Saint Petersburg (-7.6%).

Table 6. Dynamics of revenues of consolidated budgets of NWFD regions, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	100.2	105.6	100.7	-	RF	168	-	-	-
NWFD	107.2	96.4	102.2	3	NWFD	165	2	2	2
1. Nenets Autonomous Area	99.3	78.2	117.3	3	1. Nenets Autonomous Area	699	1	2	1
2. Kaliningrad Region	86.2	89.2	110.4	8	2. Saint Petersburg	182	10	11	9
3. Saint Petersburg	123.5	92.4	107.2	14	3. Murmansk Region	179	11	9	10
4. Leningrad Region	103.8	120.7	101.5	33	4. Komi Republic	159	9	12	12
5. Komi Republic	109.7	84.4	97.3	47	5. Republic of Karelia	143	12	13	15
6. Arkhangelsk Region	104.5	88.7	97.1	49	6. Arkhangelsk Region	134	13	17	17
7. Republic of Karelia	92.7	96.9	94.6	64	7. Leningrad Region	130	28	19	18
8. Pskov Region	99.4	107.9	93.6	68	8. Kaliningrad Region	123	17	28	20
9. Vologda Region	83.7	101.3	92.6	73	9. Vologda Region	119	19	20	24
10. Murmansk Region	78.7	108.9	92.0	75	10. Novgorod Region	99	26	25	38
11. Novgorod Region	101.8	102.4	86.2	82	11. Pskov Region	94	43	39	41
Compiled from: Rosstat data.									

The dynamics of the indicator across territories are uneven: a significant increase was noted in the Nenets Autonomous Area, Kaliningrad Region, and Saint Petersburg (by 17.3%, 10.4%, and 7.2%, respectively). At the same time, in most regions of Northwest Russia, budget revenues declined, especially in the Novgorod Region (by 13.8%). A negative trend is observed in the Republic of Karelia, where the decline in revenues was continuous and amounted to 15% over three years.

As a conclusion, we can highlight the transformation of the income distribution structure in the NWFD economy: the incomes of businesses and the state are shifting in favor of population incomes against a backdrop of labor market shortages and an incomplete adaptation to external pressure.

Final use of incomes in the economy

Consumer demand

Against the backdrop of growing real population incomes, consumer activity is recovering: in 2023–2024, both the NWFD and Russia as a whole saw an increase in retail trade turnover (13.1 and 4% vs 8 and 7.2% respectively, *Tab. 7*). However, in 2024, the district ranked last in terms of retail trade growth rates.

Regional trends, due to the constant increase in income in all analyzed entities, fully correspond to the general trend. Nevertheless, some slowdown in trade growth was noted in the Arkhangelsk Region and the Nenets Autonomous Area (with dynamics of 100 and 99.2% respectively in 2024).

Retail trade turnover per capita in the NWFD as a whole surpassed the all-Russian level in 2024, driven by indicator values in Saint Petersburg, the Leningrad, Murmansk, and Arkhangelsk regions, as well as the Republic of Karelia. However, the Murmansk Region has worsened its position over the last three years, moving from 7th to 20th place in the country.

The volume of paid services provided to the population in the NWFD increased by only 0.2% in 2024, compared to 3.3% for Russia as a whole (*Tab. 8*).

The macro-regional dynamics show a tendency towards slowdown, approaching near-zero values. This is partly explained by a noticeable rise in service prices, which outpaces both the increase in cost of goods and the growth of real population incomes.

At the same time, in most NWFD entities, the annual dynamics of paid services to the population

Table 7. Dynamics of retail trade turnover in NWFD regions, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	93.5	108.0	107.2	-	RF	380	-	-	-
NWFD	93.7	113.1	104.0	8	NWFD	415	2	2	2
1. Kaliningrad Region	96.7	107.5	110.7	16	1. Saint Petersburg	499	5	3	5
2. Pskov Region	97.6	102.3	109.8	20	2. Leningrad Region	398	19	12	19
3. Novgorod Region	98.8	102.9	106.0	54	3. Murmansk Region	395	7	13	20
4. Republic of Karelia	90.2	112.2	104.1	65	4. Arkhangelsk Region	394	8	8	21
5. Vologda Region	91.5	102.6	104.1	65	5. Republic of Karelia	394	22	18	22
6. Komi Republic	91.6	105.8	103.6	69	6. Pskov Region	352	33	36	32
7. Leningrad Region	96.5	114.4	103.6	69	7. Kaliningrad Region	330	47	45	38
8. Saint Petersburg	92.0	119.2	103.5	73	8. Novgorod Region	328	40	41	39
9. Murmansk Region	99.4	101.1	101.9	80	9. Komi Republic	323	41	39	41
10. Arkhangelsk Region	92.9	102.8	100.0	83	10. Nenets Autonomous Area	319	27	31	47
11. Nenets Autonomous Area	99.7	103.7	99.2	84	11. Vologda Region	276	58	67	69

Compiled from: Rosstat data.

Table 8. Dynamics of the volume of paid services provided to the population of the NWFD (2022–2024)

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	105.0	104.4	103.3	-	RF	118	-	-	-
NWFD	104.8	103.0	100.2	7	NWFD	125	3	2	2
1. Saint Petersburg	103.9	103.9	107.2	6	1. Saint Petersburg	170	3	3	3
2. Leningrad Region	107.5	105.7	106.0	11	2. Murmansk Region	140	4	5	5
3. Murmansk Region	101.8	102.9	102.7	35	3. Republic of Karelia	120	13	13	12
4. Arkhangelsk Region	108.9	89.5	102.5	40	4. Kaliningrad Region	113	24	19	17
5. Republic of Karelia	98.5	100.7	102.4	43	5. Arkhangelsk Region	105	25	23	23
6. Pskov Region	101.4	101.7	101.7	57	6. Nenets Autonomous Area	95	21	28	27
7. Kaliningrad Region	102.0	99.8	100.3	68	7. Komi Republic	92	26	26	28
8. Novgorod Region	103.4	100.3	99.6	74	8. Vologda Region	84	35	36	42
9. Komi Republic	100.6	99.3	99.6	74	9. Novgorod Region	80	42	46	46
10. Nenets Autonomous Area	106.4	104.1	98.4	80	10. Leningrad Region	77	65	55	53
11. Vologda Region	104.0	97.7	97.0	84	11. Pskov Region	70	66	67	67
Compiled from: Rosstat data.									

ended up in positive territory, and the overall trend is upward. This confirms the previously stated thesis about the recovery of consumer demand and its increasing influence on the economy as a growth factor. The most significant increase in the volume of paid services provided to the population was in the Kaliningrad and Leningrad regions (by 7.2 and 6%, respectively). A decline in the volume of paid services was recorded in the Vologda and Murmansk

regions, Saint Petersburg, and the Komi Republic, resulting in these regions occupying the worst positions in the country for this indicator.

Starting from 2023, the pace of housing commissioning has been declining both in the Russian Federation as a whole and in the NWFD and most of its regions (*Tab. 9*). This is due to market saturation and reduced access to mortgage lending.

Table 9. Dynamics of residential housing commissioning in NWFD regions, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1000 people, 2024, sq. m	Rank		
	2022	2023	2024				2022	2023	2024
RF	111.0	107.5	97.6	-	RF	737	-	-	-
NWFD	108.4	101.7	91.3	8	NWFD	754	3	2	3
1. Murmansk Region	355.2	33.7	118.7	5	1. Leningrad Region	1985	1	1	1
2. Nenets Autonomous Area	200.8	60.8	116.2	9	2. Kaliningrad Region	1181	5	5	4
3. Republic of Karelia	95.5	100.8	106.9	20	3. Republic of Karelia	640	32	39	28
4. Komi Republic	113.0	107.1	104.6	28	4. Pskov Region	626	34	31	31
5. Arkhangelsk Region	100.9	103.3	102.9	32	5. Vologda Region	610	35	29	33
6. Kaliningrad Region	103.7	92.3	100.3	46	6. Nenets Autonomous Area	599	9	45	35
7. Leningrad Region	117.2	105.5	97.1	52	7. Novgorod Region	594	30	30	36
8. Pskov Region	108.0	111.6	95.4	54	8. Arkhangelsk Region	476	46	50	48
9. Vologda Region	101.4	115.1	91.5	63	9. Saint Petersburg	474	25	35	49
10. Novgorod Region	111.9	109.6	89.6	72	10. Komi Republic	316	59	62	60
11. Saint Petersburg	100.3	100.2	76.6	83	11. Murmansk Region	110	60	82	81
Compiled from: Rosstat data.									

Table 10. Price dynamics for various product categories in the NWFD in 2024, % to December 2023

Territory	Consumer goods	Primary housing market	Manufactured goods	Investment purpose goods	Agricultural products	Freight traffic
RF	109.5	112.6	107.9	108.2	-	113.7
NWFD	109.3	108.4	108	108.8	100.5	108
1. Kaliningrad Region	110.3	112.2	108.4	109.8	103.7	119.2
2. Vologda Region	110	105.2	102.8	107.7	108.4	106.6
3. Saint Petersburg	109.5	108.4	105.4	108.3	-	116.4
4. Leningrad Region	109.3	103	112.6	108.7	99.5	100.5
5. Komi Republic	109.3	122.6	108	106.6	97.2	87.2
6. Novgorod Region	109.2	118.3	105.4	110	86	110.6
7. Republic of Karelia	108.6	111.2	109.1	110.7	113.2	106.6
8. Pskov Region	108.5	108.7	109.7	108	100.8	101.4
9. Murmansk Region	108.2	122.1	112.8	111.8	102.6	105.4
10. Arkhangelsk Region	108.1	107.4	109.5	108.5	119.3	105.3
11. Nenets Autonomous Area	106.3	99	98	107.7	98.2	105.5
Compiled from: Rosstat data.						

The change in the aggregate value for the macro region was influenced by the slowdown in housing commissioning in most regions. In particular, in Saint Petersburg, this indicator decreased by 23.4% against the backdrop of near-zero dynamics in previous years. In a number of northern regions (Murmansk Region and Nenets Autonomous Area), a sharp decline in housing commissioning volumes (by 40–65%) was recorded in 2023.

The change in real population incomes, which caused a sharp increase in demand, triggered an inflationary surge observed in almost all price categories except for agricultural products (*Tab. 10*).

Consumer inflation in the NWFD accelerated, reaching 9.3% (a year earlier, consumer prices in the macro region increased by 7.4 and 7.1%, respectively). Food prices in the federal district rose by 10.6%. Overall in Russia, producer prices for industrial goods grew slightly slower than in the NWFD (by 7.9 and 8.0%, respectively). The most significant increase was in the cost of industrial products in the Murmansk and Leningrad regions (by 12.8 and 12.6%, respectively). At the same time, prices for industrial products in the Nenets Autonomous Area decreased by 2%.

The situation with prices in the primary housing market in the NWFD regions is almost universally

negative (with the exception of the Nenets Autonomous Area) – growth ranging from 3 to 22.6% was recorded. Similar processes occurred in pricing for investment goods – due to constrained access to investment resources, both material and financial, price increases from 6.6 to 11.8% are observed. Rising fuel prices and increased pressure on rail transport due to the development of the Northern Sea Route have led to higher freight tariffs in most regions; however, price growth rates in the NWFD are lower than the Russian average.

The most favorable trend is in agricultural product prices. On average for the NWFD, the indicator increased by only 0.5%, while more than half of the agricultural regions demonstrated price decreases ranging from 0.5 to 14%. In the Arkhangelsk and Vologda regions and the Komi Republic, increases from 8.4 to 19.3% relative to the previous year were recorded.

Investments

In 2022, the NWFD experienced a slight slowdown in the growth rate of capital investment volumes due to the negative impact of external economic processes. This was followed, starting in 2023, by actively accelerating growth driven by adaptation processes. Thus, the cumulative increase in the indicator for 2022–2024 amounted to 22.9%

Table 11. Dynamics of investment in fixed capital in the NWFD, 2022–2024

Territory	% to the previous year			Rank, 2024	Territory	Volume per 1 inhabitant, 2024, thousand rubles	Rank		
	2022	2023	2024				2022	2023	2024
RF	106.7	109.8	107.4	-	RF	271	-	-	-
NWFD	97.8	108.7	115.6	1	NWFD	290	4	4	4
1. Leningrad Region	116.0	122.0	138.4	2	1. Nenets Autonomous Area	2607	2	2	2
2. Vologda Region	73.5	87.3	137.0	4	2. Leningrad Region	542	13	13	10
3. Pskov Region	76.8	101.1	132.3	7	3. Murmansk Region	482	10	11	12
4. Nenets Autonomous Area	105.0	94.6	118.0	16	4. Saint Petersburg	272	21	19	18
5. Komi Republic	83.6	98.4	112.5	25	5. Vologda Region	224	27	43	27
6. Saint Petersburg	99.9	110.7	110.5	28	6. Komi Republic	215	25	30	28
7. Murmansk Region	86.9	92.4	105.1	44	7. Republic of Karelia	199	18	25	32
8. Novgorod Region	103.0	117.6	102.6	56	8. Kaliningrad Region	176	45	29	40
9. Republic of Karelia	104.7	92.5	92.9	71	9. Novgorod Region	150	52	48	50
10. Kaliningrad Region	104.7	135.1	89.3	75	10. Pskov Region	119	74	77	67
11. Arkhangelsk Region	88.1	100.8	85.3	79	11. Arkhangelsk Region	116	48	50	68
Compiled from: Rosstat data.									

(for comparison, an increase of 25.8% was recorded for Russia as a whole). In 2024, the NWFD ranked 1st among federal districts in terms of capital investment volume (*Tab. 11*).

The situation appears most positive in the leading regions by contribution to GRP (stable growth in the Leningrad Region, slightly slower in Saint Petersburg). The Novgorod Region also shows high results. A number of regions have distinctly negative trends (Arkhangelsk, Murmansk, and Vologda regions; Komi and Karelia republics). Ambiguous but still positive dynamics of investment volumes are observed in the Nenets Autonomous Area: despite a decrease in the indicator in 2023, the overall dynamics for the study period equaled 17.2%. Investment activity is also recovering in the Pskov Region (after a 23.2% decline in 2022, the overall increase for 2022–2024 was 2.7%, with a sharp acceleration in capital investment).

In 2024, the highest per capita volume of investment in fixed capital was recorded in the Nenets Autonomous Area (2,607 thousand rubles per resident), which exceeds the national average by more than nine times. This is due to a combination of low population and concentration of capital investments in the oil and gas sector,

including projects for hydrocarbon extraction and transportation. The Leningrad Region, Murmansk Region, and Saint Petersburg also demonstrate per capita indicators above the national average, which is explained by developed industry and active development of the Northern Sea Route, accompanied by significant infrastructure investments.

Based on the analysis of economic processes in the regions of Northwest Russia at the third stage of the reproduction cycle, it can be concluded that the key trend of structural transformation is the redistribution of the role of factors in economic dynamics. Against the backdrop of declining export activity, the main drivers of the economy are consumer demand, fueled by rising real population incomes, and increased capital investment through budgetary investments. However, the resulting momentum, according to 2024 data, is losing strength.

Conclusion

The economy of Northwest Russia at the current stage operates under severe external and internal constraints (systemic economic sanctions, mobilization strain, the excessively tight monetary policy of the Bank of Russia) against a backdrop

of a general slowdown in global economic growth. Despite all constraints, the NWFD economy shows a trend of active restructuring of economic and logistical ties.

The main positive trends in the development of the Northwest Russia economy in 2022–2024 include the following:

- noticeable acceleration in industrial production growth (an 11.4% increase over three years), with rates exceeding the national average (9.8%, respectively); the most significant growth was recorded in Saint Petersburg (33.1%), the Leningrad and Pskov regions (12.8% and 20.5%, respectively);

- increase in agricultural output, driven by a leap in key agricultural regions: the Pskov and Kaliningrad regions increased agricultural production volumes by 22.3% and 12.9%, respectively, over 2022–2024;

- rise in real monetary incomes of the population (18.2% over three years), observed in all NWFD regions; only in 2024 was some stagnation noted in the Komi Republic (+2%), the Murmansk (+1.9%), and Arkhangelsk (+0.3%) regions;

- growth in consumer demand across the NWFD: +10% in retail trade and +8.1% in the volume of paid services; however, some slowdown in dynamics occurred in 2024, with growth rates of +4 and +0.2%, respectively;

- positive investment dynamics: growth rates began to outpace the national average, indicating recovery after the 2022 downturn (115.6% in the NWFD versus 107.4% on average in Russia in 2024); some regions recorded investment growth of more than 30% (Leningrad, Vologda, and Pskov regions).

The following can be noted as negative trends:

- negative dynamics of regional budget revenues, particularly pronounced in 2023–2024; a decline was observed in most regions and in 2024 ranged from 2.7 to 13.8%. In regions where revenue growth rates were positive in 2024, the growth was

largely of a recovery nature, with the 2022 level not being reached anywhere. The exception was the Leningrad Region, where growth was recorded every year, resulting in a 27.2% increase in budget revenues over 2022–2024;

- decline in housing construction: the growth rates of housing commissioning volumes lag significantly behind the national average (the cumulative increase for 2022–2024 in the NWFD was 0.7%, while for the country as a whole it was 16.5%);

- high inflation rates in almost all product groups, approaching double-digit values, with the exception of agricultural products in some regions (Leningrad and Novgorod regions, Komi Republic).

The locomotives of positive dynamics in the NWFD economy have been Saint Petersburg and the Leningrad Region, which showed high industrial production growth, as well as the Pskov and Kaliningrad regions, which demonstrated some of the best agricultural production results in the country. The key positive trend in income distribution is the growth in real population incomes, observed for more than a year now. In the consumer sector, continued growth is recorded due to the increased purchasing power of population incomes. However, the economy is under severe pressure from inflationary risks. Investment processes in the macro region as a whole can be characterized as positive, the main argument for which is the high growth rate of capital investment despite all existing constraints.

An analysis of the key trends in the economic development of the Northwest Russia regions leads to the conclusion that the adaptation period and the process of active structural transformation continue. Based on the identified trends and outlined problems, we propose the following directions for economic policy aimed at changing negative and maintaining positive development trends in the Northwest regions (*Tab. 12*).

Table 12. Directions of economic policy for accelerating the development of the Northwest Russia regions in the short term

Addressing economic development problems	Economic development support measures
1. Support for the housing construction sector through subsidizing with housing certificates or reinstating the preferential mortgage mechanism at the regional level; stimulating modular-frame construction. 2. Increasing budget revenue levels by revising the existing list of regional tax incentives, localizing tax revenues from economic agents (firms registered in another region), and improving the efficiency of using state property. 3. Improving the financial performance of organizations (creating regional clusters, localizing value chains, subsidizing investment loans).	1. Support for industrial and agricultural production development (creating regional «skills passports», eliminating bottlenecks in existing value chains, supporting innovations to enhance the economy's income-generating capacity and more efficient use of primary resources). 2. Stimulating growth of population incomes by increasing labor productivity through identifying and developing relevant market niches for promising economic specialization; supporting investments in production automation and robotization. 3. Structural transformation of consumer and investment demand (assessing the status and scenario modeling of the production and export potential of economic sectors; determining the capacity of external and interregional demand, sales geography; assessing import substitution potential in economic sectors; evaluating the need for state support measures; forming a roadmap for implementing support measures and removing barriers to establishing new productions in priority investment areas).
Compiled based on: (Pogosov, Sokolovskaya, 2014; Zamyatina, Pilyasov, 2017; Shirokova, 2025; Nev'yantseva, Akberdina, 2025; Glazyev et al., 2025; Uzyakov, 2011; Sidorov, 2022; Cheplinskite, Lukin, 2024; Lukin, 2025; Lazhentsev, 2025); Shirov A.A. (Ed.). (2022). Potential for Growth of the Russian Economy: Analysis and Forecast: Scientific Report. Moscow: Artik Print. 296 p. DOI: 10.47711/sr2-2022.	

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Appendix 1

Regional Trends in 2022–2024

Depending on the per capita values of key indicators (industrial and agricultural production, population, corporate and state budget incomes, retail trade, housing construction, and investment), the regions of the Northwestern Federal District (NWFD) occupied different positions in the ranking of economic development among Russian constituent entities.

In 2024, the leader of the macro-region in terms of the average rank for these indicators was the Leningrad Region (15th place among 85 Russian regions). The Nenets Autonomous Area, Saint Petersburg, the Murmansk and Kaliningrad regions were placed in the 3rd ten of the ranking. The other six NWFD regions occupied positions in the 4th–5th ten.

Compared to the average for 2022–2023, only four regions of the district managed to improve their rank in 2024: the Komi Republic (by 2 p.), Leningrad Region (by 2 p.), Kaliningrad Region (by 1 p.), Pskov Region (by 2 p.). The remaining regions, despite generally positive trends in their economies, moved down in the all-Russian ranking in 2024. The Republic of Karelia lost one position, Saint Petersburg and the Vologda Region lost 2 positions, the Murmansk Region lost 4 positions, while the Nenets Autonomous Area, and the Novgorod and Arkhangelsk regions lost 5 positions each.

The composite ranks of the NWFD regions for 2022–2024, presented in Appendices 1 and 2, are calculated as the arithmetic mean of the positions of these regions among 85 Russian regions¹⁰ based on indicators characterizing economic development trends. Detailed information on significant changes¹¹ in the positions of Northwest Russia's constituent entities is presented in *Table P1.1*.

Table P1.1. Change in positions of NWFD regions by per capita indicators among 85 Russian constituent entities in 2024 compared to the average for 2022–2023

Indicator	Significant improvement in positions	Significant deterioration of positions
Industrial production	Saint Petersburg (-4 p.; 27→23)	Republic of Karelia (+3 p.; 39→42) Kaliningrad Region (+5 p.; 41→46)
Agricultural industry	Pskov Region (-3 p.; 10→7)	–
Incomes of the population	Novgorod Region (-4 p.; 63→59) Leningrad Region (-3 p.; 33→30) Pskov Region (-3 p.; 57→54)	Komi Republic (+4 p.; 15→19) Vologda Region (+4 p.; 41→45) Arkhangelsk Region (+5 p.; 16→21)
Income of organizations	Komi Republic (-18 p.; 47→29) Arkhangelsk Region (-8 p.; 54→46) Leningrad Region (-7 p.; 18→11) Pskov Region (-5 p.; 62→57) Kaliningrad Region (-4 p.; 10→6)	Vologda Region (+4 p.; 6→10) Murmansk Region (+14 p.; 8→22) Nenets Autonomous Area (+17 p.; 6→23) Novgorod Region (+23 p.; 19→42)
Budget revenues	Leningrad Region (-6 p.; 26→18) Kaliningrad Region (-3 p.; 23→20)	Vologda Region (+5 p.; 19→24) Novgorod Region (+12 p.; 26→38)
Retail trade	Kaliningrad Region (-8 p.; 46→38) Pskov Region (-3 p.; 35→32)	Leningrad Region (+4 p.; 15→19) Vologda Region (+7 p.; 62→69) Murmansk Region (+10 p.; 10→20) Arkhangelsk Region (+13 p.; 8→21) Nenets Autonomous Area (+18 p.; 29→47)
Housing construction	Republic of Karelia (-8 p.; 36→28)	Novgorod Region (+6 p.; 30→36) Nenets Autonomous Area (+8 p.; 27→35) Murmansk Region (+10 p.; 71→81) Saint Petersburg (+19 p.; 30→49)
Investment	Vologda Region (-8 p.; 35→27) Pskov Region (-8 p.; 75→67) Leningrad Region (-3 p.; 13→10)	Kaliningrad Region (+3 p.; 37→40) Republic of Karelia (+10 p.; 22→32) Arkhangelsk Region (+19 p.; 49→68)
Overall change in region's composite rank	–	Murmansk Region (+4 p.; 26→30) Novgorod Region (+4 p.; 37→41) Nenets Autonomous Area (+5 p.; 16→21) Arkhangelsk Region (+5 p.; 39→44)

¹⁰ Excluding the Donetsk People's Republic, Lugansk People's Republic, Zaporozhye and Kherson regions due to the lack of statistical data.

¹¹ The changes in the region's ranks in 2024 by three or more positions compared to the average rank of 2022–2023 are considered significant.

The overall change in the ranks of Northwest Russia's regions by per capita indicators is as follows: the composite rank for the district as a whole remained virtually unchanged. Among the NWFD regions, an improvement in positions occurred in the Leningrad and Kaliningrad Regions, as well as in the Komi Republic (*Tab. P1.2*). The average rank of NWFD regions by per capita economic development indicators for 2022–2024 is provided in *Table P1.3*.

Table P1.2. Change in ranks of NWFD regions by per capita value of key economic development indicators for 2024

Region	Industrial production	Agricultural production	Population incomes	Corporate incomes	Budget revenues	Retail trade	Housing construction	Investments	Total rank improvement	Total rank deterioration	Total rank change
NWFD	0	-1	-1	0	0	0	1	0	-2	1	-1
Pskov Region	0	-3	-3	-5	0	-3	-1	-8	-23	0	-23
Leningrad Region	0	-1	-3	-7	-6	4	0	-3	-20	4	-16
Komi Republic	0	-1	4	-18	1	1	-1	0	-20	6	-14
Kaliningrad Region	5	-2	-1	-4	-3	-8	-1	3	-19	8	-11
Republic of Karelia	3	-1	-2	-1	2	2	-8	10	-10	17	7
Saint Petersburg	-4	0	-1	1	-2	1	19	-2	-9	21	12
Vologda Region	1	-2	4	4	5	7	1	-8	-10	22	12
Arkhangelsk Region	2	0	5	-8	2	13	0	19	-8	41	33
Novgorod Region	0	0	-4	23	12	-2	6	0	-6	41	35
Murmansk Region	0	0	1	14	0	10	10	1	0	36	36
Nenets Autonomous Area	0	-1	0	17	-1	18	8	0	-2	43	41

Table P1.3. Average rank of NWFD regions by value of key per capita economic development indicators for 2022–2024

Region	Industrial production	Agricultural production	Population incomes	Corporate incomes	Budget revenues	Retail trade	Housing construction	Investments	Average rank		
									2022	2023	2024
NWFD	2	7	2	2	2	2	3	4	3	3	3
Leningrad Region	16	19	32	15	22	17	1	12	19	16	15
Nenets Autonomous Area	1	59	3	12	1	35	30	2	13	19	21
Saint Petersburg	25	84	9	8	10	4	36	19	24	24	25
Murmansk Region	8	80	8	13	10	13	74	11	24	28	30
Kaliningrad Region	43	23	37	8	22	43	5	38	28	28	27
Vologda Region	13	33	43	8	21	65	32	32	29	32	32
Komi Republic	9	61	16	41	11	40	60	28	33	35	32
Republic of Karelia	40	72	19	35	13	21	33	25	30	34	33
Novgorod Region	34	29	61	27	30	40	32	50	36	37	41
Arkhangelsk Region	59	67	17	51	16	12	48	55	38	40	44
Pskov Region	67	9	56	60	41	34	32	73	48	47	45

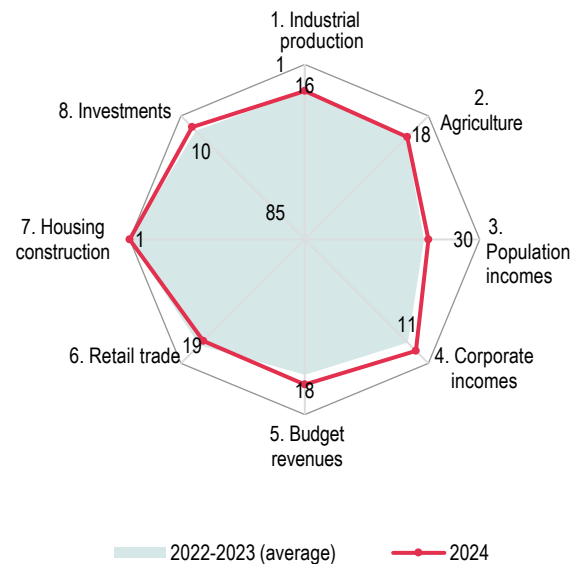
REGIONAL CASE STUDIES

1. Leningrad Region

The region's average rank in 2024 was 15, having improved by 2 positions (the average for 2022–2023 was 17).

The region consistently occupies high positions in terms of industrial and agricultural production volumes, retail trade, housing construction, investment in fixed capital, budget revenues, and corporate financial results. In 2023–2024, the region was the leader in housing construction volumes.

In 2024, the region improved its positions in population income level (-3 p.; from 33rd to 30th place in Russia), budget revenues (-6 p.; from 24th to 18th place), corporate incomes (-7 p.; from 18th to 11th place), investment in fixed capital (-3 p.; from 13th to 10th place). A deterioration in position was recorded in retail trade (+4 p.; from 15th to 19th place).

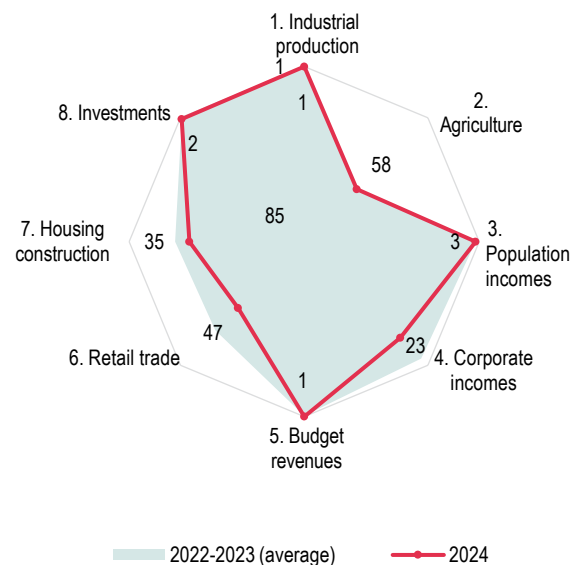


2. Nenets Autonomous Area

The region's average rank in 2024 was 21, having worsened by 5 positions (the average for 2022–2023 was 16).

The region holds high positions in such parameters as industrial production (1st place in the country), population incomes (3rd place), budget revenues (1st place), investments (2nd place).

In 2024, the region's positions worsened in per capita retail trade volumes (+18 p.; from 29th to 47th place), corporate financial results (+17 p.; from 6th to 23rd place), housing construction (+8 p.; from 27th to 35th place).



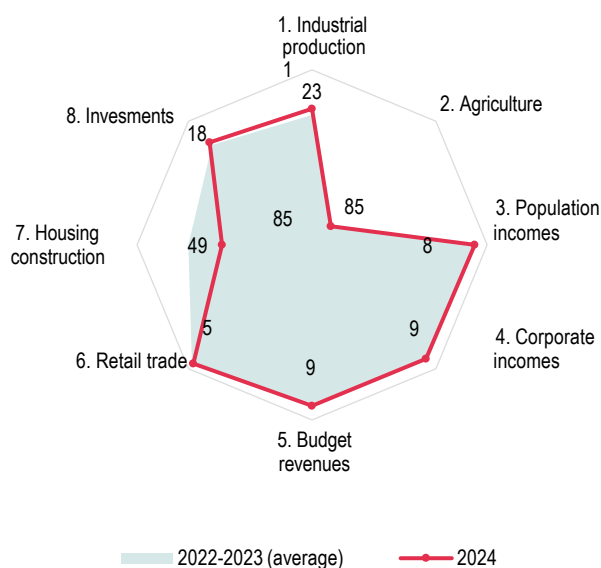
3. Saint Petersburg

The region's average rank in 2024 was 26, having worsened by 2 positions (the average for 2022–2023 was 24).

Saint Petersburg demonstrates strong positions in the following indicators: population incomes (8th place), corporate incomes (9th place), budget revenues (9th place), retail trade (5th place), investments (18th place).

In 2024, an improvement in position was recorded for industrial production (-4 p.; from 27th to 23rd place).

A deterioration was recorded for housing construction (+19 p.; from 30th to 49th place).



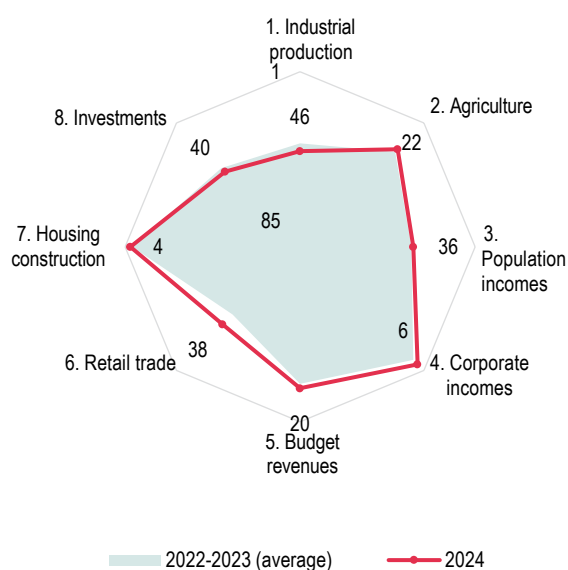
4. Kaliningrad Region

The region's average rank in 2024 was 27, having improved by 1 position (the average for 2022–2023 was 28).

Strong positions in the Kaliningrad Region economy are noted for the following indicators: corporate incomes (6th place), budget revenues (20th place), housing construction (4th place).

The greatest improvement in positions in 2024 was noted for corporate incomes (-4 p.; from 10th to 6th place), budget revenues (+3 p.; from 23rd to 20th place), retail trade (+8 p.; from 46th to 38th place).

The greatest deterioration in positions occurred for industrial production (+5 p.; from 41st to 46th place), investments (+3 p.; from 37th to 40th place).

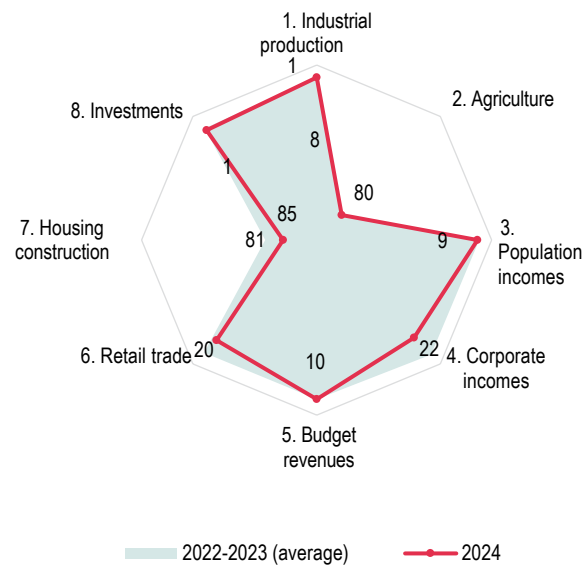


5. Murmansk Region

The region's average rank in 2024 was 30, having worsened by 4 positions (the average for 2022–2023 was 26).

The Murmansk Region demonstrates strong positions in the following indicators: industrial production (8th place), population incomes (9th place), budget revenues (10th place), retail trade (20th place), investments (12th place).

No improvements were recorded for the analyzed indicators. Deterioration of positions in 2024 was noted for corporate incomes (+14 p.; from 8th to 22nd place), retail trade (+10 p.; from 10th to 20th place), housing construction (+10 p.; from 71st to 81st place).

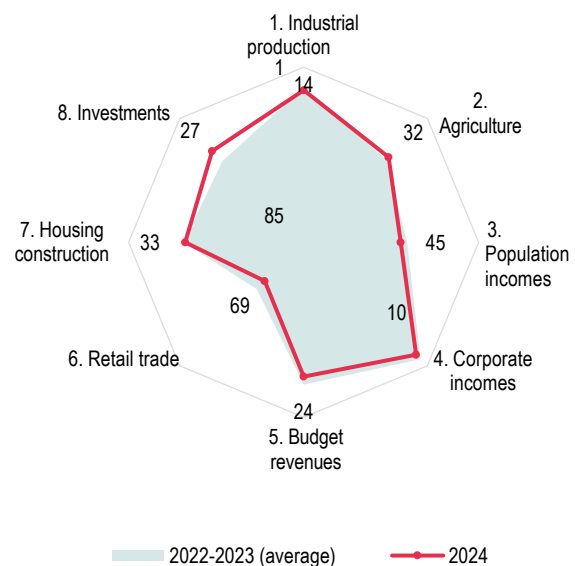


6. Vologda Region

The region's average rank in 2024 was 32, having worsened by 2 positions (the average for 2022–2023 was 30).

The Vologda Region demonstrates strong positions in the following indicators: industrial production (14th place), corporate incomes (10th place). The region has a weak position in retail trade (69th place).

The greatest improvement in positions in 2024 was noted in investments (–8 p.; from 35th to 27th place). The greatest deterioration occurred in the following indicators: population incomes (+4 p.; from 41st to 45th place), corporate incomes (+4 p.; from 6th to 10th place), budget revenues (+5 p.; from 19th to 24th place), retail trade (+7 p.; from 62nd to 69th place).

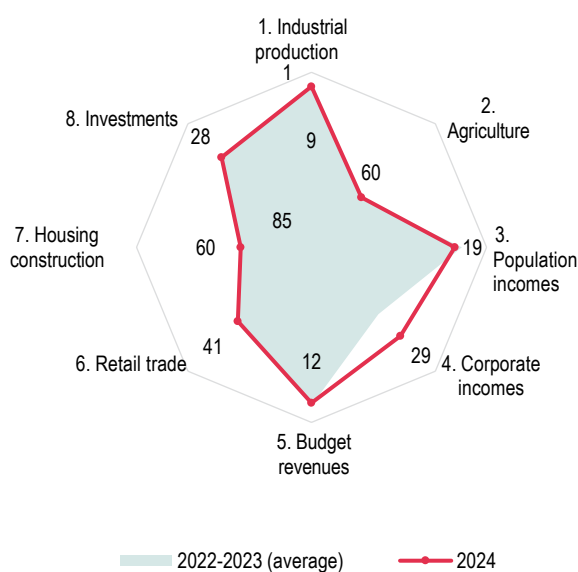


7. Komi Republic

The region's average rank in 2024 was 32, having improved by 2 positions (the average for 2022–2023 was 34).

The Komi Republic demonstrates strong positions in the following indicators: industrial production (9th place), population incomes (19th place), budget revenues (12th place).

The greatest improvement in positions in 2024 was noted for corporate incomes (–18 p.; from 47th to 29th place). The greatest deterioration occurred in population incomes (+4 p.; from 15th to 19th place).



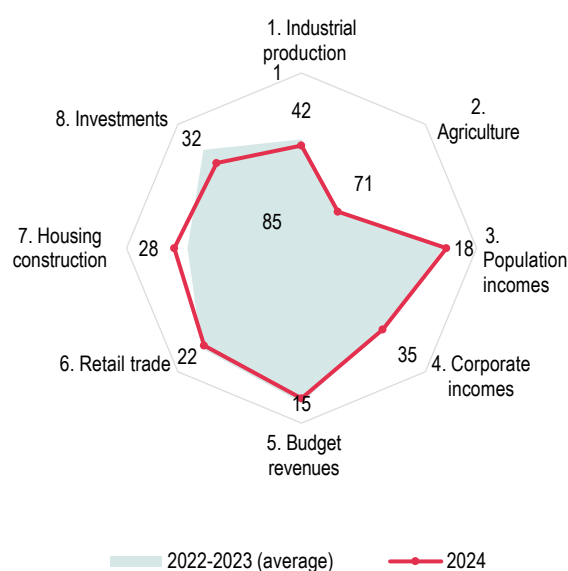
8. Republic of Karelia

The region's average rank in 2024 was 33, having worsened by 1 position (the average for 2022–2023 was 32).

The Republic of Karelia demonstrates strong positions in the following indicators: population incomes (18th place), budget revenues (15th place). A weak position remains in agriculture – 71st place.

The greatest improvement in positions in 2024 was noted for housing construction (–8 p.; from 36th to 28th place), investments (+14 p.; from 46th to 32nd place).

The greatest deterioration occurred in industrial production (+3 p.; from 39th to 42nd place), investments (+10 p.; from 22nd to 32nd place).

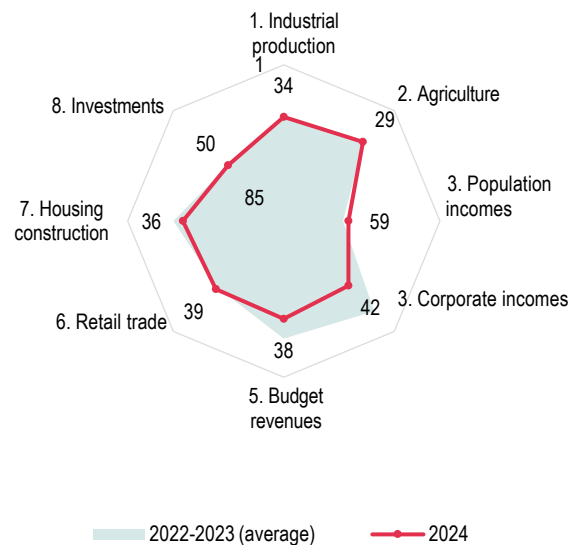


9. Novgorod Region

The region's average rank in 2024 was 41, having worsened by 5 positions (the average for 2022–2023 was 36).

The region has no clearly defined strong or weak positions among the analyzed indicators.

An improvement in position in 2024 was noted for population incomes (-4 p.; from 63rd to 59th place). Deterioration occurred in corporate incomes (+23 p.; from 19th to 42nd place), budget revenues (+12 p.; from 26th to 38th place), housing construction (+6 p.; from 30th to 36th place).

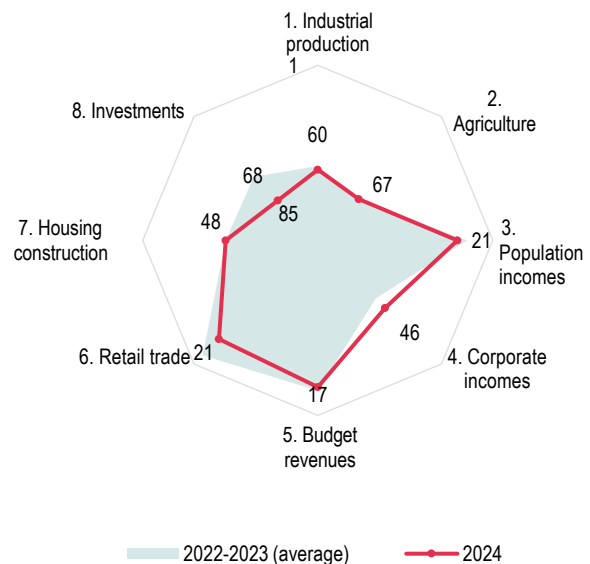


10. Arkhangelsk Region

The region's average rank in 2024 was 44, having worsened by 5 positions (the average for 2022–2023 was 39).

The Arkhangelsk Region demonstrates weak positions in agriculture (67th place), investments (68th place).

An improvement in position in 2024 was noted for corporate incomes (-8 p.; from 54th to 46th place). Deterioration occurred in the following indicators: population incomes (+5 p.; from 16th to 21st place), retail trade (+13 p.; from 8th to 21st place), investments (+19 p.; from 49th to 68th place).

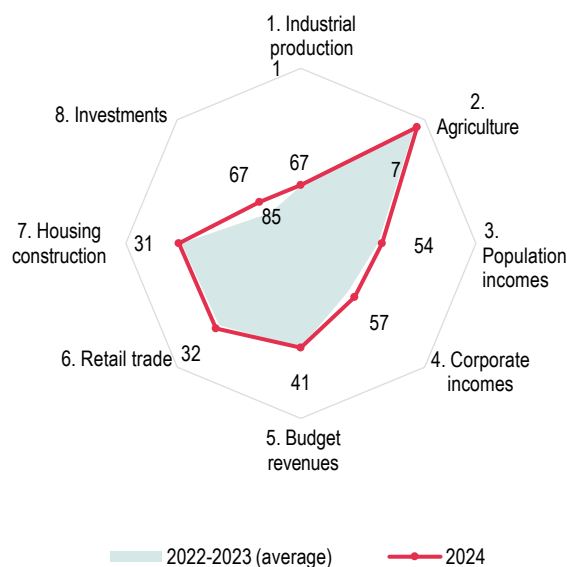


11. Pskov Region

The region's average rank in 2024 was 45, having improved by 2 positions (the average for 2022–2023 was 47).

The Pskov Region demonstrates a strong position in agriculture – 7th place in the country. The region has weak positions in industrial production (67th place), investments (67th place).

Improvements in positions in 2024 were noted for agriculture (-3 p.; from 10th to 7th place), population incomes (-3 p.; from 57th to 54th place), corporate incomes (-5 p.; from 62nd to 57th place), retail trade (-3 p.; from 35th to 32nd place), investments (-8 p.; from 75th to 67th place). No deteriorations were recorded for the analyzed indicators.



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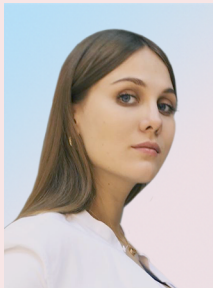
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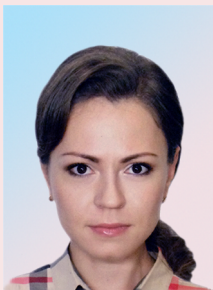
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Improving the Population's Quality of Life: The Role of the Socio-Economic Genotype in Shaping the Regions' Development Strategy



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Abstract. This article examines methodological approaches to studying the socio-economic genotype, as well as practical aspects of its application in the context of regional development. The obtained results demonstrate, for the first time, a stable and statistically significant relationship between the quality of life of the population and the socio-economic genotype within a regional framework. The study identifies three fundamental genes of the socio-economic genotype: production, innovation, and institutional-social, and elucidates their economic nature. The concept of the “genotype core” is refined, defined as the minimal set of indicators sufficient for identifying a region's type. As a result of the research, regions were grouped according to the dominant gene, which revealed stable economic patterns, strengths and weaknesses of different groups, “hidden” regional patterns, and specifics of regional development that impact the population's quality of life. The proposed regional classification is based not on traditional sectoral specialization, but on the identified genetic profile, which is analyzed within the context of four quartile groups of quality of life – an approach not previously documented empirically. Statistical analysis using the Chi-square criterion confirmed a statistically significant relationship between the genotype core and the integral quality of life index. By comparing the genetic map and the quality of life index, it was established that the institutional-social gene contributes the most to a high quality of life, whereas the production gene, without reinforcement from innovation and institutional-social factors, does not lead to increased well-being. The paper concludes by justifying the integration of the socio-economic genotype into regional strategies and monitoring systems for socio-economic programs, thereby expanding the toolkit for governance. The scientific novelty lies in applying a new approach to studying regional development issues, involving the analysis of the simultaneous interaction between the socio-economic genotype and quality of life. The theoretical significance of the work is defined by the development of a conceptual model of the socio-economic genotype, based on a triad of socio-economic genes (production, innovation, and institutional-social) and the subsequent construction of the genotype core using the Frobenius norm applied to indicator matrices as a quantitative assessment of territories' internal potential. The practical significance stems from the creation of a methodological toolkit that enables more precise and effective development of regional strategies aimed at improving the population's quality of life.

Key words: socio-economic genotype, quality of life, Frobenius norm, production gene, innovation gene, institutional-social gene, genotype core, strategizing.

Acknowledgment

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Introduction

Ensuring the sustainable socio-economic development of regions is accompanied not only by ongoing programs and managerial economic decisions, but also by the inherent regional features of the institutional, social, historical, and cultural past. In recent years, we can note an increasing interest in defining latent, time-invariant (like human DNA) regional features, which are revealed in the scientific literature through the definition of “socio-economic genotype”. The stable and inherited characteristics of the region make it possible to more accurately formulate strategic

priorities and develop effective measures to improve the quality of life, which is key in developing a regional development strategy. The use of the scientific connotation under consideration expands the possibilities for analyzing and managing the quality of life, which is an important aspect in the context of strong regional differentiation in determining strategic vectors of regional development. The synthesis of economic and genetic approaches forms a new tool for a deeper analysis of regional differences, which increases the effectiveness of the entire strategizing process (Kvint, Okrepilov, 2013; Kvint, Okrepilov, 2014).

Currently, there are no universal methodological approaches to the definition, composition and structure of the genome of a region against the background of increasing interest in the genetic model of regional development. In this regard, it seems relevant to develop the theory of the socio-economic genotype of regions in terms of its structural analysis, which makes it possible to identify sustainable regional patterns, the analysis of which expands the mechanisms for making strategic decisions and improving the quality of life (Shakleina, Shaklein, 2017). The novelty of the proposed methodological approaches to the analysis of socio-economic genotype is to consider regional development in the genotype – quality of life coordinate system. The socio-economic genotype creates a kind of filter for the perception of quality of life factors. For example, commensurate investments in medicine are associated with different quality of life margins in regions with “innovative” and “industrial” genotypes. The integration of socio-economic genotype and quality of life is able to demonstrate how the “generic” potential of the region has been transformed into quality of life.

The aim of our study is to develop methodological aspects of the structural analysis of the socio-economic genotype of Russian regions in the context of the development of the quality of life.

We define the following tasks to achieve this aim:

- 1) to develop and describe the main methodological aspects of identifying key socio-economic genes that reflect the unique features of the region, the development features;
- 2) to test this methodology and cluster regions based on the identified genotype;
- 3) to assess the relationship between the socio-economic genotype and the quality of life;
- 4) to determine the prospects of using a genetic approach to analyze the quality of life.

The practical significance of the socio-economic genotype in the practice of regional management and improving the quality of life lies in creating tools which can be used by executive authorities to improve the effectiveness of management decisions in terms of improving the quality of life, implemented through the prism of strategic priorities.

Materials and methods

Interdisciplinary nature of the genetic approach in socio-economic research

The gene field in economics is a relatively new area of scientific knowledge that has emerged at the intersection of genetics and economics (Benjamin, 2007; Benjamin et al., 2012). The main idea of the direction is to use biological models in business processes. The practice of such integration, the features and possibilities of using the biological idea for a better understanding of economic problems were first formulated by the Soviet and Russian economist E.Z. Maiminas.

In the research (Maiminas, 1989), the scientist gives the following definition of the socio-economic genotype: “The socio-economic genotype (SEG) is an information mechanism that ensures the reproduction of the structure, principles of functioning, processes of regulation and learning (selection, memorization and transfer of positive experience) in a given socio-economic system”. V. Mayevskii, N. Kondrat’ev, G. Kleiner, and

V. Polterovich considered this problem at different times (Mayevskii, 1994; Kondrat'ev, 1989; Kleiner, 2004; Polterovich, 1998).

The interdisciplinary nature of the research is the application of biological mechanisms and processes in economics, psychology, and sociology in foreign practice. A study of the American scientist V. Diego (Diego et al., 2023) presents an interdisciplinary approach combining genetic and economic research to assess the quality of life. Based on the interaction of genetics and environmental factors, the authors analyze the influence of education level and socio-economic status on the risk of cardiovascular diseases. The analysis allows concluding that with a higher level of education, the genetic influence increases, and genes begin "working brighter". The social environment determines the degree of manifestation of the genetic potential. The work of other foreign colleagues (Biroli et al., 2025) shows that genes are another type of "source capital" that, interacting with the external environment, affects behavior and life outcomes (income, level of education, health).

Table 1 presents interdisciplinary connections of the genetic approach in socio-economic processes.

Despite the extensive nature of the interdisciplinary connections of the phenomenon under consideration in economic practice, the most well-known are the two main approaches of A. Auzan (Auzan, 2022) and E. Maiminas, Y. Myslyakova (Maiminas, 1989; Myslyakova, 2020, 2022) to understanding the socio-economic genotype.

Comparison of the main approaches to understanding the socio-economic genotype

A.A. Auzan's approach (Auzan, 2022; Almond, 1963; Weiner, 1989), which we will call "socio-cultural codes", focuses on the behavioral and value aspects of society that determine how and what an individual does in economics, politics, and everyday life. A. Auzan shows that Russia does not have a single cultural code but there is a set of values that combine in different proportions. A. Auzan's "Genetics" makes it possible to design institutions that will be consistent with the dominant code and turn strengths into long-term competitive advantages. Regarding the issues of improving the

Table 1. Interdisciplinary nature of the genetic approach in socio-economic research

Interrelationships of disciplines	Theme of the relationship	Literature	Content
Economics and Genetics	How do inherited parameters affect economic development	Ashraf, Galor 2013; Benjamin et al., 2007; Clark, 2007; Abdellaoui, 2022; Biroli et al., 2025	The idea that economic outcomes are linked to genetic prerequisites is tested.
Sociology and Genetics	Role of genes in the formation of behavioral attitudes, political activism, and social stratifications	Mills et al., 2020; Fowler, 2008; Аузан, 2013; Hodgson, 2003; Ostrovitianov, 1977	These articles discuss how the social environment can include or, conversely, mute a genetic predisposition. Cultural codes are considered as an addition to biological uniqueness.
Psychology, Sociology (behavioral sciences) and Genetics	Individual economic behavior, well-being, and "personality genes"	Fletcher, 2011; Fletcher, 2012; Fletcher, 2014; Benjamin, 2010	Conclusions about how genetic differences affect the propensity to take risks, accumulate capital, and choose a profession – through the prism of psychology and well-being. Based on a genetic approach, Fletcher developed and substantiated the idea that differences in the level of financial well-being and self-development are caused by genetics.
Source: own compilation based on the literature analysis.			

quality of life and comfortable living conditions, it is especially necessary to take into account the cultural code, since the effectiveness of any economic policy is aimed at improving the quality of life, and without taking into account the “embedded” attitudes of the population, views on the problem of improving the quality of life, living conditions, and values, measures to improve it will have a short-term and limited in nature.

The genetic approach, defined by other scientists (Maiminas, 1989; Myslyakova, 2020), considers the concept of the region’s genotype not only as a sum of cultural traditions and norms of behavior, but also as a system that includes institutional practices, economic strategies and models of social interaction.

Developing Maiminas’s concept (1989), Yu.G. Myslyakova (2021) focuses on institutional and cultural factors that play a fundamental role in economic behavior and regional development. The authors of this approach believe that since a region is a complex organism that combines different business entities, each entity needs to adapt to existing socio-economic relations, the study of this issue should focus not only on socio-cultural and value attitudes that have inherited the territory, but also on production and institutional parameters of the region, leading to its economic growth.

We can identify several key differences and similarities comparing the basic concepts within the framework of the genetic approach to regional development.

1. A. Auzan’s approach reduces the development of ideas of socio-economic genotype to the development of the “socio-cultural code” concept. The emphasis is on cultural attitudes and norms that influence economic behavior and shape regional development trajectories. This concept is more flexible and less formalized, which causes certain difficulties for practical use.

2. The concept of the socio-economic genotype by E. Maiminas and Yu. Myslyakova offers a

fairly clear framework for understanding and attributing socio-economic characteristics to the region’s genotype. This approach is better quantifiable to create tools for monitoring and managing regional development.

All the authors show that the genotype forms long-term patterns of behavior and development of regions despite the existing differences in the concepts presented, hence the failure to take this aspect into account makes effective regional management difficult.

It is impossible to ignore the work of Russian scientists (Ayvazyan, 2012; Kvint, 2009), who, although they did not directly use the concept of socio-economic genotype, made a significant contribution to understanding the sustainable components of institutional and cultural factors concerning territorial development. The research (Ayvazyan, 2012) proposes to use an institutional and cultural component in the model within the framework of modeling and integrated assessment of the quality of life. Kvint (Kvint, Okrepilov, 2014) proves the importance of these components in solving the issues of strategizing territories and developing strategic priorities.

In the framework of our study, we will use the concept of Maiminas and Myslyakova, since, first, this approach is more methodologically sound, allows making quantitative estimates of the elements of the socio-economic genotype; second, it has direct practical application – it allows identifying dominant genes and analyze typical regional profiles.

The similarity of the core of the socio-economic genotype considered in our study with the approach of Yu.G. Myslyakova lies in the recognition of heritability and minimal sufficiency of the core structure, while the difference lies in the emphasis on the institutional and social dimension, which is necessary to verify the relationship between the genotype and quality of life, as well as a strict quantitative procedure for integrating indicators, ensuring inter-regional comparability.

Table 2. Analysis of approaches to the definition and structural specification of the core of the socio-economic genotype

Source	Core content	Structural components
"Theoretical aspects of modeling the socio-economic genotype of industrial regions of the Russian Federation" (Myslyakova et al., 2019)	The core is considered as a set of defining and dynamic codes that ensure the hereditary memory of the territory	Production, social and innovation codes, interconnected with each other
"Social and economic genotype territories of the advancing development on example of the Ural region" (Myslyakova et al., 2020)	The core is defined as the hereditary morphological basis of the region	Production, social and institutional codes. Each of them has a set of indicators, and a set of codes forms the morphology of the core
"Genetic approach in studies of sustainable regional economic development" (Myslyakova, 2020)	The concept of a core is generalized. It is interpreted as the core of the social immunity of the territory, including protective mechanisms and inherited parameters of the state of society	Three blocks: indicators of the well-being of the population, labor potential and its activation (indicators of social sustainability)
Source: own compilation on the basis of works (Myslyakova, Neklyudova, 2021; Myslyakova, Shamova, 2020).		

An analysis of scientific papers on the socio-economic genotype shows that each territory has an information core containing unique stable codes that are practically unchanged throughout the entire stage of economic development and they determine the region's response to external challenges and incentives.

The scientific literature review revealed that a differentiated set of codes depends on the specifics of territorial development tasks. For example, for priority development territories, it is very important to attract investments and form new production clusters, therefore, production and innovation codes should be considered as specific code characteristics (Myslyakova, Neklyudova, 2021; Myslyakova, Shamova, 2020). The codes include indicators of resource provision, industry specialization, level of technological development, and R&D development.

The study of the development of single-industry towns, which are characterized by high dependence on a particular industry or enterprise, implies the identification and more detailed study of institutional and production codes. Institutional codes that characterize the maturity of institutions and the quality of governance play a crucial role in the sustainable development of territories and determine the possibilities of flexibility/

adaptation to changes in the external environment (Myslyakova, 2020).

When analyzing the quality of life and social comfort (Shakleina et al., 2021; Medyanik et al., 2024), it becomes necessary to include a socio-cultural code covering the value and behavioral attitudes of the region's population, which makes it possible to determine the impact of the socio-cultural context on the subjective perception of social policy, as well as evaluate the effectiveness of investments in healthcare and education.

In accordance with the approach of E.Z. Maiminas and Yu.G. Myslyakova, it is advisable to group stable "inherited" features of regions in the framework of this study into a triad of production, innovation, institutional and social codes. Each code reflects a certain level of spatial development of the region.

The triad of codes forms a **complex** regional genotype, which can be interpreted as a structural trace of regional dynamics. Further research provides for the extensibility of the design by including socio-cultural parameters while meeting the requirements of representativeness and comparability of time series to determine the influence of value attitudes on the perception of quality of life and social comfort.

The production code reflects the inherited economic specialization, including the infrastructural component, technological structure and employment structure of the population. This code sets the foundation of the economic system and builds resilience to economic shocks and recessions. It is reflected in such aspects as changes in economic growth rates, employment sustainability, and specialization structure.

The innovative code, in turn, represents the ability for technological renewal and transition to new economic structures. It is important to note that the innovation code is “visible” in labor productivity and generation of the high-tech sector, includes the amount of R&D and correlates with the human capital development.

The institutional and social code of the region is a set of stable rules and interaction between the key actors of the region, reflected in the effectiveness of the implementation of strategies and the quality of management of the territory. The code combines indicators of the quality of institutions and the social environment, including the increase in the Gini coefficient, as a distributive indicator within the complex structure of the institutional-social code. Thus, the social characteristics of the population are not excluded, but are integrated into the core of the genotype through the institutional and social code, which includes not only a set of formal norms and institutions, but also ways of their intergenerational transmission. In this way, the hypothesis of an inherited form of interaction between government, business and society is confirmed, which gives the code genetic stability.

The triad of codes (industrial, innovative, and institutional-social) within the framework of the socio-economic genotype concept has a synergetic potential. In our study, the core of the genotype will be defined as a functionally integrated structure reflecting the interaction of the three codes. The genotype itself is considered as an indicator of the functional effectiveness of a socio-economic region, while maintaining continuity in the application of the genetic approach and code modeling methods.

Results

We selected 9 indicators to determine the socio-economic genotypes of the regions. They are divided into 3 components – production, innovation, institutional and social. Indicators related to the socio-economic genotype should meet the following methodological requirements:

- relative stability over time;
- low sensitivity to short-term political and economic shocks;
- historical depth (availability of a number of data for the previous 20–30 years).

All indicators of the information core of the socio-economic genotype are presented in the table (*Appendix*).

The choice of the triad of codes presented in *Table 3* is justified by the fact that it is precisely this composition that provides a closed cause-and-effect relationship, where the transformation of the resource and industry base into social results takes place. The composition of the proposed code is minimally sufficient and robust to confirm or refute the statistical relationship with the quality of life,

Table 3. Indicators of socio-economic genotype, %

Production code	Innovative code	Institutional and social code
Increase in the share of industry in GRP	Increase in R&D expenses	Increase in the region's debt burden ratio
Growth in the industrial production index	Increase in the number of patents by 10 thousand people	Growth in the number of small and medium-sized enterprises
Increase in the number of all organizations	Growth in the number of personnel engaged in scientific research and development	Increase in the Gini coefficient
Source: own compilation on the basis of works (Myslyakova, Neklyudova, 2021; Myslyakova, Shamova, 2020).		

which is also due to the avoidance of excessive multicollinearity between indicators of a similar nature.

The indicators of the production code record the steady specialization and dynamics of output, characterize the supporting forces of the region's economy. The work (Myslyakova et al., 2020) uses incremental indicators for shipments, the share of manufacturing industries and investments as standard elements of the production unit. In our case, the use of the parameter of the increase in the number of all organizations characterizes the strengthening and expansion of the industrial and sectoral basis of the regional economy.

The innovation code indicators represent the region's ability to technological renewal, creation of innovations, and development of scientific research. In the typology of Yu.G. Myslyakova (Myslyakova et al., 2019), the innovation code is formed through the logical sequence "potential – result". The triad of indicators reflects this logic, while the transition to standardized patent activity and R&D dynamics enhances inter-regional comparability.

The indicators of the institutional and social code take into account the financial stability of management, the business environment, and the distributional results through which the economic success of the region is converted into a high quality of life. In the institutional block of the work (Myslyakova et al., 2020), variables are widely used to characterize the business environment (the presence of innovative small and medium businesses, the index of employment growth in SMEs, etc.). Adding a debt burden correctly describes the financial stability of management, and the inclusion of the Gini coefficient is used in the work (Myslyakova, 2021) as a social indicator associated with a predisposition to technological transformations, which makes it possible to expand the considered code to an institutionally social one. The integration of the Gini coefficient into

the institutional and social code is justified as an element of the "inherited" rules of interaction between society, business, and government. Thus, the methodological requirements are set by the framework of the genetic approach of Yu.G. Myslyakova, and also expanded by us in the context of assessing the impact of the region's genotype on the quality of life.

The study identified the genotypes of the regions based on an analysis of their growth rates for the period from 2022 to 2023 in 83 regions of the Russian Federation. The Jewish Autonomous Region and the Chukotka Autonomous Area were excluded from the research sample due to the lack of published statistical data on the innovative genotype due to the need to respect the confidentiality of primary information provided by organizations¹. In addition, the Donetsk People's Republic, the Luhansk People's Republic, the Zaporozhye Region, and the Kherson Region were excluded in the sample due to the lack of relevant statistical data.

The paper uses the Frobenius norm to calculate the core of the socio-economic genotype, since this method ensures the objectivity and mathematical rigor of the integral assessment of the matrix of indicators. The Frobenius norm allows taking into account the contribution of each element of the matrix, while maintaining the internal structure of the interrelationships of indicators. When calculating using this method, we can not only determine the state of a region by its genotype, but also compare the positive and negative polarity of development, forming an indicator of genetic tension. In fact, the Frobenius norm performs the function of an integrator that reflects the latent state of the socio-economic system and ensures comparability of regions with different indicator structures.

¹ On official statistical accounting and the system of state statistics in the Russian Federation: Federal Law 282-FZ, dated November 29, 2007 (paragraph 5 of Art. 4, part 1 of Art. 9).

At the next stage, after data collection, the core of the socio-economic genotype of the regions is modeled, which is presented in a matrix format: it consists of production (P), innovation (I), institutional and social (IS) codes. The matrix shows the incremental values of the indicators from the Table (*Appendix 1*).

$$A = \begin{bmatrix} P_1 & P_2 & P_3 \\ I_1 & I_2 & I_3 \\ IS_1 & IS_2 & IS_3 \end{bmatrix} \quad (1)$$

After the formation of the “information matrix”, the size of the core of the territorial genotype was determined using the Frobenius norms. For this purpose, we calculated a measure of the generalized matrix in the positive and negative polarity of development.

$$\|A^+\| = \sqrt{\sum_{i=1}^m \sum_{j=1}^n a_{ij}^2} \text{ при } a_{ij} > 0, \quad (2)$$

a_{ij} – elements of the matrix A .

A positive transformation captures productive and progressive dynamics for each gene.

$$\|A^-\| = \sqrt{\sum_{i=1}^m \sum_{j=1}^n a_{ij}^2} \text{ при } a_{ij} < 0 \quad (3)$$

Negative transformation captures regressive and inhibitory development factors.

At the final stage, a matrix between the positive and negative core has been determined, which

makes it possible to identify an indicator of the genetic tension or potential for the region's development.

$$SEG = \|A^+\| - \|A^-\| \quad (4)$$

If $SEG > 0$, the regional core is development-oriented, and if $SEG < 0$, then stagnation, structural decline, or institutional degradation is observed.

Thus, the application of the Frobenius norm ensures objectivity and forms the basis for the distribution of regions by dominant gene.

Table 4 shows that the Sakhalin Region and the Republic of Ingushetia demonstrated a pronounced dominance of the innovation gene due to the predominance of positive polarity ($I^+ = 1.38$ and $I^+ = 1.00$, respectively). Innovation processes in the regions are one of the key factors in improving the quality of life – the regions are included in the comprehensive state programs “Socio-economic Development of the Far East”, “Strategy of the North Caucasus Federal District-2025”, where the priority is the development of digital services and human capital. The dominance of the innovation gene does not mean that the regions of this group are technological leaders or leaders in socio-economic development. The disclosure of the available potential is determined by the economic development level, the availability of a resource and production base, and the quality of institutions.

Table 4. Results of the socio-economic genotype using the example of regions with different dominant genes

	P^+	P^-	I^+	I^-	IS^+	IS^-	Gene	Core
Sakhalin Region	0.12	0.01	1.38	0.04	0.02	0.44	I	1.51
Republic of Ingushetia	0.00	0.11	1.00	0.00	0.00	0.56	I	-0.16
Kemerovo Region	0.23	0.03	0.13	0.21	0.16	0.01	P	0.51
Novosibirsk Region	0.03	0.02	0.00	0.02	0.02	0.03	P	-0.02
Perm Territory	0.02	0.09	0.02	0.10	0.12	0.04	IS	0.15
Saint Petersburg	0.04	0.09	0.00	0.20	0.66	0.03	IS	0.25
Source: own compilation based on Rosstat data.								

The Kemerovo Region and the Novosibirsk Region are characterized by the dominance of the production genotype. It is worth noting that the Kemerovo Region is characterized by the intensity of positive production activity $P^+ = 0.23$, while the Novosibirsk Region ($P^+ = 0.03$) retains only inertial elements of the production profile, the value of the innovation component remains at a low level.

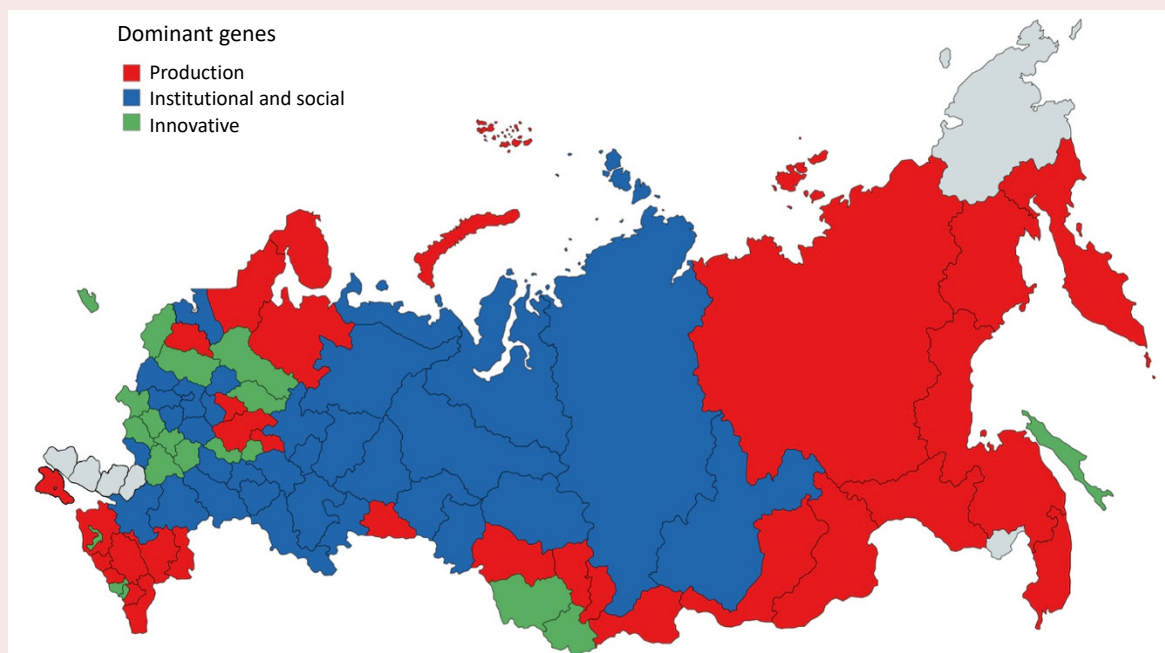
The Perm Territory and Saint Petersburg demonstrate the dominance of the institutional and social gene. The stability of the institutional contour is observed in the Perm Territory, while in Saint Petersburg ($IS^+ = 0.66$) the institutional and social potential is clearly expressed, the leading role of the urban environment in the formation of infrastructure is confirmed.

The final indicator of the genotype core reflects the general vector of the region's development. Positive values indicate the active development of the region, while negative values indicate the

presence of structural constraints. The most pronounced innovative type of core is typical for the Sakhalin Region, which confirms the innovative orientation of the region. The negative value of the core is recorded in the Republic of Ingushetia, which indicates the instability of the institutional foundation. The Perm Territory and Saint Petersburg have the most balanced cores. In these regions, the positive effects of institutions and the social environment compensate for the weakness of other codes. Within the framework of this study, special attention is paid to the dominant genes, since the isolation of the dominant gene allows proceeding to a functional analysis, which helps to understand exactly which internal mechanisms determine the quality of life and economic dynamics of the region (*Fig. 1*).

The institutional and social code dominates in 34 regions of the Russian Federation, including both the largest megacities (Moscow, Saint

Figure 1. Map of the RF constituent entities by dominant genes



Source: own compilation based on the calculations performed.

Petersburg) and regions with a high level of urbanization and developed infrastructure (Samara, Tyumen, Sverdlovsk regions, Republic of Tatarstan, etc.). The regions of this group are characterized by the presence of developed digital services and a stable legal environment, as well as significant investments in social and transport infrastructure. The presence of strong universities contributes to the reproduction of institutional culture. The predominance of the social gene is reflected in the concentration of human capital – a high level of education, the presence of a developed medical and cultural infrastructure. In such regions, institutions effectively transform social potential into an increase in the quality of life.

The other two genes (production and innovation) play a supportive, but not a determining role.

The innovation code is registered in 19 Russian regions. The innovation gene in this group of regions performs a compensating function: in the absence of a strong production core and a stable institutional and social contour, room is made for quick and easy innovations (most often the creation of digital services, increasing the availability of services, etc.) that can meet the basic needs of the population and improve the digital infrastructure of life. The development processes of small and medium-sized businesses are also being launched. The dominance of the innovation gene is not identical to technological leadership; the presence of an innovation contour in the region is a tool for improving the quality of life. The geographical remoteness and peripheral location of a number of regions dominated by the innovation gene acts as a factor stimulating demand for highly qualified specialists through the implementation of remote solutions through the development of the digital infrastructure of the region, which is typical for regions with the status of an external or island border (Kaliningrad Region, Pskov Region,

Sakhalin Region), as well as for subjects with an agricultural and mountainous terrain (Republic of Adygea, Republic of Altai, Republic of Ingushetia).

One of the most numerous groups is regions with a dominant production code, with a total of 30 constituent entities in the sample, in the socio-economic structure of which the key role is assigned to industrial and resource sectors. The formation of the genotype occurred under the influence of the industrialization of the Soviet period. Typical examples are the Kemerovo Region, the Murmansk Region, the Primorye and Khabarovsk territories, the Republic of Sakha, the Trans-Baikal Territory, etc. These regions are characterized by high employment in the mining, energy, forestry, and metallurgical industries. Despite its large role in the country's economy, the dominance of the manufacturing gene is combined with low or below-average indicators of quality of life. This is due to the weak institutional maturity of the regional environment and the innovation contour. The innovation gene in these regions is poorly expressed and mainly serves requests for modernization of basic industries.

Development prospects of socio-economic genotype theory in the context of improving the quality of life

In the conducted study, the dominant gene was determined for each Russian region relative to the other two genes. In general, a triad of genes was analyzed: production, innovation, and institutional-social. If in the approach of Yu.G. Myslyakova (2020, 2021, 2022) the genotype core serves as a tool for typologizing territories, then in this study the dominant gene is considered as a functional basis for analyzing the relationship between the genotype and the quality of life of the population. The proposed genes are not mutually exclusive, but rather complement each other in the process of progressive regional development. The accumulated experience forms the basis for the future development of the

region. Based on the results obtained, the following hypotheses about the relationship between the socio-economic genotype and the quality of life in the region are formulated.

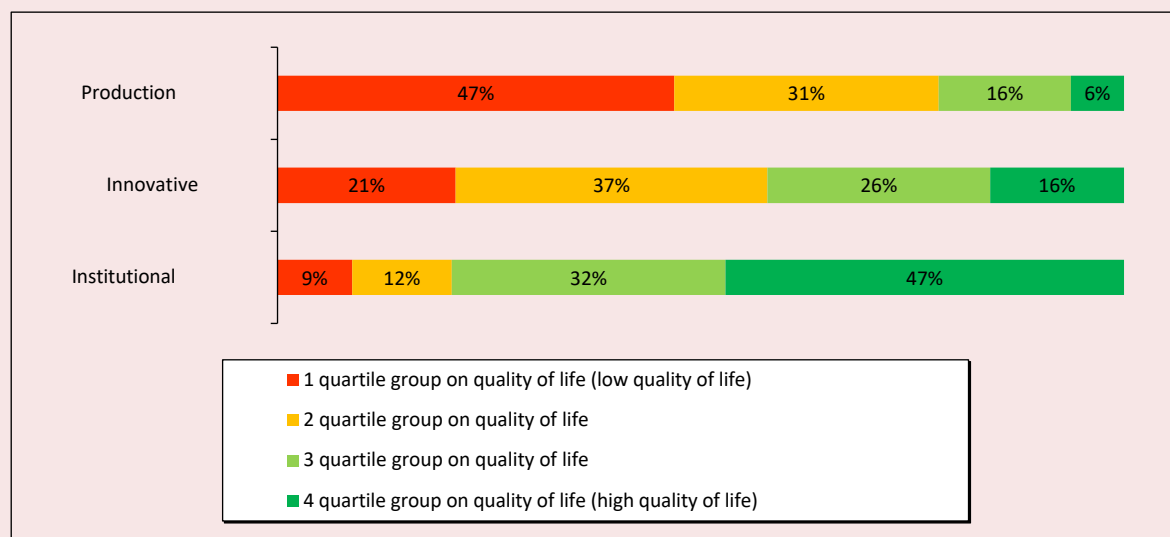
Hypothesis 1. The production gene is an auxiliary gene for the formation of a strategic resource base as the basis for the further development of the region, while the production gene alone does not provide a high quality of life.

Hypothesis 2. The innovation gene is a kind of driver for the qualitative transfer of the economy to the next level of development, creating prerequisites for the formation of high-quality development institutions.

Hypothesis 3. The institutional and social gene ensures a high quality of life in the region after the accumulation of the necessary resource and innovation potential.

The Rating of Russian Regions on Quality of Life-2023 was used as a source of information on the quality of life, the methodology of which was developed and approved by the RIA Rating Center for Economic Research². The rating is based on “indicators that capture the actual state of certain aspects of living conditions and the situation in the social sphere, allowing us to assess interregional differences in this area”³. The assessment is carried out in points on a scale from 0 (lowest quality of life) to 100 (highest quality of life). At the next stage, the regions are divided into four quartile groups according to the value of the quality of life rating score. The first quartile group has the lowest quality of life, the fourth – the highest quality of life). *Figure 2* shows the relationship between the dominant gene and the quality of life.

Figure 2. Relationship between quality of life and socio-economic genotype



Source: own compilation based on calculations, data from Rosstat and the RIA Rating Center for Economic Research – “Rating of Russian Regions on quality of Life-2023”.

² Russian Regions' Quality of Life Rating-2023. RIA Rating Center for Economic Research. Available at: <https://riarating.ru/images/63025/75/630257548.pdf> (accessed: 01.07.2025).

³ RIA Rating of Russian regions by quality of life. Available at: <https://riarating.ru/images/63027/69/630276945.pdf> (accessed: 01.07.2025).

We use the Chi-square criterion for testing the hypothesis of the independence of socio-economic genotype and quality of life. The calculated value of $\chi^2 = 27.23$, $p = 0.00013$, which is less than 0.05, we can conclude that the null hypothesis about the independence of socio-economic genotype and quality of life is rejected. The relationship between genotype and quality of life is statistically important and moderately strong (the Pearson and Chuprov coefficients are about 0.4 and statistically significant).

The production gene. Let us consider a group of regions with a dominant production code, which includes 6% of the regions of the fourth quartile group of quality of life and 47% of the regions from the first quartile group of the quality of life. The regions of this group rely primarily on the production and extraction of natural resources, forming the resource base for further economic growth. However, the availability of resource potential does not guarantee high standards of living. Industrial regions are limited by environmental problems and monospecialization of the economy, which hinders development and reduces the quality of life (Mayminas, 2020).

The regional quality of life rating confirms that the predominance of the manufacturing gene is characteristic mainly of outsider regions in terms of quality of life. For example, the Republic of Tyva, the Chukotka Autonomous Area, the Kurgan Region, and others have a production genotype, but these regions are outsiders in terms of quality of life (the first quartile group). The regions of this group are rich in raw materials and industrial resources, but at the same time they face social problems, underdeveloped infrastructure, and low population incomes. The presence of a manufacturing gene makes it possible for the region's economy to grow, but without the subsequent transition of the region to innovation and developed institutions, the region remains in low positions in terms of the quality of life.

The innovative gene is almost proportionately present in all quartile groups in terms of the quality of life (Fig. 2). In the analyzed sample of regions, the share of regions with a strong innovative gene is highest in the second quartile group in terms of quality of life (37%) – the Republic of Mordovia, the Vologda Region, the Tver Region, etc. The quality of life in this group is higher than in the production group, but due to the low quality of institutions, it lags behind the leading regions.

The presence of developed R&D centers and startup ecosystems in certain regions without long-term institutions leads to little progress in improving the quality of life (Myslyakova et al., 2020).

The Kaliningrad, Voronezh, and Lipetsk regions belong to the fourth quartile group (the highest) in terms of quality of life. They are a good example when the innovation gene does not work idly, but goes hand in hand with institutional development: special economic zones, cooperation between universities and businesses, the presence of export-oriented high-tech industries allows improving urban infrastructure, to make it more comfortable for living (Auzan, 2022).

In the first group of outsider regions in terms of the quality of life, there are regions with the dominance of the innovative gene – the Altai Territory, the Republic of Altai, the Republic of Ingushetia, and the Republic of North Ossetia-Alania. The regions of this group are characterized by tourism and innovative agricultural projects, but geographical remoteness and lack of infrastructure reduce the potential of the innovation gene.

The institutional and social gene reflects the stage of regional development at which the resource potential of the region's development and modern development institutions are formed – effective public administration, strong workforce and human potential, and developed infrastructure. A region that has reached institutional and social maturity is capable of providing high levels of income, education, medical services, and security. The

obtained result confirms Yu. G. Myslyakova's thesis about the crucial role of the quality of institutions in the conversion of economic resources into welfare (Myslyakova, 2020). The fourth quartile group of leading regions in terms of the quality of life includes 47% of regions with a dominant institutional gene. Moscow, Saint Petersburg, the Leningrad Region, and the Republic of Tatarstan are the leaders in institutional development.

The first and second quartile groups in terms of quality of life include regions such as the Kirov Region, the Komi Republic, and the Nenets Autonomous Area, where historically formed institutions are outdated and new management practices are being implemented slowly.

The study showed that the region's dominant gene largely determines the quality of life and the vector of its improvement in the medium and long term.

For regions with a predominance of the manufacturing gene, the initial strategic priority should be to increase the innovation activity of the economy, for regions with a strong innovation gene, institutional modernization with an improved legal environment and the development of the social sphere are relevant. By developing innovative potential on the available resource and industrial base, and progressively forming and improving development institutions, it is possible to bring regions lagging behind in terms of the quality of life to a higher development stage. All the hypotheses put forward in the study were confirmed.

The genetic approach makes it possible to identify hidden relationships between the historically established structure of the economy and current development indicators and how lagging regions should develop systematically in order to overcome the genetic predisposition to economic vulnerability. High quality of life is the genetically determined quintessence of economic development and the ultimate goal of every development strategy, which is preceded by a long and, most importantly, progressive development.

Conclusion

The article considers a new approach to the issue of regional development, which consists in analyzing the socio-economic genotype through a triad of genes (industrial, innovative, institutional, and social) inextricably linked with the quality of life of the population. The genetic approach makes it possible to identify hidden relationships between the current structure of the economy and current indicators of the development of the quality of life.

The production gene participates in the creation of the necessary resource base, the innovation gene contributes to the complication, diversification, and expansion of the base, and the institutional and social gene modifies economic success into a sustainable improvement in the quality of life. In fact, all three genes exist, but the main question remains which gene dominates. The most successful regions with a high quality of life (Moscow, Saint Petersburg, Kazan) demonstrate balance, but with the dominance of the institutional and social gene. At the same time, outsider regions in terms of quality of life represent a bias toward the production gene. The predominance of the industrial principle without innovative processes limits the growth potential and, consequently, the quality of life. On the other hand, formally, the predominance of the institutional and social gene without a resource base (Kirov Region) leads to the fact that the population does not feel an improvement in the quality of life. The dominance of the innovation gene without relying on a resource base and strong institutions also does not improve the quality of life. The analysis showed that the innovation gene is present in both the low quartile group of the quality of life and the high quartile group, however, a significant increase in quality of life occurs in those regions where innovation is combined with strong institutions (Tatarstan). The Samara, Sverdlovsk regions and other industrial regions were able to integrate innovations and improve institutions, which led them to the highest quartile group in terms of the quality of life.

The definition of the socio-economic genotype is of predictive value in the context of strategic planning of the socio-economic development of the constituent entities of the Russian Federation. The obtained code values and the genotype core make it possible to identify sustainable and vulnerable areas of regional development and identify more targeted strategic management decisions.

A promising area of further research is to increase the core of the genotype in terms of expanding the socio-cultural codes of territories and the possibility of exploring other latent categories, such as social comfort, in inextricable connection with the socio-economic genotype. Their integration is seen as the development of theory and methodology for assessing the quality of life. The socio-economic genotype creates a

filter for the perception of living conditions and factors of social comfort. The use of big data in the context of solving this scientific problem (panels of statistical surveys of the living conditions, Internet search queries) It can significantly enrich the results of the previous studies (Shakleina et al., 2021). It is important to develop methods for modeling and forecasting the dynamics of the socio-economic genotype using modern information technologies and big data, which will, first, weighty expand the possibilities of practical application of the approaches developed in the article, and, second, to explore it in all regions of Russia. Their integration is seen as the development of the theory and methodology of assessing the quality of life, in particular, proposed by Ayvazyan and his students in their works (Fantazzini et al., 2018; Mironenkov et al., 2024).

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Appendix 1

Socio-economic genotype of Russian regions and RIA Rating-2023 quality of life rating

	P^+	P^-	I^+	I^-	IS^+	IS^-	Gene	Core	Rating score in the Rating is 2023
Belgorod Region	0.00	0.00	0.01	0.08	0.13	0.00	IS	0.18	64.625
Bryansk Region	0.00	0.01	0.02	0.03	0.00	0.01	I	-0.23	53.634
Vladimir Region	0.05	0.00	0.00	0.14	0.07	0.00	IS	0.11	54.792
Voronezh Region	0.01	0.01	0.01	0.01	0.00	0.00	I	0.03	64.061
Ivanovo Region	0.02	0.01	0.00	0.18	0.00	0.06	P	-0.63	52.159
Kaluga Region	0.02	0.06	0.01	0.08	0.22	0.00	IS	0.18	64.622
Kostroma Region	0.00	0.02	0.06	0.01	0.00	0.00	I	0.00	47.781
Kursk Region	0.01	0.02	0.05	0.04	0.00	0.01	I	-0.12	59.704
Lipetsk Region	0.02	0.01	0.76	0.00	0.01	0.00	I	1.01	61.932
Moscow Region	0.00	0.02	0.00	0.02	0.33	0.00	IS	1.02	79.999
Orel Region	0.00	0.00	0.00	0.00	0.00	0.07	I	-0.26	53.666
Ryazan Region	0.00	0.00	0.00	0.07	0.59	0.00	IS	0.50	59.010
Smolensk Region	0.00	0.01	0.02	0.08	0.08	0.00	IS	0.04	51.167
Tambov Region	0.00	0.00	0.00	0.00	0.00	0.06	I	-0.24	52.410
Tver Region	0.00	0.02	0.05	0.00	0.00	0.02	I	-0.06	49.859
Tula Region	0.00	0.02	0.00	0.05	0.30	0.00	IS	0.18	62.602
Yaroslavl Region	0.00	0.00	0.00	0.04	0.55	0.00	IS	0.54	57.439
Moscow	0.00	0.00	0.00	0.02	0.29	0.00	IS	2.42	83.640
Republic of Karelia	0.05	0.00	0.00	0.04	0.00	0.06	P	-0.22	41.937
Komi Republic	0.00	0.00	0.01	0.11	5.66	0.00	IS	0.85	43.921
Arkhangelsk Region	0.01	0.00	0.00	0.02	0.00	0.15	P	-0.43	40.100
Nenets Autonomous Area	0.04	0.00	0.00	0.00	4.93	0.00	IS	2.42	42.237
Vologda Region	0.00	0.18	0.88	0.14	0.15	0.00	I	0.53	48.802
Kaliningrad Region	0.00	0.03	0.06	0.07	0.00	0.01	I	-0.29	66.175
Leningrad Region	0.00	0.01	0.00	0.02	1.24	0.01	IS	0.77	67.970

Continuation of Appendix

	P^+	P^-	I^+	I^-	IS^+	IS^-	Gene	Core	Rating score in the Rating is 2023
Murmansk Region	0.00	0.00	0.00	0.00	0.00	0.01	P	-0.10	54.253
Novgorod Region	0.04	0.01	0.00	0.06	0.00	0.13	P	-0.51	49.682
Pskov Region	0.00	0.03	0.16	0.04	0.00	0.20	I	-0.42	46.753
Saint Petersburg	0.04	0.09	0.00	0.20	0.66	0.03	IS	0.25	82.310
Republic of Adygea (Adygea)	0.00	0.00	0.06	0.00	0.00	0.18	I	-0.18	60.137
Republic of Kalmykia	0.07	0.03	0.03	0.00	0.00	0.41	P	-0.38	41.711
Krasnodar Territory	0.02	0.00	0.02	0.00	0.00	0.45	P	-0.39	74.355
Astrakhan Region	0.01	0.00	0.00	0.00	0.00	0.00	P	0.10	48.385
Volgograd Region	0.00	0.00	0.00	0.44	2.60	0.00	IS	0.95	54.039
Rostov Region	0.00	0.00	0.00	0.04	0.24	0.00	IS	0.29	64.844
Republic of Crimea	0.02	0.00	0.00	0.07	0.00	0.00	P	-0.12	52.743
Sevastopol	0.13	0.02	0.00	0.21	0.00	0.45	P	-0.31	58.927
Republic of Dagestan	0.01	0.02	0.01	0.41	0.00	0.52	P	-0.08	45.680
Republic of Ingushetia	0.00	0.11	1.00	0.00	0.00	0.56	I	-0.16	33.261
Kabardino-Balkarian Republic	0.03	0.00	0.00	0.30	0.00	0.02	P	-0.52	46.081
Karachay-Circassian Republic	0.16	0.01	0.00	0.33	0.00	0.37	P	-0.88	38.080
Republic of North Ossetia – Alania	0.00	0.02	0.05	0.01	0.00	0.32	I	-0.58	46.078
Chechen Republic	0.03	0.00	0.02	0.00	0.00	0.74	P	-0.55	45.318
Stavropol Territory	0.01	0.00	0.00	0.01	0.00	0.04	P	-0.20	58.868
Republic of Bashkortostan	0.00	0.00	0.00	0.05	0.10	0.00	IS	0.09	61.553
Republic of Mari El	0.01	0.03	0.00	0.01	0.00	0.10	P	-0.49	49.580
Republic of Mordovia	0.01	0.01	0.13	0.00	0.00	0.08	I	0.08	52.117
Republic of Tatarstan (Tatarstan)	0.00	0.00	0.00	0.03	1.60	0.00	IS	1.09	73.757
Udmurt Republic	0.00	0.01	0.00	0.07	4.54	0.00	IS	0.77	54.310
Chuvash Republic – Chuvashia	0.00	0.05	0.13	0.00	0.00	0.01	I	0.04	58.025
Kirov Region	0.00	0.00	0.00	0.06	5.21	0.00	IS	0.94	45.724
Nizhny Novgorod Region	0.03	0.00	0.01	0.08	0.00	0.03	P	-0.18	63.955
Orenburg Region	0.00	0.01	0.00	0.07	0.47	0.00	IS	0.32	55.906
Penza Region	0.00	0.00	0.00	0.27	9.52	0.00	IS	0.84	56.132
Perm Territory	0.02	0.09	0.02	0.10	0.12	0.04	IS	0.15	54.154
Samara Region	0.01	0.02	0.00	0.02	5.10	0.00	IS	1.08	64.836
Saratov Region	0.00	0.00	0.00	0.00	0.01	0.00	IS	0.10	54.104
Ulyanovsk Region	0.01	0.03	0.01	0.03	0.04	0.00	IS	0.05	56.785
Kurgan Region	0.03	0.01	0.00	0.14	0.00	0.07	P	-0.57	40.590
Sverdlovsk Region	0.00	0.01	0.01	0.00	0.32	0.00	IS	0.57	63.198
Tyumen Region	0.00	0.00	0.00	0.02	0.51	0.00	IS	0.57	62.699
Khanty-Mansi Autonomous Area – Yugra	0.00	0.00	0.15	0.12	59.07	0.00	IS	3.43	66.114
Yamal-Nenets Autonomous Area	0.00	0.00	0.00	0.03	17.57	0.00	IS	4.02	60.494
Chelyabinsk Region	0.00	0.01	0.00	0.02	0.39	0.00	IS	0.38	61.232
Republic of Altai	0.00	0.08	0.22	0.00	0.00	0.54	I	-0.55	37.254
Republic of Tyva	0.17	0.05	0.00	0.15	0.00	0.15	P	-0.59	26.506
Republic of Khakassia	0.01	0.02	0.00	0.10	0.00	0.12	P	-0.70	46.808

End of Appendix

	P^+	P^-	I^+	I^-	IS^+	IS^-	Gene	Core	Rating score in the Rating is 2023
Altai Territory	0.00	0.00	0.02	0.00	0.00	0.03	I	-0.03	45.139
Krasnoyarsk Territory	0.01	0.00	0.03	0.02	0.53	0.00	IS	0.86	54.042
Irkutsk Region	0.00	0.00	0.00	0.06	0.74	0.00	IS	0.62	48.222
Kemerovo Region	0.23	0.03	0.13	0.21	0.16	0.01	P	0.51	49.260
Novosibirsk Region	0.03	0.02	0.00	0.02	0.02	0.03	P	-0.02	59.761
Omsk Region	0.00	0.00	0.00	0.04	0.58	0.00	IS	0.56	48.427
Tomsk Region	0.00	0.00	0.00	0.09	3.18	0.00	IS	1.48	52.118
Republic of Buryatia	0.03	0.01	0.00	0.03	0.00	0.36	P	-0.35	35.511
Republic of Sakha (Yakutia)	0.01	0.00	0.00	0.01	0.01	0.00	P	0.10	44.382
Primorye Territory	0.40	0.00	0.01	0.01	0.00	0.24	P	0.14	52.642
Khabarovsk Territory	0.52	0.12	0.00	0.45	0.00	0.37	P	-0.53	56.428
Amur Region	0.03	0.00	0.00	0.02	0.00	0.00	P	0.03	43.376
Kamchatka Territory	0.00	0.00	0.00	0.02	0.00	0.00	P	-0.14	53.456
Magadan Region	0.09	0.00	0.00	0.09	0.00	0.23	P	-0.48	47.861
Sakhalin Region	0.12	0.01	1.38	0.04	0.02	0.44	I	1.51	54.238
Trans-Baikal Territory	0.09	0.12	0.06	0.02	0.02	0.01	P	0.10	33.584
Source: own compilation based on Rosstat data.									

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The Influence of the Agglomeration Effect on the Demographic Policy of Territories

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Abstract. In the context of increasing spatial polarization and uneven urbanization, the central question becomes the empirical assessment of the agglomeration effect's influence on the demographic dynamics of peripheral settlements. This study is devoted to a quantitative analysis of the relationship between the distance of peripheral settlements from the core of an urban agglomeration and changes in their population during the 2010–2021 intercensal period. The theoretical and methodological basis is formed by the concepts of center-periphery systems and spatial polarization. The research covers 40 urban agglomerations in Russia and is based on studying the demographic dynamics of about 25,000 settlements. The methodology included: determining the geodesic distances from each peripheral settlement to the corresponding core; calculating four metrics of demographic dynamics: absolute, relative, logarithmic growth, and average annual growth rate; estimating paired Pearson and Spearman correlation coefficients between distance and demographic indicators. The empirical data is based on the results of the 2010 and 2020 All-Russian Population Censuses. Overall, for the entire set of peripheral settlements, a weak but stable negative monotonic dependence was recorded. Based on the analysis results, agglomerations were divided into three groups: those with a strong negative gradient (18 agglomerations, predominantly in Siberia and the Urals), a moderate gradient (15 agglomerations, including the largest ones – Moscow and Saint Petersburg), and no significant gradient (7 agglomerations). No positive correlations were found in any case. The practical significance of the results lies in substantiating the priorities of demographic policy: the need for targeted support of remote zones, the development of sub-centers, and the consideration of transport accessibility.

Key words: agglomeration effect, demographic dynamics, spatial polarization, geodesic distance, correlation analysis, center-periphery gradient.

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Introduction

Urban agglomerations represent complex center-periphery systems where demographic processes unfold unevenly. Large core cities typically accumulate population due to migratory influx and natural increase, whereas peripheral settlements often experience outmigration. The concept of spatial polarization directly points to the trend of population concentration in urban centers alongside the contraction of the periphery (Sitkovskiy, 2022). In other words, the agglomeration effect can manifest as a negative relationship between a settlement's distance from the agglomeration core and its population dynamics: the farther from the

center, the weaker the growth or the stronger the decline in population.

The relevance of this study is driven by the need for empirical determination of the zone of influence of the agglomeration effect under Russian conditions, within the framework of addressing the tasks of balanced spatial development enshrined in the strategic documents of the Russian Federation. Despite existing research dedicated to individual agglomerations, a gap in scientific knowledge persists, related to the lack of a systematic inter-agglomeration analysis that would allow not only confirming the existence of a gradient but also

revealing typical patterns of its manifestation for different types of Russian agglomerations.

This study aims to fill this gap and proposes a quantitative assessment of the agglomeration effect using the example of 40 urban agglomerations, the list of which is specified in the draft¹ of the Spatial Development Strategy for the period up to 2025². The centers of all these agglomerations are included in the list of supporting settlements approved by the current Spatial Development Strategy for the period up to 2030³; however, unlike the previous draft strategy, it does not define the composition of agglomerations. The primary focus is on the peripheral settlements of the agglomerations, i.e., settlements administratively or functionally attributed to an agglomeration but not being core cities. The scientific novelty of the research lies in the development and testing of a typology of agglomerations based on the nature of the demographic gradient. The research hypothesis is that a stable negative demographic “center – periphery” gradient exists in Russian urban agglomerations, manifested in a systematic decrease in growth rates (or an increase in decline) of the population in peripheral settlements as their distance from the agglomeration core increases. The study’s objective is a comprehensive test of this

hypothesis through the identification, quantitative assessment, and typologization of patterns in the manifestation of the agglomeration effect in the demographic dynamics of peripheral territories.

To achieve the stated objective and test the hypothesis, the following tasks are sequentially addressed in the work: 1) formation and analysis of an extensive database including coordinates of settlements, their statuses within the agglomeration (core or periphery), as well as population figures from the two previous All-Russian Population Censuses of 2010 and 2020; 2) calculation for each peripheral settlement of the geodesic distance to the core of the corresponding agglomeration and several metrics of demographic dynamics (absolute, relative, and logarithmic growth, as well as the compound annual growth rate – CAGR); 3) assessment of the strength and direction of the relationship between distance and demographic dynamics using paired Pearson and Spearman correlation coefficients; 4) development of a typology of agglomerations based on the obtained correlation dependencies; 5) interpretation of the strength of center-periphery gradients in different agglomerations based on the results and the developed typology.

Literature review

The observed dependence of population change rates on the distance to an agglomeration core in many countries is a classic gradient problem in spatial demography. Its theoretical foundation traces back to Clark’s exponential density decline and works on suburbanization and changes in urban contours: radial-distance profiles serve as the natural scale for analyzing population growth/decline in the core, inner suburbs, and more distant periphery (Clark, 1951).

Despite extensive research on general trends of urbanization and suburbanization in Russia, systematic quantitative assessments allowing for the comparison of the strength and nature of the center-periphery demographic gradient for a

¹ Draft of the Spatial Development Strategy for the period up to 2025. Available at: https://www.spss.ru/assets/files/2018/v-nts_strategiya-prostranstvennogo-razvitiya.pdf (accessed: 14.09.2025).

Note: Neither the adopted Spatial Development Strategy for the period up to 2025, nor the subsequent Spatial Development Strategy for the period up to 2030, include a composition of agglomerations.

² On Approval of the Spatial Development Strategy of the Russian Federation for the period up to 2025: RF Government Resolution 207-r dated February 13, 2019. URL: <https://www.vktid.ru/files/upk/2.pdf> (accessed: 14.09.2025).

³ On Approval of the Spatial Development Strategy of the Russian Federation for the period up to 2030 with a forecast up to 2036: RF Government Resolution 4146-r dated December 28, 2024. Available at: https://www.economy.gov.ru/material/directions/regionalnoe_razvitie/strategicheskoe_planirovanie_prostranstvennogo_razvitiya/strategiya_prostranstvennogo_razvitiya_rossii_do_2030_goda_c_prognozom_do_2036_goda/ (accessed: 14.09.2025)

representative sample of agglomerations have not yet been conducted. Existing studies typically focus either on the migration component or on in-depth analysis of individual, mostly large agglomerations. The present study aims to fill this gap by proposing a formalized inter-agglomeration analysis based on a unified methodology for 40 agglomerations.

Empirical studies for Russia over the last decade systematically record a pronounced center-periphery gradient in intra-agglomeration dynamics. Research based on detailed migration data for 2011–2020 confirms that maximum positive migration effects are observed in the “inner belt” of suburbs around major and regional centers at distances of approximately 20–40 km from the center. In contrast, more distant zones show weaker growth or even decline, with the magnitude of the “peak” depending on the scale of the core and the morphology of the agglomeration (Karachurina et al., 2021; Mkrtchyan, Gilmanov, 2023b). This redistribution of population is part of the broader process of vertical migration – upward movement along the settlement hierarchy from small settlements to large ones. In the 2010s, Russia saw almost no downward movement, and the beneficiaries of migration were cities with populations over 250,000, especially the agglomerations of Moscow and Saint Petersburg (Mkrtchyan, Gilmanov, 2023a). These studies convincingly confirm the predominant population growth in suburbs due to migration influx. However, the final demographic outcome, resulting from the combined influence of migration and natural population movement, as well as its variability across the country, remains insufficiently studied.

In the Russian context, suburbanization-driven population increase is almost always migration-determined and markedly age-selective: it primarily involves groups of young and middle-aged working-age people. Meanwhile, demographic aging and elevated mortality can offset growth at greater

distances (Karachurina, Mkrtchyan, 2016; Mkrtchyan, 2019). Thus, the final population dynamics of settlements result from the interaction of migration and natural population movement (Halfacree, 2012; Stockdale, 2016; Johnson, Lichter, 2020).

A key methodological risk in assessing the relationship between population dynamics and distance to an agglomeration core stems from the effects of reclassification (changes in administrative boundaries, settlement status, etc.). L.L. Rybakovsky proposes terming such growth “mechanical”, alongside natural and migratory growth⁴. Ignoring reclassification can systematically overestimate the true growth of the core and/or the nearest belts and underestimate indicators for peripheral territories. Therefore, approaches that separate growth into components related to migration, natural movement, and mechanical movement are considered more accurate (Jiang et al., 2022). Within this study, we deliberately accept this limitation, focusing on the final population dynamics according to census data. This, on one hand, prevents the disaggregation of growth components but, on the other hand, provides a representative picture of the final result of spatial population redistribution for all types of settlements.

The delineation line between “core – suburbs – periphery” is also sensitive to the method of agglomeration delimitation. Classic methods for assessing real interaction within an agglomeration are considered to be functional approaches based on commuting patterns (Raisikh, 2020a) and mobile operator data, which has been applied in Russian research for the Moscow agglomeration (Makhrova, Babkin, 2019). Unfortunately, data on daily movements are not collected for a large

⁴ Rybakovsky L.L. (Ed.). (2003). *Demographic Conceptual Dictionary*. Moscow: CSP. P. 169. Available at: <https://studylib.ru/doc/2234370/demograficheskij-ponyatijnyj-slovar> (accessed: 14.09.2025).

number of agglomerations in Russia. Under such conditions, preference should be given to proxy methods that allow for identifying actual catchment radii based on roads and other transportation lines and, consequently, correct distances. An assessment of the actual catchment radii for a large number of Russian agglomerations, based on a comparison with the areas of foreign agglomerations calculated from commuting data and the recalculation of agglomeration areas based on actual distances, was carried out in a study (Raisikh, 2020b). This directly relates to distance calculation: for correlation analysis, it is advisable to compare both straight-line geodesic distances and travel-time accessibility to the core via public roads.

International sources confirm the dynamic nature of the gradient: phases of suburbanization and deurbanization are replaced by new cycles of reurbanization, which changes the sign and shape of the “growth – radius” dependence in specific time intervals (radii) and city classes (Haase et al., 2013). The scale and morphology of ringed growth are further explained by the size of the agglomeration and its polycentricity (Angel, 2023), as well as the distribution of nighttime light/urbanized areas by distance (Rubiera-Morollón, Garrido-Yserte, 2020).

A number of international big data studies show that the intensity of movements and their radial structure scale with city size: large cores have extensive catchment belts, and the growth profile with distance takes on a non-linear form with a local maximum in the near periphery (Kabisch, Haase, 2011; Kroll, Kabisch, 2012). For post-socialist metropolises (e.g., Prague), the contribution of migration and natural movement to suburbanization-driven growth varies across radii, further emphasizing the need to model not just a correlation with distance, but a gradient (Vobecká, Piguet, 2012).

For the Russian empirical context, two patterns are consistently observed: first, centripetal migration

along the hierarchy of settlement → small city → regional center/suburb of large cities; second, “spillover” between the core and the nearest suburbs, where the growth of the latter is often more intensive than in the center, especially with the expansion of expensive and scarce housing and job segments (Karachurina, 2022). These findings align with distance-radial patterns of housing construction and central accessibility, which influence the final demographic dynamics of peripheral settlements.

The literature review has shown that when assessing the relationship between the dynamics of peripheral settlements and their distance to the core, a non-linear specification with zonal radius approximation and fixed agglomeration effects is preferable, along with the decomposition of growth into migration and natural components (if available). Such a design allows for separating the true distance-based response from artifacts of reclassification and differences between agglomerations (Aguilera, Mignot, 2004; Lambert, 2016; Sultana, Weber, 2013).

The conducted review allows us to conclude that, despite in-depth research on migration flows and suburban growth, the following gaps persist in existing scientific knowledge, which the present study aims to address:

- 1) the absence of a formalized comparative typology of Russian agglomerations based on the strength and nature of the center-periphery demographic gradient;
- 2) the limited analysis of the final demographic dynamics (the combined result of migration and natural movement) at the level of all peripheral settlements, not just the suburban zone;
- 3) a lack of rigorous quantitative comparisons performed on a unified methodological basis for a representative sample of 40 agglomerations, which prevents the identification of nationwide patterns and regional specifics.

The methodology of this research is aimed at overcoming these limitations and obtaining comparable quantitative estimates of the agglomeration effect for the entire country.

Methodology and methods

The objects of the study are 40 urban agglomerations of the Russian Federation, listed in the draft of the Spatial Development Strategy for the period up to 2025⁵. The draft Strategy was chosen as the basis for the study precisely because it contained a complete list of municipalities constituting the core and periphery of the agglomerations. The core of an agglomeration is the largest settlement; the periphery consists of all settlements included in the municipal formations of the agglomerations according to the aforementioned draft Strategy. Data on population in settlements were obtained from the results of the two All-Russian Population Censuses of 2010 and 2020, as only they contain information precisely broken down by each settlement. The data were obtained through requests to Rosstat and are hosted on the EverGis platform⁶. The generated database for each settlement includes geographical coordinates (latitude φ and longitude λ), administrative affiliation, status within the agglomeration (core or periphery of a first or second-order agglomeration), as well as the resident population figures for 2010 and 2021 (since the 2020 All-Russian Population Census was actually conducted in 2021).

The chosen data source has two limitations: first, the population by individual settlements is not estimated in the intercensal period, meaning this indicator is only available on the census date;

second, there is also no possibility to separate population growth (decline) into natural and migration components. Mechanical growth was not estimated, as peripheral settlements of urban agglomerations were defined as all those classified as such at the time of the study, regardless of their municipal affiliation in 2010.

Table 1 presents the population of the agglomerations, calculated as the sum of the population in all core and peripheral settlements. Collectively, the 40 agglomerations cover a population of approximately 73.3 million people as of 2021, representing about half of Russia's population. Of these, approximately 47.7 million people ($\approx 65\%$) resided in the agglomeration cores (largest cities), and ≈ 25.6 million people ($\approx 35\%$) – in peripheral settlements. On average, each urban core accounted for about 1.17 million inhabitants, while the average total population of the periphery of a single agglomeration was ≈ 0.63 million people (a core-to-periphery ratio of approximately 2 to 1 in terms of population). The total number of peripheral settlements across the 40 agglomerations is about 24.7 thousand (out of 155.5 thousand); thus, the average population size of an individual peripheral settlement is small (about 1 thousand inhabitants, many settlements are rural). Nevertheless, the population dynamics of the periphery in 2010–2021 were overall slightly positive: the total number of inhabitants in peripheral territories increased by approximately 4.2% (from 24.6 to 25.6 million people), while the total growth of core city populations was about 6.6% (from 44.7 to 47.7 million people). This indicates the leading role of cores in the overall population growth of agglomerations, although the periphery, on the whole, did not lag too far behind, thanks to growth in some suburban settlements.

⁵ Draft of the Spatial Development Strategy for the period up to 2025. Available at: https://www.spsss.ru/assets/files/2018/v-nts_strategiya-prostranstvennogo-razvitiya.pdf (accessed: 14.09.2025).

⁶ Sitkovskiy A.M. (2025). The settlement system of Russia. Geoinformation Platform EverGis. Available at: <https://clck.ru/32gGeT> (accessed: 14.09.2025).

Table 1. Population size and dynamics in Russian urban agglomerations, 2010–2021

Agglomeration	Population size									Number of settlements, units
	Core			Periphery			Total			
	2010, people	2021, people	Increase, %	2010, people	2021, people	Increase, %	2010, people	2021, people	Increase, %	
Moscow agglomeration	11503501	12380664	+7.63	7467735	7629273	+2.16	18971236	20009937	+5.48	6834
Saint Petersburg agglomeration	4879566	5225690	+7.09	1192500	1311299	+9.96	6072066	6536989	+7.66	1532
Yekaterinburg agglomeration	1349772	1515832	+12.30	1062818	1106312	+4.09	2412590	2622144	+8.69	319
Samara agglomeration	1164685	1156608	-0.69	1348951	1399565	+3.75	2513636	2556173	+1.69	386
Rostov agglomeration	1089261	1125299	+3.31	1393681	1400933	+0.52	2482942	2526232	+1.74	399
Nizhny Novgorod agglomeration	1250619	1276560	+2.07	949266	912857	-3.84	2199885	2189417	-0.48	1442
Novosibirsk agglomeration	1473754	1618039	+9.79	474352	517363	+9.07	1948106	2135402	+9.61	325
Kazan agglomeration	1143535	1205651	+5.43	424100	592443	+39.69	1567635	1798094	+14.70	805
Chelyabinsk agglomeration	1130132	1134643	+0.40	571917	647584	+13.23	1702049	1782227	+4.71	424
Volgograd agglomeration	1021215	1030400	+0.90	561545	578544	+3.03	1582760	1608944	+1.65	239
Krasnodar agglomeration	744995	987828	+32.60	425690	618088	+45.20	1170685	1605916	+37.18	187
Ufa agglomeration	1062319	1096702	+3.24	366564	393335	+7.30	1428883	1490037	+4.28	876
Omsk agglomeration	1154116	1178391	+2.10	241118	246146	+2.09	1395234	1424537	+2.10	326
Voronezh agglomeration	889680	1054111	+18.48	257488	270243	+4.95	1147168	1324354	+15.45	271
Perm agglomeration	991162	1048011	+5.74	181137	191281	+5.60	1172299	1239292	+5.71	300
Krasnoyarsk agglomeration	973826	1066934	+9.56	150223	150385	+0.11	1124049	1217319	+8.30	107
Irkutsk agglomeration	587891	623479	+6.05	392200	438487	+11.80	980091	1061966	+8.35	126
Kama agglomeration	513193	524444	+2.19	573513	523263	-8.76	1086706	1047707	-3.59	598
Tyumen agglomeration	581907	744554	+27.95	142582	157454	+10.43	724489	902008	+24.50	76
Vladivostok agglomeration	592034	633102	+6.94	160047	145247	-9.25	752081	778349	+3.49	67
Makhachkala agglomeration	572076	597316	+4.41	612250	679127	+10.92	1184326	1276443	+7.78	101
Saratov agglomeration	837900	840785	+0.34	369660	401047	+8.49	1207560	1241832	+2.84	197
Tula agglomeration	501169	546953	+9.14	659463	667919	+1.28	1160632	1214872	+4.67	1423
Novokuznetsk agglomeration	547904	551919	+0.73	521769	482277	-7.57	1069673	1034196	-3.32	239
Izhevsk agglomeration	627734	648944	+3.38	344804	349768	+1.44	972538	998712	+2.69	357

End of Table 1

Agglomeration	Population size									Number of settlements, units
	Core			Periphery			Total			
	2010, people	2021, people	Increase, %	2010, people	2021, people	Increase, %	2010, people	2021, people	Increase, %	
Caucasian Mineral Waters	142511	145971	+2.43	802989	808301	+0.66	945500	954272	+0.93	202
Barnaul agglomeration	612401	633432	+3.43	285218	294957	+3.41	897619	928389	+3.43	149
Yaroslavl agglomeration	591486	603961	+2.11	254351	263777	+3.71	845837	867738	+2.59	2589
Stavropol agglomeration	398539	425853	+6.85	414394	424185	+2.36	812933	850038	+4.56	191
Astrakhan agglomeration	520339	532699	+2.38	264512	277725	+5.00	784851	810424	+3.26	294
Cheboksary agglomeration	453721	492331	+8.51	326063	317855	-2.52	779784	810186	+3.90	774
Ulyanovsk agglomeration	614786	627870	+2.13	170862	165582	-3.09	785648	793452	+0.99	245
Tomsk agglomeration	524669	575352	+9.66	205026	211279	+3.05	729695	786631	+7.80	142
Orenburg agglomeration	548331	561686	+2.44	145464	175032	+20.33	693795	736718	+6.19	175
Kirov agglomeration	473695	501247	+5.82	254485	219752	-13.65	728180	720999	-0.99	1137
Khabarovsk agglomeration	577441	617473	+6.93	85313	91382	+7.11	662754	708855	+6.96	71
Kemerovo agglomeration	532981	558973	+4.88	139799	142659	+2.05	672780	701632	+4.29	133
Penza agglomeration	517311	522317	+0.97	160353	174914	+9.08	677664	697231	+2.89	152
Lipetsk agglomeration	508887	509420	+0.10	148645	154871	+4.19	657532	664291	+1.03	193
Ryazan agglomeration	524927	537622	+2.42	91430	93124	+1.85	616357	630746	+2.33	294
Total	44725971	47659066	+6.56	24594277	25625635	+4.19	69320248	73284701	+5.72	24697
Compiled from: population data for all settlements within agglomerations according to the results of the All-Russian Population Censuses of 2010 and 2021.										

For each peripheral settlement, the distance to the core was calculated. The distance D from each peripheral settlement to the center of the agglomeration was calculated as the geodesic (shortest arc on a spheroid) distance using coordinates. For this, the haversine formula for a sphere with radius $R \approx 6371$ km was applied:

$$D = 2R \arcsin \left(\sqrt{\sin^2 \left(\frac{\Delta\varphi}{2} \right) + \cos \varphi_i \cos \varphi_c \sin^2 \left(\frac{\Delta\lambda}{2} \right)} \right), \quad (1)$$

where $\Delta\varphi = \varphi_i - \varphi_c$ and $\Delta\lambda = \lambda_i - \lambda_c$ – differences in latitude and longitude between the peripheral

settlement i and the core city c . All distances are calculated in kilometers as straight-line distances (without considering the road network, as this work does not apply road graph methods or other network metrics – the analysis is limited to geographical distances). For the agglomerations, based on their composition defined in the draft of the Spatial Development Strategy for the period up to 2025, distances to peripheral points range from a few kilometers (for suburbs) to approximately 100 km (the most remote settlement within a municipality considered part of the agglomeration's periphery:

for example, the village of Lyubitsy in Zhukovsky Municipal District of the Kaluga Region, which is part of the Moscow agglomeration). In the case of polycentric agglomerations (e.g., Caucasian Mineral Waters), the main city (the largest core, e.g., Pyatigorsk) was chosen as the conditional center of the agglomeration for distance calculations.

For each settlement, indicators of population dynamics over the decade 2010–2021 were calculated. Several newly emerged settlements were excluded from the analysis of relative changes. Four complementary metrics were used:

- *absolute growth* ΔP : the difference between the population in 2021 and 2010;
- *relative growth* R : the ratio of absolute growth ΔP to the population in 2010;
- *logarithmic growth* L : the natural logarithm of the ratio of the population in 2021 to that in 2010;
- *compound annual growth rate (CAGR)*: calculated as the average annual geometric rate of population change based on the 11-year study period.

$$CAGR = \left(\frac{P_{2021}}{P_{2010}} \right)^{1/11} - 1, \quad (2)$$

where P_{2021} – population in 2021, and P_{2010} – population in 2010.

Each of these indicators has its advantages. Absolute growth is more informative for large cities (where even a small relative growth results in a large influx of people), whereas relative and annual growth rates allow for comparing the dynamics of settlements of different sizes. In the subsequent analysis, we consider all four metrics, but we will pay special attention to relative growth and CAGR as the most illustrative characteristics.

To assess the relationship between the distance D from the center and the population dynamics indicators (Y), paired Pearson (r) and Spearman (ρ) correlation coefficients were used. The Pearson coefficient characterizes the degree of linear dependence between the values of two variables and ranges from -1 to +1. A negative value of r would indicate that as distance D increases, there is a systematic decrease in Y (which corresponds to the hypothesis of degradation in the distant periphery). The Spearman coefficient assesses a monotonic relationship and is computed as the Pearson coefficient but using ranked variables. It is less sensitive to outliers and non-linearities, showing whether a general tendency for Y to decrease (or increase) with increasing D is maintained. The complete results of the correlation coefficient calculations can be found in *Table 2*.

Table 2. Pearson (r) and Spearman (ρ) correlation coefficients between distance from core to periphery (D) and population dynamics indicators of Russian urban agglomerations for 2010–2021

Agglomeration	Correlation coefficient							
	Pearson (r)				Spearman (ρ)			
	ΔP	R	L	$CAGR$	ΔP	R	L	$CAGR$
<i>Group 1. Strong negative gradient</i>								
Astrakhan agglomeration	-0.32	-0.45	-0.52	-0.52	-0.52	-0.56	-0.56	-0.56
Barnaul agglomeration	-0.28	-0.15	-0.32	-0.31	-0.54	-0.52	-0.53	-0.53
Volgograd agglomeration	-0.14	0.02	-0.13	-0.12	-0.29	-0.33	-0.32	-0.32
Izhevsk agglomeration	-0.22	-0.31	-0.32	-0.32	-0.4	-0.39	-0.39	-0.39
Irkutsk agglomeration	-0.26	-0.45	-0.52	-0.52	-0.68	-0.64	-0.64	-0.64
Kirov agglomeration	0.02	-0.26	-0.32	-0.32	-0.26	-0.45	-0.38	-0.38
Krasnodar agglomeration	-0.34	-0.17	-0.16	-0.18	-0.44	-0.35	-0.35	-0.35
Lipetsk agglomeration	-0.37	-0.16	-0.25	-0.24	-0.42	-0.36	-0.37	-0.37
Novokuznetsk agglomeration	0.01	-0.3	-0.37	-0.37	-0.3	-0.42	-0.44	-0.44
Novosibirsk agglomeration	-0.25	-0.36	-0.38	-0.39	-0.52	-0.54	-0.54	-0.54
Orenburg agglomeration	-0.38	-0.44	-0.43	-0.44	-0.48	-0.48	-0.48	-0.48

End of Table 2

Agglomeration	Correlation coefficient							
	Pearson (r)				Spearman (ρ)			
	ΔP	R	L	$CAGR$	ΔP	R	L	$CAGR$
Penza agglomeration	-0.15	-0.31	-0.3	-0.3	-0.4	-0.47	-0.46	-0.46
Perm agglomeration	-0.14	-0.42	-0.43	-0.43	-0.46	-0.54	-0.54	-0.54
Tomsk agglomeration	-0.16	-0.27	-0.37	-0.36	-0.51	-0.52	-0.51	-0.51
Tyumen agglomeration	0.16	-0.47	-0.46	-0.47	-0.51	-0.61	-0.6	-0.6
Ulyanovsk agglomeration	-0.15	-0.22	-0.26	-0.26	-0.39	-0.45	-0.46	-0.46
Khabarovsk agglomeration	-0.24	-0.45	-0.35	-0.36	-0.54	-0.57	-0.56	-0.56
Cheboksary agglomeration	-0.12	-0.03	-0.21	-0.2	-0.26	-0.38	-0.38	-0.38
<i>Group II. Moderate negative gradient</i>								
Vladivostok agglomeration	-0.03	-0.36	-0.25	-0.26	-0.33	-0.2	-0.2	-0.2
Voronezh agglomeration	-0.25	-0.21	-0.21	-0.21	-0.24	-0.28	-0.27	-0.27
Yekaterinburg agglomeration	-0.17	-0.12	-0.08	-0.09	-0.18	-0.19	-0.19	-0.19
Caucasian Mineral Waters	-0.06	-0.22	-0.22	-0.22	-0.15	-0.26	-0.26	-0.26
Kazan agglomeration	-0.06	-0.11	-0.11	-0.12	-0.3	-0.23	-0.24	-0.24
Kemerovo agglomeration	-0.22	-0.17	-0.19	-0.2	-0.33	-0.33	-0.35	-0.35
Moscow agglomeration	-0.02	0.01	-0.07	-0.06	-0.1	-0.13	-0.1	-0.1
Nizhny Novgorod agglomeration	0	-0.16	-0.22	-0.22	-0.25	-0.25	-0.26	-0.26
Omsk agglomeration	-0.21	-0.26	-0.21	-0.22	-0.2	-0.28	-0.28	-0.28
Samara agglomeration	-0.02	-0.12	-0.13	-0.13	-0.21	-0.21	-0.2	-0.2
Saint Petersburg agglomeration	-0.06	-0.07	-0.24	-0.24	-0.3	-0.33	-0.32	-0.32
Saratov agglomeration	-0.13	-0.13	-0.06	-0.05	-0.16	-0.14	-0.07	-0.07
Stavropol agglomeration	-0.06	-0.1	-0.04	-0.05	-0.18	-0.24	-0.24	-0.24
Ufa agglomeration	-0.1	-0.06	-0.16	-0.16	-0.14	-0.15	-0.16	-0.16
Chelyabinsk agglomeration	-0.18	-0.22	-0.19	-0.19	-0.29	-0.26	-0.26	-0.26
<i>Group III. No significant gradient</i>								
Kama agglomeration	0.02	-0.04	-0.02	-0.02	0.07	0	0.02	0.02
Krasnoyarsk agglomeration	-0.11	-0.11	-0.1	-0.1	-0.05	-0.03	-0.03	-0.03
Makhachkala agglomeration	-0.09	0.1	0.19	0.19	-0.05	0.12	0.14	0.14
Rostov agglomeration	-0.14	0.08	0.07	0.07	-0.04	0.05	0.05	0.05
Ryazan agglomeration	-0.02	0.05	0.05	0.05	0	0.03	0.03	0.03
Tula agglomeration	0.05	-0.02	-0.02	-0.02	0.02	0.01	0.01	0.02
Yaroslavl agglomeration	-0.04	-0.05	-0.09	-0.1	-0.13	-0.1	-0.1	-0.1
Note: ΔP – absolute population growth, R – relative population growth, L – logarithmic population growth, $CAGR$ – compound annual growth rate of population. Source: own compilation.								

Correlations were calculated first for the entire set of peripheral settlements across Russia, and then separately for each agglomeration (i.e., within groups of settlements belonging to the same agglomeration). The statistical significance of the coefficients (null hypothesis $\rho = 0$) was tested at the level $p < 0.05$. For this, sample sizes were taken into account: thus, in the entire sample (about 25,000 observations), even very weak correlations can be significant, whereas within a single agglomeration (hundreds of observations) the sensitivity threshold

is lower. Due to the non-Gaussian nature of the distributions (especially of relative growth rates), primary attention is given to interpreting the Spearman coefficient as a more reliable indicator of trend.

Results

For the entire set of peripheral settlements across the 40 agglomerations, a weak but statistically significant negative correlation was found between distance from the center and demographic dynamics. In other words, on average, remote settlements

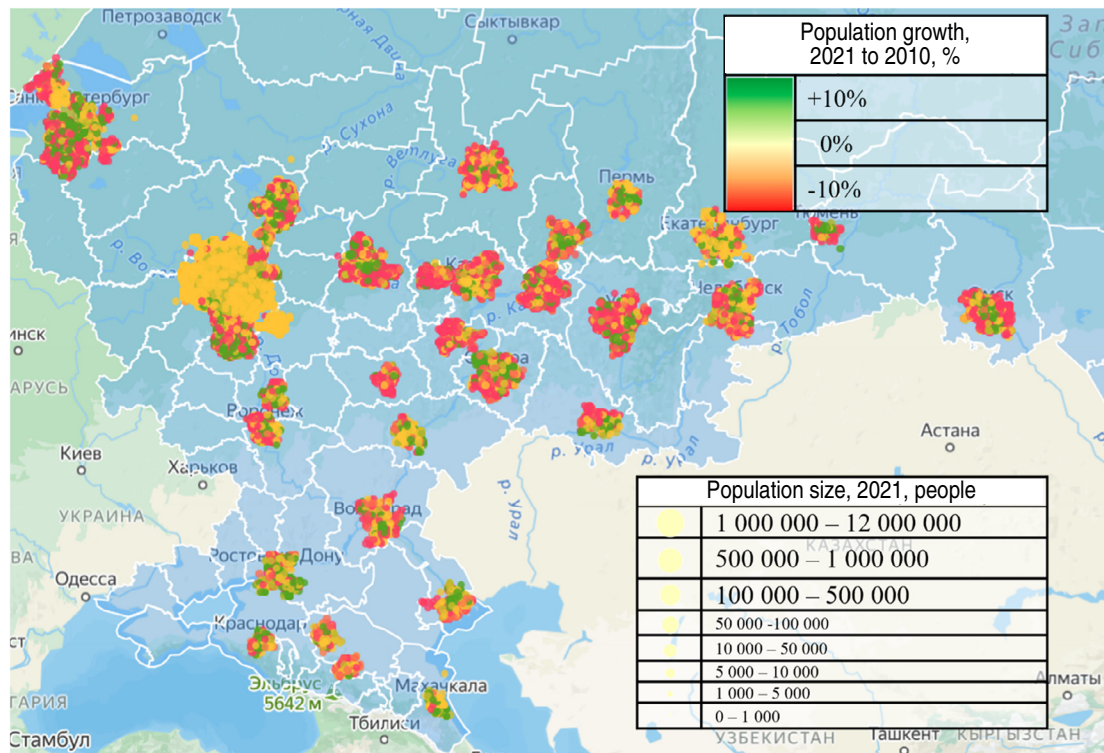


Figure 1. Population size and its dynamics in settlements of urban agglomerations in western Russia for 2010–2021

Compiled from: Sitkovskiy A.M. (2025). The settlement system of Russia. Geoinformation Platform EverGis. 2025. Available at: <https://clck.ru/32gGeT> (accessed: 14.09.2025).

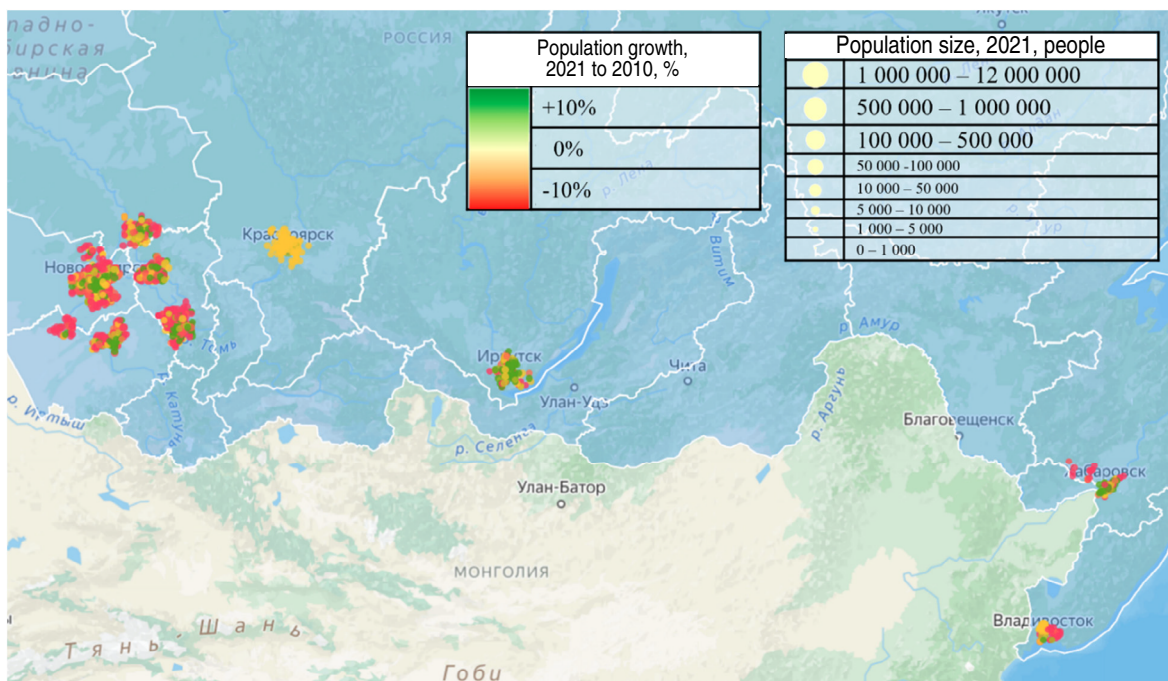


Figure 2. Population size and its dynamics in settlements of urban agglomerations in eastern Russia for 2010–2021

Compiled from: Sitkovskiy A.M. (2025). The settlement system of Russia. Geoinformation Platform EverGis. 2025. Available at: <https://clck.ru/32gGeT> (accessed: 14.09.2025).

showed slightly worse population growth indicators over the decade than those close to the cores. For instance, the Spearman coefficient ρ between distance D and relative growth R was approximately -0.12 (with $p \approx 10^{-72}$, i.e., significant at any reasonable level). A similar value of $\rho \approx -0.129$ was obtained for CAGR (also highly significant), and $\rho \approx -0.127$ for absolute growth. Pearson coefficients were even smaller in absolute value (around -0.03 to -0.09), indicating that the linear dependence is very weak and the overall trend is formed primarily by the rank-based (monotonic) component. In other words, at the all-Russian scale, the distance effect manifested insignificantly: against the backdrop of numerous other factors determining the growth or decline of specific settlements, distance from the core city alone explains only a small fraction of the variation. Nevertheless, the sign of the coefficient is negative, which corresponds to the initial hypothesis that “the center develops faster than the periphery”.

It should be emphasized that the negative relationship is observed when averaging across all agglomerations, but it is by no means equally pronounced in each agglomeration. Some agglomerations show a clear center-periphery demographic gradient, while in others the dependence is weak or statistically indistinguishable. Let us consider the differentiated results by agglomeration.

Figures 1 and 2 present a cartogram reflecting the total population in 2021 (relative size of the circle) and population dynamics for 2010–2021 (color: red -10% over 10 years, yellow 0% , green $+10\%$) for all settlements included in the 40 urban agglomerations of Russia.

From the cartogram in Figures 1, 2 and the statistical data, it is evident that the strongest negative distance effect is characteristic of a number of agglomerations in different regions. For instance, the Novosibirsk agglomeration shows one of the strongest dependencies: Spearman's $\rho \approx -0.543$ (for relative growth, $p \approx 5.9 \times 10^{-2}$). This means that more distant rural areas and small towns around

Novosibirsk lost population significantly faster, while the population in the nearest suburbs of the core grew or declined less. Similar coefficients were obtained for logarithmic growth and CAGR (around -0.54), as well as for absolute growth ($\rho \approx -0.52$). The latter fact is interesting because absolute changes are usually smoothed out in rural areas, yet even they are ranked quite strictly by distance. A similarly strong gradient is observed in the Irkutsk agglomeration ($\rho \approx -0.64$ for relative growth) and the Barnaul agglomeration ($\rho \approx -0.52$), as well as in a number of medium-sized agglomerations in the European part, such as Kirov ($\rho \approx -0.45$), Ulyanovsk ($\rho \approx -0.45$), and Penza ($\rho \approx -0.47$). In all these cases, the coefficients are statistically significant at $p < 0.001$, indicating pronounced demographic centralism: the periphery is effectively drawn toward the core, with remote settlements depopulating much faster than suburban zones.

Alongside the aforementioned cases, moderately strong negative correlations (ρ in the range of -0.3 to -0.4) were found for approximately half of the agglomerations. These include, for example, Perm ($\rho \approx -0.54$), Orenburg ($\rho \approx -0.48$), Chelyabinsk ($\rho \approx -0.259$), Omsk ($\rho \approx -0.277$), Novokuznetsk ($\rho \approx -0.417$), Lipetsk ($\rho \approx -0.357$), Krasnodar ($\rho \approx -0.350$), Kama ($\rho \approx -0.327$, although $p > 0.1$), and others. The Moscow agglomeration – the largest in the country – showed a relatively weak negative relationship: ($\rho \approx -0.128$) (but with a huge $n > 6000$, so $p \approx 10^{-24}$). In other words, the influence of distance in the localities near Moscow is statistically significant but small: it is noticeable that, on average, distant parts of the Moscow Region lost population slightly more than nearby suburbs, but the variability is substantial. This is more likely explained by the fact that the actual influence of the Moscow agglomeration, expressed in positive population dynamics, extends far beyond its formal boundaries. The Saint Petersburg agglomeration demonstrated a more pronounced

gradient: $\rho \approx -0.327$ ($p \approx 10^{-36}$) for relative growth, indicating a clear concentration of growth around Saint Petersburg (essentially, growth in the core and nearest suburbs alongside depopulation in many remote territories of the Leningrad Region). At the same time, the Pearson coefficient for Saint Petersburg was close to zero (about -0.07), indicating some non-linearity: likely, the main population decline was concentrated in the most distant parts (>100 km from the city), while the intermediate zone ($50\text{--}100$ km) did not differ significantly from the suburbs, forming a two-tier structure of “suburban zone” and “distant periphery”.

It is important to note that no significant positive correlation between distance indicators and population growth was found in any of the examined agglomerations. In other words, there are no examples where more distant settlements systematically grew faster than closer ones. The closest to zero (and the only one with a positive sign) was the relationship in the Makhachkala agglomeration ($\rho \approx +0.14$, $p = 0.21$, not significant) – essentially, no effect. In the Rostov agglomeration, the correlation was close to zero ($\rho \approx +0.054$, $p = 0.28$), i.e., the growth/decline in the number of inhabitants in settlements weakly depends on the distance to Rostov-on-Don. A similar pattern is observed in the Tula agglomeration ($\rho \approx +0.014$, $p = 0.64$) and a number of others: the absence of a significant gradient (with ρ ranging from -0.1 to $+0.1$) was recorded in eight agglomerations. Besides those mentioned above, these also include Saratov ($\rho \approx -0.14$, $p \approx 0.07$ – borderline significant), Krasnoyarsk ($\rho \approx +0.032$, $p = 0.76$), Vladivostok (small $\rho \approx +0.20$, but the sample is small, $p > 0.3$), Kama (the polycentric agglomeration of Tatarstan with centers in Naberezhnye Chelny and Nizhnekamsk, $\rho \approx +0.003$, $p \approx 0.95$), and Caucasian Mineral Waters ($\rho \approx -0.257$, $p < 0.01$ – significant but relatively small in magnitude). The absence of a pronounced distance-based gradient

in these systems may be due to various reasons – from polycentricity or linear layout (as, for example, in the resort towns of Caucasian Mineral Waters, where there are several comparable centers and settlements are tied to them, not to a single core) to generally low-variability dynamics (in a number of agglomerations, the population is decreasing in all settlements, both near and far, under the influence of a general regional trend).

To illustrate the above, let us consider several illustrative cases:

Novosibirsk agglomeration. In the core – the city of Novosibirsk – the population increased from 1.47 to 1.62 million people ($+10.2\%$) during the 2010s. The population of the near periphery (suburbs within a radius of ≈ 30 km, including satellite cities like Berdsk, Ob, and a number of settlements) also generally grew or remained stable. However, remote districts of the Novosibirsk Region ($70\text{--}100$ km or more from the city) lost a significant amount of population – in many villages, it decreased by $20\text{--}30\%$ or more. As a result, at a distance of $\approx 10\text{--}20$ km from Novosibirsk, most settlements had R close to zero or positive; at ≈ 50 km – around zero or slightly negative; and beyond $70+$ km – almost entirely significantly negative growth. Statistically, this is reflected in $\rho \approx -0.54$. Thus, the Novosibirsk agglomeration represents a classic example of a large city drawing population from the periphery: nearby settlements benefit from integration into the urban economy (some rural residents move closer to the city, to the suburbs), while distant villages become depopulated.

Moscow agglomeration. Moscow, as a megacity, is unique in scale (over 12.5 million inhabitants in 2021). Since 2010, its population has grown by almost 2 million people, primarily due to migration influx. The population of the Moscow Region (the agglomeration’s periphery) also increased ($+4\%$, from 7.1 to 7.4 million), but the growth is extremely unevenly distributed: satellite cities and settlements in the near belt (especially at distances of $5\text{--}30$

km from the Moscow Ring Road) experienced a construction boom and population influx (e.g., Krasnogorsk, Domodedovo, dozens of settlements in New Moscow), while remote districts of the Region (70–100 km from the capital) stagnated or declined. Since Moscow's near periphery is very extensive and includes thousands of settlements, and the distant periphery is represented by a relatively smaller number of settlements, the overall correlation effect is smoothed out. The calculated $\rho \approx -0.13$, although significant, is much weaker than in Novosibirsk. Nevertheless, the qualitative trend is the same: Moscow's suburban ring is a zone of population attraction, while the outlying districts of the Moscow Region and adjacent regions (partially included in the agglomeration) experience outmigration. For the Moscow agglomeration, statistics confirm the classic center-periphery bias.

Rostov agglomeration. An opposite example is the almost complete absence of a center-periphery gradient. Rostov-on-Don is a large city (small population growth, +2.5%, to 1.13 million people in 2010–2021), but the surrounding territories have their own specificities. First, there are other cities nearby (satellite cities Taganrog, Bataysk, Novocherkassk), which themselves attract some migration. Second, the population of rural areas in the Rostov Region is generally declining not too intensively due to the relatively developed agriculture in southern Russia. As a result, the variation in growth rates in the periphery is large and not ordered by distance: there are remote stanitsas (Cossack villages) with population growth (e.g., districts with an influx of labor migrants), nearby villages with decline, and vice versa. The Spearman correlation is statistically zero, i.e., the agglomeration effect is not traceable. A similar situation is noted for a number of other agglomerations in the south and center of Russia, where demographic differences are determined more by historical-economic factors than by geography.

Caucasian Mineral Waters. This is a polycentric agglomeration: a number of resort towns (Pyatigorsk, Kislovodsk, Yessentuki, Mineralnye Vody, Georgievsk, Zheleznovodsk) are relatively equal in size and role. The periphery includes settlements around them. Here, there is not one capital center, but several, and the distance to one conditional core (we used Pyatigorsk in the calculations) only partially reflects a settlement's actual connection to the centers. As a result, the coefficient ρ equals -0.257 : a weak negative dependence, but significantly less pronounced than in monocentric agglomerations. In fact, this agglomeration is structured according to a different logic: each peripheral village is tied not so much to Pyatigorsk as to the nearest city, so the overall gradient is blurred.

Out of the 40 agglomerations, 18 exhibit a noticeable negative gradient ($\rho < -0.3$) between distance and population growth in the periphery. These include most agglomerations in Siberia and the Urals (Novosibirsk, Omsk, Kemerovo, Krasnoyarsk, etc.), a number of agglomerations in the Volga Region (Perm, Kazan, Ulyanovsk), and the Center (Kirov, Lipetsk, etc.). In almost all these cases, $p < 0.001$, meaning the effect is statistically highly significant.

Fifteen agglomerations have a moderately negative relationship ($-0.3 < \rho < -0.1$). These include, for example, the Moscow, Saint Petersburg, Yekaterinburg, Samara, Volgograd, Voronezh, Nizhny Novgorod agglomerations, and others. The significance of the effect varies: in megacities, due to the huge n , even $\rho \sim -0.1$ is reliable, while in some medium-sized cities, $\rho \sim -0.2$ is already borderline significant.

The remaining seven agglomerations did not show a significant trend ($|\rho| < 0.1$, $p > 0.05$): the Rostov, Tula, Krasnoyarsk, Makhachkala, Kama, and some other agglomerations. Here, either demographic dynamics are uniformly negative everywhere (all peripheral settlements are losing

population at roughly the same rate, as in the Tula agglomeration), or various local factors are at play, leveling out the effect of distance (as in the Rostov agglomeration or Caucasian Mineral Waters).

Thus, the sign of the correlation between “distance – population growth” is universally negative or zero; no opposite tendency was found anywhere. This leads to an important conclusion: in no major urban region does the periphery as a whole grow faster than the areas close to the city. The agglomeration effect manifests in one form or another everywhere, although its scale varies significantly.

Discussion of results

The obtained results confirm the existence of an agglomeration (center-periphery) effect in the demographic dynamics of Russian urban agglomerations; however, its degree of expression depends on numerous circumstances. In most agglomerations, the principle of spatial polarization is clearly observed: the largest cities act as centers of population attraction, while the remote periphery stagnates or degrades. This conclusion aligns with previously noted general trends of urbanization in the post-Soviet space, where urban growth is accompanied by outmigration from rural peripheral territories. Quantitative analysis has shown that this trend is statistically significant at the aggregate level and is especially pronounced in a number of regional agglomerations (in Siberia, the Urals, and the Volga Region).

At the same time, the heterogeneity in the influence of distance between agglomerations indicates the presence of other important factors. For instance, a weakly expressed gradient in some agglomerations means that the spatial distribution of growing and shrinking settlements may be determined by specific local conditions, rather than simply by remoteness from the center.

Polycentricity and subcenters. In agglomerations with several large cities (examples include Caucasian Mineral Waters, as well as the Kazan-Naberezhnye

Chelny linkage in Tatarstan – two agglomerations in the region), residents of peripheral territories may migrate to the nearest sub-center, not necessarily the largest one. This smooths out a single radial gradient. More accurate results for such agglomerations would likely be obtained by calculating distances to the nearest core city, rather than to one fixed center.

Features of economy and settlement patterns. In agglomerations with developed agricultural or dacha (summer house) peripheries (e.g., the Rostov, Krasnodar agglomerations), population outflow may be less pronounced at greater distances, as the rural population there is more stable. Conversely, in resource-based regions (Kemerovo, Perm Territory), small mono-towns in the periphery may rapidly depopulate regardless of distance (influenced by the closure of enterprises). Such processes overlay the geographical factor.

Transport layout. The presence of high-speed transport arteries and suburban railway connections can expand a city’s zone of attraction. For Moscow and Saint Petersburg, for example, the distant periphery, if well-connected (commuter trains, highways), may remain more populated than the actual distance suggests. This complicates the dependency: the key parameter may not be geodesic distance, but travel-time accessibility. Our study did not use a road network graph, so for agglomerations with non-uniform transport accessibility (e.g., river barriers, mountains, lack of roads in certain directions), the results may be distorted.

General regional trends. If a region is depopulating overall (e.g., some regions in Central Russia), then all settlements around a city may be losing people – both near and far. Under such conditions, the correlation will be low, although the city may still fare somewhat better (its population declines more slowly). The results we obtained for the Tula and Saratov agglomerations align closely with this pattern: slight population decline, with minor and random differences.

The virtually complete absence of cases with positive correlation is noteworthy. This means that no agglomerations were found with an inverse effect, where the remote periphery would grow faster than the near periphery. Theoretically, this could occur if the agglomeration core were stagnating or losing population, while peripheral settlements were growing for some reason (e.g., due to residents relocating to the outskirts or development of the outer belt). However, even in steadily depopulating urban agglomerations (Kirov, Omsk), we observe the opposite picture: the core population is decreasing, but in the periphery, it declines even faster.

This indicates the radial spread of depopulation – when the economic problems of the center multiply in the periphery. In successful agglomerations, the growth of the core is complemented by the growth of the near periphery but does not reach the distant boundaries. Overall, the gradient of “better in the center, worse on the periphery” is observed everywhere, which aligns with the study’s initial hypothesis. Our conclusions about the demographic gradient are consistent with the patterns of migration attractiveness identified for Russian suburbs (Mkrtchyan, Gilmanov, 2023b).

It is also worth noting the differences between Pearson and Spearman coefficients observed in several cases. The Spearman coefficient revealed monotonic trends, while the Pearson coefficient was sometimes closer to zero (or even differed in sign for certain metrics). This suggests a non-linear dependency. Most often, such a situation arose when the near periphery of an agglomeration grew almost as actively as the core, while the distant periphery shrank. In this case, linear regression may yield a small slope (or an ambiguous slope depending on the weight of the groups), whereas rank correlation captures the overall decreasing trend. An example is the Krasnodar agglomeration: the population of Krasnodar grew rapidly ($\approx +32\%$ over the decade), suburbs also showed high growth, but areas 60–80 km away stagnated or experienced population

decline. As a result, the Pearson coefficient for relative growth turned out to be insignificant ($r \approx +0.17$, $p = 0.04$), while the Spearman coefficient was significantly negative ($\rho \approx -0.35$, $p = 1.9 \times 10^{-5}$). Therefore, the dependency was clearly non-monotonic: first, growth rates increase with distance (from the center to the suburbs), and then, after approximately 20–30 km, begin to fall as distance increases (transition to the remote periphery). Such two-zone models require more complex analysis (e.g., segmentation by distance or polynomial regression), which is beyond the scope of this study. However, it is important to emphasize that even in such cases, the periphery as a whole did not outpace the core: it is simply that the near periphery shares the success of the core, while the distant periphery does not. Such a two-step profile is characteristic of the largest agglomerations, where a broad “growth belt” forms around the city.

Several limitations of the study should be mentioned. First, the use of geodesic distance as the sole spatial metric simplifies reality. Future research could incorporate road network distance or travel time, which would likely improve the model’s explanatory power (especially for agglomerations with complex geography). However, such calculations are very labor-intensive and require not only specialized software but also an actual road network graph for all of Russia. Second, correlation analysis reveals a relationship but does not prove a direct cause-and-effect dependency. The negative correlation between distance and population growth indicators aligns with the hypothesis that proximity to a city promotes growth (due to the availability of jobs, infrastructure, etc.).

However, reverse influences are also possible: for example, rapidly growing suburban settlements may become administratively closer to the city (incorporated into its boundaries), i.e., the agglomeration itself may expand, absorbing developing settlements. Such cases are accounted for in our data (the “periphery” status was retained even

if a settlement formally became part of the city limits). Nevertheless, in this study, we do not equate correlation with causation. Third, factors such as settlement size and initial population size were not considered. It is possible that large sub-centers (district centers) in the periphery have their own drivers of growth or resistance to decline, independent of the main city. A more complex regression model could include variables of initial population, economic profile, etc. Here, however, we focused precisely on the paired dependency on geography, which, of course, simplifies the multidimensional nature of socio-ecological-economic space.

The results of the study are significant for state policy and territorial development planning. The identified agglomeration effect means that, all else being equal, the most remote settlements of agglomerations are at risk of demographic decline. This should be considered when developing measures to support the rural periphery – it may be necessary to stimulate economic activity not only in the main city but also in key peripheral nodes (sub-centers) to extend the positive influence of the center in space. The Spatial Development Strategy of the Russian Federation declares the need for balanced development of agglomerations; however, our data shows that this balance is often not yet achieved: cores confidently outpace the outskirts in demographic dynamics. This is particularly acute in eastern regions, where distances are great and population density is low: without targeted efforts, further concentration of population in a few points with extensive depopulated peripheral territories may occur.

On the other hand, the presence of suburban growth zones around megacities (Moscow, Saint Petersburg, Kazan, Krasnodar, etc.) indicates the spread of urbanization – the phenomenon of suburbanization, where part of the population prefers to settle outside the city but close to it. This is a positive aspect in terms of relieving pressure

on cities, but it increases the load on the transport system and requires the formation of polycentric agglomeration frameworks. Planning solutions, such as creating new points of attraction (technoparks, social facilities) in the periphery, could smooth out excessively sharp gradients, but, as experience shows, they cannot be completely eliminated: a large city will still remain more attractive. Nevertheless, the blurring of the agglomeration effect (for example, in the Rostov or Krasnodar agglomerations, where the periphery is growing relatively) can be regarded as a sign of more uniform development of the agglomeration territory. State policy should strive for precisely such equalization, supporting peripheral settlements so that they do not lag too far behind the core.

Conclusion

This study presents a comprehensive analysis of the influence of the agglomeration effect – the factor of distance to the urban center – on the population dynamics of peripheral settlements located within agglomerations. The research object comprised 40 urban agglomerations in Russia for the period 2010–2021, using statistical comparison of distances and demographic indicators for tens of thousands of settlements as the methodology. The following key findings were obtained.

In almost all agglomerations, a negative relationship is observed between a settlement's distance from the core city and its population growth rate. On average for Russia, the Spearman coefficient $\rho \approx -0.12$ for relative growth, which, although not high in absolute value, is statistically significant and indicates an entrenched center-periphery gradient: the distant periphery contributes less to the agglomeration's population growth, often showing decline, while core cities and their immediate surroundings grow.

The strength of the agglomeration effect varies significantly. In approximately half of the agglomerations, the gradient is strong ($\rho < -0.3$), reaching peak values in the Novosibirsk, Irkutsk, and Barnaul

agglomerations ($\rho \approx -0.5$). In another third of cases, the relationship is moderate ($\rho \approx -0.2$), and only about 20% of agglomerations show no significant influence of distance (within statistical error). No positive correlations were found in any case, meaning nowhere does the periphery outpace the core in demographic rates.

In a number of agglomerations, a non-linear nature of the dependency was identified: close suburbs may grow almost as fast as or faster than the city itself (a suburbanization effect), creating a locally positive relationship at short distances. However, beyond a certain radius, the trend reverses to negative (distant villages lag sharply). Overall, two zones can be distinguished: an inner periphery (roughly 0–30 km), gravitating toward and often benefiting from the core's growth, and an outer periphery (50 km and beyond), gradually losing population. The boundary between them is blurred and depends on the specific city (larger for megacities). This two-zone pattern results in the Pearson coefficient being close to zero, while the Spearman coefficient captures the overall decline in indicators with increasing D . The use of both coefficients in the study allowed for revealing these nuances.

The results indicate the need to pay increased attention to the development of the remote peripheries of agglomerations. Without support, these territories risk continuing demographic decline, exacerbating the imbalance between center and periphery. Simultaneously, the growth of suburban zones requires integrated planning – creating infrastructure, transport links, and jobs in new development areas so that the agglomeration develops harmoniously. The methodology applied in the study (spatial analysis merging statistical and geographical data) can be used to assess subsequent periods or to test the influence of other factors (road accessibility, industrial development, migration flows).

In conclusion, we emphasize that the agglomeration (center-periphery) effect is clearly present in the demography of Russian urban agglomerations, though its scale varies. The work supplements qualitative understanding with quantitative measurements. The obtained data can serve as a basis for further research on urbanization and for making informed decisions within the framework of implementing the strategy for balanced spatial development of the country and regions of Russia.

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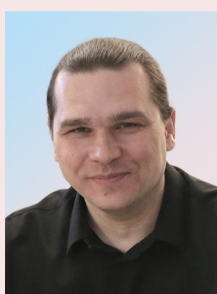
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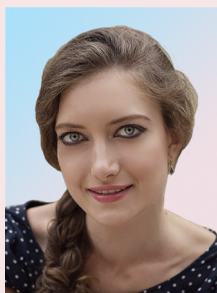
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Adaptation of Russian Ferrous Metallurgy Supply Chains to Geopolitical Challenges: From Reorientation of Flows to Changes in Financial Results



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Abstract. For the Institute of Economics and Industrial Engineering of the Siberian Branch of the Russian Academy of Sciences and Vologda Research Center of the Russian Academy of Sciences, the study of sectoral and corporate development in ferrous metallurgy and its impact on economic growth is of particular importance due to the territorial location of production facilities. Years of research have established a robust methodological and practical foundation for understanding the patterns of spatial distribution of flows within Russia's ferrous metallurgy supply chains. Concurrently, the transformation of external and internal conditions shifts the research focus to new aspects, broadening and deepening the inquiry. The paper examines the spatial reconfiguration of flows within the supply chains of the Russian ferrous metallurgy industry under the influence of recent geopolitical shocks and challenges. The analysis focuses on three key regions: Siberia, the Urals, and the Northwest, which represent major centers for the production and consumption of metallurgical products. Using these regions as case studies, the article

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analyzes changes in logistics linkages and in the directions of raw material and finished product supplies amid heightened geopolitical instability. It also identifies the factors that determined the effectiveness of the spatial redistribution of flows within the supply chains of one of the country's key industries. The work analyzes how geopolitical shocks stimulate the reorientation of flows. Particular attention is paid to assessing the impact of these changes on the final financial performance of industrial enterprises. The research is based on the analysis of statistics and corporate public reporting data. The article is of interest to specialists in economics, logistics, regional development, and representatives of the metallurgical industry.

Key words: ferrous metallurgy, supply chains, material flows, cash flows, spatial distribution, focal firm, geopolitical shocks, external shocks, sanctions.

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The authors have made an equal contribution to the preparation of the publication.

Introduction

In the late 20th and early 21st centuries, the dominance of the globalization concept in the world economy led to a high degree of spatial distribution of supply chains and their dependence on global markets. However, despite all the advantages, the formation of global chains has also become a cause of reduced economic security for individual countries, increasing their vulnerability to geopolitical events, global trends, and other challenges. To preserve the capacity to withstand these challenges, the need has grown for understanding both the factors destabilizing industry markets and external shocks, as well as the composition of supply chains, since their participants are interconnected technologically and economically. Consequently, the propagation of effects from shocks in one link of the supply chain determines the effectiveness of the entire chain.

The geopolitical events of 2022 led to the imposition of sanctions by a number of countries against specific individuals, enterprises, and

industries in Russia. As a result, it became necessary to restructure certain parameters of the Russian economy, which was integrated into global markets. A wide range of industries faced serious challenges, including ferrous metallurgy, engineering, and energy, which had already encountered various restrictions on global markets since 2014. The economy's adaptation to the new conditions, in particular, took the form of restructuring supply chains. This primarily manifested in the reconfiguration of inter-industry linkages, including changes in the composition of their participants and the spatial orientation of these chains' operations. The reorientation toward new sales markets, prompted by imposed restrictions on exports to Western countries, was especially pronounced. Due to changes in various chain links, a redistribution of material and cash flows occurred. Furthermore, problems that were previously solved through imports intensified,

primarily concerning equipment, materials for production activities, and service support. At the same time, despite the similarity of effects from the imposed sanctions, the depth of changes varied significantly among different economic entities and within the supply chains they participated in.

In the conditions described above, the issue of identifying the factors determining changes in flows within the supply chains of Russia's ferrous metallurgy under the influence of the imposed sanctions, which served as external (geopolitical) shocks for the industry, has become particularly relevant. This constitutes the objective of the present study.

Theoretical foundations and the state of research on the topic

An emerging supply chain within an industry complex represents a system of economic agents, activities, information, and resources involved in moving a product or service from a supplier to a customer (Dametew et al., 2016). In essence, these are ordered sequences of suppliers and customers, where each customer is also a supplier, and so on until the finished product reaches the end user. Furthermore, modern supply chains may not end with the final consumption process but can include after-sales support and product disposal services.

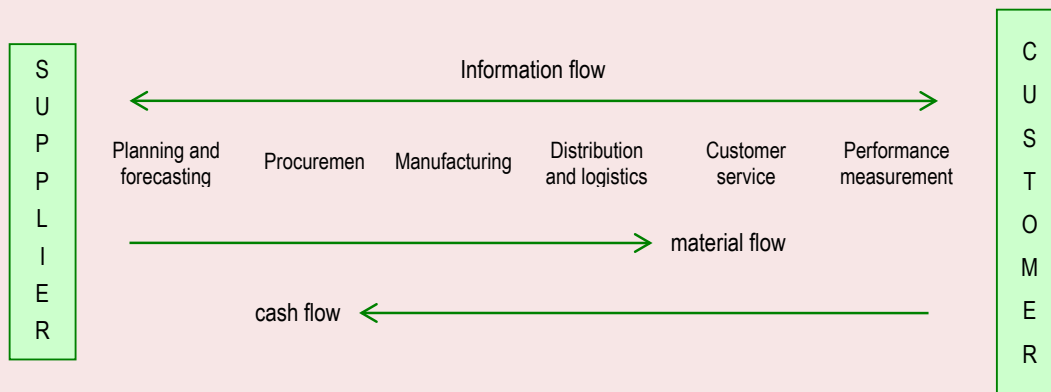
Supply chains consist of entities that facilitate the movement of goods from suppliers to end customers. Key participants in these chains include suppliers of raw materials and components, equipment suppliers, producers of the product or service, distribution firms, financial institutions, and so on. In this context, customers also become important participants in the chains built around the enterprises in question, serving as a source of information necessary for enhancing firms' competitiveness (Prigulniy, 2021). This underscores the strong link between supply chain organization and end-customer satisfaction (Abd et al., 2016). A special place in the supply chain is occupied by the focal firm, the entity around which the entire chain is structured. Essentially, this is the firm

that determines the chain's configuration, and its goals influence the structure, forms of interaction among participants, and the overall organization of the chain (Lyubyashchenko, 2023). Typically, the manufacturer acts as the focal firm, concentrating flows of raw materials, components, equipment, necessary services, etc., and serving as the starting point for the movement of the product created within the supply chain.

In turn, the interconnections between supply chain participants are expressed in the material, financial, and information flows existing within them (*Fig. 1*). The study of these flows is fundamental to understanding how supply chains are formed, how their organizational forms influence the chain participants and the industry markets they operate in (and vice versa), what problems and failures exist in chain operations, and what determines their effectiveness, among other things. Furthermore, considering the role of various participants in the form of a multi-level organization of supply chains determines the spatial distribution of flows within them (Tyapukhin, 2021). As seen in Figure 1, supply chains can be described as a flow of materials, information, payments, and services from raw material suppliers through manufacturers and distributors to end customers (Dametew et al., 2016). It should be noted that focusing attention either on the participants of supply chains or on the flows between them leads to the identification of two approaches to defining, constructing, and analyzing supply chains: the object-based and the process-based approaches (Kireeva, 2012).

The primary methodological toolkit for studying supply chains is established within the management discipline of supply chain management (SCM). A wide range of works on SCM presents research aimed at forming the concept of supply chain management, defining its object and methods of study, identifying general directions for the discipline's development, and so on. Typically, such research is applied in nature and involves studying the organization and functioning of specific chains, the experience of

Figure 1. Components and flows of a manufacturing firm's supply chain



Source: (Spekman et al., 1998).

individual firms or firms within a particular industry, and developing tools for efficiently conducting transactions with suppliers and customers (Donohue, Croson, 2002; Cheng, Grimm, 2006; Kireeva, 2012; Chopra, Meindl, 2013).

The focus of supply chain management as a discipline on researching and developing tools for managing specific chains has become the basis for its criticism as a scientific field with a weakly formed paradigm from the perspective of economic theory representatives (see, for example, Williamson, 2008; Storchevoy, 2014). At the same time, the analysis of supply chains using the tools of economic theory is less common. However, both theoretical and applied research is being conducted. Within economic works, one can identify the application of tools from industrial organization theory (Ralston et al., 2015; Delgado, Mills, 2020), game theory (Um et al., 2010; Zinovieva, Savin, 2020), input-output modeling (Thekdi, Santos, 2016), and network modeling (Pazoki et al., 2011). It should be noted that the presented works examine either a separate aspect of supply chain functioning and its impact, for example, on firms' profitability, or specific industry markets and firms. In our view, this is due, firstly, to the absence of a well-developed toolkit within economic theory specifically designed for supply chain analysis, and secondly, to significant differences in the applied aspects of industry

market structures and firm behavior within them. Therefore, applying the supply chain concept is currently only feasible at the level of individual industry markets. For instance, one can highlight works dedicated to researching the construction industry using industrial organization theory tools (London, 2008), the oil industry (Chima, 2007; Li et al., 2021), and the automotive industry (Ambe, Badenhorst-Weiss, 2011). Among domestic studies, there is research focused on modeling supply chain operations in food production (Fetyukhina, 2007), mechanical engineering (Kovalev, 2014), and the coal industry (Solodovnikov, 2018).

Works aimed at researching supply chains in ferrous metallurgy are primarily related to supply chain management. For example, V.V. Solodovnikov presented an overview of supply chain development in ferrous metallurgy, built a generalized supply chain model for metallurgical enterprises, and identified tools for integrated supply chain planning (Solodovnikov, 2017a; Solodovnikov, 2017b). A number of works are dedicated to the issue of supply chain integration in the steel industry, including on global markets (Pleshchenko, 2013; Dametew, Ebinger, 2017; Fregoso, 2019). However, in our opinion, they do not pay sufficient attention to spatial aspects and the influence of various factors, such as geopolitical events, on the functioning of supply chains in ferrous metallurgy.

Methodological aspects of the research

This study is applied in nature and utilizes categories of industrial organization theory within the process-based approach to supply chain analysis. The methodological foundation of this work is an expert-analytical approach to assessing changes in flows and their spatial distribution within the supply chains of Russia's ferrous metallurgy. The information base included publications by domestic and foreign authors on the development of supply chains and Russia's ferrous metallurgy. Furthermore, the work utilized annual, public financial reports of Russian metallurgical enterprises, data from Rosstat, as well as information and data from official media websites (Kommersant, Interfax, RBC, Vedomosti, etc.).

Research results

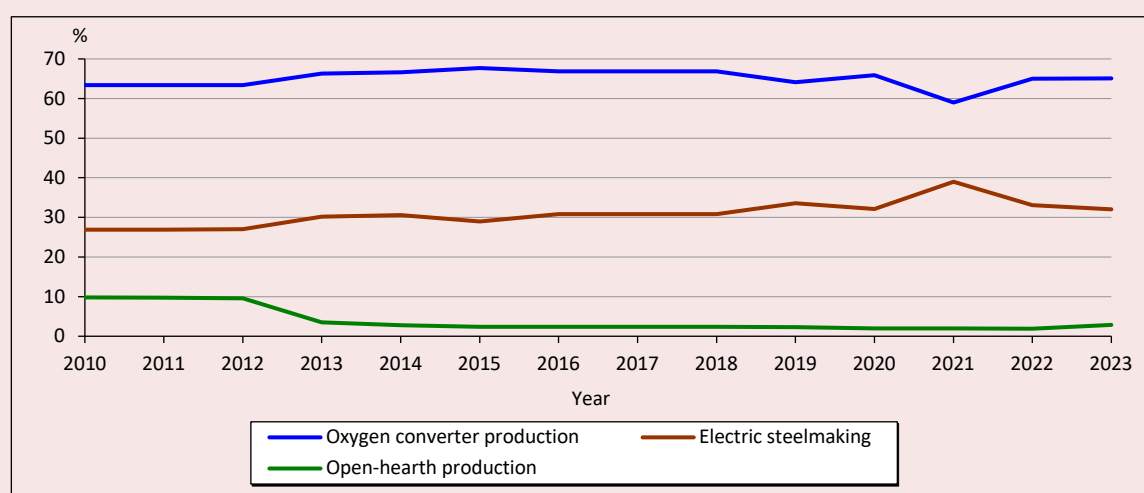
Organization of flows in the supply chains of Russia's ferrous metallurgy

In light of technological and economic factors, ferrous metallurgy has become an industry with a high degree of integration of various stages of the supply chain. Consequently, the organizational form of ferrous metal producers based on large integrated plants, since the 2000s consolidated with suppliers

of key raw material types into holding structures, has become most widespread in Russia. For instance, in 2020, the eight largest plants in the country accounted for 94% of pig iron production, 77% of steel, and 80% of rolled products (Katunin et al., 2021). However, a long-term trend of increasing the share of steel production using electric arc furnace capacities is evident (Fig. 2). This has manifested, in particular, in increased steel production by small, non-integrated plants, including through the launch of new enterprises (e.g., Tyumen Electrosteel, Abinsk ESW). As a result, two main schemes for organizing supply chains, differing in the spatial scope of the flows formed within the chains, have emerged in Russia's ferrous metallurgy.

The primary scheme for organizing supply chains in Russia's ferrous metallurgy is the supply chain of an integrated metallurgical enterprise with a metallurgical plant as the focal firm (Fig. 3). On one hand, it centralizes flows from suppliers of raw materials, energy, services, etc. On the other hand, it generates flows towards end customers. An important feature here is that the metallurgical plant's output is intermediate. This leads, in the direction of flows to customers, to predominant

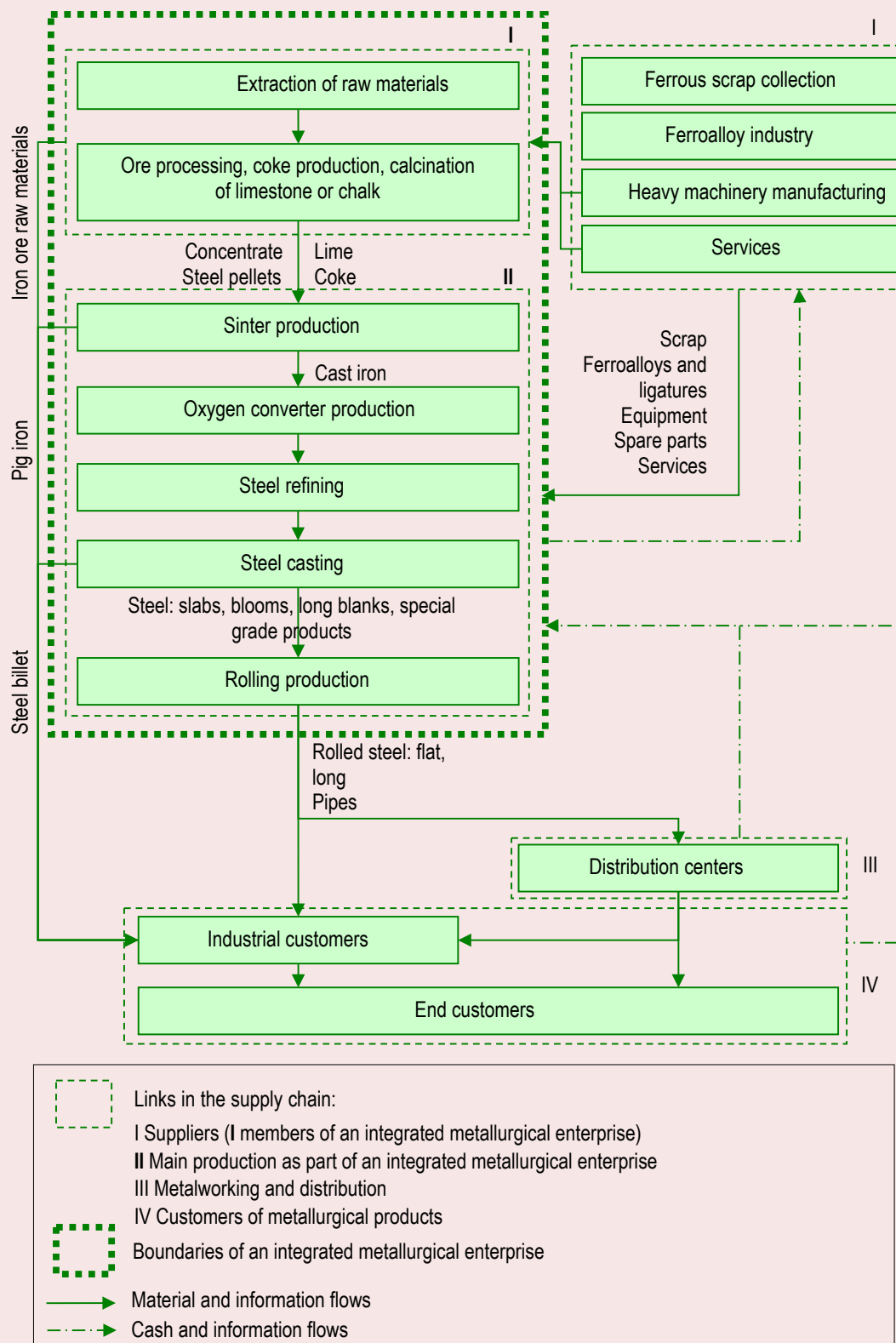
Figure 2. Technological structure of steel production in Russia, 2010–2023



Note: the structure for 2023 is estimated.

Source: World Steel in Figures. World Steel Association. Available at: <https://worldsteel.org/data/world-steel-in-figures/> (accessed: 17.08.2025).

Figure 3. Predominant scheme of the supply chain organization for an integrated metallurgical enterprise in Russia



Source: (Petrov, 2023).

interaction with producers engaged in further processing. The scale of operations of metallurgical plants (product range, production volumes) explains the broad spatial distribution of the supply chains built around them.

There is one integrated metallurgical enterprise each in Siberia and Northwestern Russia: JSC EVRAZ Consolidated West Siberian Metallurgical Plant (EVRAZ ZSMK) within EVRAZ, and Cherepovets Metallurgical Plant (CherMK) within PJSC Severstal, respectively. They have a similar organization of raw material, supply, and energy flows within their supply chains. The main raw material supply hub for EVRAZ ZSMK is internal suppliers based in the Kuzbass basin, integrated into the enterprise. However, while EVRAZ ZSMK is fully self-sufficient in coking coal, its self-sufficiency in iron ore raw materials is incomplete. Therefore, additional raw material flows come from the Irkutsk Region, the Republic of Khakassia, the Urals, and the Northwest of the country. CherMK is located at the intersection of ore, coal, and finished product flows. Ore flows come from the Republic of Karelia, Murmansk Region, and Belgorod Region. Coal flows arrive from the Urals, based on the Pechora coal basin, formed by the mining and processing capacities within PJSC Severstal. Ore is also supplied by external suppliers in the Murmansk and Kemerovo regions (Ilyin et al., 2021; Lukin, 2021; Pechenskaya-Polishchuk, Malyshev, 2022). Unlike these enterprises, the Ural plants have relatively low self-sufficiency in raw materials, leading to a broader spatial scope of flows from other regions, including Siberia and the Northwest of the country, as well as import supplies. For example, the primary portion of iron ore raw materials for the Chelyabinsk Metallurgical Plant (ChMK), part of PJSC Mechel, is supplied from the Irkutsk Region via the Korshunovsky Mining and Processing Plant (GOK), which is also part of Mechel¹. Meanwhile, until 2022, the Magnitogorsk Metallurgical Plant (MMK) received the bulk of

its ore from the Northwest of the country and from Kazakhstan.

Flows toward customers, despite similar organizational forms among different ferrous metal producers, have several distinctive features. Overall, the main customers of integrated metallurgical enterprises' products are construction companies, engineering enterprises, metal product manufacturers, and the energy sector. This determines a wide spatial coverage of metallurgical product flows. The products of full-cycle plants are shipped to virtually all regions of Russia. The specialization of a particular enterprise is crucial here. For example, EVRAZ ZSMK specializes in semi-finished products, construction sections, and railway sections (these segments accounted for 37.1, 31.2, and 10.6% of sales revenue in 2021, respectively²). While construction sections primarily serve the needs of the Asian part of the country (estimated, based on Rosstat data for 2017–2019, an average of 55.6% of section supplies from Kemerovo Region went to Asian Russia), railway sections are widely supplied for export and across all of Russia, as the plant is a key supplier to Russian Railways (RZhD), as well as tram and subway rails. For instance, PJSC Severstal, specializing in flat and long steel products, until 2022 exported about 45% of its production, mainly to Europe (31% of the company's total sales volume in 2021)³. MMK, also specializing in flat and long products, primarily focuses on domestic demand, exporting less than 20% of its output, with the group's main foreign buyers, as with EVRAZ, being Eastern countries⁴.

The second scheme for organizing supply chains in ferrous metallurgy is associated with the activities of small metallurgical plants, which act as the focal firms (*Fig. 4*). Typically, such plants are electric

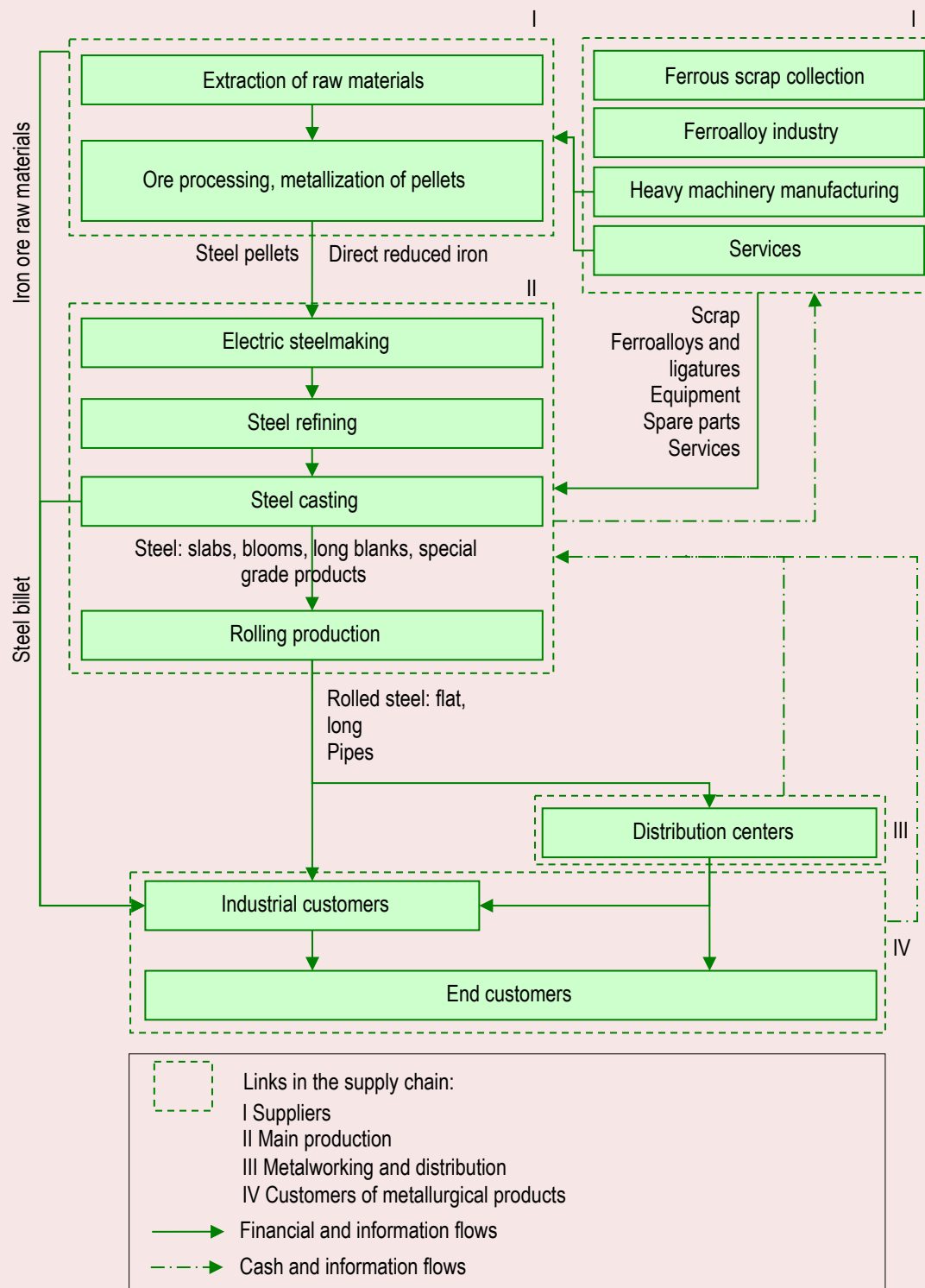
¹ Russian iron ores. Available at: <https://nedradv.ru/nedradv/ru/ratings?rubric=b8ce6228fc2b2c8bdf8b61cdf5d9dd97> (accessed: 10.08.2025).

² Annual report 2021 of EVRAZ. Available at: https://www.evraz.com/upload/iblock/5c5/EVRAZ_Annual_Report_2021.pdf (accessed: 10.08.2025).

³ Annual Report 2021 of PJSC Severstal. Available at: <https://e-disclosure.ru/portal/files.aspx?id=30&type=2> (accessed: 10.08.2025).

⁴ MMK Annual Report 2020. Available at: <https://e-disclosure.ru/portal/files.aspx?id=9&type=2> (accessed: 10.08.2025).

Figure 4. Predominant scheme of the supply chain organization around an electric steelmaking plant in Russia



Source: (Petrov, 2023).

steelmaking facilities, and unlike the supply chains of integrated metallurgical enterprises, their flows have a more limited spatial scope. Both flows from suppliers of raw materials and components and flows toward customers are primarily concentrated within the region where the focal firm is located. The basic raw material for their operations is ferrous scrap metal, which is sourced from the federal district where the steelmaking plant is situated. The main products supplied to customers within such a supply chain are long steel products for the construction industry and metal products aimed at the needs of engineering enterprises. For example, OOO UMK Tyumen Electrosteel in the Tyumen Region operates according to this scheme. Some plants focus on exporting their products, like OOO Amurstal in the Khabarovsk Krai, which supplies not only rolled products to regions of the Far East but also steel billets to China and Southeast Asian countries.

Sanctions imposed by western countries on Russia's ferrous metallurgy industry

Ferrous metallurgy is one of the Russian economic sectors most affected by the sanctions imposed against the country since 2022. A series of sanctions packages adopted by Western countries contain restrictions on the free operations of Russian metallurgy on the global market. It is worth emphasizing that various forms of restrictions on the activities of Russian metallurgical companies began to be introduced as early as 2014, but until 2022, they primarily took the form of duties, quotas, etc., and did not lead to significant consequences for the established supply chains in Russia's ferrous metallurgy. With the adoption of the 2022 sanctions, a situation emerged testing the capabilities of focal firms to restructure their chains in response to drastic changes in operating conditions. This restructuring of supply chains manifested itself primarily in a change in the spatial orientation of key flows.

In March 2022, as part of the fourth sanctions package, the European Union imposed sanctions against Russian steelmakers, restricting the import

of certain types of steel products from Russia. In October 2022, EU countries adopted the eighth sanctions package against Russia, which included, among other things, restrictions on the supply of ferrous metal semi-finished products. The sanctions targeting slab supplies were structured in such a way that until September 30, 2024, Russia was allowed to export 3.75 million tons per year, as otherwise, a severe blow would have been dealt to European metallurgical enterprises dependent on supplies from Russia⁵. On December 16, 2022, the ninth sanctions package was adopted, affecting the mining sector. It introduced a prohibition on new investments in Russia's mining industry, including the provision of loans for these purposes. However, a number of exceptions were specified for raw materials critical to Europe, including iron ore⁶. In December 2023, the 12th sanctions package banned supplies of pig iron (including refined/spiegel iron), ferroalloys, and direct reduced iron from Russia⁷. Notably, under the 12th package, the deadline permitting the import of Russian steel slabs and billets into the EU was extended until 2028⁸.

Based on the target of restrictions and their impact on supply chains in the ferrous metals industry, the sanctions can be divided into two types (*Fig. 5*).

The first type encompasses sanctions related to industries that consume ferrous metals, which essentially affect domestic demand indirectly. These manifest both as bans on supplying products from Russian metal-consuming

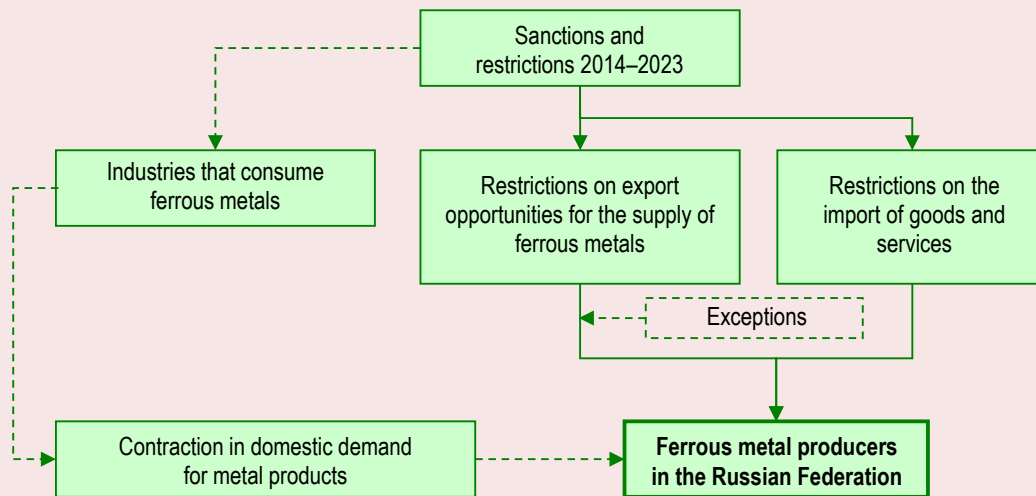
⁵ Europe took pity on its steel. Available at: <https://www.kommersant.ru/doc/5606244> (accessed: 12.09.2025).

⁶ The ninth package of EU sanctions. What is important to know. Available at: <https://www.rbc.ru/economics/18/12/2022/639e21ba9a79472670331892> (accessed: 30.09.2025).

⁷ The 12th package of EU sanctions against Russia. What is important to know. Available at: <https://www.rbc.ru/economics/19/12/2023/65807aff9a794779f386ace3> (accessed: 22.08.2025).

⁸ The postponement of the ban on the supply of slabs to the EU gives NLMK's structure time to transform. Available at: <https://www.interfax.ru/business/936940> (accessed: 27.08.2025).

Figure 5. External shocks of restrictions and regulation on Russia's ferrous metallurgy



Sources: (Dranev, 2021; Petrov, 2023).

industries to external markets and as restrictions on the supply of components, technologies, and equipment, thereby reducing the production capacities of these industries. This, in turn, led to a contraction in demand for metal products. Firstly, there was a destabilization of already established linkages within supply chains. Secondly, limitations arose in the ability to build new connections between metal producers and domestic customers to replace the lost flows. As a result, the alteration of supply chains from this type of sanction was expressed in a narrowing of material flows from primary production to customers and of cash flows in the opposite direction along the chain linkages. For instance, in 2022, metal consumption by the engineering sector fell significantly due to a drop in automobile production (by 67% compared to 2021⁹) following the halt in supplies of a range of foreign components and the exit of foreign manufacturers from Russia.

⁹ Dynamics of industrial production in 2022. Rosstat. Available at: <https://rosstat.gov.ru/folder/313/document/196621> (accessed: 19.09.2025).

An important consequence of this type of sanction is that, under non-integrated forms of interaction, the risk of overall supply chain disruption increased due to a higher probability of bankruptcy for the focal firm. Since the profitability of such enterprises is several times lower than that of integrated ferrous metallurgy enterprises, the decline in revenue resulting from the imposed sanctions has a more pronounced impact on the financial stability of non-integrated companies.

The second type comprises sanctions directly targeting the ferrous metallurgy industry, which primarily affected export capabilities. In this case, the supply chains experienced a disruption of material flows from primary production toward customers. In response, metallurgical holdings began forming new flows in two directions. The first direction involves establishing or expanding ties with customers in friendly countries. However, the necessity of offering discounts on ferrous metal products for these new markets, which are less lucrative compared to the now-closed European ones, has led to a significant reduction in the volume of cash flows within the supply chains.

The second direction of countermeasures against the imposed sanctions has been the formation of flows enabling indirect supply of products to the global market. For instance, exports of raw materials and semi-finished products, previously shipped directly to the EU, are now partially routed through Türkiye, where they are processed and then exported to European countries¹⁰. Furthermore, new flows have been created or existing ones expanded on the domestic market to replace some of the lost export shipments.

Russian steel corporations are in acute need of a stable and uninterrupted financial settlement system to conduct any international trade and financial operations without hindrance. Sanctions have been imposed on individuals such as A. Mordashov, a shareholder of PJSC Severstal; R. Abramovich, co-owner of Evraz; V. Rashnikov, owner of the Magnitogorsk Iron and Steel Works (MMK); and A. Usmanov, owner of Metalloinvest¹¹. At the same time, the owner of NLMK, V. Lisin, has avoided sanctions, partly because the holding has production facilities in Belgium, Denmark, Italy, and France, with a total annual output of 4.4 million tons and an average headcount of about 1.8 thousand people¹². Among Russian metallurgical corporations, PJSC Severstal has been the most severely affected. Due to the imposed sanctions, supplies to Europe (34% of the company's exports) were halted as early as March 2022. In just the period from February to November 2022, the corporation lost \$400 million due to the seizure

of its Western warehouses and accounts¹³. In turn, one of the earliest reactions to Western sanctions was the re-domiciliation of the charter capital of PJSC MMK to Russian jurisdiction – from the Cypriot Mintha Holding Limited to the Russian company Altair in Magnitogorsk – prompted by the risks associated with managing Russian investments¹⁴.

As a consequence of the imposed sanctions and the formation of new flows, 2022 saw a decline in metallurgical production and capacity utilization. In 2023, production began to recover, though not uniformly across all regions hosting metallurgical enterprises (*Tab. 1*).

The contraction of primary production led to changes in the volume of flows along the linkages between suppliers and producers. In this case, however, the changes primarily concerned flows from foreign suppliers, which incentivized focal firms to reconfigure these flows towards domestic sources. For example, this issue manifested in 2022 when the Sokolov-Sarbai Mining and Processing Production Association (SSGPO) from Kazakhstan refused to supply iron ore raw materials to the Magnitogorsk Iron and Steel Works (MMK). Supplies from Kazakhstan had accounted for approximately 70% of the plant's needs. PJSC MMK shifted to purchasing additional volumes of raw materials from Russian producers, including Metalloinvest, which found it advantageous to reorient its supplies to the domestic market due to a shortage of dry cargo ships for exporting raw materials from Russian ports¹⁵.

¹⁰ Kobitz E. Metallurgists are opening up new horizons. Available at: <https://expert.ru/2022/10/14/metallurgi-otkryvayut-novyye-gorizonty/> (accessed: 12.09.2025).

¹¹ Putin considered sanctions against metallurgists to be inconsistent with WTO standards. Available at: <https://www.rbc.ru/politics/20/04/2022/62601c189a79472a3b0649da> (accessed: 15.07.2025).

¹² Analysts have named the companies that will be most affected by EU sanctions. Available at: <https://www.forbes.ru/biznes/459489-analitiki-nazvali-kompanii-kotorye-bol-se-drugih-postradaut-ot-sankcij-es> (accessed: 25.07.2025).

¹³ Severstal lost \$400 million due to sanctions. Available at: <https://www.kommersant.ru/doc/5694827> (accessed: 29.07.2025).

¹⁴ The metallurgical plant has changed jurisdiction. Available at: <https://news.myseldon.com/ru/news/index/268255358> (accessed: 25.09.2025).

¹⁵ After Kazakhstan's refusal to supply Russia, MMK switched to Metalloinvest ore. Available at: <https://www.vedomosti.ru/business/articles/2022/05/17/922281-posle-otkaza-kazahstana-metalloinvesta> (accessed: 31.08.2025).

Table 1. Capacity utilization rate (% of average annual production capacity) for selected products

Region	2021	2022	2023
Unalloyed steel in ingots or other primary forms, and semi-finished products of unalloyed steel			
Kemerovo Region	69.5	59.6	54.9
Vologda Region	93.7	85.5	90.4
Chelyabinsk Region	95.9	83.7	-
Finished rolled products			
Kemerovo Region	80.2	71	65.6
Vologda Region	72.5	63.1	65.4
Chelyabinsk Region	81.2	70.8	-

Compiled from: Industrial Production. Territorial Branch of the Federal State Statistics Service for the Kemerovo Region – Kuzbass. Available at: <https://42.rosstat.gov.ru/folder/38696> (accessed: 29.08.2025); Industrial Production. Territorial Branch of the Federal State Statistics Service for the Vologda Region. Available at: <https://35.rosstat.gov.ru/proizvodstvo> (accessed: 29.08.2025); Industrial Production. Territorial Branch of the Federal State Statistics Service for the Chelyabinsk Region. Available at: https://74.rosstat.gov.ru/industrial_production (accessed: 29.08.2025).

The ban on supplies of metallurgical equipment to Russia had an unambiguously negative effect on the interaction between suppliers and producers of ferrous metals. In 2021, imported products accounted for 70% of the metallurgical equipment market, and for 80–90% of most positions in the mining and processing equipment market¹⁶. The main suppliers were European enterprises. A similar situation was observed with service maintenance. While flows of raw materials, supplies, and metallurgical products can be restored in the short term, flows related to equipment and service maintenance require long-term investments.

As a result, the outlined dimensions of sanction impact allow us to identify a number of key factors that determined the degree of change in the flows within Russia's ferrous metallurgy supply chains:

- type of product: low value-added (primary processing), general-purpose, specialized products;
- type of end customers: large-scale or small-scale customers;
- sales orientation: domestic market, exports to the West, exports to Asia and countries of the Global South;
- presence of assets abroad that are critical to the host countries;

– dependence on external supplies: metallurgical equipment, service maintenance, raw materials and supplies, etc.

Impact of sanctions on the financial performance of Russian ferrous metallurgy corporations

Based on the identified key factors that influenced the degree of change in the supply chain flows of metallurgical plants, a logical question arises: how did the impact of these factors during the sanctions period affect the operational and financial results of the enterprises? To answer this question, it is advisable to use the official public reporting of the companies themselves, compared with the pre-sanctions period. Given the available data, this analysis will be conducted for the first half-year periods of four years, starting from 2021, for the major companies PJSC Severstal, PJSC MMK, and PJSC EVRAZ. A large Russian company from the Central Federal District, PJSC NLMK, has also been added to the comparative analysis.

PJSC Severstal (Northwestern Federal District, Vologda Region)

The key factor driving changes for PJSC Severstal was the cessation of operations with the European market (34% of revenue), which negatively impacted almost all of the company's

¹⁶ Ulyanov N. (2023). The situation in the heavy machinery has not become easier. Available at: <https://expert.ru/expert/2023/12/tyazhelomu-mashinostroyeniye-legche-ne-stalo/> (accessed: 20.09.2025).

Table 2. Dynamics of financial results of PJSC Severstal for the first half-year, million RUB

Indicator	H1 2021	H1 2022	H1 2023	H1 2024	H1 2024 vs H1 2021
Revenue	383064	376893	339429	409138	1.1-fold
Cost of sales	158868	199472	193010	247591	1.6-fold
Share of cost of sales in revenue, %	41.5	52.9	56.9	60.5	+19 p.p.
Gross profit	224196	177421	256419	161547	0.7-fold
General and administrative	12330	13823	12246	15323	1.2-fold
General & administrative expense-to-revenue, %	3.2	3.7	3.6	3.7	+0.5 p.p.
Selling expenses	24327	30714	23141	28703	1.2-fold
Selling expense-to-revenue, %	6.4	8.1	6.8	7.0	+0.6 p.p.
Operating profit	187153	115329	100434	107007	0.6-fold
Finance income	247	2581	3738	14393	58.3-fold
Finance costs	5793	4990	5606	13689	2.4-fold
Net foreign exchange result	-909	37214	29695	-13437	14.8-fold
Profit before tax	171217	145423	122548	98764	0.6-fold
Income tax expense	33343	27743	17545	15446	0.5-fold
Tax burden on the tax base, %	19.5	19.1	14.3	15.6	-3.9 p.p.
Profit for the period	137836	117680	105003	83318	0.6-fold
Net profit margin, %	36.0	31.2	30.9	20.4	-15.6 p.p.
Compiled from: PJSC Severstal IFRS data.					

operational and financial performance indicators (Tab. 2). For instance, in the first half of 2024 compared to the first six months of 2021, consolidated revenue grew by only 7% – from RUB 383 billion to RUB 409 billion – while the cost of sales increased much more significantly, by 56%, ultimately reducing gross profit by almost one-third (-28%). In turn, the growth in production costs outpacing the company's income led to an increase in the share of cost of sales in revenue from 41.5% to 60.5%. Simultaneously, sanctions against PJSC Severstal and its owner resulted in increased selling expenses for the company, both in the first half of 2022 (+26.3%, to RUB 30.7 billion) and in subsequent periods. To preserve corporate governance, the parent company Rutgers Severtar of A. Mordashov changed its jurisdiction from Cypriot to Russian. The Cherepovets-based LLC Rutgers Severtar changed its owner from the

Cypriot Severtar Holding LTD to the Russian MK LLC Severtar Holding and registered in a special economic zone in the Kaliningrad Region¹⁷.

Against the backdrop of all these trends, net profit volume decreased (by 40%), as did its profitability margin (from 36 to 20.4%), along with the tax burden. Thus, the company's profit before tax by the end of the period showed a sharp decline of 42% compared to the first six months of 2021 (to RUB 98.8 billion), and income tax fell by 54% (to RUB 15.4 billion). This was reflected in the drop in the current income tax rate, which, compared to the standard 20%, decreased from 19.5 to 15.6%.

Following the 2022 sanctions, PJSC Severstal redirected its flows from external to domestic markets. Whereas before the restrictions the company sold up to 40% of its products on export markets, this share subsequently decreased to 10–15%¹⁸.

¹⁷ A. Mordashov's parent company Rutgers Severtar has changed its jurisdiction from Cyprus to Russia. Available at: https://www.akm.ru/news/golovnaya_kompaniya_rutgers_severtar_a_mordasheva_smenila_yurisdiksiyu_s_kiprskoy_na_rossiyskuyu/ (accessed: 20.08.2025).

¹⁸ Severstal intends to focus on the Russian market for the next five years. Available at: <https://tass.ru/ekonomika/20985641> (accessed: 20.08.2025).

PJSC MMK (Ural Federal District, Chelyabinsk Region)

The imposed sanctions led to a decline in profitability (*Tab. 3*). In 2021 the profit margin reached 20–25%, while by May–June 2022 it had shrunk to 1–4%. General and administrative expenses, as well as selling expenses, increased by 37% and 27%, respectively. Against the backdrop of a sharp rise in production costs (+34%), the share of cost of sales in revenue increased from 57.6 to 74.6%. In turn, the company's tax base contracted by 53%, and income tax itself fell by 44%, while the effective tax rate remained relatively high (23.4%). Both the company's consolidated net profit (down 55%) and its profitability (from 27.6 to 12%) also decreased.

It is important to note that PJSC MMK was among the first companies after February 24, 2022, to carry out re-domiciliation (a transfer from Cypriot to Russian jurisdiction). As a result of the transaction, 79.76% of PJSC MMK shares held by Mintha Holding Limited (Cyprus) were transferred to the ownership of Altair LLC (Russian Federation, Magnitogorsk)¹⁹. The decision to restructure was made considering the reduced attractiveness of Cyprus for holding and managing Russian investments, as well as to leverage the advantages created in Russia in the sphere of corporate regulation and the existing legal and investment norms in the Russian Federation²⁰.

Table 3. Dynamics of financial results of PJSC MMK for the first half-year periods 2021–2024, million RUB

Indicator	H1 2021	H1 2022	H1 2023	H1 2024	H1 2024 vs H1 2021
Revenue	403851	403039	352708	417829	1.03-fold
Cost of sales	232801	288514	251816	311500	1.3-fold
Share of cost of sales in revenue	57.6	71.6	71.4	74.6	17 p.p.
Gross profit	171050	114525	100892	106329	0.6-fold
General and administrative	7774	8487	8827	10647	1.4-fold
General & administrative expense-to-revenue	1.9	2.1	2.5	2.5	+0.6 p.p.
Selling expenses	22995	24569	25701	29228	1.3-fold
Selling expense-to-revenue	5.7	6.1	7.3	7.0	+1.3 p.p.
Operating profit	141235	79740	65996	67364	0.5-fold
Finance income	843	3041	5099	9353	11.1-fold
Finance costs	1195	2471	3383	2713	2.3-fold
Net foreign exchange result	292	-1814	1899	-5992	-20.5-fold
Profit before tax	139097	72668	66892	65701	0.5-fold
Income tax expense	27495	15880	15274	15392	0.6-fold
Tax burden on the tax base	19.8	21.9	22.8	23.4	+3.6 p.p.
Profit for the period	111602	56788	51618	50309	0.5-fold
Net profit margin	27.6	14.1	14.6	12	-15.6 p.p.
Compiled from: PJSC MMK IFRS data.					

¹⁹ The metallurgical plant has changed jurisdiction. Available at: <https://news.myseldon.com/ru/news/index/268255358> (accessed: 20.09.2025).

²⁰ The main shareholder of MMK Rashnikov transferred his stake in the company from the jurisdiction of Cyprus to the Russian Federation. Available at: <https://tass.ru/ekonomika/13946665> (accessed: 20.08.2025).

PJSC EVRAZ (Siberian Federal District, Kemerovo Region)

Due to PJSC EVRAZ's inability to secure an auditor following sanctions against the company, the latest IFRS reporting available for analytical purposes is only for the first half of 2022²¹.

Despite the sanctions pressure against Russia, the company's revenue grew by 28%, reaching nearly RUB 593 billion. Unlike other companies, the increase in the cost of sales was similar (+31%), which did not lead to a significant rise in its share of revenue (+1.1 p.p., to 59.9%). Logistics problems were reflected in the company's selling expenses, which increased by 61%, with their share of revenue rising from 6.7 to 8.4%. A key factor in reducing the taxable base was a 58.4-fold increase in the net loss on foreign exchange differences. As a result, profit before tax decreased by 79%, while income

tax expense showed a smaller decline (-19%). Due to high income tax expenses, the company's net profit plummeted 206-fold to RUB 439 million, with its net profit margin for the first half of 2022 amounting to just 0.1% (Tab. 4).

In March 2023, the Cypriot company Streamcore, 50% of which was owned by PJSC EVRAZ, was re-registered under Russian jurisdiction in the Special Administrative District on Russky Island in Vladivostok, under the name MK OOO Streamcore. According to the Unified State Register of Legal Entities (EGRUL), 50% of Streamcore is owned by the Luxembourg-based company Evraz Group S.A., and 50% by LLC Invest-VK, whose primary owner is A. Rybkin (beneficial owner of JSC Siberian Mining and Metallurgical Company, Kemerovo Region)²².

Table 4. Dynamics of financial results of PJSC EVRAZ for the first half-year periods 2021–2022, million RUB

Indicator	H1 2021	H1 2022	H1 2022 vs H1 2021
Revenue	461136	592552	1.3-fold
Cost of sales	271173	354785	1.3-fold
Share of cost of sales in revenue	58.8	59.9	+1.1 p.p.
Gross profit	189963	237767	1.3-fold
General and administrative	21497	25833	1.2-fold
General & administrative expense-to-revenue	4.7	4.4	-0.3 p.p.
Selling expenses	30902	49764	1.6-fold
Selling expense-to-revenue	6.7	8.4	+1.7 p.p.
Operating profit	130548	28029	0.2-fold
Finance income	224	878	3.9-fold
Finance costs	9256	7830	0.9-fold
Net foreign exchange result	-2239	-130702	58.4-fold
Profit before tax	121741	25833	0.2-fold
Income tax expense	31275	25394	0.8-fold
Tax burden on the tax base	25.7	98.3	+72.6 p.p.
Profit for the period	90466	439	0.005-fold
Net profit margin	19.6	0.1	-19.5 p.p.
Compiled from: PJSC EVRAZ IFRS data.			

²¹ EVRAZ will not publish its annual report and IFRS financial statements due to the absence of an auditor. Available at: <https://www.interfax.ru/business/887815> (accessed: 26.08.2025); EVRAZ will not be able to disclose the IFRS report for 2023. Available at: <https://www.metalinfo.ru/ru/news/160642> (accessed: 26.08.2025); EVRAZ will not publish its annual report and financial statements under IFRS for 2024 due to the absence of an auditor. Available at: <https://mcc-analytics.ru/media/news/evraz-ne-budet-publikovat-opublikovat-godovoy-otchet-i-finansovuyu-otchetnost-po-msfo-za-2024/> (accessed: 26.08.2025).

²² The joint venture between Evraz and the owner of SMMC was redomiciled from Cyprus to the Russian Federation. Available at: <https://www.interfax.ru/business/893517> (accessed: 20.08.2025).

PJSC NLMK (Central Federal District, Lipetsk Region)

The consolidated revenue of the Novolipetsk Steel plant remained virtually unchanged (-0.4%), and the increase in its cost of sales was not as substantial as that of the other analyzed companies – 17% (rising from 49 to 57.6% of revenue). The taxable base was significantly impacted by a 1.5-fold increase in selling expenses and a 3.6-fold rise in the loss on foreign exchange differences. This led to a 47% decrease in the company's profit before tax and a 40% reduction in income tax payments, even against a slight increase in the effective tax rate (from 18.6 to 21.2%). Meanwhile, the company's consolidated net profit halved, and its net profit margin dropped from 30.6 to 15.8% (*Tab. 5*).

In June 2023, the key shareholder of PJSC NLMK, V. Lisin, transferred his stakes in NLMK and First Cargo Company from Cypriot jurisdiction to structures named Serenity II Holdings and Nebula II Holdings, registered in Abu Dhabi (UAE). As of the end of 2022, control over 79.3% of PJSC NLMK shares was exercised through the Cypriot company Fletcher Group Holdings²³.

It should be noted that PJSC NLMK has not been subjected to EU or US sanctions. For instance, Belgium did not vote for the eighth sanctions package against Russia because NLMK Group operates plants on its territory employing 1,200 people²⁴. Furthermore, NLMK Group owns and operates plants in Italy and the USA²⁵ with an annual production volume exceeding 4 million tons²⁶.

Table 5. Dynamics of financial results of PJSC NLMK for the first half-year periods 2021–2024, million RUB

Indicator	H1 2021	H1 2022	H1 2023	H1 2024	H1 2024 vs H1 2021
Revenue	520017	no data	444162	517789	0.99-fold
Cost of sales	255127	no data	253396	298106	1.2-fold
Share of cost of sales in revenue	49.1	no data	57.1	57.6	+8.5 p.p.
Gross profit	264890	no data	190766	219683	0.8-fold
General and administrative	15804	no data	13509	16388	1.0-fold
General & administrative expense-to-revenue	3.0	no data	3.0	3.2	+0.1 p.p.
Selling expenses	29828	no data	41326	44993	1.5-fold
Selling expense-to-revenue	5.7	no data	9.3	8.7	+3 p.p.
Operating profit	216106	no data	121808	132769	0.6-fold
Finance income	203	no data	5048	8342	41.1-fold
Finance costs	5703	no data	2981	547	0.1-fold
Net foreign exchange result	-3425	no data	8244	-12463	3.6-fold
Profit before tax	195276	no data	114651	103614	0.5-fold
Income tax expense	36390	no data	27423	21967	0.6-fold
Tax burden on the tax base	18.6	no data	23.9	21.2	+2.6 p.p.
Profit for the period	158886	no data	91752	81647	0.5-fold
Net profit margin	30.6	no data	20.7	15.8	-14.8 p.p.
Compiled from: PJSC NLMK IFRS data.					

²³ Billionaire Lisin transferred his stake in NLMK from Cyprus to Abu Dhabi. Available at: <https://www.forbes.ru/milliardery/492001-milliarder-lisin-perevel-dolu-v-nlmk-s-kipra-v-abu-dabi> (accessed: 20.08.2025).

²⁴ Europe has released NLMK's steel exports from restrictions: is there anything to be happy about? Available at: <https://mshgazeta.ru/obshchestvo/evropa-osvobodila-iz-pod-ogranichenij-eksport-stal-noj-produkcii-nlmk-est-li-chemu-radovat-sya--10919.html> (accessed: 20.08.2025).

²⁵ NLMK has maintained its supply regime to Europe and the United States. Available at: https://quote.rbc.ru/news/short_article/6244248d9a79474d63f980ed (accessed: 20.08.2025).

²⁶ Analysts have named the companies that will be most affected by EU sanctions. Available at: <https://www.forbes.ru/biznes/459489-analitiki-nazvali-kompanii-kotorye-bol-se-drugih-postradaut-ot-sankcij-es> (accessed: 20.08.2025).

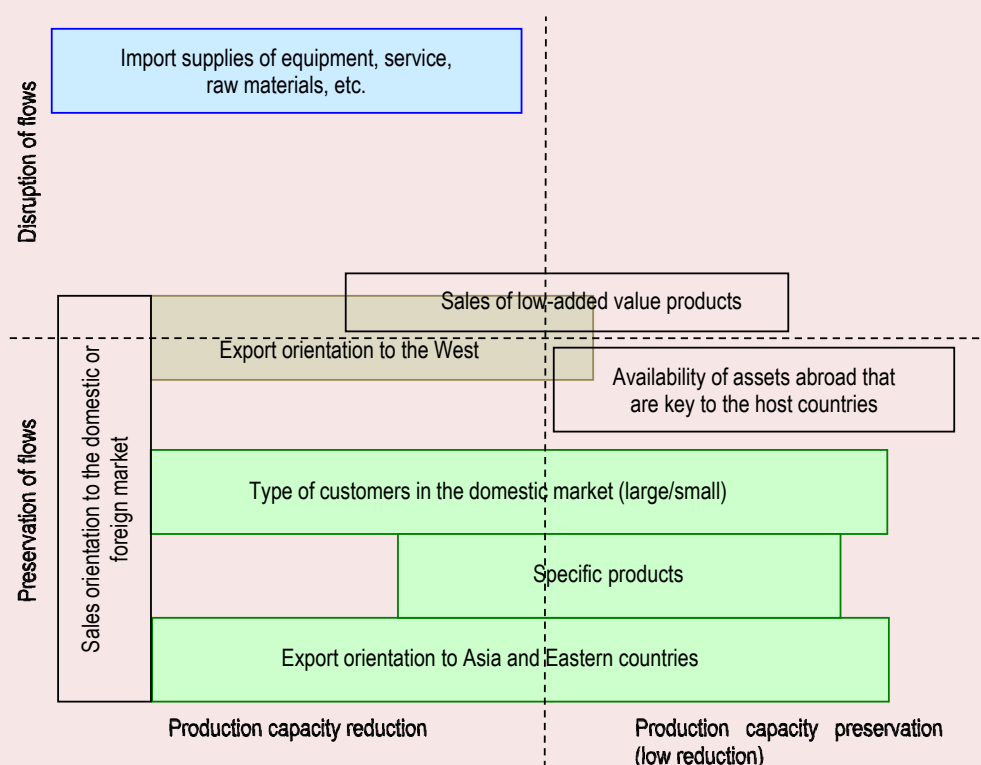
Conclusions and discussion

Thus, the factors of sanction impact on the flows within Russia's ferrous metallurgy supply chains, as presented in the study, have two main dimensions of influence. Their intersection creates four types of consequences (four quadrants in *Figure 6*). The first dimension is related to the very existence of flows and, under the impact of sanctions, determines either the disruption or the preservation of flows. The second dimension is related to the impact on flow volumes, as some flows decreased, while others were either preserved at previous levels or decreased insignificantly.

As can be seen from the framework in *Figure 6*, the primary quadrant of influence is "Flow preservation – Production capacity reduction".

The factors contained within it determine the impact predominantly of the first type of sanctions (see *Fig. 5*), which are associated with reduced demand from the main customers of metal products. As a result, material flows were preserved but narrowed. Therefore, supply chains that were oriented more towards either domestic market sales or exports to Asia and Eastern countries turned out to be more resilient to external shocks. In a number of cases, alignment with the specified factors allowed flow volumes to be preserved as well, which is particularly evident in sales of specialized (non-commodity) product types. Such shocks had a greater impact on cash flows, which was expressed in a reduction in the sales margin of ferrous metal producers.

Figure 6. A framework of the combined influence of factors on material flows in the supply chains of Russia's ferrous metallurgy in the coordinates of Flow Existence / Flow Volume



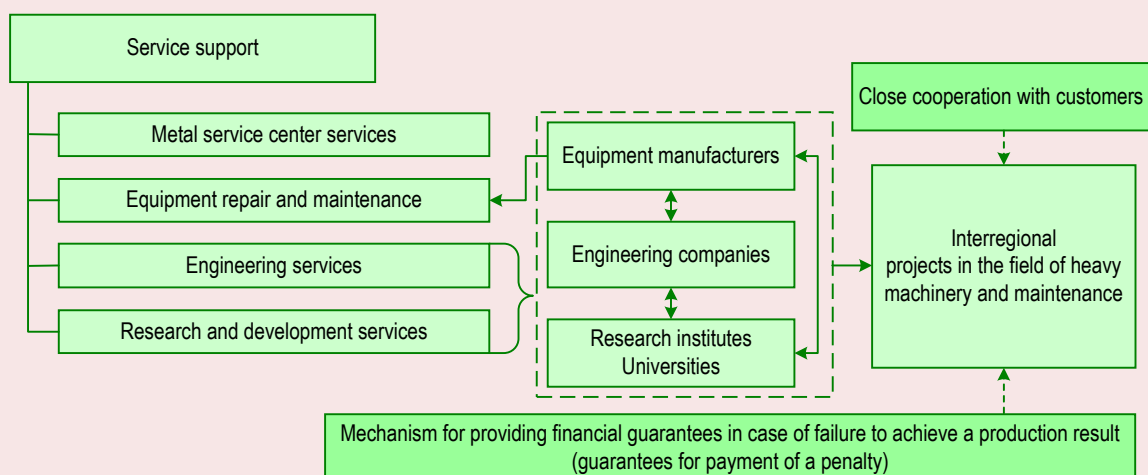
Source: own compilation.

The impact of sanctions belonging to the second type is more ambiguous and manifests when export orientation is toward the West. An important feature is that the non-uniformity of the impact is due to the interconnectedness of this factor with others. Thus, a more significant disruption of material flows occurred. The fact that exports to Europe consisted mainly of low value-added (primary) products also had an influence. However, some flows, related, for example, to specialized (non-commodity) products, were preserved. Vanadium-containing products were not included in the list of prohibited goods. A portion of semi-finished product exports (slabs and square billets) to European plants, which represent key metallurgical production capacities in their respective regions, also continued. A special case is the disruption of flows while maintaining their volumes. This can be explained by the restructuring of these flows from direct supplies to indirect ones via third countries, which

process the previously exported raw materials into finished products and ship them to countries that have imposed sanctions.

A crucial factor negatively affecting both the existence and the volume of flows was the dependence of Russian metallurgical enterprises on imported supplies of metallurgical equipment and service support. The peculiarity of this factor is that, despite the disruption of material flows, a reduction in production capacity can be expected in the long term as the previously acquired foreign equipment wears out. In the short and medium term, servicing this equipment may become a problem, as foreign suppliers, among other things, have ceased repair and maintenance activities in Russia. Therefore, an important tool for rectifying this situation is the development of projects in heavy machinery manufacturing and a service support system that will include engineering services, research and development services, equipment repair, etc. (Fig. 7).

Figure 7. General framework for comprehensive service support in Russia's ferrous metallurgy



Compiled from: (Nikolaev, 2010; Khayrullina, 2016; Romanova, Sirotin, 2022); Metallurgy companies seek financial guarantees when ordering domestic equipment. Available at: <https://www.vedomosti.ru/business/articles/2023/02/10/962441-metallurgii-hotyat-fingarantii-pri-zakaze> (accessed: 10.09.2025).

This requires not only developing the activities of enterprises that can replace departed foreign players in the service market (such as the production of specific components and spare parts²⁷), but also forming an integrated system based on the interconnections between scientific institutions, engineering companies, and equipment manufacturers. This system should be oriented towards customer needs and operate within a supportive institutional environment.

This study contributes to the development of applied aspects of the process approach in the industry analysis of supply chains under new challenges. It clearly demonstrates the impact

of geopolitical shocks on the distribution of commodity, logistical, financial, and other flows within the supply chains of Russia's ferrous metallurgy corporations. As part of developing this research direction, we plan to obtain quantitative estimates of the impact of geopolitical shocks on the cash flows of both individual companies and the ferrous metallurgy industry as a whole. Another important prospective direction will be substantiating recommendations for ensuring the adaptability of Russia's ferrous metallurgy to geopolitical challenges, optimizing logistics chains, reducing risks, and ensuring supply stability under conditions of uncertainty.

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Prerequisites for the Creation of an Agrobiotechnology Park as an Element of Innovation Infrastructure



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Abstract. In the context of the technological transformation of the agro-industrial complex, agrobiotechnology parks are becoming a key tool for integrating science and production. High import dependence, limited adoption of biotechnologies, and insufficient processing infrastructure hinder the industry's development, necessitating the formation of innovative agro-industrial clusters to enhance the competitiveness and technological independence of agriculture. This study substantiates the feasibility of establishing the “Subtropics of Russia” agrobiotechnology park in Sochi, Krasnodar Territory, as a key element for the technological modernization of the agro-industrial complex and the formation of an export-oriented model of subtropical crop cultivation. The methodological framework of the research includes theories of cluster and spatial development, the triple helix concept, principles of

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noonomy, as well as tools of statistical, comparative, and spatial-economic analysis. These tools allow for the integration of natural-climatic, agroecological, logistical, and institutional parameters into a unified assessment of regional potential. The study relies on a dialectical approach, which facilitates the identification of interrelationships between agroclimatic characteristics, the dynamics of agricultural production, institutional constraints, and the tasks of technological modernization. The obtained results demonstrate that the region possesses a unique combination of agroclimatic, soil-ecological, and logistical advantages, providing a sustainable foundation for the concentration of high-tech production in subtropical crop cultivation. The developed conceptual model of the agrobiotechnology park reflects its potential to reduce import dependence, establish a system for the reproduction of virus-free planting material, develop breeding and genetic materials, implement digital agrotechnologies, and enhance the competitiveness of the agricultural sector. The scientific novelty of the research lies in the formation of a spatial-economic rationale for the location of an agrobiotechnology park, taking into account natural-resource, institutional, and logistical factors, as well as in the development of a territorially adapted model of a high-tech agro-industrial cluster focused on the development of subtropical crop cultivation. Its practical significance lies in the scientific and methodological substantiation for the creation of agrobiotechnology parks as a tool for achieving technological sovereignty and enhancing food security. Prospects for further research are associated with assessing the economic efficiency of such technopark structures and developing models of institutional support for their development.

Key words: agrobiotechnology park, agro-industrial complex, regional potential, subtropical crops, biotechnologies, breeding, scientific-educational complex, investment potential.

Introduction

In modern conditions, the development of the agro-industrial complex (AIC) is driven by the need to enhance technological competitiveness, reduce resource losses, and use innovative economic models, which necessitates strategic restructuring of state regulation mechanisms, investment support, and the transfer of scientific developments to the real sector. One of the main strategic directions for AIC development is achieving key targets within the framework of the Food Security Doctrine, approved by Presidential Decree 20, dated January 21, 2020¹ (hereinafter referred to as the Doctrine).

The implementation of the Doctrine's provisions in 2024 demonstrated the resilience of the AIC to macroeconomic challenges, evidenced

by increased domestic production volumes, reduced import dependence, and strengthened export potential. However, ensuring long-term food independence requires not only expanding production capacities but also actively introducing innovative technologies. The necessity for innovative development of the AIC and intensifying its technological modernization processes is noted by many researchers (Al-Baydani, 2021; Ahmetshin, 2021; Ushachev et al., 2022; Glazunova, Sukharev, 2024). Works (Nechaev, Semenov, 2022; Nechaev, 2023; Nechaev et al., 2023) emphasize that innovative development and technological modernization of the AIC are key conditions for achieving its technological sovereignty. Overall, the changes in 2022–2024 were the following: reduced imports of seeds for major agricultural crops, increased production costs due to disrupted logistics

¹ On the approval of the Food Security Doctrine of the Russian Federation: Presidential Decree 20, dated January 21, 2020. RF Legislation Collection, 4, article 345. 2020.

chains, growing technological risks, and structural renewal of the agri-food market. These changes have intensified the role of spatially integrated innovative structures as a mechanism for bridging the technological gap.

Furthermore, starting from 2025, within the Food Security Strategy, the implementation of the national project “Technological Support for Food Security”² is planned, aimed at achieving 75% self-sufficiency in seeds of key crops by 2030³ through the introduction of biotechnologies that accelerate plant breeding and enhance the adaptive potential of agroecosystems. In this regard, a collective work (Timakova et al., 2021) highlights the need for integrating biotechnological methods at all stages of the agro-production cycle, from raw material cultivation to processing and storage.

Current trends in scientific and technological development in agriculture necessitate the integration of innovative solutions into agro-production processes, leading to the increasing role of agrobiotechnology parks as structural platforms for transforming the agricultural sector. Their functioning aims to establish high-tech infrastructure that ensures the introduction of advanced bioengineering developments, digitalization of production processes, improved efficiency in the use of natural and technogenic resources, and the implementation of sustainable development strategies for the AIC. These structural entities, building an end-to-end chain of “research – development – production – commercialization”, are designed to ensure the resilience of the agricultural sector to increasing

external and internal risk factors. Under current conditions, traditional models of agricultural system reproduction demonstrate limited adaptability, especially in segments requiring a high concentration of scientific expertise, biotechnological solutions, and specialized experimental facilities.

According to research (Urasova et al., 2023), agrobiotechnology parks are a primary tool for implementing the tasks of technological independence and ensuring Russia’s food security. V.V. Budyukin assigns them the role of an instrument for enhancing regional innovation activity, integrating science, education, and production. However, he also emphasizes that the effectiveness of these technology park structures is conditioned by their inclusion in a system of comprehensive measures for transforming agricultural infrastructure (Budyukin, 2025). A similar approach is shared by A.T. Stadnik and V.V. Vasil’ev: analyzing the experience of the Novosibirsk Region, they view an agrobiotechnology park as an infrastructural platform for accelerated technology transfer, the effectiveness of which depends on multi-level coordination among science, education, business, and authorities (Stadnik, Vasil’ev, 2024).

Despite the intensive development of the agrobiotechnology park concept in contemporary scientific thought, it should be noted that existing approaches are predominantly limited to infrastructural models without territorial justification for creating these technology parks and do not account for the industrial, agroclimatic, and logistical characteristics of specific regions. The works of V.V. Budyukin, A.T. Stadnik, A.A. Urasova, Yu.L. Blokhin, V.V. Maslakov, L.V. Glezman, S.S. Fedoseeva, V.V. Vasil’ev, A.S. Slepokurov, and other scientists focus on researching the essential aspects and role of technology parks as platforms for innovation transfer; however, spatial-economic analysis

² Technological Support for Food Security. Available at: <http://government.ru/info/54316/>

³ Implementation of the RF national project “Technological Support for Food Security” will require at least 1 trillion rubles. Available at: <https://agroexpert.press/products/realizacziya-naczproekta-po-tehnologicheskemu-obespecheniyu-prodovolstvennoj-bezopasnosti-rf-potrebuemne-menee-1-trln-rublej>

of their development and functioning is not conducted in these works. Currently, there is a lack of scientifically motivated spatial-economic approaches to locating agrobiotechnology parks, as well as sufficient methodological justification for criteria in selecting regions as sites for high-tech agro-industrial structures. The dominant models in scientific literature are universalized infrastructural schemes that do not consider agroecological differentiation, institutional fragmentation of regional space, climatic limitations, and the logistical specifics of locating biotechnological clusters. We believe that the absence of spatial analysis in creating agrobiotechnology parks may contribute to reduced economic effectiveness. Such analysis also allows for identifying and accounting for a set of regional factors, which is particularly relevant in areas such as subtropical crop cultivation. Without analyzing regional aspects, it is not possible to ensure the efficiency of performance, specialization, and reproduction of the technology park model in the agrarian economy.

Thus, in determining the role of agrobiotechnology parks in transforming the AIC, territorial differentiation considering agroclimatic, soil-ecological, logistical, and scientific-educational factors remains the least researched.

The Krasnodar Territory, possessing unique agroclimatic characteristics, a developed transport system, and a high concentration of scientific institutes, is a justifiably promising territory for locating an agro-industrial technology park with subtropical specialization. However, these listed advantages require precise integration into an analytical model developed using methods of spatial economics, cluster analysis, and the “triple helix” concept. Based on the identified contradictions, the hypothesis is formulated that the city of Sochi meets the requirements for locating an agrobiotechnology park, and the combination of natural-climatic,

logistical, and scientific-innovative factors is a stable basis for creating an export-oriented agricultural ecosystem.

The research aim is the scientific substantiation of the territorial feasibility of locating the “Subtropics of Russia” agrobiotechnology park and the development of a model for its institutional functioning as an element of regional innovation infrastructure.

To achieve this aim, the following objectives were set:

- analyze scientific approaches to creating agrobiotechnology parks, their conceptual models, and role in AIC development;
- develop a methodological basis for spatial analysis;
- assess competitive advantages of the Krasnodar Territory for creating an agro-industrial technology park and developing subtropical crop cultivation;
- determine the agrobiotechnology parks role in the regional AIC development, including based on an analysis of foreign experience.

Research methodology

The methodological basis of the research is built on integrating theoretical approaches that allow viewing an agrobiotechnology park as a territorially anchored high-tech system, the functioning of which is determined by a combination of agroclimatic conditions, soil-ecological characteristics, infrastructure accessibility, and the developed scientific-educational potential.

The research relies on analytical tools that reveal the spatial dependence of technology parks and their reproduction mechanisms in the regional economy. The theoretical foundation includes cluster theory, concepts of spatial development and institutional analysis, which allow defining agro-industrial technology parks as an integrated high-tech cluster, the effectiveness of which is determined by horizontal links

density, knowledge exchange intensity, and the degree of involvement of the scientific core in production. In the context of increasing external pressure, including in the technological sphere, the increase in scientific and technological sovereignty is of particular importance, serving as a methodological basis for defining the technology park model as a tool for developing resilience and transformative potential of the regional AIC.

The empirical basis of the research is systematized data from the Federal State Statistics Service, materials from regional AIC management bodies, and information from specialized research institutions. To identify territorial differences, spatial analysis was used, including comparing agroclimatic parameters, indices of soil-substantiated fluctuations in hydrothermal regimes, which allows assessing a region's suitability for cultivating specialized subtropical crops. The applied analytical approach supplements climatic characteristics with an assessment of soil-resource potential and landscape-ecological limitations influencing production specialization.

For assessing the region's logistics capacity, a system of indicators is used, reflecting multimodal hubs accessibility, infrastructure density, rail and sea freight traffic, transport routes stability, and their seasonal capacity range. This approach allows determining the degree of a region's readiness to create an export-oriented agro-cluster aimed at subtropical agricultural products, which require strict adherence to delivery timelines and temperature regimes during transportation and storage. The internal logic of the research for establishing connections between agro-production dynamics, the institutional environment, investment activity, and natural-climatic features relies on the dialectical method. The statistical method is used to identify production trends and structural shifts in demand, technology, and logistics.

Theoretical analysis is also based on an abstract-logical approach, allowing for the identification of structural characteristics of technology parks and revealing the role of science in ensuring their functional integrity.

Theoretical foundations of the research

Agrobiotechnology parks creation is a strategic mechanism for AIC technological transformation, ensuring comprehensive integration of scientific achievements, innovations, and production capacities into a unified ecosystem. In the scientific community, agrobiotechnology parks are considered within various conceptual models. For instance, in the work (Kotvyts'ka, 2022), the author characterizes them as fundamental catalysts for innovative transformation of the agri-food system, emphasizing the role of these structures in accelerating technological exchange and introducing progressive agricultural production methods. O.Yu. Antsiferova, V.V. Budyukin, O.V. Nikolaev, N.V. Kochkina, L. Ling, X. Chen, Y. Wu, S. Li, J. Wei, Q. Zhou define agrobiotechnology parks as an innovative object for developing the agricultural sector (Nikolaev, Kochkina, 2006; Antsiferova, Budyukin, 2024; Ling et al., 2023). Some researchers highlight the production aspect as the key direction of agrobiotechnology parks activity but emphasize that they serve as a strategic tool for integrating science and production, accelerating the "research – development – implementation" cycle and facilitating the commercialization of scientific achievements (Krygiel, Niec, 2008; Zianko, Nechyporenko, 2023; Popova, Strikh, 2023).

Also expressed in scientific literature is the view that such technology parks are institutionally formalized scientific-production clusters focused on diversifying agro-industrial production, digital transformation of agriculture, and commercializing scientific developments (Hasanov, Akbulaev, 2020). Some scientists consider agrobiotechnology parks as a tool for eliminating structural disproportions

in the AIC caused by reduced technological modernization, low profitability, and insufficient adaptability of scientific developments (Andryushchenko, 2019; Melikhov et al., 2021), while others interpret them through the “triple helix” concept, where innovations arise at the intersection of universities, business, and the state (Etzkowitz, Leydesdorff, 2000). E.N. Tazin shares a similar approach and defines agrobiotechnology parks as territorially integrated systems comprising research and development, technological, and production enterprises focused on utilizing the intellectual, production, and venture capabilities of residents (Tazin, 2017).

Another idea is that the structural organization of technology parks is oriented toward creating vertically integrated value chains, including crop farming, animal husbandry, agro-processing, and sales, which allows minimizing transaction costs and increasing agribusiness operational efficiency (Prasetyo, 2023). The dual function of technology parks is noted: they contribute to the development of small innovative businesses and provide institutional conditions for innovation growth at the macro level (Rashedi, 2020).

Agro-industrial technology parks perform cultural, environmental, and social functions, ensuring preservation of traditional land use forms in the context of urbanization. This societal significance is complemented by the essential role of these structures as a mechanism for territorial management aimed at protecting agricultural production from displacement due to urbanization pressure, ensuring land use stability through integrating the agro-industrial sector into spatial planning systems (Tóth, Supuka, 2013).

An important aspect of agrobiotechnology park development is their environmental component. In this context, it is necessary to focus on issues such as the rational use of bioclimatic resources, introduction of water-saving technologies, and

environmental safety of agricultural territories. Creation of sustainable agricultural technologies becomes one of the priority tasks, determining the necessity for developing specialized strategies for the functioning of agrobiotechnology parks.

P.M. Pershukevich notes that the accelerated technological development of the AIC is accompanied not only by production capacity growth but also by significant environmental risks. In his view, industry sustainability requires rethinking existing production models with an emphasis on resource-saving technologies that contribute to reducing human impact, restoring agro-landscapes, and increasing soil bioproductivity. Implementing closed production cycles, biotechnological platforms, and adaptive mechanisms for regulating agro-ecosystems within agro-industrial technology parks will balance technological progress and sustainability principles (Pershukevich, 2017). P. La Panga, K. Ekasari, A. Kasirang, A.L. Dewi, F. Sasmita also note the importance of the ecological aspect in developing agro-industrial technology park structures (La Panga et al., 2024).

V.V. Maslakov and co-authors view agrobiotechnology parks through the lens of their infrastructural capabilities, highlighting specialized research centers, laboratories, and engineering companies as fundamental elements for their successful functioning. According to this approach, it is scientific developments, transformed into production technologies, that form the basis of the competitive advantages of these structures (Maslakov et al., 2017).

We emphasize the multifaceted nature of agrobiotechnology parks, their role not only in the innovative development of the agricultural sector but also in creating new organizational and economic mechanisms for managing agriculture (Pyankova, Makarenko, 2024). Also, foreign experience shows that agrobiotechnology parks have

significant potential (Makarenko, 2023). However, it should be accompanied by deep analytical work that considers the specifics of the domestic AIC.

Thus, agro-industrial technology parks are spatially organized innovation centers where research organizations, experimental production sites, engineering centers, educational structures, and high-tech agricultural enterprises are concentrated, ensuring the effective “on-site” implementation of scientific achievements into practice. This format of organizing innovative activity allows minimizing the gap between advanced technologies development and their transition into agricultural production, which is crucial for overcoming the technological lag of Russia’s agriculture and enhancing its resilience in conditions of growing competition in global food markets. Given the high degree of spatial heterogeneity of agricultural territories, spatial analysis becomes a necessary condition for justifying the creation and functional specialization of such technology parks.

Model of the agro-industrial unit “Subtropics of Russia”

The development of the “Subtropics of Russia” agrobiotechnology park is aimed at creating a high-tech research and production platform ensuring the comprehensive development of subtropical crop cultivation, genetic plant-breeding technologies, and high-level processing of products. It is a multifunctional research and production complex oriented toward the development and implementation of advanced technologies in agriculture, biotechnology, genetics, digital agro-systems, and agro-industrial production. Its primary operational goal is technological modernization of the industry through introduction of advanced methods of molecular genetics, bioengineering, and digital monitoring of agro-ecosystems, which will enhance subtropical agriculture productivity, minimize import dependence, and increase food

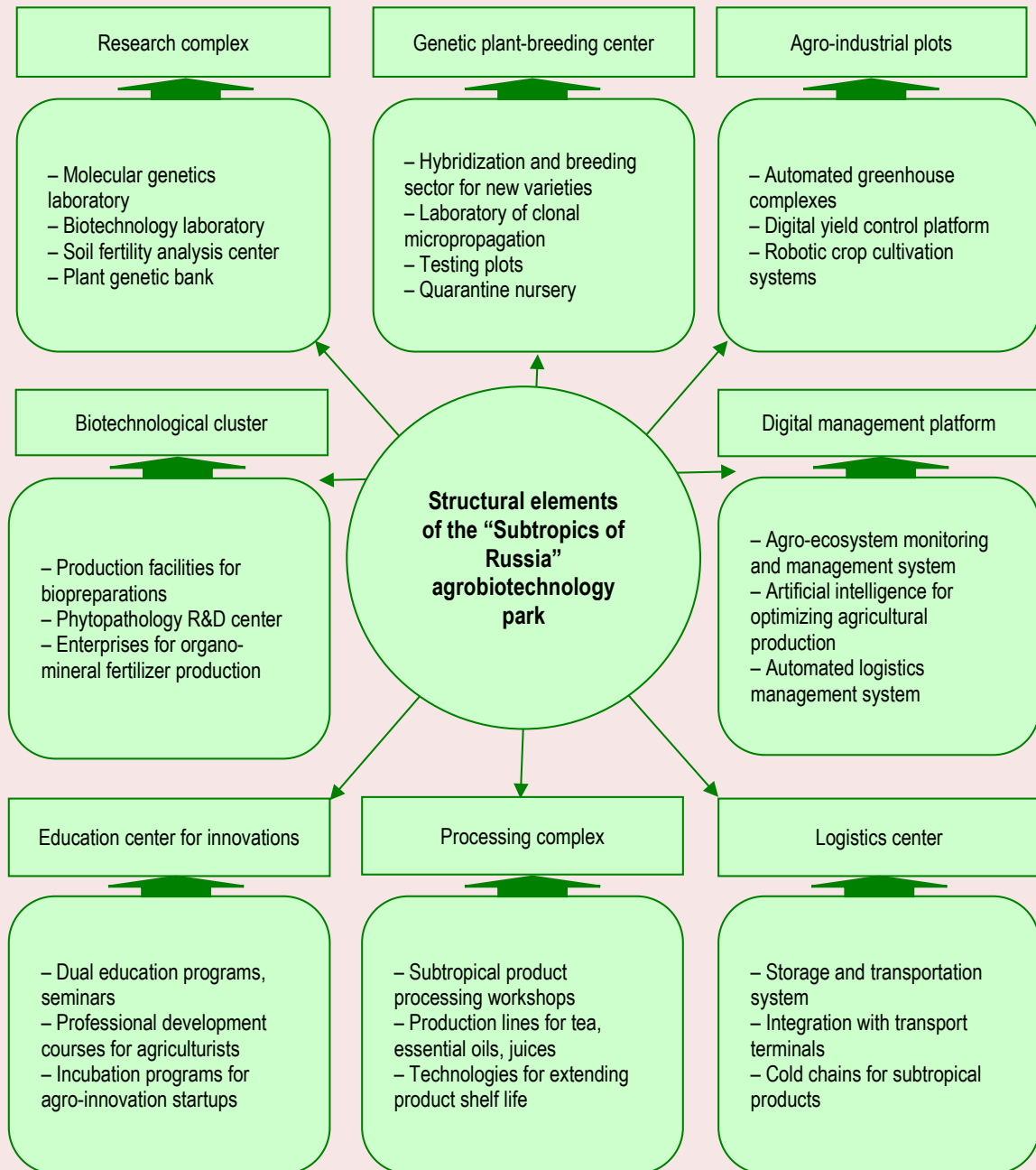
sovereignty. Creating innovative infrastructure – biotechnological laboratories, experimental agro-plots, and processing enterprises – will not only increase the level of domestic agricultural production but also form export-oriented clusters with high added value, ensuring diversification of the agricultural sector and its long-term competitiveness in the global food system.

To explore the functioning of the “Subtropics of Russia” agro-industrial technology park, it should be noted that the activities of this unit are wide-ranged, which is conventionally represented in *Figure 1*.

It should be noted that the functioning of a subtropical-oriented agrobiotechnology park should be considered as the activity of a complex spatial-institutional system within which scientific, production, technological, and managerial elements are connected by stable flows of knowledge, technology transfer, efficient resource distribution, and coordinated work of regulating institutions. Unlike simplified models representing a technology park as a formal association of residents, the proposed model aims to identify mechanisms of internal interaction, establish a functional hierarchy, densify horizontal links and the core structure, ensuring continuity and sustainability of innovative reproduction in the regional economy.

The structural core of the agrobiotechnology park is formed by the research block, including genetic plant-breeding centers, bioengineering laboratories, synthesis units, and specialized research institutes that ensure the development and primary testing of technological systems. This component acts as a source of innovative activity, creating new genotypes, breeding developments, biomaterials, and protocols for reproducing virus-free planting material, thereby defining the parameters of future production cycles. The research core is the backbone of the system, it regulates the transfer of knowledge and technologies

Figure 1. Structural elements of the “Subtropics of Russia” agrobiotechnology park



Source: own compilation.

to production units, creating a closed loop of sustainable innovative reproduction within the technology park model.

The second functional level of the agrobiotechnology park is represented by the production and technology block, including economic entities with the potential to integrate research findings into applied agricultural processes. This block comprises high-tech farming structures, seed-growing complexes, nurseries, specialized farms for cultivating subtropical crops, as well as enterprises for primary processing of agricultural raw materials. The interaction between the production and technology block and the research core ensures the continuity of the technological cycle, within which the research findings go through large-scale testing, adaptation to the regional agro-ecological context, and finally, integration into the agricultural process. At this level, the effectiveness of developed innovative solutions is evaluated, confirming their production efficiency and economic feasibility for application in the agricultural reproduction system.

The backbone of the agrobiotechnology park model is the management unit, ensuring integration of all interaction levels – from research and production to institutions and government. Its functions are technology transfer coordination, institutional support for residents, formal approval of legal operating conditions, investment policy implementation, and biological safety compliance monitoring. The management unit ensures model integrity, coordinating interaction between the research core, the production block, and state institutions. This structural element eliminates internal fragmentation, minimizes transaction costs, and ensures the coherence of all elements of the technology park system.

In our opinion, the agrobiotechnology park should be implemented as a cluster model. It is created based on the interaction between enterprises

with high-level processing of subtropical raw materials, export-oriented logistics operators, special service groups, and a digital platform ensuring biotechnological management. Unlike traditional models where the digital environment is considered a separate element, in this concept it functions as an end-to-end tool, ensuring data synchronization, production parameters monitoring, risk management, and creation of digital twins.

The institutional conditions for the agrobiotechnology park's functioning are determined by the participation of state bodies, educational organizations, AIC management bodies, financial institutions, and infrastructure operators. These entities ensure access to state support instruments, develop personnel and investment potential, and create the material and logistical basis for their enterprise. Their coordinated actions set the macroeconomic frame for the agrobiotechnology park's operation and ensures its integration into regional and national systems of agrarian development.

Thus, the conceptual model of the agrobiotechnology park is a multi-level, institutionally and technologically interconnected system, in which research, production, management, and infrastructure are within a unified mechanism of end-to-end exchange of knowledge, technologies, and resources. Its formation in the subtropical area is not a set of isolated competitive advantages, but the result of targeted systemic design ensuring innovation cycle continuity – from development and testing of scientific solutions to their industrial implementation, particularly in the context of the spatial and agro-ecological specifics of Russia's southern territories. Given the high dependence of subtropical agricultural production on agroclimatic, soil characteristics, and logistics, the territorial aspect of implementing the agrobiotechnology park is of the top priority.

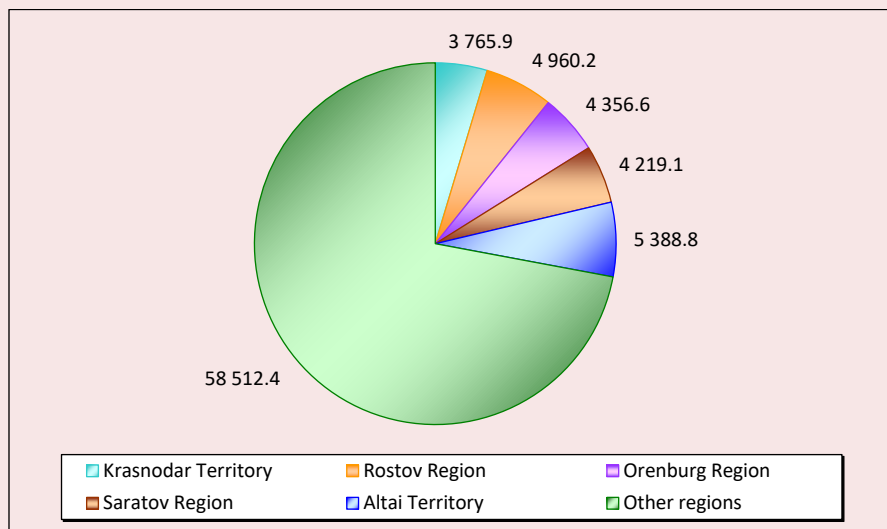
Agro-industrial capacity of the Krasnodar Territory

The Krasnodar Territory is one of the key agro-industrial regions of Russia, it accounts for 7% of the Russia's total agricultural output and its share in the AIC structure of the Southern Federal District is 39.8%. In the context of macroeconomic instability, rising production costs, changing export structure, and adaptation to new climatic conditions, the region demonstrates its production resilience, ensuring growth in a number of key

indicators. Considering these factors, this region is one of the promising territorial objects for AIC development, including for siting agro-industrial technology parks.

For example, the Krasnodar Territory is leading in Russia in gross grain harvest and sugar production. The region ranks second in milk production and third in oilseed crop cultivation. Based on 2023 results, the total sown area of the territory ranks fifth among all regions (*Fig. 2*), and its share is 4.64% of the Russia's total sown area (*Tab. 1*).

Figure 2. Russia's sown area by regions, 2023, thousand ha



Source: Sown areas of the Russian Federation in 2023. Federal State Statistics Service. Available at: https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://rosstat.gov.ru/storage/mediabank/posev-4%25D1%2581%25D1%2585_2023.xlsx&ved=2ahUKEwj6xdfM4OWLAxWoCBAIHdNMKjgQFnoECBMQAQ&usg=AOvVaw14Uhd9y9-sN7nXbN_MoUFQ

Table 1. Ranking of regions by sown area

Region	All categories of farms, 2023, thousand ha	Share in total area, %
<i>Total for Russia</i>	<i>81 202.8</i>	<i>100.00</i>
Altai Territory	5 388.8	6.64
Rostov Region	4 960.2	6.11
Orenburg Region	4 356.6	5.37
Saratov Region	4 219.1	5.20
Krasnodar Region	3 765.9	4.64
Other regions	58 512.4	72.06
Compiled based on: Rosstat.		

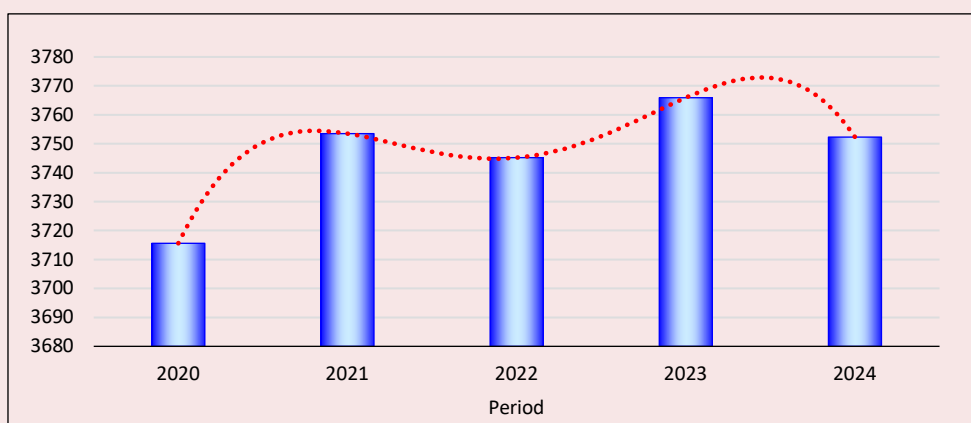
In general, the dynamics of the total sown area in the Krasnodar Territory for all categories of farms in 2020–2024 are presented in *Figure 3*.

Furthermore, based on 2023 results, total agricultural production in the region was 584.8 billion rubles, which is 4.2% lower than the 2022 level. The share of this indicator as of 2023 amounted to 6.9% of Russia's total agricultural production. Within the Southern Federal District, its share is 39.0%. However, in January-July 2024, production reached 299.8 billion rubles⁴, corresponding to 104.9% of the same period in

2023. Moreover, in 2024 overall for the AIC, turnover in current prices grew by 16.5%, including in agriculture – by 21.2% compared to the same period in 2023⁵. The dynamics of key AIC indicators for Krasnodar Territory in 2021–2024 are presented in *Table 2*.

The region's export revenue based on 2023 results amounted to 3.0 billion US dollars, equivalent to 7% of Russia's total AIC product exports. Export deliveries cover 107 countries, ensuring diversification of foreign trade flows and reducing dependency on individual regional

Figure 3. Dynamics of total sown area in Krasnodar Territory, 2020–2024, thousand ha



Source: Rosstat.

Table 2. Dynamics of key AIC indicators of the Krasnodar Territory, 2021–2024

Indicator	2021	2022	2023	2024 (as of 01.08.2024)
Total agricultural production, billion rubles	590.2	610.4	584.8	299.8
Turnover of large and medium AIC organizations, billion rubles	480.5	500.2	530.1	518.4
Grain production, million tons	10.50	10.82	10.32	11.88
Oilseed crop production, million tons	1.40	1.45	1.41	1.50
Milk production, million tons	1.18	1.22	1.23	1.03
Livestock and poultry slaughter weight, thousand tons	415.0	420.1	440.0	308.2
Gross harvest and yield of fruits and berries, million tons	0.57	0.60	0.61	0.64*
* Preliminary data for 2024. Compiled based on: data from the Territorial Body of the Federal State Statistics Service in Krasnodar Territory.				

⁴ Available at: https://23.rosstat.gov.ru/storage/mediabank/Val_03.pdf

⁵ Available at: https://msh.krasnodar.ru/upload/iblock/3fc/dh9ssj9authbf2c0063w15jztjr0ptdo/Tekushchaya-situatsiya-na-01.08.2024-_na-sayt_.docx

markets. The dynamics of export capacity demonstrate an average annual growth rate of 5% for 2019–2023, confirming the stability of foreign economic activity in the region's agro-industrial sector, with the region entering the top three leaders in AIC product export based on 2023 results.

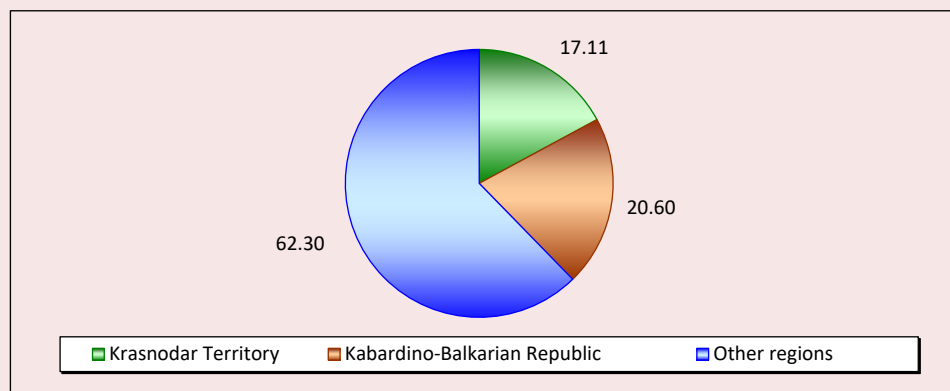
Also, the Krasnodar Territory is one of the leaders in fruit and berry harvest. In particular, based on 2024 results, it ranked second among regions for this indicator (*Fig. 4*).

Moreover, an increase in this indicator is observed compared to the same period in 2023 by 5.71%. The dynamics of fruit and berry harvest in 2023–2024 are presented in *Table 3*.

The climatic conditions of the Krasnodar Territory provide one of Russia's most productive agro-landscapes, determining its strategic role in

the national agro-industrial complex. The geographical location of the region in a mixed zone with temperate continental climate typical for most of the territory, semi-arid Mediterranean climate in the area from Anapa to Tuapse, and a subtropical climate in the area south of Tuapse, favorable heat and moisture balance, as well as high natural soil fertility create conditions for year-round agriculture with high profitability and low costs. The average annual temperatures are 12–14 °C, from 0 to +4 °C in winter and from +20 to +24 °C in summer, which provides a long growing season, allowing for several crop cultivation cycles per year, increasing the aggregate productivity of the agricultural sector. The long frost-free period (8–10 months) allows cultivating heat-loving crops, including grapes, figs, citrus, and tea, as well as harvesting twice a year,

Figure 4. Fruit and berry harvest by regions, 2024, %



Source: Rosstat.

Table 3. Dynamics of fruit and berry harvest in 2023–2024

Region	2023, thousand centners	Region's share in total volume in 2023, %	2024, thousand centners	Region's share in total volume in 2024, %	2024 to 2023, %
Total in Russia	41 997.40	100.00	37 569.20	100.00	89.46
Krasnodar Territory	6 079.80	14.48	6 426.90	17.11	105.71
Kabardino-Balkarian Republic	7 859.00	18.71	7 737.40	20.60	98.45
Other regions	28 058.60	66.81	23 404.90	62.30	83.41

Compiled based on: Rosstat.

significantly increasing the economic efficiency of agricultural production. To sum up, unlike central regions of Russia where sharp temperature fluctuations limit the range of cultivated crops, in the Krasnodar Territory the production of winter wheat, rice, corn, soybeans, sunflower, and high-value fruit and berry products is possible.

The region's agroclimatic potential is amplified by high levels of solar radiation, which promotes intense photosynthesis and supports consistently high crop yields. However, it should be noted that average annual precipitation in the Krasnodar Territory ranges from 400–500 mm in the north to 2000 mm in the mountainous and coastal zones, leading to significant differences in agricultural practices across the territory. The summer moisture deficit typical of central and western areas necessitates the active adoption of irrigation systems and water-saving technologies. In contrast, the southern and coastal areas receive between 700 and 2000 mm of annual precipitation, with a soil moisture coefficient of 1.0–1.5, ensuring stable

water supply and favorable crop-growing conditions. Despite the region's heterogeneous hydrothermal regime, the coastal areas, in particular, exhibit high drought resilience. This allows for agricultural production with minimal investment in artificial irrigation.

Overall, the Krasnodar Territory can be divided into four agro-economic zones based on crop categories (*Fig. 5*).

The soil and ecological conditions of the Krasnodar Territory are a key factor determining its strategic agro-industrial specialization and the formation of a sustainable agricultural base. The high agro-ecological diversity of the soil cover results from the complex terrain, hydrothermal features, and natural climatic gradients, creating opportunities for spatial variability in farming systems and adaptive agriculture. For instance, carbonate and leached chernozems (black soils) dominate the steppe and forest-steppe zones, forming the fundamental soil base for intensive crop production. The region's chernozem complex

Figure 5. Agro-economic zones of the Krasnodar Territory

Northern and Central areas	• Grain production • Oilseed crop production • Beet growing • Vegetable growing
Western area	• Melon and gourd growing • Growing of plants for technical use • Fruit and vegetable production
Southern foothills	• Horticulture • Viticulture • Growing of essential oil plants
Anapa – Black Sea area	• Specialized viticulture • Subtropical fruit growing

Source: own compilation.

allows for the stable cultivation of grains (wheat, barley, corn), oilseeds (sunflower, rapeseed), industrial crops (sugar beet), and forage crops without significant investment in corrective agrochemical measures.

Brown mountain-forest soils are formed in the foothills and are characterized by a sod-carbonate or gray humus horizon. Their agro-ecological capacity is based on good structure and sufficient macro- and micronutrient content; however, limited profile depth and high stoniness restrict their use in intensive agricultural rotation. These zones are widely used for perennial plantations, including vineyards and orchards, which require adaptive cultivation technologies.

Yellow soils, located on ancient marine terraces in the Black Sea coastal areas, including Sochi, have a specific granulometric composition and high mineralization of the humus horizon. This enables specialized farming focused on subtropical crops and vineyards. Subtropical fruit plantations, including citrus, persimmon, pomegranate, fig, quince, and some olive varieties, are well-adapted to these soils due to their high moisture-storage capacity, slightly alkaline or acidic pH, and specific mineral composition. Furthermore, these soil types are particularly valuable for viticulture, as their composition affects vine metabolism, which in turn shapes the grapes' unique chemical profile.

Thus, the combined soil conditions of the Krasnodar Territory provide a foundation for intensive and diversified agriculture. Key aspects for the sustainable development of the agro-industrial sector include adaptive soil resource management, differentiated agrochemical policies, soil conservation technologies, and the integration of innovative farming methods.

Discussion of results

A spatial-economic analysis of the conditions for siting the "Subtropics of Russia" agro-industrial technology park reveals pronounced territorial

differentiation in natural, climatic, logistical, and institutional parameters. This makes territorial analysis a key factor for the technology park's sustainable development.

Unlike temperate zones, where technological cycles face seasonal limitations, the subtropics of the Krasnodar Territory enable year-round growing seasons. This is confirmed by high accumulated active temperatures exceeding 4000–4500°C and even precipitation distribution, creating favorable conditions for perennial crops. Territorial analysis indicates that the humid subtropics represent Russia's only agro-climatic zone suitable for the commercial cultivation of tea, citrus, kiwi, feijoa, persimmon, and other subtropical crops.

Moreover, the soil and climatic conditions of the Sochi area provide a stable agro-ecological foundation for a subtropical biotechnology park. The prevalence of brown and red soils with high moisture-storage capacity and neutral acidity ensures optimal nutrition and water supply for root systems, a crucial condition for stable subtropical crop cultivation. This, in turn, reduces the economic burden on enterprises by eliminating the need for irrigation systems. The area's climatic stability characterized by the absence of critical temperature fluctuations, high relative humidity, and stable hydrothermal conditions creates a natural adaptive environment. This negates the need for capital-intensive engineering infrastructure related to climate control and crop protection, significantly lowering overall costs for organizing agrobiotechnological production while maintaining technological efficiency. The region's natural and climatic advantages translate into a factor of spatial concentration for research activity, objectively justifying the choice of this location for siting genetic plant-breeding centers, micropropagation laboratories, and biotechnological complexes focused on cultivating and preserving subtropical varieties.

Overall, agricultural production in Sochi is a multifaceted process shaped by adaptation to changing climatic, economic, and technological conditions. An analysis of statistical data for 2021–2024 shows fluctuations in the output of key agricultural products.

The majority of crop production comes from small-scale farms – household plots, peasant farms, and individual entrepreneurs (*Tab. 4*). In 2024, fruits and berries accounted for 94% of total plant agricultural output. The total number of these entities in 2024 was 23651, representing 99.93% of all agricultural producers and 60.51% of registered small and medium-sized businesses. Accordingly, small business plays a significant role in Sochi's agricultural development. However, the lack of change in indicators from 2022 to 2024 points to institutional stagnation in the region's agricultural sector. This stability without growth reflects low

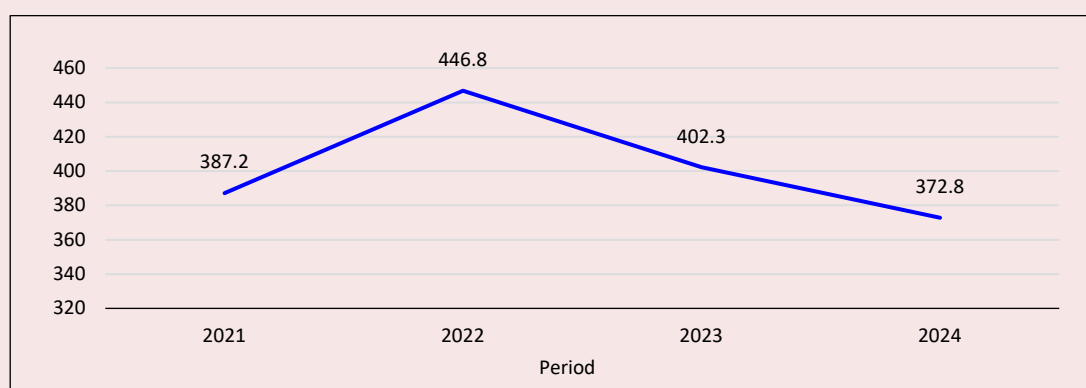
entrepreneurial activity and limited stimulating mechanisms at the municipal level.

Analysis of agricultural production in the region reveals a growing imbalance between the territory's potential and actual output. Tea production, traditionally a key segment of the agricultural sector, amounted to 372.8 tons in 2024, 7% lower than in 2023. A downward trend in green leaf tea production was also observed in 2023 compared to 2022. The corresponding dynamics for 2021–2024 are shown in *Figure 6*. The reasons include degradation of existing plantations, shortage of adapted planting material, and reduction of agricultural land due to urbanization and conversion to non-agricultural use. At the same time, consumer sector trends show growing demand for subtropical crop products, necessitating an active import substitution policy and the restoration of lost regional agricultural capacity.

Table 4. Structure of entities engaged in agriculture, 2022–2024

Indicator	2022	2023	2024
Number of active agricultural enterprises, units	16	16	16
Number of active farms, units	60	60	60
Number of household plots, units	23 591	23 591	23 591
Compiled based on: Sochi Administration data.			

Figure 6. Dynamics of tea leaf production in the Krasnodar Territory, 2021–2024, tons



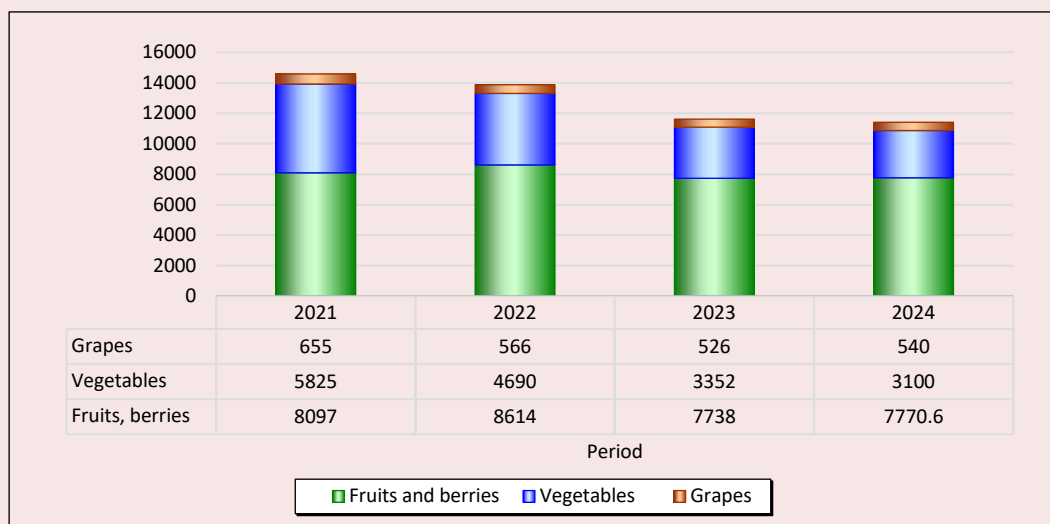
Compiled based on: Krasnodar Region reduced tea leaf harvest by 10% in 2023. Available at: <https://www.interfax.ru/business/938155>; In Sochi, 373 tons of tea were harvested in 2024, which is 7% less than a year before. Available at: <https://regioniz.ru/news/?n=n20250219224632>; Tea production in the Krasnodar Territory increased by 15%. Available at: <https://kuban24.tv/item/obem-proizvodstva-chaya-v-krasnodarskom-krae-uvelichilsya-na-15>

The main category of cultivated crops is fruits and berries, including subtropical fruits. As noted, Sochi's agro-climatic potential underpins its strategic importance for developing subtropical agriculture in Russia. Preliminary 2024 data indicate a subtropical fruit harvest of 197.9 tons, a 1% increase from 2023. The area of agricultural land with exotic orchards in 2024 was 92 hectares. Furthermore, according to agricultural enterprises, 2023 production included 94.2 tons of stone fruits (plum, cherry plum, peach) from 62.1 hectares, 141.1 tons of nut crops (hazelnut) from 12.41 hectares, 185.2 tons of subtropical fruits (fig, persimmon, feijoa, kiwi) from 112.3 hectares. Additionally, 5.83 tons of berries (raspberry, blackberry, blueberry) were harvested from 6.3 hectares, and 3.6 tons of citrus (mandarins, lemons) from 1.85 hectares. Production dynamics for 2021–2024 are presented in *Figure 7*.

Analysis of sown areas shows that fruit and berry plantations constitute the largest share. The structure of Sochi's sown areas in 2024 is presented in *Figure 8*.

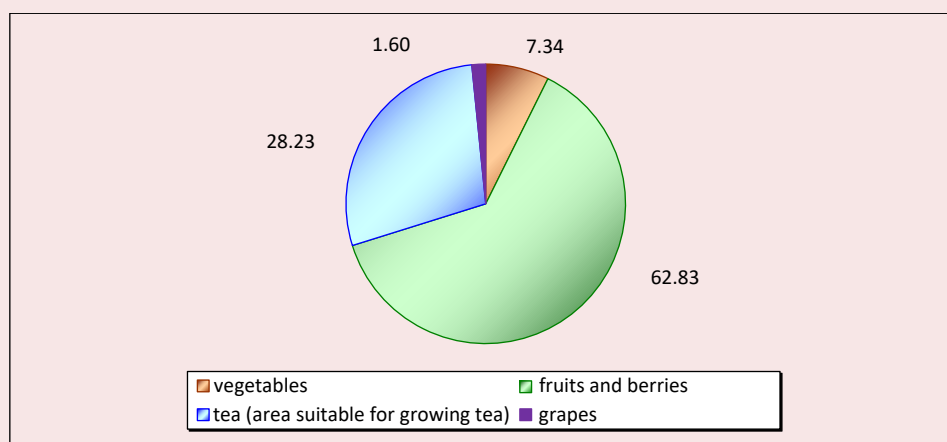
Thus, subtropical agriculture has traditionally been concentrated in the Krasnodar Territory, yet its share in the regional agro-industrial complex remains small. The potential area for cultivating subtropical crops in the region exceeds 12 thousand hectares, offering opportunities for production expansion and the formation of a specialized agro-industrial cluster. In turn, the region's coastal territories, particularly Sochi, are suited for successful cultivation of subtropical crops and tea leaves, which, with proper management of agrophysical parameters, can be of very high quality. Consequently, establishing an agrobiotechnology park in Sochi would enable significant increases in the production of subtropical crops – including

Figure 7. Crop production, 2021–2024, tons



Source: Passport of socio-economic development for 2023. Available at: <https://sochi.ru/gorod/obshchaya-informatsiya/pasport-goroda-sochi/Паспорт%20города%202023.pdf>

Figure 8. Structure of Sochi's sown areas, 2024, %



Source: Passport of socio-economic development for 2023. Available at: <https://sochi.ru/gorod/obshchaya-informatsiya/pasport-goroda-sochi/Паспорт%20города%202023.pdf>

citrus, tea, pomegranate, kiwi, fig, feijoa, bay leaf, persimmon, and olives – thereby reducing import dependence for these products.

In our view, the logistical aspect of siting the agrobiotechnology park in Sochi is a key element of the project's territorial rationale. The city is a federal-level multimodal transport hub, integrating sea, rail, and air connections into a unified infrastructure system. This can ensure stable supply of agricultural raw materials, uninterrupted operation of processing facilities, and diversified export flows. Modern port infrastructure with terminals for storing and transporting refrigerated products minimizes loss risks during logistics operations, which is crucial for perishable goods. Employing multimodal logistics solutions and modern supply chain management systems reduces time and financial costs, increasing economic profitability and enhancing the competitiveness of domestic agricultural products in the international market.

A processing cluster within the technology park's structure will optimize logistics flows by

concentrating production near export corridors, reducing time and cost for transporting high-value-added products. Utilizing multimodal (sea, rail, and air) transport will ensure the resilience of an export-oriented agro-industrial model and reduce vulnerability to fluctuations in the transport and logistics sector.

The region's comprehensive logistical accessibility makes Sochi an optimal site for a high-tech agrobiotechnology park capable of integrating into international trade networks, minimizing costs, and ensuring the long-term competitiveness of domestic agro-industrial production. Its implementation will create a cluster-based model encompassing not only raw material production but also processing, packaging, storage, and distribution to external markets, thereby increasing product value added.

The scientific and educational potential is also of considerable importance in forming the agro-industrial technology park structure, as it is the basis for the innovative development of the agro-industrial complex and a key element in ensuring technological sovereignty in subtropical agriculture.

Accordingly, the concentration of specialized research institutes in the region is vital. They can provide scientific support for modernizing the industry and implementing genetic plant-breeding technologies aimed at developing adaptive crop varieties. The fundamental scientific institution in Sochi, providing methodological and technological support for the project, is the ANO “Academy for Subtropical Agriculture Development”, along with the Subtropical Research Center of the Russian Academy of Sciences. The latter specializes in developing new subtropical plant varieties, molecular breeding, bioengineering, and adaptive crop production. The implementation of the technology park’s research and production project is planned with the participation of the “Agropishcheprom” Research and Production Center and the Institute of Agriculture of Abkhazia, forming the basis for a large-scale scientific and technological transformation of subtropical crop production in Russia. So, this technology park structure will have an international level due to the involvement of research centers from the Republic of Abkhazia.

Residents will include high-tech enterprises specializing in advanced molecular genetics, biotechnology, microbiology, agrochemistry, breeding, and industrial production of planting material. Their goal is to increase agricultural productivity, reduce import dependency, and integrate into global food chains. Their comprehensive activities will ensure the development of genetically improved crop varieties, production of biological plant protection products, innovative agrochemicals, and enriched nutrient complexes and feed additives. This will enhance the efficiency of agro-industrial production and help form an export-oriented model for subtropical agriculture.

For example, the “Agropishcheprom” Research and Production Center plans to implement a program for a genetic bank of subtropical crops. This includes developing new varieties and hybrids based on molecular breeding, genome editing, and cellular technologies, enabling the accelerated reproduction of high-yielding, stress-resistant plants. This innovative platform will be integrated with a system for developing new functional food products, including specialized infant and sports nutrition enriched with vitamins and micronutrients. Implementing targeted plant genome editing technologies will adapt subtropical crops to changing climates, increase their yield, and create an industrial base for deep processing of agricultural raw materials.

The developed system of higher agricultural education and the presence of specialized research institutes and scientific centers in the Krasnodar Territory form human assets for the technological modernization of subtropical agriculture. They ensure the training of specialists in molecular genetics, biotechnology, breeding, automated agro-industrial process management, and digital farming. Developing the “Subtropics of Russia” agrobiotechnology park requires comprehensive personnel training with competencies in molecular genetics, agro-biotechnology, and automated process management. Educational programs of the “Sirius” center, focused on genetic engineering breeding methods, cell biology, and plant bioengineering, are essential in this regard. These areas form the basis for nurturing scientific and engineering personnel capable of integrating advanced biotechnologies into agricultural production.

Furthermore, incorporation of educational programs developed in partnership with leading regional and national agricultural universities

(particularly KubSAU) into the technology park's structure will create an institutional base for training personnel with competencies in genome editing, biological plant protection product development, robotic greenhouse control, and agro-ecosystem analytics. To this end, an agreement on training scientific and teaching staff in this field was signed on February 7, 2023, between the Subtropical Research Center of RAS and the Agricultural Municipal Unitary Enterprise "Russia" (Sirius). Additionally, the collaboration includes seminars, master classes, training, and roundtables organized by the Subtropical Research Center of RAS together with educational institutions. This will facilitate practical specialist training, farmer upskilling, and knowledge exchange in innovative agricultural production.

Interaction with specialized educational institutions will stimulate the organization of master's and postgraduate programs, professional development courses, internships, and student involvement in research projects and dual education programs. This will accelerate the implementation of scientific developments into production and minimize the time gap between research and innovation commercialization. The development of human resources combined with the concentration of scientific expertise at the technology park will form the basis for an export-oriented subtropical agriculture cluster. This will ensure the long-term resilience of the national food system and reduce import dependency for strategically important food items.

Given that the current employment structure in subtropical agriculture is characterized by a high share of unskilled labor and low digitalization of agricultural processes, an educational cluster within the technology park, in our view, will ensure a qualitative restructuring of the labor market in this segment.

The project's economic indicators demonstrate the region's ability to sustain and scale the technology park model in accordance with the parameters and requirements established by current regulations governing such entities. The structure of the "Subtropics of Russia" agrobiotechnology park envisions attracting up to 50 residents and creating 850 to 1500 jobs, meeting established employment requirements for such structures. Additional economic justification comes from the inclusion of targeted objectives in Sochi's municipal strategic development, aiming for vegetable production of 3 thousand tons and fruit production of 8 thousand tons by 2030. This implies structural expansion of the agro-industrial base and the introduction of high-tech capacities combined with a biotechnological production. In our opinion, these targets can only be achieved through an integrated system including research, production, and infrastructure units.

The economic attractiveness of Sochi as a site for the "Subtropics of Russia" agrobiotechnology park is also justified by domestic demand parameters and Russia's pronounced dependence on imports of subtropical products. According to analytical data presented at a roundtable on January 23, 2025, the total imported subtropical crops market exceeds 1 trillion rubles. These estimates are supported by materials from the "Economic Prerequisites" project, which states that annual imports of subtropical products consistently exceed 1 trillion rubles, with mandarin imports in 2024 amounting to 738.3 thousand tons. This structural dependence of the Russian market on external supplies, coupled with the absence of a national production base in this segment, proves the objective necessity of creating specialized high-tech infrastructure capable of reproducing a competitive range of subtropical crops within the national agro-industrial complex.

This technology park project will ensure the reproduction of virus-free planting material through clonal micropropagation technologies, enabling the production of up to 100 million plants per year, including fig, nut crops, olives, persimmon, citrus, and tea. Breeding research conducted in genetic laboratories will develop new varieties adapted to changing climatic conditions with high productivity. Biotechnological micropropagation methods will accelerate the introduction of new varieties into commercial production, shorten adaptation cycles to regional conditions, and reduce dependence on foreign supplies. Scientific developments integrated into the production process will minimize the impact of genetic erosion, increase plant resistance to biotic and abiotic stressors, and establish a closed-cycle breeding reproduction system.

Furthermore, the region's agro-climatic profile allows for year-round agricultural production with minimal expenditure on supplementary irrigation, increasing the profitability of agro-industrial projects and reducing land maintenance costs. A steady trend of rising average annual temperatures in the region is observed, creating preconditions for expanding subtropical agro-landscapes and intensifying production. Forecasts predict that by 2035, subtropical crop production in the region will increase by 910%, and tea cultivation by 250%, partially replacing imports of similar products.

The project's investment model suggests that 4 billion rubles are invested: 500 million rubles for establishing management infrastructure and 3.5 billion rubles as private investment from technology park residents. Project implementation plans include creating 1500 new jobs in agriculture, biotechnology, and agricultural processing, contributing to reduced unemployment and increased tax revenues across budget levels. Additionally, the project integrates into rural development and agritourism programs, enhancing

regional investment appeal and increasing incomes for small business.

International experience with agro-industrial technology parks demonstrates their high efficiency, achieved through an institutionally embedded, scientifically grounded, and spatially integrated system where research, implementation, testing, and industrial production are interconnected and function as a single process. The Chinese model, yielding positive results in creating agrobiotechnology parks, serves as an example. Modern rural development strategy in China focuses on deep technological modernization of the agricultural sector, strengthening the research and innovation base, and transforming rural regions into centers of sustainable growth. National Modern Agricultural Industrial Parks (NMAIPs) are central to this strategy, serving as key platforms and catalysts for stimulating high-quality agricultural development through the integration of innovative scientific and technological elements. This system includes over three hundred facilities, with 269 certified by the PRC Ministry of Science and Technology, reflecting the level of state support and institutional stability.

In their institutional nature, Chinese NMAIPs are analogous to Russian agrobiotechnology parks, as their core comprises research centers, applied biotechnology laboratories, and scientific institutes ensuring continuous research and innovation. Strategic interaction between research institutes, universities, and production units forms a sustainable innovation reproduction model, eliminating the gap between research and application of results. Moreover, the effective development of NMAIPs stimulates national GDP growth. Statistical data from 2000 to 2020 show that NMAIPs construction significantly improved economic development in the counties where they were established: real GDP increased by 3.8%, and real GDP per capita by 4.5%.

Thus, establishing the “Subtropics of Russia” agro-industrial technology park in Sochi is an economically justified and strategic decision. It will ensure the revitalization of subtropical agriculture, development of high-tech agro-industrial production, implementation of import substitution policies, and formation of a competitive agricultural cluster. The region’s unique climatic conditions, transport and logistics capacity, scientific base, and projected economic impact make this project a key element of the long-term strategy for ensuring Russia’s food security.

Conclusion

The conducted analysis shows that the environmental assets and institutional characteristics of Sochi’s humid subtropics create a combination of conditions for the effective functioning of an agrobiotechnology park. The stability of thermal and hydrothermal regimes, combined with soil-ecological features and the natural adaptation of perennial subtropical crops, forms an environment capable of supporting their year-round reproduction. An assessment of production and innovation capacity confirms that Sochi has not only appropriate bioclimatic conditions but also the institutional and technological structure to provide a full cycle of developing, testing, and implementing innovative approaches to agro-production processes. This substantially distinguishes it from most Russian regions and justifies the choice of this territory for forming a specialized agro-industrial technological complex.

The region’s strategic importance is defined by a high degree of logistical integration, ensured by a deep-water port, year-round air service, and railway infrastructure. This creates stable export-oriented channels and reduces transaction costs for transporting time-sensitive (perishable) products. The region’s institutional density, manifested in the concentration of specialized scientific institutions,

cell selection laboratories, genetic banks, and relevant educational organizations, forms a resilient research environment. This environment can sustain continuous innovation generation and ensure the implementation of biotechnological developments in the agro-industrial complex.

Furthermore, given the structural demand of the Russian market for import substitution of subtropical products, it is necessary to form and develop a subtropical agro-industrial technology park. Establishing an agrobiotechnology park in Sochi is viewed in this context as a tool for increasing technological sovereignty, expanding the reproductive potential of the genetic plant-breeding base, and strengthening national food security in the field of subtropical agriculture.

The technology park’s operation will contribute to transforming the regional agro-economy, forming an export-oriented economic model, and integrating Russian agro-enterprises into global food chains.

The conducted research confirms the necessity of considering spatial-economic factors when creating agrobiotechnology parks and proves that their efficiency directly depends on regional specificity, agro-climatic conditions, the level of research and education, and logistics. The applied contribution of the study lies in forming a system of criteria for siting an agrobiotechnology park considering regional characteristics, which can be used in territorial planning and program-targeted management for agro-industrial complex development. The identified patterns form a scientific basis for further research on methods for assessing the economic efficiency of technology parks, analyzing the resilience of their institutional system, and developing tools for state support. These will ensure innovation development and implementation, strengthen export potential, and enhance the competitiveness of the regional agro-industrial complex.

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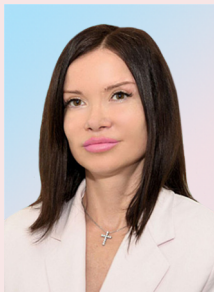
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Problems of Sustainable Development of Dairy Cattle Farming in Russian Regions under Sanctions



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Abstract. The aim of this study is to assess the differentiated impact of sanctions on the socio-economic development of dairy cattle farming, taking into account its adaptation mechanism at the regional level. A systematization of factors was carried out, identifying seven levels with critical threshold values, an adaptation strategy matrix, and a methodological framework based on factor analysis, verified using Rosstat panel data for 2019–2024 and expert assessments. Due to the varying scales of input parameters and the temporal dynamics of the processes under study, an integral assessment system was employed, utilizing three complementary methodologies. The linear convolution method revealed stable long-term industry development trends based on averaged values of normalized indicators. The geometric convolution method, more sensitive to sharp changes in the industry's structure and development rates, highlighted the specific impact of transformations in the political-economic sphere after 2020. The use of Harrington's desirability function made it possible to interpret the assessment results in terms of the

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industry's functional sustainability. The modeling results showed that, despite the economic, technological, and logistical shocks of sanctions, there is steady growth in key indicators, and by 2024, signs of systemic stability and economic maturity are emerging. Based on the developed methodology for assessing the sustainability of dairy cattle farming, a rating result is presented, incorporating economic, production, market, and socio-ecological components with justified weights. This approach accounted for regional industry specifics, ensured comparability of results across territories, and reflected the significance of each factor for assessing development sustainability. The results can be used as a decision-making tool in agricultural production and for developing regional support programs. Differentiated recommendations for overcoming the consequences of sanctions have been developed for regions with varying levels of dairy farming sustainability: leaders (index >0.7); average level ($0.5-0.7$); low level (≤ 0.5). The research is of interest not only to specialists in the agro-industrial complex but also to a wide audience concerned with the processes of the Russian economy's adaptation to external challenges.

Key words: dairy cattle farming, economic efficiency, sanctions, sustainability index, regional differentiation, modeling, forecast.

Introduction

One of the key branches of the agro-industrial complex is dairy cattle breeding, the effective functioning of which makes it possible to create social stability in rural regions and maintain food security at an optimal level. The sanctions imposed by Western countries in 2022 had a significant impact on the functioning of the sector. Sales markets have changed; restrictions on the supply of breeding cattle have led to a break in logistics chains; technological challenges have arisen, manifested in dependence on foreign solutions in the field of genetics and automation. Under the current conditions, assessing the impact of sanctions on the agro-industrial complex becomes critically important for the state in order to timely adjust support measures; it makes it possible to work out predictive models for the development of the industry.

To clarify the impact of restrictive instruments on dairy farming, it is advisable to conduct a timely analysis of the factors determining the sustainability of the industry (*Tab. 1*).

The advantage of the presented classification is to identify key conditions that reflect logistical connections, market conditions and take into account biological parameters.

In the context of ongoing geopolitical tension and growing sanctions pressure from the United States and a number of Western countries, the issue of food security of the state and the sustainable development of its agro-industrial complex is particularly acute. Due to the high dependence on imports, dairy cattle breeding, as one of the vital food segments of the country's economy, has found itself in a rather difficult position. An analysis of the impact of sanctions restrictions on dairy farming can help not only identify problems that have arisen in the industry, but also substantiate a set of national and sectoral measures aimed at ensuring its sustainable functioning in a significantly changed economic environment.

The entire sanctions period can be roughly divided into several stages¹.

The first stage is 2014. The beginning of sanctions pressure.

The European Union and the United States have restricted the supply of equipment and a number of preparation for dairy cattle breeding, and have practically banned cooperation with

¹ Profitability and investments in agriculture: Analytics and reviews. Moscow: OOO "Agroinvestor", 2022–2024. Available at: <https://agroinvestor.ru>

Table 1. Key factors in the development of dairy cattle breeding in the regions

Group of factors	Key factors	Impact on industry	Research methodology
Economic	Sanctions restrictions	Lower imports of breeding cattle, feed, and equipment; increased logistical costs	Analysis of the elasticity of demand for import substitution using econometric models
	Government support	Subsidies, preferential loans, compensation for feed costs	Assessment of the effectiveness of government programs through ROI (return on investment) in different regions
	Inflation and pricing	Cost increase → decrease in profitability	Correlation analysis of feed and milk price dynamics
Technological	Import substitution of machinery	Dependence on foreign milking machines, feed distributors	Comparison of the effectiveness of domestic and imported technologies
	Farm automation	Increased productivity, but requires investment	Case study of the implementation of robotic farms in the context of sanctions
Biological	Genetics and breeding	Dependence on import of seed and breeding cattle	Analysis of the growth dynamics of local breeding farms
	Feed base	Protein feed shortage due to sanctions	Assessment of the transition to alternative feed (insects, silage crops)
Logistics	Supply chains	Increase in the cost of transport, search for new routes	GIS-analysis of changes in logistics flows
Market	Domestic demand	Stable consumption of dairy products	Research on changes in consumer preferences (for example, an increase in demand for cheeses)
	Export opportunities	Reorientation from the European Union to Asia and the CIS	Analysis of new sales markets through gravity trading models
Environmental	Climate change	Impact of droughts on the food supply	Forecasting risks using climate indices
Social	Staffing shortage	Lack of veterinarians and animal technicians	Assessment of migration of specialists from the industry
According to: EU-Russia Agricultural Trade After 2022: Sectoral Analysis (2022). European Commission. Brussels: EC Directorate-General for Agriculture; Kuznetsov P.I. (2023). Digitalization of Dairy Farms: Russian Experience. Kazan: Izd-vo Kazanskogo GAU; Sidorenko V.V. (2021). Economic Sustainability of the Agro-Industrial Complex in the Face of Sanctions. Saint Petersburg: Profi-Inform; Resilience of Agricultural Systems to Geopolitical Shocks (2023). World Bank. Washington, DC.			

international organizations in the field of breeding and genetics of cattle (Viking Genetics, ALTA Genetics, ABS, etc.)².

Russia has imposed retaliatory restrictive measures on the import of products from “unfriendly countries”. The import ban includes breeding cattle, milking parlors, milk feeding and cooling systems, compound feeds, feed additives, amino acids, protein concentrates and premixes, vaccines and hormones for reproductive control. Logistical and genetic chains were disrupted, and dependence on alternative suppliers increased. In addition, a number of Russian banks involved in

financing dairy farming have been disconnected from Western capital markets, making it more difficult to purchase imported equipment and technology on credit. In this regard, there is an urgent need to develop state import substitution programs.

The second stage is 2015–2017. Maintaining and expanding sanctions pressure.

At this stage, Russia’s dairy cattle industry was under serious pressure in the context of the ongoing and expanding sanctions regime and retaliatory measures from the Russian Federation.

There were significant problems in completing the milking herd, as up to 70% of highly productive breeding cattle were purchased in the European Union and Canada, and breeding cattle imported

² Reports and programs on agribusiness development. Ministry of Agriculture of the Russian Federation. Available at: <https://mcx.gov.ru>.

from Brazil and Belarus could not compensate for losses in genetic quality³.

DeLaval, GEA and Westfalia milking machines became unavailable, and problems with their maintenance arose, which forced manufacturers to switch massively to Chinese and Russian analogues that were inferior in quality.

The import ban of feed additives and premixes has led to a shortage and an increase in the cost of rations. The shortage of imported drugs has become acute, which has led to difficulties with vaccination and treatment of animal diseases.

There were difficulties in attracting foreign capital and lending to the industry, the cost of milk production increased and, despite partial compensation from government subsidies and subventions, profitability decreased.

As a response, Russia launched the state program “Development of agriculture” 2013–2020, which includes the section “Development of Russian livestock breeding”, allocated subsidies for the purchase of Russian equipment for dairy cattle breeding, provided support for breeding and genetic centers in the Krasnodar Territory and the Republic of Tatarstan, and developed the first national analogues of feed additives and vaccines⁴.

The third stage is 2018–2021. Development of import substitution processes in dairy cattle breeding.

This period of industry development can be described as a transition from short-term and impulsive reactions to sanctions and restrictions to systemic measures to replace external resources, technologies and breeding material with domestic (or imports from friendly countries). At this stage, the state has not only preserved, but also expanded

measures to support dairy cattle breeding within the framework of the national programs “Agricultural development” and “Integrated rural development”. State programs to support dairy cattle breeding have been activated, production of equipment has been localized, and the development of breeding and feed supply has been strengthened, which has somewhat stabilized the situation in the industry⁵.

Among the real transformations, the creation of genetic centers in five regions of Russia should be highlighted, whose tasks included providing farms with breeding material and consulting support on breeding issues. This led to an increase in the reproduction efficiency of the dairy herd. The launch of new and expansion of existing plants for the production of premixes, amino acids, vitamin and mineral complexes has reduced the cost of feeding and improved the quality of the diet. There are government programs for partial compensation of costs for the purchase of domestic equipment. The introduction of digital accounting systems for milk yields, feed and health indicators (ERP, CRM systems for the agricultural sector) made it possible to automate individual accounting and monitoring of the condition of animals. Agricultural courses and online training for farmers and specialists have helped to improve the skills of workers and reduce the impact of management errors.

The fourth stage is 2022. A new wave of restrictions.

After the start of the special military operation (SMO) and a significant increase in sanctions pressure, new strict restrictive measures were introduced, affecting almost all components of the industry’s production chain.

The complete cessation of cooperation with foreign companies has practically stopped the supply of modern milking and refrigeration

³ Profitability and investments in agriculture: Analytics and reviews. Moscow: OOO “Agroinvestor”, 2022–2024. Available at: <https://agroinvestor.ru>

⁴ Foreign trade statistics. Eurasian Economic Commission. Available at: <https://eec.eaeunion.org>; Analysis on profitability and cost of dairy production. Institute of Agricultural Market Studies (ICAR). Available at: <https://ikar.ru>

⁵ Industry research on agro-industrial complex. Institute of Agricultural Marketing. Available at: <http://www.iam.ru>; Agriculture in Russia: Statistical collection Moscow: Rosstat, 2015–2024. Available at: <https://rosstat.gov.ru/folder/11194>

equipment, spare parts, veterinary preparations, genetic materials, technical support and access to the latest technologies. The disconnection of Russian banks from SWIFT, currency restrictions, the freezing and termination of existing contracts have made it difficult to import even from countries that have not officially supported the sanctions. Supply disruptions through ports in unfriendly countries and the reorientation to rail routes through China have increased delivery times and complicated access to critical components.

Compensatory measures include the development of accelerated import substitution programs aimed at localizing the production of livestock equipment, medicines and feed components, as well as cooperation with manufacturers from China, India, Türkiye and Brazil to supply alternative analogues; activation of programs for accelerated reproduction of breeding stock, grants and subsidies for genetic laboratories, the opening of a number of new breeding centers expansion of government support in the form of subsidies for the purchase of Russian equipment, compensation of interest rates, etc.

This stage confirmed the importance of national technological independence and the need for long-term planning for the development of dairy farming in the context of global turbulence.

The fifth stage is 2023–2024. Transition to sustainable operation under the sanctions regime.

After a period of intense external constraints and internal changes, this stage has become a time of stabilization and adaptation of dairy farming to the new reality. There are signs of sustainable development of the industry in conditions of limited access to external resources. The main direction of the state policy was the completion of localization processes of critical production equipment and technological solutions.

Breeding centers in Tatarstan, the Vologda, Novosibirsk, and Orel regions began independent production of embryos and sperm from breeding

bulls, which fully met the need for breeding material for dairy breeds. Distance learning and retraining programs for livestock specialists have been launched with the support of the Ministry of Agriculture and the RANEPa. By opening our own production facilities, import dependence on vaccines and preparations has significantly decreased. Regional support programs for smart farms and small dairy cooperatives have been implemented in 12 regions⁶.

The government has focused on creating a sustainable financial base for the development of dairy farming. The program of preferential loans at 5% was extended for 7 years, providing for the purchase of equipment, the construction of farms, the introduction of IT systems, special grants for the introduction of digital solutions and exemption from property tax for up to 5 years during the construction of new dairy complexes and farms⁷.

As a result, due to active government support, localization of equipment, genetic independence and the introduction of digital solutions, the industry has significantly increased profitability, reduced import dependence and strengthened sustainability.

The impact of the Russian embargo on the dairy sector of the EU economy

The economic sanctions imposed against Russia in 2014 and the retaliatory counter-sanctions led to serious problems in the dairy industry of the EU countries, as after the introduction of the Russian embargo, the import of European dairy products to Russia was completely banned, which caused a crisis of domestic overproduction.

It is worth noting that the EU promptly adopted a set of anti-crisis measures, including subsidizing the storage of excess milk powder and butter (Private

⁶ State report on the state and prospects of development of the agro-industrial complex of the Russian Federation. Moscow: Ministry of Agriculture of Russia, 2022–2024.

⁷ Ibidem.

Storage Aid program); compensation for losses to farms (more than 1 billion euros); compensation for costs caused by voluntary production cuts (Milk Reduction Scheme program); export subsidies to producers to enter new commodity markets.

As a result, the EU was able to partially stabilize the domestic dairy market by 2016, and by 2018, fully restore the dairy export volume, changing the geography of supplies (Bojnec, Ferto, 2017; Balkytė, Tvaronavičienė, 2019).

The sanctions against Russia have become a turning point in the development of the dairy sector of the EU economy. The loss of a major trading partner in the Russian Federation initially caused a crisis, but then led to an export reorientation to Asian and Middle Eastern markets, technological modernization of the industry, increased production efficiency and improved product quality. The EU example has shown that with a sound financial policy, sanctions can become not only a factor in the decline and degradation of production levels, but also a stimulus for development and economic growth.

The impact of economic sanctions on the dairy sector of the economy of the Republic of Belarus

After 2014, the Republic of Belarus, having lost access to European markets, took advantage of the opportunity to occupy a part of the Russian food market vacated as a result of sanctions. In 2015, the share of Belarusian products in Russian dairy imports reached 80%. This situation has made the Belarusian dairy industry dependent on the external political environment, but it is trade with Russia that has become and currently remains the main source of foreign exchange earnings for most local enterprises.

The expanding cooperation with the Russian Federation is a factor and an incentive for large-scale modernization of production. From 2015 to 2023, more than 400 dairy farms were reconstructed in the Republic of Belarus, and milk production increased from 6.8 to 7.8 million tons.

State regulation remains the basis of the Belarusian economic model. The state determines the purchase prices for milk, subsidizes the purchase of feed and machinery. Economic sanctions have become for the country not only a test of strength, but also an opportunity to expand production, modernize equipment, develop sales markets, etc. (Ley, Tochitskaya, 2021; Belyaeva, Kharitonova, 2022).

The impact of economic sanctions on the dairy sector of the economy of the Islamic Republic of Iran

The sanctions, which have restricted access to foreign technology and capital, have had a rather peculiar effect on the dairy sector development of the economy of the Islamic Republic of Iran. Under their influence, an isolated and self-sufficient model of dairy production was formed, combining state planning and elements of independent regional development.

In 2010, a strategy for the economy of resistance was adopted, aimed at import substitution and strengthening domestic production, as well as a number of government programs to support farmers and develop breeding. As a result, by 2020, the country began fully providing itself with dairy products of its own production⁸.

The national plan “Iran Dairy Vision 2030” is currently being implemented, aimed at modernizing farms and improving the genetic potential of livestock; expanding opportunities for exporting milk and dairy products to neighboring countries; expanding the production of powdered milk and whey for the confectionery industry (Pourkhanali, Saleh, 2021).

Thus, the dairy industry of the Islamic Republic of Iran was able not only to adapt to the conditions of severe foreign economic restrictions, but also to become one of the most stable areas of the national economy development.

⁸ Iran Economic Monitor: Navigating the Perfect Storm. The World Bank Group, 2022; FAO-STAT Database. Available at: <https://www.fao.org/faostat>

The impact of economic sanctions on the dairy sector of the economy of the Democratic People's Republic of Korea

Given the country's constant isolation, the DPRK's dairy industry remains at a very low technological level, and dairy products are produced in volumes sufficient only to meet the needs of medical and children's institutions. Some positive developments are observed in relations with China and the Russian Federation, which supply basic equipment and organize the exchange of specialists.

In contrast to Russia, Belarus or Iran, where economic sanctions stimulated import substitution processes (*Tab. 2*), in the DPRK, they only slowed down technological development and increased food dependence (Frank, 2019).

An analysis of the effects of economic sanctions on the dairy sector in Russia, the EU, Belarus, Iran and the DPRK has shown that the effectiveness of adaptation to changing external conditions is directly related to the quality of institutional management, the level of technological maturity, access to innovative technologies and economic autonomy.

In addition, with high innovation potential and market diversification (the EU and partly the Russian Federation), economic sanctions become an incentive for development; with a closed and centralized economy (Belarus, Iran), economic growth is achieved through the mobilization of domestic resources; with complete isolation (DPRK), sanctions lead to a significant slowdown in development and economic stagnation.

Materials and methods

We selected methods combining qualitative and quantitative analysis to assess the impact of sanctions on key parameters. We consistently used three different calculation methods for increasing the degree of objectivity and reliability of the presented studies:

1) method of linear convolution (weighted sum) with preliminary normalization of each particular indicator, and then their averaging taking into account the weights;

2) method of geometric convolution (multiplicative index), i.e. a method of constructing an integral indicator based on the geometric mean of normalized values, in which low values of one factor do not have a decisive effect on the final index;

Table 2. Indicators of the dairy farming industry before and after the introduction of sanctions

Indicator	Country				
	Russia	EU	Belarus	Iran	North Korea
Period before/after sanctions, years	2010–2013 / 2015–2024	2010–2013 / 2014–2024	2010–2013 / 2015–2024	2008–2011 / 2012–2024	2008–2011 / 2012–2024
Milk production	+5%	-1,8%	+20%	+17%	-23%
Annual salary per cow	+36%	+7%	+26%	+38%	-12%
Number of animals	-12%	-14%	-7%	-12%	-13%
Import share	-19 p. p.	+3 p. p.	-6 p. p.	-10 p. p.	+10 p. p.
Exported countries	CIS, China, Middle East countries	Africa, Asia, Middle East	Russia, Kazakhstan, China	Iraq, Afghanistan, UAE	no
State support	+130%	+10%	+66%	+120%	-75%
Main effect of sanctions	Import substitution, increased processing	Loss of the Russian market	Export growth in the RF	Growth of domestic investments	Dependence on China
Key issues	Import of machinery and genetics	Energy costs, falling prices	Limited markets	Lack of technology	Shortage of feed, isolation
According to: Kuznetsova I., Yanbykh R. (2021). Russian food security and the import substitution policy: The case of dairy. Russian Journal of Economics, 7(3), 266–285; EU dairy farms report 2020. DG Agriculture and Rural Development (2020). European Commission; Impact of Sanctions on Agricultural Trade and Food Security in the Eurasian Region (2023). Food and Agriculture Organization of the United Nations (FAO); (Belyaeva, Kharitonova, 2022); (Pourkhanali, Saleh, 2021); Final Report of the Panel of Experts Submitted Pursuant to Resolution 2345 (2017). United Nations, S/2021/211.					

3) methodology using the Harrington desirability function, which allows converting each indicator into a scale [0; 1] according to the degree of desirability and is most often used to assess the degree of compliance of parameters with a normative or other set level.

We propose to use the composite index developed by us based on four key indicators to assess the sustainability of dairy cattle breeding (Tab. 3).

The index is calculated when the indicators are normalized (min-max scaling to bring them to a scale of 0–1), taking into account the weight by aggregating them into the final index:

$$\text{Index}_{\text{sustainability}} = 0.3 \times \text{Econ.} + 0.3 \times \text{Prod.} + 0.2 \times \text{Market} + 0.2 \times \text{SocEnv.} \quad (1)$$

Weight combinations were determined based on several methods. With the help of expert analysis, average significance estimates for key factors were identified: economic – 4.7, production – 4.5, market – 3.8, socio-environmental – 3.5. The main component method based on statistical analysis of the RSA revealed the explanatory power of conditions in the following proportions: economic – 28% variance, production – 27% variance, market – 19% variance, socio-ecological – 16% variance.

We used comparative analysis methods of software to assess the impact of sanctions: Python 3.10 (libraries: Pandas, Scikit-learn, Folium, Matplotlib); Google Colab for cloud computing. Cartographic visualization is based on an interactive map (Folium) with color differentiation and static maps (Matplotlib) for accounting documents.

Results

In the course of the research, we used digital material obtained exclusively from open sources of information as the initial data. In the absence of a complete set of reliable annual statistics, a logically constructed trend based on general industry data was applied, taking into account the patterns identified in the research process.

Table 4 presents the initial data for calculating the integral index of dairy cattle breeding development.

The integral index was calculated using the linear convolution method as the average value of the normalized indicators: milk production, average annual yield (positive impact), equipment imports, feed imports, and milk costs (negative impact). Normalization was carried out using the min-max method. The integral index I_t for each year was found by the formula:

$$I_t = \frac{1}{n} \sum_{i=1}^n X_{i,t}^H, \quad (2)$$

where t – serial number of the year;

$X_{i,t}^H$ – normalized value of the i -th indicator.

Table 3. Indicators for assessing the sustainability of dairy farming under sanctions*

Component	Indicator	Weight in the index, %
Economic sustainability	Profitability of dairy farming (%) Share of government support in revenue (%) Dependence on imported feed and machinery (%)	30
Production sustainability	Milk yield per 1 cow (kg/year) Dairy herd (thousand heads) Share of automated farms (%)	30
Logistical and market sustainability	Export volume of dairy products (thousand tons) Availability of alternative markets (diversification index)	20
Socio-environmental sustainability	Availability of locally produced feed (%) Staffing (number of veterinarians per 1,000 heads)	20
* The index weight is determined based on the following methods: PCA, consistency criterion, regression analysis. Source: own compilation.		

Table 4. Initial data for calculating the integral index of dairy cattle breeding in the Russian Federation, 2013–2024

Year	Milk production, million tons	Share of equipment imports, %	Share of feed and drug imports, %	Average annual weight, kg	Profitability, %
2013	30.5	70	60	4,400	10.5
2014	31.0	65	57	4,500	11.2
2015	30.8	60	55	4,550	10.8
2016	30.2	55	53	4,700	9.6
2017	30.7	50	50	4,900	10.1
2018	30.9	48	47	5,100	10.9
2019	31.6	45	43	5,500	14.2
2020	32.2	42	40	5,800	19.5
2021	32.6	40	38	6,200	20.1
2022	32.8	38	35	6,700	20.2
2023	32.9	36	33	7,400	29.9
2024	33.1	35	30	7,650	31.8

Source: Agriculture, hunting and forestry in Russia: Statistical collection Moscow: Rosstat, 2023; Analytical report on the state and development of dairy farming in Russia for 2022–2024. Ministry of Agriculture of the Russian Federation: Moscow, 2024; Global Dairy Market Overview. FAO. 2024.

Table 5 shows the calculation of the integral index of dairy cattle breeding development and shows the dynamics of its change in 2013–2024. According to the data, during the period under review, the integral index for the development of dairy cattle breeding in Russia demonstrates steady growth, which indicates the industry's transition from a state of high dependence on imports and low animal productivity to a phase of effective industry development. A particularly noticeable increase has been observed since 2019, due to adaptation to external constraints and improved production efficiency.

The geometric convolution method using z-normalization made it possible to give a more sensitive assessment of the integral index of dairy cattle breeding development. The general formula for calculating the integral I_t index is as follows:

$$I_t = (\prod_{i=1}^n | \frac{X_{i,t} - X_{i,cp}}{\sigma_i} |)^{\frac{1}{n}}, \quad (3)$$

where $X_{i,cp}$ – average value of the i -th indicator for the entire period;

σ_i – standard deviation of indicator i .

Table 5. Calculation of the integral index of dairy cattle breeding development RF by linear convolution, 2013–2024

Year	Milk production	Share of equipment imports	Share of feed and drug imports	Average annual salary	Profitability	Integral index
2013	0.103	0.0	0.0	0.0	0.04	0.029
2014	0.276	0.143	0.1	0.031	0.071	0.124
2015	0.207	0.286	0.167	0.046	0.054	0.152
2016	0.0	0.429	0.233	0.092	0.0	0.151
2017	0.172	0.571	0.333	0.154	0.018	0.25
2018	0.241	0.629	0.433	0.215	0.063	0.316
2019	0.483	0.714	0.567	0.338	0.196	0.46
2020	0.690	0.811	0.667	0.431	0.442	0.606
2021	0.828	0.857	0.733	0.554	0.464	0.687
2022	0.897	0.914	0.833	0.708	0.464	0.763
2023	0.931	0.971	0.9	0.923	0.911	0.927
2024	1.0	1.0	1.0	1.0	1.0	1.0

According to: Agriculture in Russia: Statistical collection Moscow: Rosstat, 2015–2024. Available at: <https://rosstat.gov.ru/folder/11194>

Table 6 shows the integral index of the dairy cattle breeding development in the Russian Federation for 2013–2024 calculated using this method.

The use of z-normalization made it possible to assess the strength and balance of the development of Russian dairy farming in the face of sanctions pressure. We should say that in the period 2013–2017, the integral index had multidirectional dynamics, indicating an unstable level of health, and since 2020, a gradual increase in the indicator begins, reflecting the beginning of positive processes in the industry.

The methodology using the Harrington desirability function provides for the calculation of each annual D_t index according to formula (3),

followed by the geometric mean of all partial desirability coefficients:

$$D_t = \exp \left(- \exp \left(-b \frac{2X_t - X_{min} - X_{max}}{X_{max} - X_{min}} \right) \right), \quad (4)$$

where X_t – actual value of indicators;

X_{max}, X_{min} – acceptable range of indicator values;

b – empirical coefficient.

Table 7 shows all calculations using this method.

Calculations using the Harrington desirability function show that, despite a significant decrease in desirability for a number of indicators at the beginning of the 2014–2016 sanctions period, the index began to grow and reached its highest values in 2024, which corresponds to a “good” rating on the desirability scale.

Table 6. Calculation of the integral index of dairy cattle breeding development RF by geometric convolution using z-normalization, 2013–2024

Year	Milk production	Share of equipment imports	Share of feed and drug imports	Average annual salary	Profitability	Integral index
2013	-1.099	-1.917	-1.552	-1.112	-0.804	0.256
2014	-0.603	-1.467	-1.24	-1.021	-0.711	0.152
2015	-0.801	-1.018	-1.032	-0.975	-0.764	0.058
2016	-1.396	-0.569	-0.824	-0.838	-0.924	0.148
2017	-0.901	-0.12	-0.511	-0.655	-0.871	0.286
2018	-0.702	0.06	-0.199	-0.472	-0.738	0.511
2019	-0.008	0.329	0.217	-0.107	-0.339	0.989
2020	0.587	0.599	0.529	0.168	0.392	1.445
2021	0.983	0.779	0.737	0.533	0.459	1.688
2022	1.181	0.958	1.049	0.99	0.459	1.912
2023	1.281	1.138	1.257	1.63	1.788	2.406
2024	1.479	1.228	1.569	1.859	2.054	2.622

According to: Agriculture in Russia: Statistical collection. Moscow: Rosstat, 2015–2024. Available at: <https://rosstat.gov.ru/folder/11194>

Table 7. Calculation of the integral index of dairy cattle breeding development RF by geometric convolution using the Harrington desirability function, 2013–2024

Year	Milk production, million tons	Share of equipment imports, %	Share of feed and drug imports, %	Average annual weight, kg	Profitability, %	Integral index
2013	0.0015	0.0001	0.0001	0.0001	0.0002	0.0001
2014	0.0458	0.0042	0.0013	0.0001	0.0005	0.0015
2015	0.0159	0.0520	0.0072	0.0002	0.0003	0.0031
2016	0.0001	0.1913	0.0248	0.0011	0.0000	0.0015
2017	0.0081	0.3749	0.0885	0.0054	0.0001	0.0100
2018	0.0281	0.4431	0.1972	0.0184	0.0004	0.0285
2019	0.2604	0.5308	0.3690	0.0931	0.0131	0.1438
2020	0.5075	0.5993	0.4844	0.1940	0.2080	0.3585
2021	0.6175	0.6351	0.5476	0.3528	0.2365	0.4477
2022	0.6557	0.6640	0.6211	0.5247	0.2365	0.5069
2023	0.6713	0.6871	0.6574	0.6679	0.6624	0.6692
2024	0.6968	0.6968	0.6968	0.6968	0.6968	0.6969

According to: Agriculture in Russia: Statistical collection. Moscow: Rosstat, 2015–2024. Available at: <https://rosstat.gov.ru/folder/11194>

For the convenience of analyzing the results obtained, a graphical visualization of the data was carried out (*Fig. 1*).

The nature of the chart for the period under study confirms the steady growth of the integral index of dairy cattle breeding in the Russian Federation according to all the calculation methods presented. Despite the apparent slowdowns or plateaus noticeable in some years, the overall development vector is positive.

The linear convolution shows a steady sustainable improvement in the index after 2017, and from 2020 to 2024 there has been intensive growth associated with increased government support for the industry and increased import substitution processes.

Geometric convolution is more sensitive to high values of particular indicators, and sharp changes in the index in the period 2018–2024 indicate a qualitative leap in the face of sanctions pressure.

The Harrington desirability function curve shows a relative plateau with acceleration after 2018, indicating a transition from a “bad” state to a “moderate” one and then (after 2023) a “good” level.

Let us determine the sustainability of the industry based on the proposed indices. Weights from the EU experience in assessing the effects of the 2014 sanctions and the FAO Dairy Sustainability Index (2022) were adapted for the calculation. We selected 12 indicators for 85 RF regions for 2022–2023 as the initial data. Factor loadings were determined based on the RSA method and the rotated component matrix (*Tables 8, 9*).

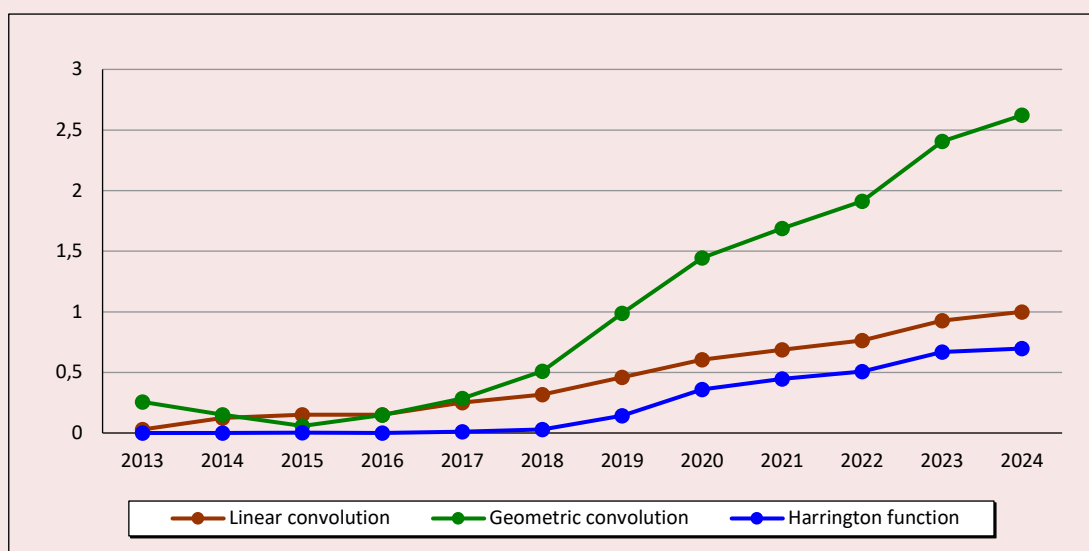
Component 1: “Economic sustainability” (pressures on profitability and government support).

Component 2: “Production capacity” (milk yield and livestock loads).

Component 3: “Market activity” (export burden).

Component 4: “Resource availability” (feed load).

Figure 1. Dynamics of changes in the level of dairy cattle breeding development in the RF, 2013–2024



Source: Regions of Russia. The main socio-economic indicators of cities. 2023: Statistical collection Moscow: Rosstat. 2023; Agriculture in Russia: Statistical collection. Moscow: Rosstat, 2015–2024. Available at: <https://rosstat.gov.ru/folder/11194>

Table 8. RSA results

Component	Proper value	% of the explained variance	Cumulative %	Bec, %
1 Economic	3.85	32.1	32.1	38.9
2 Production	2.97	24.8	56.9	30.00
3 Market	1.76	14.7	71.6	17.8
4 Socio-environmental	1.32	11.0	82.6	3.3

Table 9. Factor loadings (rotated component matrix)

Indicator	Component 1 (Economic)	Component 2 (Production)	Component 3 (Market)	Component 4 (Socio-environmental)
Profitability	0.92	0.15	0.08	0.03
Share of state support	0.87	0.22	0.12	0.09
Milk yield for a cow	0.11	0.94	0.05	0.08
Livestock	0.18	0.89	0.13	0.07
Export volume	0.09	0.07	0.91	0.12
Availability of feed	0.05	0.11	0.14	0.93

Let us calculate the weights:

Component_Weight = (Proper value) / (Sum of the eigenvalues of the selected components)

Economic: $3.85/9.90 \approx 0.39 \rightarrow$ Rationing is up to 30%.

Production: $2.97/9.90 \approx 0.30 \rightarrow 30\%$.

Market: $1.76/9.90 \approx 0.18 \rightarrow 20\%$.

Socio-environmental: $1.32/9.90 \approx 0.13 \rightarrow 20\%$.

Based on the developed methodology and refined weights, we will compile a table of the regions' rating according to the dairy cattle sustainability index (Tab. 10).

Table 10. Rating of regions according to the dairy cattle sustainability index, 2023

Rating	Region	Econ. (30%)	Prod. (30%)	Market (20%)	Soc-env. (20%)	Final index	Sustainability Group
1	Republic of Tatarstan	0.85	0.90	0.75	0.80	0.83	High
2	Krasnodar Territory	0.80	0.85	0.70	0.75	0.78	High
3	Republic of Bashkortostan	0.75	0.80	0.65	0.70	0.73	High
4	Belgorod Region	0.78	0.72	0.68	0.65	0.72	High
5	Voronezh Region	0.70	0.75	0.60	0.65	0.68	Average+
6	Altai Territory	0.65	0.70	0.55	0.60	0.63	Average+
7	Leningrad Region	0.68	0.65	0.58	0.55	0.62	Average+
8	Sverdlovsk Region	0.60	0.65	0.50	0.55	0.58	Average+
9	Kirov Region	0.58	0.62	0.48	0.52	0.56	Average+
10	Rostov Region	0.55	0.60	0.45	0.50	0.54	Average+
11	Novosibirsk Region	0.50	0.58	0.42	0.48	0.51	Average+
12	Omsk Region	0.48	0.55	0.40	0.45	0.49	Average+
13	Tyumen Region	0.45	0.52	0.38	0.42	0.46	Low+
14	Kaliningrad Region	0.42	0.48	0.35	0.40	0.43	Low+
15	Chelyabinsk Region	0.40	0.45	0.32	0.38	0.40	Low+
16	Irkutsk Region	0.35	0.42	0.28	0.32	0.36	Low
17	Amur Region	0.30	0.38	0.25	0.28	0.32	Low
18	Republic of Sakha (Yakutia)	0.28	0.32	0.22	0.25	0.28	Low-
19	Magadan Region	0.25	0.28	0.18	0.20	0.24	Critical
20	Chukotka AA	0.20	0.22	0.15	0.18	0.19	Critical
21	Vologda Region	0.60	0.78	0.70	0.65	0.68	Average+

Source: own compilation.

The presented data demonstrate high indicators for the Republic of Tatarstan (0.83), the Krasnodar Territory (0.78), and the Republic of Bashkortostan (0.73). The main success factors are high profitability (15–20%), over 85% availability of feed, and the availability of developing automated farms and processing plants. The average values for regions with a sustainability index of 0.5–0.7. These territories are characterized by limited export opportunities and moderate dependence on feed imports (30–50%). The recommendations for them include the development of the feed base and the modernization of equipment. The outsiders among the regions with an index value of less than 0.4 are the Magadan Region and the Chukotka Autonomous Area, which are highly dependent on imported feed (> 70%). To achieve optimal results, they need to create logistics hubs and develop greenhouse feed production. The Vologda Region is one of the leaders in dairy cattle breeding: the final index is 0.68, which indicates values above the average level of industry development. After the sanctions imposed in 2022, the region faced problems related to rising production costs and a shortage of imported equipment. However,

active government support measures have helped the industry adapt and achieve record cow productivity. *Figure 2* shows the main indicators of the development of dairy cattle breeding in the Vologda Region.

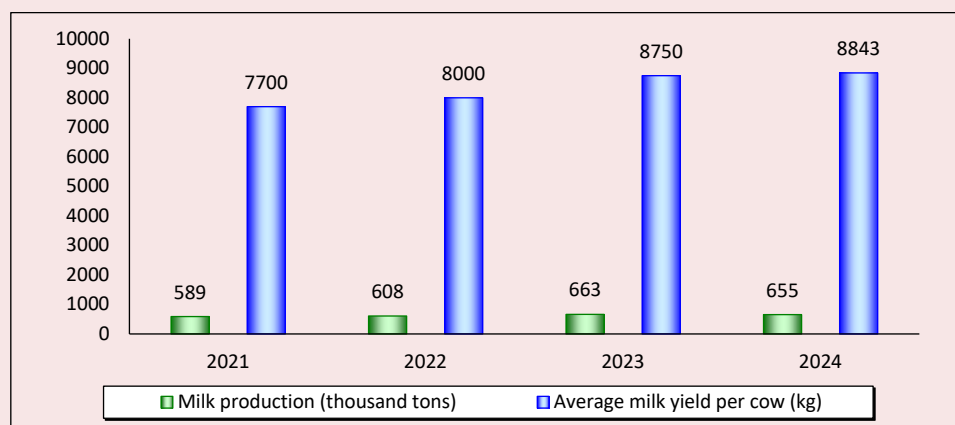
Despite the sanctions, milk production increased by 3.2% in 2022 due to increased cow productivity. The increase in this indicator in 2023 was 9.2% compared to the previous one. In 2024, this indicator will stabilize at a high level and the historical maximum productivity of cows will be reached – 8,843 kg per cow.

Figure 3 presents the cartogram of the distribution of regions according to the sustainability index of the dairy farming industry.

Geographical distribution has shown the best results in the regions of the Central and Southern federal districts, special measures are required in the territories of the Far East and the North.

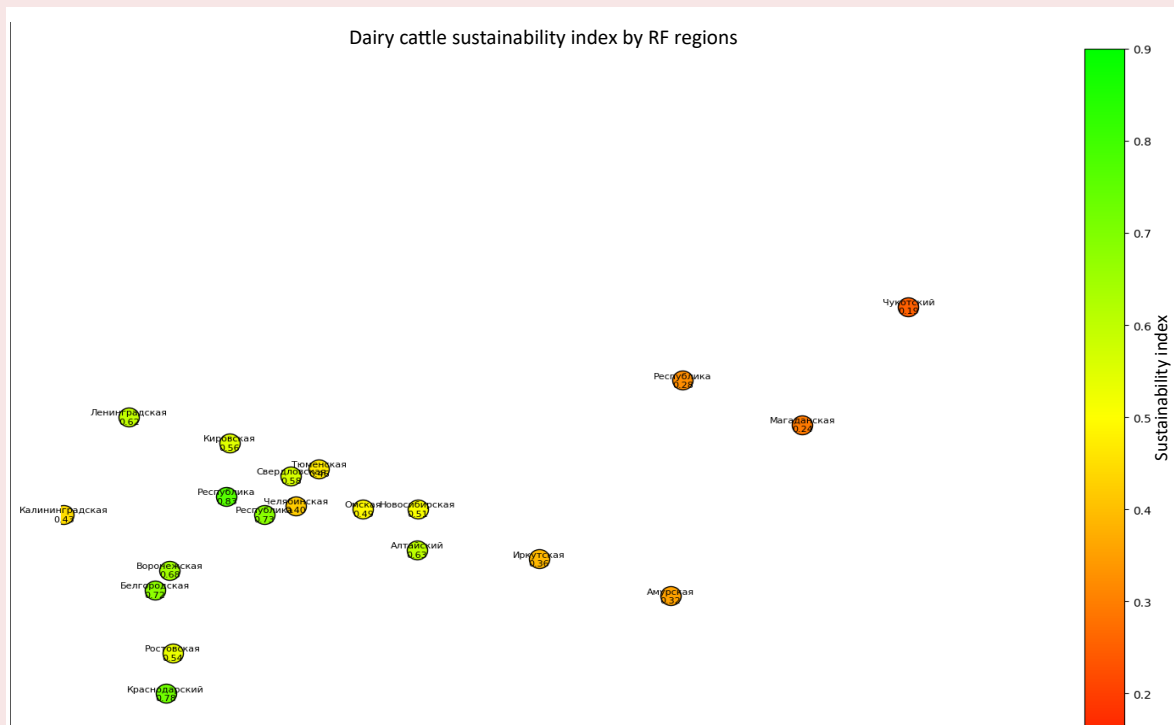
The average sustainability index for 2023 increased by 8.3% (*Fig. 4*). Despite the prohibitive measures from Western countries, the industry is demonstrating successful adaptation in most regions. Territories with diversified economies (Voronezh and Chelyabinsk regions) show minimal changes.

Figure 2. Main indicators of the development of dairy cattle breeding in the Vologda branch for 2021–2024



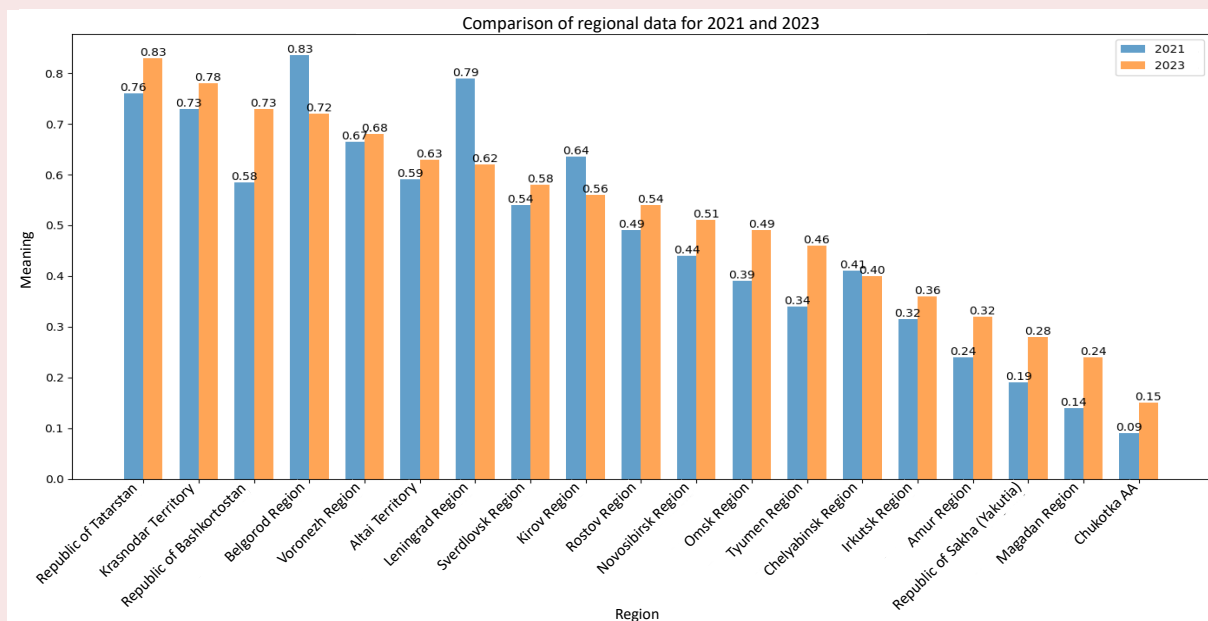
Source: Livestock numbers in agricultural organizations of the Vologda Region: Statistical report. Federal State Statistics Service. Moscow, 2024. Available at: <https://35.rosstat.gov.ru> (accessed: 13.11.2025); About livestock and milk production in the Vologda Region farms: Statistical report. Territorial Body of the Federal State Statistics Service for the Vologda Region (Volgdastat). Vologda, 2021–2024. Available at: <https://35.rosstat.gov.ru> (accessed: 13.11.2025).

Figure 3. Cartogram of the distribution of regions according to the dairy cattle sustainability index for 2023



Source: data from Table 8. Software: Python 3.10, Libraries: Folium 0.14.0., GeoPandas 0.12.2, Matplotlib 3.7.1, Pandas 2.0.3 in the Google Colab cloud development environment.

Figure 4. Dairy Cattle Sustainability Index by the RF regions for 2021, 2023



Source: data from our methodology calculation "Dairy Cattle Sustainability Index".

The forecast of the dairy cattle breeding development will allow the government and business to understand the effects of the processes taking place in the economy and other areas and prepare in advance for the upcoming tasks. Modeling conditions makes it possible to assess the scenario consequences of various options: inertial development, optimistic (easing sanctions and increasing government support), pessimistic (strengthening sanctions and reducing aid).

In the face of increasing external pressure and the need for adaptation, the government, based on the forecast, will be able to justify the amount of subsidies and form support programs. Businesses, in turn, will be able to assess how profitable investments in dairy farming are and what risks should be taken into account in planned investment projects.

In this case, there is an urgent need to develop and apply a forecasting tool that allows taking into account not only the internal dynamics of changes in indicators, but also the impact of key macro-economic regulators on the object under consideration. From the variety of existing analysis methods, we selected the ARIMAX model, i.e. an extended version of moving average autoregression (ARIMA), which, when making a forecast, takes into account not only the internal state of the system itself, but is also able to integrate the influence of controlled environmental factors into calculations (formula 5):

$$Y_t = c + \sum_{i=1}^p \phi_i Y_{t-i} + \sum_{j=1}^p \theta_j \varepsilon_{t-j} + \sum_{k=1}^p \beta_k Y_{k,t} + \varepsilon_t, \quad (5)$$

where Y_t – value of the predicted indicator t ;

c – constant reflecting the average level

ϕ_i – weighting factor reflecting the degree of influence of the previous value on the present;

θ_j – coefficient of the moving average, depending on the previous random disturbances in the previous period;

ε_t – random error of the predicted value at time t ;

β_k – coefficient reflecting the degree of sensitivity of the indicator to changes in the factor.

When constructing the forecast model, special attention was paid to substantiating external regressive factors that have a decisive impact on changes in industry indicators. After conducting a preliminary analysis, the level of sanctions pressure (on a scale of 0–10) and the amount of government support (also on a scale of 0–10) were selected as the basic external factors, since they have a high degree of significance and relevant variability over time. Moreover, sanctions acted in the model as an external destructive factor negatively affecting the pace of development, and government support as a positive indicator compensating for the negative external impact.

The forecast horizon (2025–2030) was not chosen by chance. This period covers the medium-term implementation cycle of the state agro-industrial policy, and a number of key federal programs are planned to be completed by 2030, which will make it possible to correlate the forecast with real budget forecasting tools.

For businesses, the seven-year period coincides with the payback cycles of most investment projects, and investors will have the opportunity to assess the prospects for return-on-investment risks depending on the proposed development scenarios.

Based on the structure presented in the formula, ARIMAX partial mathematical models were constructed, taking into account the dynamics of changes in partial and integral forecast indicators characterizing the degree of dairy cattle breeding development:

– depending on the volume of milk production

Y_t^{milk} :

$$Y_t^{\text{milk}} = 0,9 + 0,76Y_{t-1}^{\text{milk}} - 0,45X_{1,t} + 0,72X_{2,t} + \varepsilon_t; \quad (6)$$

– depending on the average annual milk yield

per cow Y_t^{yield} :

$$Y_t^{\text{yield}} = 170 + 0,85Y_{t-1}^{\text{yield}} - 0,45X_{1,t} + 0,72X_{2,t} + \varepsilon_t; \quad (7)$$

– depending on the profitability of milk

production Y_t^{prof} :

$$Y_t^{\text{prof}} = 2,9 + 0,72Y_{t-1}^{\text{prof}} - 1,7X_{1,t} + 3,6X_{2,t} + \varepsilon_t; \quad (8)$$

– depending on the import of equipment Y_t^{imp1} :

$$Y_t^{\text{imp1}} = 3,2 + 0,64Y_{t-1}^{\text{imp1}} + 2,1X_{1,t} - 2,8X_{2,t} + \varepsilon_t; \quad (9)$$

– to depend on the import of feed and drugs Y_t^{imp2} :

$$Y_t^{\text{imp2}} = 3,7 + 0,81Y_{t-1}^{\text{imp2}} + 2,3X_{1,t} - 4,5X_{2,t} + \varepsilon_t; \quad (10)$$

– to calculate the integral development indicator Y_t^{int} :

$$Y_t^{\text{int}} = 0,94 + 0,61Y_{t-1}^{\text{int}} - 0,032X_{1,t} + 0,057X_{2,t} + \varepsilon_t. \quad (11)$$

Analyzing expression (11), it is necessary to note the following:

– base level of the index is greater than zero, which indicates the internal ability of the system to develop without the influence of external factors;

– value reflecting the degree of influence of the previous value on the next one is 0.61 units, which indicates a fairly high inertia and stability of the industry;

– negative value of the β_1 coefficient (-0.032) confirms the negative impact of sanctions on the development of the industry;

– positive value of the β_2 coefficient (+0.057) indicates the beneficial effect of government support, and since the absolute value is $|\beta_2| > |\beta_1|$, according to our calculations, support is quite capable of compensating for the industry's losses from sanctions.

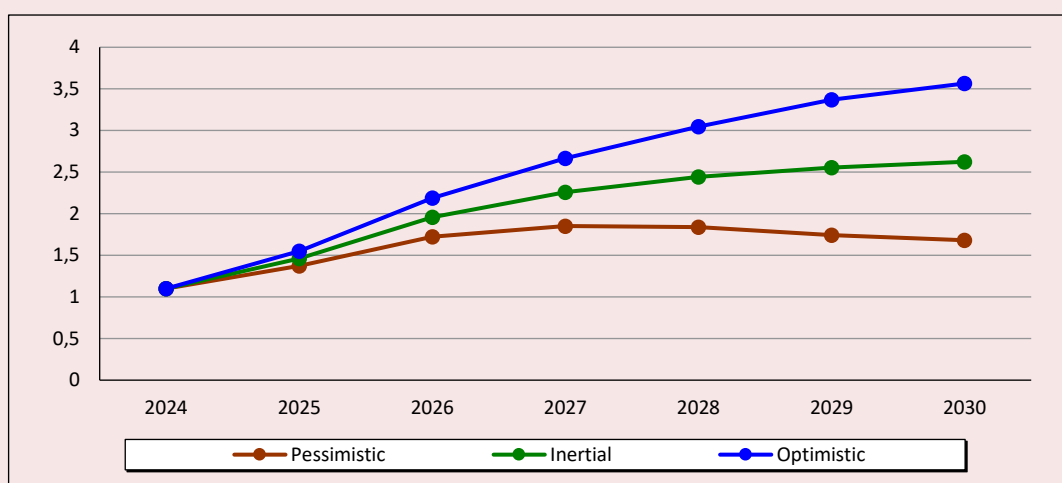
The dynamics of the forecast change in the combined integral index of dairy cattle breeding development was calculated for three scenarios – inertial, optimistic and pessimistic. The unit of measurement is a point (0 points – minimal development; above 3 points – high efficiency). *Table 11* presents the calculation results.

To make the research results clearer and easier to perceive, they were visualized (*Fig. 5*).

Table 11. Combined integral index of development of dairy cattle breeding in Russia, 2025–2030

Year	Development scenario		
	Pessimistic	Inertial	Optimistic
2025	1.373	1.462	1.552
2026	1.724	1.957	2.189
2027	1.852	2.258	2.667
2028	1.837	2.443	3.048
2029	1.741	2.555	3.369
2030	1.682	2.624	3.565

Figure 5. Forecast curves of the combined index of dairy cattle breeding in Russia, 2025–2030



The analysis of the research results allows drawing the following conclusions.

Under an optimistic development scenario involving a consistent easing of sanctions pressure and increased financial support for the industry, the combined integral index demonstrates steady positive dynamics, which indicates the industry's high potential for growth under favorable development conditions.

The inertial scenario, which provides that the parameters of the sanctions pressure will remain at the level of 2024, shows a more moderate increase in the combined integral indicator, which confirms the internal stability of the industry, but practically excludes the occurrence of breakthrough changes in the context of structural challenges.

A pessimistic scenario involving increased external pressure and a reduction or even termination of government assistance indicates a potential stagnation of the industry.

Conclusion

Thus, the sanctions had a mixed impact on the development of dairy cattle breeding in the period 2022–2024. We can identify several trends:

- 1) dependence on sanctions decreased due to stimulation of own feed production (Central and Volga Federal Districts);
- 2) milk exports to the EAEU countries, the Middle East and China increased by 18–25%, especially in the border areas (Altai Territory, Kaliningrad Region);
- 3) in the Krasnodar Territory and Tatarstan, by increasing subsidies, it became possible to fully compensate for losses from sanctions.

However, the negative consequences in the form of a shortage of high-tech equipment, rising costs and logistics services, spare parts, and the emergence of imbalances between regions require additional measures aimed at developing export prospects and shaping the long-term sustainability of dairy farming in the territories.

Table 12. Main directions of overcoming sanctions measures

Type of region	Key issues	Recommendations	Examples of successful measures
Leaders (index > 0.7) Tatarstan, Krasnodar Territory, Bashkortostan	Risks of oversaturation of the local market; dependence on export logistics chains	1. Export diversification (Asian and Middle Eastern countries) 2. Creation of regional brands of dairy products 3. Investments in deep milk processing	Tatarstan: launch of the cluster «From feed to cheese» with a full production cycle; Krasnodar Territory: export development to the UAE through new logistics routes
Average level (index 0.5–0.7) Voronezh, Leningrad, and Sverdlovsk regions.	Shortage of local forage resources; outdated equipment	1. Subsidies for the modernization of farms (up to 50% of the cost of equipment) 2. Development of forage cooperatives 3. Introduction of energy-saving technologies	Leningrad Region: Farm 4.0 program with robotic milking systems; Voronezh Region: creation of 10 feed cooperatives
Laggards (index < 0.5) Magadan region, Chukotka Autonomous Region, Yakutia	Extreme climatic conditions; high logistical costs	1. Development of greenhouse feed farms 2. Special programs «Northern delivery» with state support of transport 3. The use of local feed additives (yagel, fish meal)	Yakutia: experiment on growing hydroponic feed in permafrost conditions; Magadan region: preferential tariffs for the air delivery of veterinary drugs
According to: research results.			

Based on the results and conclusions obtained, recommendations can be proposed to improve the position of each region in the context of ongoing sanctions measures (*Tab. 12*).

Thus, the analysis carried out using various methods of integrated assessment confirms a single vector of movement of Russian dairy cattle breeding – from instability and dependence on imports to sustainability and intensive growth. Despite the initial decline caused by the sanctions restrictions

of 2014–2017, in 2022–2024 the industry was able to adapt due to import substitution, increased profitability of production and increased productivity of animals. The steady significant growth of the integral development indices since 2020 indicates the formation of an independent and effective model capable, with the participation and support of the state, of resisting external pressure and contributing to ensuring Russia's internal food security.

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Subjective Social Status of Russians: Relationship with Property Characteristics



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Abstract. The article analyzes the relationship between subjective status and the level of consumption and volume of property in contemporary Russian society. It shows that key differences in income (the material basis of consumption), sets of durable goods, volume of property, and financial behavior are formed mainly between the subjective lower classes, which constitute a minority of the Russian population (14.5%), and the majority, which includes the subjective middle classes, as well as those who assess their status as high (85.5%). An analysis of the list of durable goods and various types of property made it possible to identify those that have become the generally accepted standard for the population, as well as those that have lost their differentiating power over the past two decades. Relatively new “markers” of subjective status include goods and property related to home comfort (e.g., air conditioners and dishwashers), mobility (foreign cars), and digital inclusion (computers and high-speed Internet access). The differences are even more pronounced depending on the novelty of certain types of consumer goods and property among owners from different status groups. Differences between status groups have been identified in terms of the financial behavior of their members: from wide-spread consumer loans for current needs among the “subjective lower classes” to the investment use of resources among “high-status” groups, while the “middle classes” adhere to a hybrid model. The low differentiating power of housing conditions in the context of subjective status was demonstrated, although ownership of a second apartment is more common among representatives of the subjective middle classes and in the “high-status” group and living in rented accommodation or in cramped conditions is more often associated with low status self-esteem.

Key words: subjective status, status groups, property characteristics, consumption level, subjective stratification, social inequality.

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Subjective stratification and consumption: current state of research

The research on the relationship between subjective stratification and the consumption level has deep theoretical foundations and a rich empirical tradition. Although the term “subjective status” was coined in science in the 1950s–1970s, the prerequisites for its study, including in terms of its relationship with the wealth level and consumption characteristics, appeared in the middle of the 19th century in the works of K. Marx and F. Engels, who pointed out the essential role of consumption and access to certain goods in capitalist society, which have a high symbolic significance in it and become a mechanism of social identification¹.

The idea of the relationship between social status and consumption was further developed in the works of T. Veblen and M. Weber. In T. Veblen’s famous work “The Theory of the Leisure Class”, the relationship between social status and consumption is described in detail and the term “conspicuous consumption” was coined as a scientific concept (Veblen, 1984). It also shows that in conditions of increasing social mobility, property and consumption are becoming the main tools for demonstrating and confirming one’s social status. In turn, M. Weber revealed in more detail the essence of the relationship between social status and consumption in the framework of his proposed multidimensional approach to social stratification, showing through the concept of status groups (one of the stratification dimensions along with economic class and political party) that consumption is not limited only to demonstrating wealth, but is an integral element of lifestyle, which sets the boundaries between status groups based on social prestige (Weber, 2016). The topic was further developed in the works of P. Bourdieu, who linked

consumption styles and cultural capital to the reproduction of class differences (Bourdieu, 1979). The importance of cultural and consumer practices as elements of structural differentiation was also pointed out by D. Goldthorpe in his studies of class mobility (Goldthorpe, 1980).

However, these classical works largely dealt with the relationship between objective status and the volume of property and consumer practices. Instead, the importance of subjective status has increased dramatically, as modern research shows, precisely with the transition of developed societies to the post-industrial stage of development, which is characterized by a profound transformation of the employment structure, accompanied by an increasing role of knowledge and technology, and as well as changes in values and consumption patterns (Bell, 1999; Castells, 2000). In addition, the opportunities for social mobility in the new environment are gradually narrowing, and institutional opportunities are limited.

In this sense, modern research focuses not so much on expanding as on deepening the interpretations of the relationship between the consumption level and subjective status, the construction of which is multidimensional and very complex. This, in particular, was vividly demonstrated in the experiments of L. Festinger. According to them, any self-assessment requires comparing individual’s abilities, results or opinions with those that are characteristic or common among representatives of the individual’s reference group (Festinger, 1954).

Modern studies of the relationship between subjective status and consumption correspond to this position and show, for example, that low subjective status, regardless of real income, correlates with so-called “conspicuous consumption” (Walasek, Brown, 2016). Thus, in the context of social comparison, the consumption level and property volume become not only a

¹ Marx K., Engels F. (2023). Manifest Kommunisticheskoi partii [Manifesto of the Communist Party]. Moscow: Azbuka.

tool for distinguishing one's position, but also a real social marker an individual can be guided by to subjectively achieve a certain status. The work carried out as part of a large-scale Whitehall II² study showed that low relative income and limited consumer opportunities consistently correlate with low subjective status and deterioration in health indicators, even when basic needs are met. At the same time, subjective social status reflects the cognitive average of standard indicators of socio-economic status and it is almost free of psychological prejudice. In this regard, researchers are trying to consider the factors of influence not only of the current socio-economic environment of adult individuals, but also of their past socio-economic experience, including childhood. Thus, research shows that subjective social status in adulthood is the result of a complex developmental process associated with the acquisition of socio-economic self-perception, which is an integral part of subjective social status and includes current and past experiences, as well as individual and family experiences (Ferreira et al., 2018; Lindberg et al., 2021; Varghese et al., 2021).

In the Russian context, characterized by a high level of socio-economic inequality and the consequences of the transformation period, the relationship between subjective status and consumption is becoming particularly acute. Against this background, the works of Russian researchers focus both on the lifestyle features of consumption and its role in the development of social identity, which are beyond the scope of this article, and on how consumption in post-Soviet Russia turned from meeting basic needs into the fundamental mechanism of social differentiation. In particular, researchers analyze how new consumer markets have created the basis for a "new middle class" with a set of benefits which has become

not just an attribute of comfort, but an element of group identity and confirmation of social success. Also, there is an important theoretical premise that consumer practices not only reflect, but also actively shape the Russian social structure, and differences in access to goods and services become visible boundaries between social groups (Radaev, 2005; Radaev, 2025).

The findings of Russian stratification studies, which focus largely on consumption and property volume as criteria for belonging to the middle class (a group that creates a demand for a higher standard of living (Ovcharova, Popova, 2013), also show that for Russians, assessment of their place in society is closely linked to the ability to maintain a standard of consumption perceived as "normal"³ (Pishnyak et al., 2020). Accordingly, the inability to afford this standard set can lead to a decrease in subjective status.

Along with this, the relationship between subjective status and consumption is influenced by the peculiarities of the Russian development model based on the fusion of power relations with property relations (Shkaratan, 2004). For example, self-assessed status can be underestimated due to informal employment, even if incomes are equal (Zudina, 2013). These features and the existing multidimensionality of the social system lead to the fact that not every good, service or other property is perceived by Russians as indicators of achievement, increasing their self-assessment or lowering it in the absence of such property.

In this regard, in Russia there was a noteworthy change in the attitude toward certain types of property and durable goods, for example, cars, which gradually turned from a luxury item into a means of transportation for the mass strata, but their presence still affects the subjective feelings of

² A study of London civil servants used a 10-point self-assessment scale to measure their subjective status.

³ Gorshkov M.K., Tikhonova N.E. (Eds). (2016). *Srednii klass v sovremennoi Rossii. Opyt mnogoletnikh issledovanii* [The Middle Class in Modern Russia. Long-Term Research Experience]. Moscow: Ves' MIR.

Russians (Kononenko, 2011). The situation with housing in Russia is also ambiguous, a significant part of which is inherited rather than acquired through one's own efforts (Zavisca et al., 2021), although the main tool for improving housing conditions for Russians is currently the purchase of housing, which is not affordable to everyone (Kolennikova, 2024a). Thus, as a hypothesis, it can be suggested that even with access to goods that are substantial for the subjective status assessment, it is not only and not so much their availability that is crucial, as their quality and, probably, even their origin and legitimacy.

As a result, in order to develop a discussion about the changing differentiating power of consumption and property for self-determination of an individual's position in the context of a wide consumer choice, partly demonstrated by the data of the last round of RLMS-HSE, the aim of this study was to analyze the relationship of Russians' self-assessment with their consumption level and a set of property characteristics, including its quality parameters available. In particular, we will focus, first, on the peculiarities of differentiation of Russians according to their subjective status, evaluated through individuals' self-assessment of their position on a respect scale. Objective social status measured, as a rule, through a set of specific indicators representing the foremost status scales in society (see, for example, Kolennikova, 2019), will remain outside the scope of this study. Second, we will turn to the analysis of income (as the material basis of consumption) and key items of expenditure in the context of their distribution within groups with different self-assessments of social status. Third, we will assess the dynamics of consumption and property characteristics, as well as analyze their differentiating power in relation to groups of people with different self-assessments of social status. The empirical base is data of the 33rd round (N = 12000) of the Russia Longitudinal Monitoring Survey –

Higher School of Economics (RLMS-HSE)⁴ of the health and economic welfare of the population. To illustrate the dynamics, we also used RLMS datasets from earlier periods with a similar sample size.

Features of the allocation of status groups and changes in their numbers

Subjective status is a scientific construct and includes many empirical indicators that can be measured in different ways. In this regard, the issue of its evaluation in each specific study deserves special attention. In this study, the subjective status was evaluated based on the individuals' self-assessment of their position on a respect scale⁵. This methodology is based primarily on the premise that status (combining both collective prestige and individual respect) is a separate stratification dimension (Weber, 1978), as well as on the generally accepted tradition of measuring subjective status through a comprehensive scale⁶ reflecting not only, for example, financial status, as self-assessments of the position on the rich-poor scale do. It is worth noting that to identify the boundaries of status groups, the interrelationships of self-assessments of one's position on the respect scale with self-assessments of economic and power statuses were considered⁷.

⁴ Websites devoted to RLMS-HSE: <https://rlms-hse.cpc.unc.edu> and <http://www.hse.ru/rlms> (accessed: 20.07.2025).

⁵ This single-item 10-rung scale is often used by researchers of subjective social status in relation to a particular society (in cross-country analysis, single-item scales may not be invariant) and is considered one of the most reliable and valid. This is partly verified and shown in recent methodological scientific papers, see for example (Raudenská, 2024).

⁶ See for example: MacArthur Scale of Subjective Social Status – Adult Version. Stanford University. Available at: <https://sparqtools.org/mobility-measure/macarthur-scale-of-subjective-social-status-adult-version/> (accessed: 08.08.2025).

⁷ For this purpose, statistical significance of these relationships was tested. Spearman's correlation coefficient between self-assessments on the respect scale and economic status was 0.351; between self-assessments on the respect scale and power status it was 0.417. P-value is 0.01 (two-sided tests).

As can be seen from *Table 1*, the higher the individuals' position on the respect scale is, the higher they assess their economic and power statuses and, accordingly, vice versa. However, this principle is not strictly observed in comparison, for example, with economic and power statuses (their mean and median values coincided and were equal to 4 points). Russians often rate themselves on the respect scale higher (the corresponding values were 6 points each). Thus, while the 4-point value of self-assessed economic and power statuses indicates the lower limit of subjective middle classes, in terms of the respect status it is the upper limit of subjective lower classes. This is also noticeable considering the overall distribution of values of this status, when rungs from the first to the fourth are chosen by a minority, which means they are not typical for the mass strata in Russia. In addition, among those who rated their respect status from the first to the fourth rung, over 90% assessed their economic and power statuses similarly (though the average share in Russia of those who estimate these statuses from the first to the fourth rung is about 60%).

Considering the outlined theoretical, methodological and empirical prerequisites, we identified three status groups that significantly differ in their self-assessed positions on the respect scale and are conventionally designated as a group with low status scores (14.0%, those who chose the rungs 1–4), with medium status scores (60.3%, those who chose the rungs 5–7) and, accordingly, high status scores⁸ (25.7%, those who chose the rungs 8–9).

Now, let us take a closer look at the changes in their numbers and some socio-demographic

features, and then move directly to income, the specifics of consumption in these status groups and their property characteristics.

So, considering the dynamics of the transformation of the subjective stratification of Russian society in 1994–2024, attention is drawn primarily to the change in the number of groups with low status scores, which almost halved in the period from 1994 to 2004 (*Fig. 1*). This happened against the background of intense transformations in the Russian social structure and the still open channels for social mobility. In the following decade (2004–2014), as positive economic developments continued, the group's share continued to decline. However, from 2014 to 2024, there was a slight rollback and its number increased, although it does not exceed the level of 2004. In part, this may indicate a reaction to the stabilization of the social structure model that has developed as a result of the transformation period (Tikhonova, 2021a; Tikhonova, 2021b).

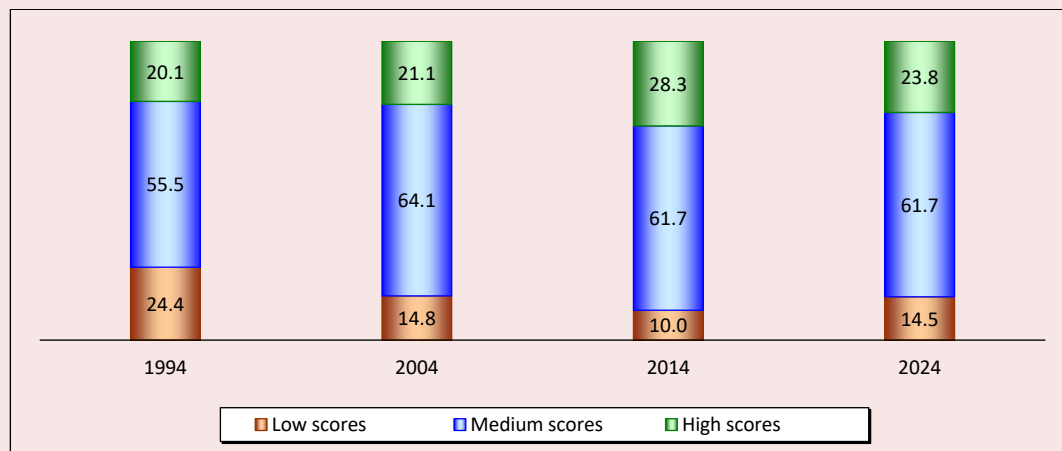
The group with medium status scores is the most numerous and stable throughout the entire period. The considerable fluctuations in its number were from 1994 to 2004, and since then the changes have been insignificant. This supports the thesis that it is the conditional “middle classes” that form the structural core of subjective stratification (Kolennikova, 2024b). It is noteworthy that the subjective middle classes should not be confused with the middle class, including the subjective one, since a stable identity with this group is crucial to correspond to it, which, according to available research, Russians do not yet have (Tikhonova, 2021a).

⁸ The names of the groups are conditional and are given solely to interpret the empirical data under consideration. The term “status groups” is used as a synonym for the term “groups with different subjective statuses” and only partially reflects the classical definition of “status groups” by M. Weber.

Table 1. The relationship of subjective status values based on the respect scale with self-assessments of economic and power statuses*, 2024, %

Question	Answer options	Another ladder with 9 rungs, where at the bottom are the people who are not respected at all, and at the top are those who are very respected. Which of the nine rungs are you personally on today?									Share in the sample
		LOWEST RUNG	2	3	4	5	6	7	8	HIGHEST RUNG	
Imagine a ladder with 9 rungs, where the beggars stand at the bottom, on the first rung, and the rich are at the top, on the ninth rung. Which of the nine rungs are you personally on today?	LOWEST RUNG	76.5	20.0	7.9	3.8	1.6	1.4	1.1	1.7	1.8	2.4
	2	8.8	57.3	29	18.2	8.5	6.4	5.2	4.1	4.5	8.6
	3	5.9	12.7	44.7	31.7	22.8	19.6	16.1	13.8	10.3	19.9
	4	8.8	5.5	13.4	38.6	23.9	32.9	25.8	19.9	19.1	25.5
	5	-	2.7	3.7	6.6	39.5	21.9	26.6	25.4	28.3	25.4
	6	-	0.9	1.0	1.2	3	15.9	14.6	17.9	16.6	11
	7	-	-	0.2	-	0.7	1.8	9.9	11.4	13.4	5.5
	8	-	0.9	-	-	0.1	0.1	0.8	5.6	3.8	1.4
	HIGHEST RUNG	-	-	-	-	-	-	-	0.2	2.4	0.2
Imagine a ladder with 9 rungs, where those having no rights stand at the bottom, on the first rung, and those with great power are at the top, on the ninth rung. Which of the nine rungs are you personally on today?	LOWEST RUNG	97.1	20.4	9.2	3.2	3.1	3.3	2.4	2.9	4.8	3.9
	2	2.9	67.6	26.4	20.9	11.3	9.3	6.2	4.7	3.6	10.2
	3	-	8.3	57.1	29.9	20.3	16	12.4	11.7	6.9	17.5
	4	-	1.9	4.7	41	20.4	24.1	18.9	14.6	14	20.2
	5	-	0.9	1.5	3.9	42.2	25.5	26	21.6	23.9	25.2
	6	-	0.9	0.5	0.5	2.1	19.9	18.3	18.4	12.9	12.1
	7	-	-	0.5	0.5	0.5	1.7	15	16.4	14	7.5
	8	-	-	-	0.2	-	0.2	0.8	9.2	11.8	2.6
	HIGHEST RUNG	-	-	-	-	-	-	-	0.4	8.2	0.7
STATUS GROUPS	Total	0.4	1.1	4.2	8.8	21.7	18.0	22.0	16.2	7.6	100
		LOW SCORES			MEDIUM SCORES			HIGH SCORES			
* The darker the table cell, the higher the corresponding indicator, and vice versa. Compiled based on: RLMS-HSE.											

Figure 1. Dynamics of the number of groups with different subjective statuses (status groups), 1994–2024, %



Calculated based on: RLMS-HSE.

The dynamics of the number of the group with high status scores deserves special attention. On the one hand, it increased significantly from 1994 to 2014. On the other hand, the upward trend was no longer recorded in the following decade, instead, there was a downward trend. The decrease may be related to the general trend of “leveling off” the position of population masses (Mareeva, 2024), and to the increase in social inequality⁹. As a result, narrowed routes for prestigious positions are reflected in the subjective assessments of Russians.

To sum up, there are two trends in the dynamics of status groups in Russia: the group with medium status scores has stabilized while the shares of conditional bottom and top groups fluctuated with varying intensity in different periods. This indicates a high dependence of the extreme segments of the stratification pyramid on socio-economic transformations and the institutional environment.

In this context, the analysis of the consumption level and property characteristics is particularly interesting considering not only their differentiating power, but also the question what material opportunities, as well as specific sets of property, correspond to today’s “normality” and how this standard has changed in the last two decades.

Before proceeding to these issues, we will describe the profiles of the represented status groups in order to understand the role of key factors that affect, among other things, the consumption level and property characteristics of their representatives.

An analysis of the correlation dynamics between subjective status and socio-demographic characteristics in 1994–2024 shows that the set of significant factors is relatively stable, but their hierarchy is changing (*Tab. 2*). Subjective status is better connected with educational level and profession: after 2000s when their link was not so

⁹ Inequality in Russia has almost reached “pre-sanctions” levels. Available at: <https://www.rbc.ru/economics/07/03/2025/67c96f139a794702ed62e69a> (accessed: 08.08.2025).

Table 2. Dynamics of relationships of subjective status assessments with various socio-demographic characteristics, 2003–2023, points

Feature	Spearman's correlation coefficient with subjective status (in absolute values)			
	1994	2004	2014	2024
Education	0.137	0.070	0.097	0.134
Occupational group	0.110	0.097	0.120	0.133
Presence of subordinates	0.097	0.078	0.131	0.129
Monthly individual income	0.050	0.089	0.140	0.108
Ranked in descending order of coefficients for 2024. Compiled based on: RLMS-HSE.				

clear (at the time of the active formation of a new structures of social positions) it has strengthened again by 2024. This may indicate a gradual restoration of the value of institutional features for the stratification position, although they are not decisive for the subjective status, which, in general, corresponds to the peculiarities of the relationship between the subjective and the objective.

It is also noteworthy that in the 2010s, the relationship between subjective status and power (measured through the presence of subordinates) has significantly increased and it is still at approximately the same level. This may reflect the perception of managerial positions as one of the key and consistent objective criteria of social prestige. At the same time, the relationship between subjective status and income fluctuates dramatically, which may reflect the instability of the economic context, in which income turns out to be a less reliable marker of a subjective social position than education, profession and power.

In general, these correlation dynamics between subjective status and socio-demographic characteristics correspond to the overall European picture, where income and education also correlate with subjective status (Lindemann, Saar, 2014). The main difference of the Russian dynamics is its

greater variability over a relatively short period of time. This reflects both the period of rapid transformations of the Russian social structure and its gradual stabilization, as well as the peculiarities of the etacritic (or neo-etacritic) model of Russian society, according to which symbolic and structural resources strengthen their relationship with Russians' self-assessment influencing their position on the scale of respect.

These trends of profiles of groups with different subjective statuses suggest that the relationship of subjective status with property and consumption in Russia is indirect: income does not directly affect status, but influences its perception through accumulated material resources and forms of consumption, serving as symbolic confirmation of education and profession. It can be assumed that in the Russian context, property is more closely related to the perception of status than income. Combined with the growing importance of education and profession, this may indicate a "hybrid model" where self-assessment of one's own position is formed on the basis of institutional achievements, while consumption and property act as confirmatory, demonstrative practices or an essential part of an individual's status identity. Now, let us look at these issues in more detail.

Income and expenditure as markers of subjective status

First, we will turn to the dynamics of absolute indicators of individual income, which for the majority of Russians is wages (considering working people) and social transfers (considering non-working people)¹⁰.

The most remarkable thing about income as the primary consumer base for different status groups is the spread of its values between those who characterize their status as low and, conversely, high. Despite the general trend of a significant excess of mean and median incomes in the group with high self-assessed status in comparison with the national average and a corresponding downward deviation in income values in the group with low self-assessed status, the gap between these indicators remains extremely small and ranges from 1.2-fold in 1994 to 1.4-fold in 2024 (*Tab. 3*).

This is also noticeable when considering the dynamics of the number of income groups¹¹. From

1994 to 2024, there was a gradual “compression” of income distribution extremes and concentration of population majority in the “medium income zone”, including in the context of the status groups under consideration (*Fig. 2*). This suggests a homogeneous consumption structure and a reduction in opportunities for demonstrative distancing directly through income.

However, there are still dissimilarities in income and subjective perception of status in the context of income. Nevertheless, they are expressed primarily in the different probability for representatives of each status group to fall into the low-income category or stay in the middle-income group.

To sum up, the relationship between subjective status and the level of material security in Russia is becoming “flatter”, although the group with low status scores still faces increased risks of poverty, and those who assess their status as high have comparatively frequent access to relatively high income.

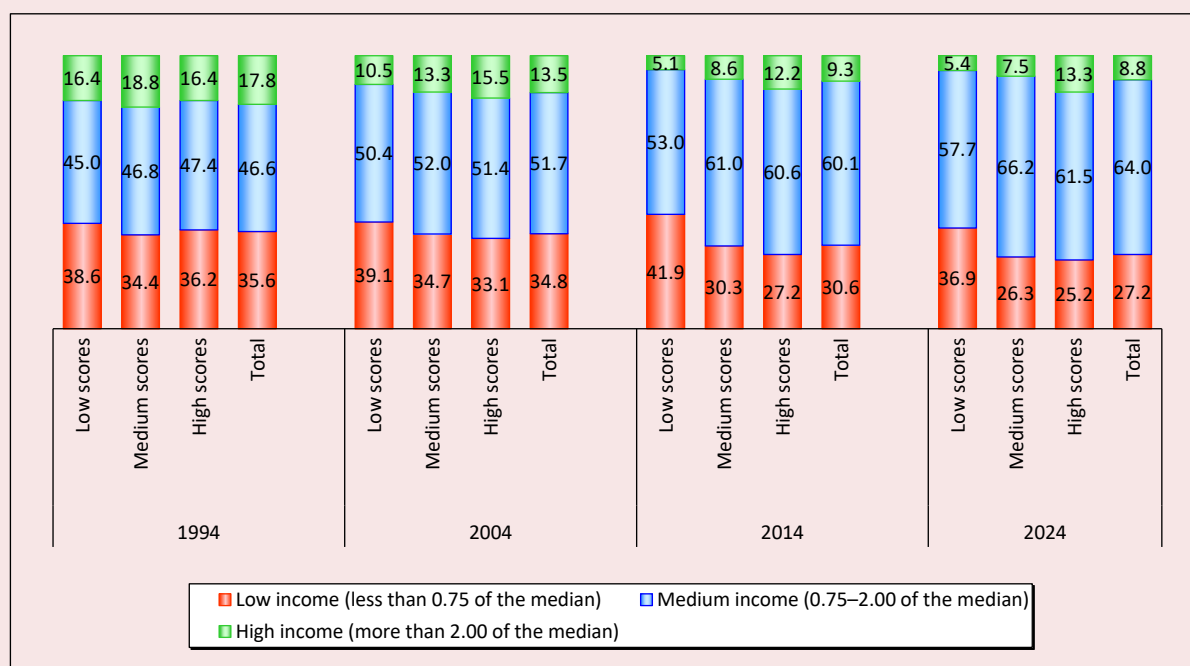
Table 3. Dynamics of the mean and median level of individual income in groups with different self-assessed subjective status, 1994–2024, rubles

Status scores (self-assessment)	1994	2004	2014	2024
Individual income (mean)				
Low scores	227193.0	4364.6	18597.3	40053.2
Median scores	276921.4	5316.3	21714.3	49740.1
High scores	268620.6	6088.5	26168.9	55169.9
<i>Sample average (for reference)</i>	<i>265620.9</i>	<i>5384.8</i>	<i>22651.6</i>	<i>50109.6</i>
The gap between groups with high and low scores, -fold	1.2	1.4	1.4	1.4
Individual income (median)				
Low scores	150000.0	3200.0	15000.0	35000.0
Median scores	190000.0	4000.0	18000.0	41000.0
High scores	180000.0	4100.0	20000.0	45000.0
<i>Sample average (for reference)</i>	<i>180000.0</i>	<i>4000.0</i>	<i>19000.0</i>	<i>40000.0</i>
The gap between groups with high and low scores, -fold	1.2	1.3	1.3	1.3
Compiled based on: RLMS-HSE.				

¹⁰ Rosstat revealed the income structure of the poorest and richest Russians. Available at: <https://www.rbc.ru/economics/12/01/2024/659eb1429a79470c7c9a19c0> (accessed: 08.08.2025).

¹¹ Median income is used as a typical standard of living. This version considered regional income inequality, and used the regional median of individual incomes to identify three income classes.

Figure 2. Dynamics of the number of people from different income classes depending on their subjective status, 1994–2024, %



Compiled based on: RLMS-HSE.

These features are also revealed in the context of the financial behavior of representatives of different status groups. First of all, this concerns saving activity – it is more characteristic of groups with high subjective status (24.2% versus national average 19.6% and 14.6% among the subjective lower classes). In the last month before the survey, they managed to save a relatively large amount (26,001 rubles versus national average 23,617 rubles) than representatives of the subjective lower classes (18,123 rubles) and the middle classed (23,507 rubles), although the gap in this parameter remains relatively small as well. Moreover, credit exposure of different status groups does not differ considerably, despite the fact that representatives of the group with low subjective status are slightly more likely to take out loans and have them¹².

However, the difference is noticeable considering types of loans applied for by representatives of different status groups. For example, representatives of the group with low subjective status compared to other groups are more likely to buy goods on credit, probably to provide a supplement to their current consumption level. Moreover, the share of people taking out loans to buy houses among them is several times lower than among representatives of the subjective “middle classes” and Russians with high subjective status (*Tab. 4*). Also, this group has the highest percentage of student loans, although in general this type of loan is not popular among Russians. It can be assumed that such a deviation is an attempt by some of the members of this group to invest in the children’s or their own future in the hope of positive changes.

¹² Over the past 12 months, 7.2% of Russians have taken out loans (the corresponding proportions were: 8.5% among Russians with low subjective status, 7.1% among Russians with medium status, and 6.9% among Russians with high status). At the time of the survey, 21.5% of Russians had loans (the corresponding proportions were: 21.5% among Russians with low subjective status, 21.7% among Russians with medium status, 20.8% among Russians with high status).

Table 4. The prevalence of loans by purpose among Russians with different subjective statuses*, 2024, %

Type of loan	Status scores (subjective assessment)			Sample average (for reference)
	Low scores	Medium scores	High scores	
Consumer loan in a bank for any purpose	40.2	41.3	36.4	40.0
To buy something in a shop	32.5	22.9	28.6	25.8
To buy a car	17.9	23.6	21.4	22.2
Mortgage to buy a house, real estate	4.3	10.3	12.3	9.7
To pay for a service in a company	5.1	2.4	6.5	3.8
Student loan	2.6	1.4	1.3	1.6
* The highest values in the row are highlighted in grey. Compiled based on: RLMS-HSE.				

Against this background, Russians with a high subjective status demonstrate an investment model of using loans. Among them, the share of mortgages to buy a house is high. This indicates not a lack of money for living, but the perception of such investments as a tool for building assets. In addition, this group has the lowest percentage of those with consumer loans without a specific purpose. This model of financial behavior is consistent with the relatively high saving activity of this group. To sum up, this group members' consumption primarily has goals, including long-term ones, and acts as a tool for improving their well-being.

The most popular group with a medium subjective status demonstrates a hybrid and the most active model of financial behavior. On the one hand, they have the opportunity to combine strategies to supplement the current standard of living with longer-term consumer goals. On the other hand, due to the high credit activity compared to other groups, it creates quite high financial risks.

Now, we will take a closer look at some of the expenditure items of Russians with different subjective statuses, which deepen the conclusions about consumer patterns and consumer activity levels of different status groups. In general, the structure of expenditures not typical for most Russians is not very diverse. Spending on supplementing the current standard of living (keeping pets, buying cosmetics and perfumes), as

well as investments in children's education, costs on attending cultural events, loan and tax payments are relatively common. Medical expenses, mortgages (probably due to their limited availability), adult education (a rather alarming signal in the context of constantly changing labor market requirements), and insurance payments are less common.

All this indicates inequality not only and not so much on the basis of income, but rather on the availability of various opportunities for the accumulation of social and cultural capital. It means that, though status groups are quite similar in terms of their income, they use it differently, which is partly determined by the self-assessment of their status, and partly influences it. The key differences are recorded between the aggregate majority (groups with medium and high subjective statuses) and the minority, who assess their status as low (*Tab. 5*).

To summarize, subjective low position on the "social ladder" is indeed fraught with difficulties in terms of compliance with the generally accepted status norm both in terms of income and involvement in effective models of financial behavior that allow not only supplementing the current standard of living, but also to increase intangible capabilities, as well as in consumer practices that have not only more diverse but also more long-term goals. At the same time, a high subjective status is not at all a confirmation of "isolation" and a qualitatively different standard of living, but rather indicates

greater confidence (in comparison with a group whose representatives rate their status as medium) in their abilities not only to sustain current needs, but also to build up additional assets. Now, we will look at how these patterns, identified in relation to income, financial behavior, and expenses, are consistent with data on various consumer assets¹³ of Russians, taking into account their subjective status.

Property characteristics and housing conditions of various status groups

All the property and durable goods available for analysis within the framework of the RLMS

toolkit in terms of their prevalence among Russians can be roughly divided into three zones. The first of them includes products that have become a common standard and are available to at least half of the population, regardless of their self-assessed status. These are goods, the presence of which in itself does not significantly differentiate the Russian population and does not mark an objective or subjective social status. Nevertheless, first, some of these goods are relatively less common among the subjective lower classes, and second, there are small differences in

Table 5. The prevalence of monthly expenditures on goods and services among Russians with different subjective statuses*, 2024, %

Expenditure item	Low scores	Medium scores	High scores	Sample average (for reference)
Pets keeping	32.2	37.3	39.3	37.0
Cosmetics and perfumes	24.9	31.1	34.4	31.0
Payment for children's classes in preschool institutions, schools, extracurricular activities, private lessons, tutors, including gifts to teachers	21.2	26.7	24.7	25.5
Tickets to theaters, circuses, movie theaters, concerts, amusement parks and other entertainments	18.7	23.8	24.3	23.2
Loan repayment	17.1	17.0	17.6	17.2
Taxes on real estate and transport, licenses, fees for registration of documents (except taxes on income and land)	11.0	16.8	15.3	15.6
Dental treatment and prosthetics (excluding the purchase of medicines)	8.2	11.2	8.4	10.1
Treatment, examination in polyclinics, outpatient clinics (excluding the purchase of medicines)	6.5	7.7	8.6	7.7
Repayment of the mortgage	4.7	6.1	7.1	6.2
Insurance payments for life, health, car, home, etc.	4.1	6.5	6.3	6.1
Payment for adult family members' classes in various activities, courses, and teachers	3.8	6.2	5.9	5.8
Treatment and examination in inpatient medical institutions: hospitals, clinics (excluding the purchase of medicines)	5.3	5.6	5.2	5.5
* The question was: "Has your family spent money on ... in the last 30 days?" The question was asked in relation to 23 items of expenditure, 12 were selected for analysis. Due to the low differentiating power, 3 items typical of the majority of Russians and 8 items reported by no more than 3–5% of the population are excluded from the analysis. The highest values in the row are highlighted in grey. Compiled based on: RLMS-HSE.				

¹³ The analysis focuses primarily on consumer assets (which are not profitable, but require maintenance), although it is possible that some types of such assets may have a dual purpose and, under certain conditions, turn into investment assets.

the mean age of the available set of such common goods¹⁴, which decreases as they move from low assessments of their own status to high ones (Tab. 6).

The exception is access to high-speed Internet, the mean duration of use of which is highest among those who rate their status as medium (9.1 years versus 8.6 in groups with low and high self-status scores), and the median duration is lowest in the group with high self-status scores (8.0 years versus 9.0 in the other two status groups). In other words,

Russians from the low subjective status group started using high-speed Internet earlier than those who rate their status as high. This is probably due to, first, the popularity of high-speed Internet among young people (for example, 83.5% of those aged 18 to 24 and only 54.5% of those aged 55 and older have this technology)¹⁵, and second, due to the fact that youth representatives aged 18–24 are relatively more common among those who give low estimates of their status (10.2% versus 5.2% in the group with high estimates)¹⁶.

Table 6. Property and durable goods among representatives of different status groups*, 2024, %

Property and durable goods	Low scores	Medium scores	High scores	Total
Flat-screen TV – plasma or LCD	92.2	94.9	95.3	94.6
Automatic washing machine	92.0	95.0	94.8	94.5
Microwave oven	76.6	82.8	85.7	82.6
Refrigerator with no frost function	73.3	82.6	83.2	81.4
Desktop computer or laptop	64.6	73.6	77.7	73.3
High-speed Internet access	55.9	71.2	75.8	70.1
Passenger car of foreign make	22.8	36.0	40.6	35.2
Cable TV	32.7	32.6	38.9	34.1
Separate freezer	21.5	26.9	31.1	27.1
Adult bike	25.3	25.7	28.1	26.2
Russian passenger car	19.9	23.6	22.6	22.8
Satellite dish	18.0	22.5	22.6	21.9
Air conditioner	8.0	20.1	26.1	19.8
Dacha or other house, part of a house, garden house	16.3	20.4	18.6	19.4
Lawnmower	12.2	18.4	19.3	17.7
Another apartment or part of an apartment	8.8	13.0	12.8	12.4
Low-speed Internet access	17.4	11.3	11.4	12.2
Dishwasher	7.0	10.2	12.6	10.3
Truck	1.5	2.9	2.8	2.7
Motorcycle, motor scooter, motorboat, speedboat, snowmobile	1.9	2.0	3.2	2.3
Tractor or mini tractor	1.9	2.3	2.6	2.3
Electric scooter	0.9	1.3	1.8	1.3

*Durable goods that are prevalent among at least half of the Russian population are highlighted in gray, goods of no more than 3% of the population are highlighted in pink. The indicators that deviate significantly from the national average downwards (by more than 3–5% statistical error) are highlighted in red, and those that deviate upwards, respectively, are highlighted in blue.
Compiled based on: RLMS-HSE.

¹⁴ The mean age of a set of goods, including a TV, a washing machine, a microwave oven, a refrigerator (no frost), a computer or laptop, was 8.7 years across the sample. Respectively, among Russians with low status scores, this indicator was 9.1, for the medium group it was 8.7, for the high group it was 8.6. The duration of high-speed Internet access was not considered in these values and was analyzed separately.

¹⁵ Spearman's correlation coefficient was 0.245. The significance at 0.01 is two-sided.

¹⁶ Although the variables of age and subjective status do not show a significant correlation.

The second zone includes goods and property that Russians have but that are not typical for the majority of them, which means that they have a relatively high differentiating power and influence subjective status assessment, if there are significant deviations between groups. These include, first of all, foreign cars, which clearly distinguish those who assess their status as high (40.6% of representatives of this group own them against 22.8% of the subjective lower classes, while the mean age of cars in the first group is lower – 9.4 versus 10.8 years). In this sense, the subjective status is marked both by the very fact of owning a foreign car and by its novelty.

This zone also includes goods related to providing a comfortable lifestyle: separate freezers, air conditioners, lawnmowers and dishwashers, which are relatively more common among representatives of groups with high subjective status and less common among those who assess their status as low. So far, these goods can be classified as markers of subjective status, since the differences between the groups are quite noticeable, including in terms of the mean age of the set of these goods¹⁷, but their availability is gradually increasing in all status groups. For example, in 2013, 15% of Russians with high status scores had air conditioners and 6.4% of those who rated their status as low. The corresponding shares for that period for freezers were 16.0 and 9.9%, for lawn mowers – 12.7 and 7.8%, for dishwashers – 4.3 and 2.5%.

The third zone includes rare goods that no more than 1–3% of Russians have. These items are not in mass use, but they have niche significance, probably related to lifestyle or, in part, professional activity. These include trucks, water transport, tractors, and electric scooters. They are prevalent in the group

with high and medium scores and less so in the group with low scores.

The situation with electric scooters is unique: if we look at the analysis of not only their availability, but also the mean age, it is the highest among electric scooter owners with medium and high subjective status scores (2.8 years and 2.5 years, respectively) than in the group of Russians with low social status scores (1.8 years). This probably indicates that representatives of subjective “middle classes” and groups with high status scores have become the first buyers of this relatively new technology for Russians, while those who rate their status as low are slower to engage in such consumer practices.

The situation with real estate is also original, it is characterized by the minimal difference in ownership between the analyzed groups. This is especially true for dachas and houses. It is also small considering the mean age of such property – dachas and houses’ mean age exceeds 20 years in all groups, and among owners from the high-status group, it is the highest and is 24 years. The mean age of additional apartments is lower, but its range is not significant in different status groups (from 15 to 16.5 years), although the presence of such apartments is still significantly less common among those who assess their status as low, and in this sense, a second housing still strongly affects the likelihood of subjectively striving for higher rungs of the social ladder. Thus, the presence and age of additional real estate do not sharply divide the status groups under consideration, although there is a differentiation in the presence of a second apartment between them. This may be caused both by the cultural specifics of Russia (dacha is a multifunctional attribute of Russian life, combining opportunities for leisure,

¹⁷ The mean age of the set of goods, including a freezer, a dishwasher, a Russian passenger car, a foreign passenger car and an air conditioner, was 8.7 years across the sample. Respectively, among Russians with low status scores, this indicator was 9.1, for the medium group it was 8.7 and for the high group it was 8.6. Moreover, with regard to the median age of this set, a more pronounced dynamics was recorded and the corresponding indicators were 7.8 years in the sample in total, 7.4 years among those who rated their status as high, 7.7 in the group with medium scores and 7.8 in the group with low scores.

gardening, and interaction with nature), and the fact that such property is transmitted by heredity (especially in the case of a second housing) and its ownership is long-term.

High stability of real estate assets is also observed considering housing conditions of groups with different subjective statuses. Thus, over 90% of their representatives live in their own housing. The most common type of housing is a separate apartment (over 60% of Russians live in them, regardless of their subjective status), and individual houses are the next most popular. Living in part of an apartment or part of a house is rather an exception for the Russian population, although representatives of the group with low subjective status scores are slightly more common among the latter (8.6% versus 6.3% on average). Despite the fact that in the vast majority of cases, the owners of the housing in which they live are household members, among those who do not live in their own housing, those who assess their status as low are relatively more common (10.3% versus 8.0 on average in the sample).

There are also small differences in housing sizes among representatives of different status groups, but

some of them are noteworthy. *Table 7* shows that the largest total area of housing is typical to the subjective “middle classes”, and in the group with high subjective status scores it is slightly lower. In part, as a check on the RLMS data shows¹⁸, this may be explained by the desire of people with high self-assessed status to live in large cities, where housing is more expensive and, as a rule, more compact.

Considering housing area, we see, on the one hand, a fairly uniform distribution of its median values, which indicates the existence of a “basic standard” of living conditions. On the other hand, however, the group with medium subjective status scores shows the maximum average value of this indicator. It is also interesting that number of living rooms is slightly higher among the subjective “middle classes”. This may be indirectly affected by the peculiarities of household composition. Thus, although there is no direct relationship between subjective assessments of marital status and the number of family members, the last two variables demonstrate a high correlation with the level of consumption¹⁹. Based on this, it can be assumed that official marriages and large families²⁰ are more

Table 7. Characteristics of the main housing of Russians with different subjective statuses, 2024, %

Question	Value	Low scores	Medium scores	High scores	Total
What is the total usable area in your family's apartment (house), including living rooms, kitchen, bathroom, hall, storage room, etc.?	<i>Mean</i>	61.7	65.0	62.5	63.9
	<i>Median</i>	54.0	57.0	56.0	56.2
What living area does your family have? How many square meters is it?	<i>Mean</i>	41.6	45.3	42.8	44.2
	<i>Median</i>	36.0	38.0	38.0	38.0
How many living rooms does your family have?	<i>Mean</i>	2.5	2.7	2.6	2.7
	<i>Median</i>	2.0	3.0	2.0	3.0
Compiled based on: RLMS-HSE.					

¹⁸ Although the “type of settlement” variable does not have a significant statistical relationship with the subjective status variable, it does have a significant relationship with the level of consumption, which increases as the population of the settlement increases. Given that Russians with high subjective status scores tend to have higher levels of consumption, it is possible that the type of settlement indirectly affects self-perceived social status. However, further research is needed to confirm this hypothesis.

¹⁹ Pearson’s correlation coefficient between marital status and the total amount of property and durable goods was 0.258. Spearman’s correlation coefficient between the total number of family members and the total amount of property and durable goods was 0.416. Correlations are significant at 0.01, two-sided.

²⁰ The number of which will exceed the median of 3 people.

numerous among Russians with medium and high estimates of their status, but due to the latter's desire to move to large cities, their housing conditions are somewhat inferior. However, this hypothesis needs additional verification. Nevertheless, although the differences in housing conditions between status groups are poorly expressed, the leading position in terms of area is occupied not by the group with high scores, but by the subjective "middle classes". This indicates both that housing conditions in Russia do not always directly correlate with subjective status, and their dependence on cultural, regional, and demographic factors (Kolennikova, 2024a).

Conclusion

In modern Russian society, which has made the transition from the model with the large number of subjective outsiders typical of the transformational period of the 1990s to a more stable and complex system of perception of subjective well-being (Tikhonova, 2018; Sushko, 2025), consumption and property, as shown by the conducted research, become important factors reflecting not only objective characteristics of an individual's position, but also his or her subjective place in the society.

With the current structure of subjective stratification by respect, with the dominance of subjective middle classes, a significant proportion of subjective "upper classes" and a comparative small number of subjective lower classes, the basic consumption model dominates in Russian society. It includes, first of all, the availability of durable goods in the household such as a flat-screen TV, a washing machine, a refrigerator, a computer (or laptop), a microwave oven and high-speed Internet access, which have practically lost their differentiating function, becoming a generally accepted standard of living accessible to the vast majority of the population, including Russians who rate their status as low. However, when we move from the analysis of simple availability to the qualitative characteristics of the mentioned goods or less common types of

property and durable goods, significant differences between status groups still appear.

The old markers of subjective status are being replaced by new ones related to access to digital technologies, convenience and mobility. A computer or laptop, high-speed Internet access, an air conditioner, and, in particular, a foreign passenger car are now significant indicators of subjective status, and the "gaps" between groups with subjective low and high status scores in these parameters turn out to be very significant. Not only the fact of ownership is crucial, but also the "novelty" of the analyzed product or property, which is especially noticeable by the mean age of cars (primarily foreign brands).

This is complemented by the analysis of different status groups' financial behavior, which demonstrated significant variability in the management models of available resources among these groups. Consumer loans aimed at supporting the current standard of living is more common among those who rate their status as low, which indicates a short-term planning horizon and limited resources. For representatives of the group with high subjective scores, loans become an investment instrument to purchase expensive assets, including real estate. Their financial behavior in general, including higher savings activity, is strategic in nature and is aimed at increasing the resource base. The conditional subjective "middle classes" demonstrate a hybrid, but also the riskiest model, they actively use loans to support the current standard of consumption, without forgetting about investments in health, education of children and real estate. However, this puts them in a vulnerable position during periods of economic instability. Thus, financial practices actively reproduce and deepen the existing status inequality, which is reflected, among other things, in self-assessments.

These conclusions correspond with data on the role of income in status self-determination, which

do not fully explain the differences, although the incomes of the group with high subjective status scores are on average higher than in the other two groups, but the gap with those who assess their status even as low is not dramatic. Income turns out to be an even less reliable marker of a subjective status than education, profession, and the presence of power. This indicates the development of a “hybrid model” of stratification, where institutionally fixed achievements (education, profession) presuppose their symbolic confirmation through certain consumption patterns. Property and access to certain services (for example, paid education for children, cultural leisure) are visible evidence of social success, legitimizing a higher status in the eyes of both the individual and his or her environment. Nevertheless, in modern Russian conditions, status groups in the context of their property and consumption level are rather divided into the group with low subjective status and the cumulative majority of the subjective middle and high “classes”. Representatives of the high subjective status group do not differ dramatically in terms of the range of durable goods they have and property, but rather they manage it differently based on longer-term goals.

This is partly confirmed in the context of the analysis of housing conditions of different status groups, which, in addition to the peculiarities found, correspond to the general Russian specifics, when the presence of a dacha or a second house (unlike in many Western societies) is not a clear marker of high (at least subjective) status. At the same time, owning a second apartment has a significant differentiating force and is more common among representatives of the subjective “middle classes” and in the high status group. In general, although housing conditions show a tendency toward standardization, living not in one’s own housing or in cramped conditions is more often accompanied by low subjective status.

Thus, the consumption level and property characteristics are among the key mechanisms for constructing and reproducing the subjective social structure in modern Russia. In conditions where objective economic indicators (particularly income) do not always directly correlate with a person’s self-assessed position, differences in consumer practices and property characteristics form visible boundaries between social groups, making abstract social inequality partly tangible.

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Informal Employment: Problems of Work-Life Balance



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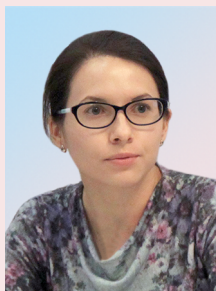
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Abstract. The study analyzes the impact of flexible work schedules on the job satisfaction and behavioral strategies of platform workers with minor children, aiming to identify the advantages and risks of this form of employment for achieving a work-personal/family life balance. The relevance of the research is driven by shifts in employment structures associated with the development of the digital economy and the growing popularity of platform work. The central idea posits that while flexible schedules can facilitate a better balance, they also carry risks of self-exploitation and the systematic blurring of boundaries between work and personal life. The research is based on qualitative in-depth interviews with platform workers who have children, conducted using video conferencing software. The empirical data reveal a paradox of flexibility inherent in this employment form. A flexible schedule allows workers to autonomously regulate their workload; however, according to boundary theory, this very autonomy leads to a systematic breakdown in the segmentation of life domains. The constant pressure stemming from the need to monitor orders and maintain reputational capital fosters self-exploitation, manifested in working non-standard hours (late evenings, weekends) and even while ill, which in turn provokes family conflicts and the “always on” phenomenon. Gender differentiation in approaches to organizing an optimal work schedule is identified, reflecting the gender contract: women use flexibility to reduce paid working hours in favor of domestic responsibilities, whereas men, bearing financial responsibility, intensify their labor. From the standpoint of rational choice theory, workers prefer a high degree of autonomy (the ability to independently regulate time and adapt it to family needs) over the institutional stability of traditional employment, perceiving a standard schedule as “slavery”. Possible strategies to mitigate risks and improve working conditions for platform workers are proposed.

Key words: fixed schedule, flexible schedule, work-life balance, platform work, boundary theory, rational choice, gender contract.

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Introduction

An individual allocates their time among various activities in pursuit of both personal and societal goals. Certain standards exist for the distribution of work and leisure time, such as the length of the working day and breaks for recovery. These norms were developed under conditions of mass industrial production when the majority of workers were employed full-time, enabling the efficient use of production capacities (Razumova, Serpukhova, 2022). The transition to a new technological paradigm, accompanied by technological changes, digitalization, the introduction of artificial intelligence, shifts in the sectoral structure of employment, and changing demands on workers,

affects the distribution of time between work and other activities. The duration of education and professional retraining is increasing, and work becomes not only a source of income but also an opportunity for self-development and self-realization¹. According to a Harvard Business Review report for 2025, employees with a healthier work-life balance are 21% more productive and 35% more engaged in their work². This data underscores

¹ Work-life balance statistics that leaders need to know in 2025. Available at: <https://www.runn.io/blog/work-life-balance-statistics> (accessed: 20.10.2025).

² Employee work-life balance in 2025: A comprehensive guide. Available at: <https://vouchfor.com/blog/employee-work-life-balance> (accessed: 20.10.2025).

the importance of studying the work-life balance as a foundation for successful human functioning.

Among labor factors, one of the primary parameters hindering the harmonization of work and personal/family life is the work schedule. A “rigid” or “fixed” schedule (Pichuk et al., 2024), dictated by production necessity, legislation, and the employer, is established without considering workers’ personal needs and capabilities, forcing them to adjust the rhythms of their personal lives to the rhythms of work time. Moreover, practices of working overtime beyond official hours persistently exist in many enterprises and organizations; these are unofficially encouraged and often not compensated by the employer. Workers with overtime are more likely than those without it to report difficulties in combining work and personal/family life (Burhanova, Baimurzina, 2025, p. 294). Providing a convenient work schedule for employees with family responsibilities is an effective social measure that helps maintain balance but is rarely practiced in enterprises and organizations. According to a 2024 study, such a measure is available at work for only 10.9% of respondents (2020 – 8.3%); among them, the share of respondents with a good work–personal/family life balance was 87.5% (2020 – 83.6%) (Burhanova, Baimurzina, 2025, pp. 297–298).

An alternative to the fixed (rigid) schedule is the “flexible” work schedule – a work and rest regime that allows individuals themselves to determine how much and when to work, taking into account personal and family interests and needs. This schedule is made possible by platform employment – obtaining orders for work through digital internet platforms (Chernykh, 2021). It is platform employment that will determine the vector of labor market development in the digital economies of Russia and other countries (Yanovskaya, 2025, p. 80). The hypothesis of the study is that a flexible schedule acts as the most important factor positively influencing the work–personal/family life balance

of platform workers, but at the same time, it carries risks that negatively affect life balance, which are difficult or impossible to eliminate or overcome.

Literature review

The issue of work-life balance first appeared in foreign scientific and business literature in the 1970s and was associated with the increasing number of working women facing difficulties in combining family and professional responsibilities (Tartakovskaya, 2019). By the mid-1990s, it had firmly entered business and scientific discourse because, in conditions of high competition and a neoliberal economy, a work culture emerged that demanded high engagement and practically unlimited working hours from people, leading to the intrusion of work duties into personal life, including through electronic means of communication.

An analysis of Russian and foreign publications, corporate reports, as well as dissertation research leads us to the conclusion that, to date, a unified approach to defining, understanding, and conceptualizing the phenomenon of work-life balance has not been established in scientific discourse, nor have universally accepted approaches to its measurement been formed.

In a number of studies, work/family/leisure balance describes the desired state of a person who successfully combines various aspects of their life (“balance” here implies an already achieved equilibrium). For example, work–family balance is understood as “an equal degree of individual involvement in and satisfaction with work and family roles” (Greenhaus et al., 2003). However, the concept of balance can also be used to describe the specific actions a person takes striving for that balance, or types of social policy aimed at supporting workers with family responsibilities (Tartakovskaya, 2019). In the article (Greenhaus et al., 2003), the components of balance are operationalized: time balance, involvement balance, and balance of satisfaction with various aspects of life.

Within the framework of a meta-analysis, diverse personal and organizational factors affecting the quality of balance are examined, concluding that long working hours, overload, and job insecurity are negatively associated with balance, while extroversion, psychological capital, work autonomy, schedule control, and coworker support in the workplace positively influence it (Vaziri et al., 2022).

J.H. Greenhaus and T.D. Allen emphasize that balance is not a static state but a process that requires constant attention from both employees and HR managers (Greenhaus, Allen, 2011).

Russian (Razumova, Serpukhova, 2022) and foreign (Miri-Lavassani, Movahedi, 2014; Wayne, 2017) authors summarize and compare various theories applicable to the analysis of work/family balance (theories of segmentation, compensation, integration, conflict, boundaries, roles, time allocation, spillover) and methods for measuring the work-family balance (methods of subjective assessment, component approaches, an approach based on measuring role involvement). For example, in the work (Greenhaus et al., 2003), the measurement of work-family balance is carried out by determining the degree of role involvement through an assessment of psychological (satisfaction from fulfillment and involvement) and temporal (satisfaction from time allocation) costs of engagement in the studied life spheres (Razumova, Serpukhova, 2022).

It should also be noted that researchers place different emphases when analyzing the second component of balance. Most often, it concerns the optimization of professional and family responsibilities, although for a number of workers, balancing work with their hobbies and leisure is more important. In the first case, it is the ratio of various duties in a worker's life, and in the second, the focus is on work and rest (leisure). Sometimes the term "personal life" is used, which includes both family responsibilities and time off from them. There is a range of research that deals not

with balance but with work-family conflict (Weer, Greenhaus, 2024).

Questions about the significance of a flexible, i.e., self-determined, work and rest schedule for workers, how it affects life, and the possibility of achieving a balance between work and personal spheres, are raised in Russian (Diallo, 2025; Suleimenova, Orynbekov, 2025; Mukhamadiarova et al., 2024; Tartakovskaya, 2019) and foreign (Greenhaus et al., 2003; Wilson et al., 2007) studies.

The ability to independently manage time, plan work hours, and have a flexible work and rest schedule were significant positive aspects of work for employees (both men and women) who had remote employment during the coronavirus pandemic (Tonkikh, Chernykh, 2022; Tonkikh et al., 2024). However, combining work and family with such a schedule and employment, according to respondents' assessments, "is not always easy and has its nuances" (Tonkikh et al., 2024, p. 369). For freelancers, a high level of autonomy in managing their own time with a flexible (free) schedule not only has obvious advantages but can also lead to self-exploitation, manifested in working non-standard hours: late evenings and nights, on weekends, holidays, when other people are resting (Strekov, Shevchuk, 2019).

Methodology, empirical base

The object of the study consists of workers obtaining orders on the digital platform "Profi.ru" (platform workers) who have minor children. The data collection method was a qualitative focused interview conducted using video conferencing software. The fieldwork was carried out in June–August 2025. Interview invitations were sent to workers registered on the platform with at least one year of experience, while controlling for place of residence; those who responded were interviewed³. A total of 70 respondents were interviewed,

³ Belanovsky S.A. (2023). The representativeness of qualitative surveys. *Interaktsiya. Interv'yu. Interpretatsiya*, 15(1), 69–94. DOI: <https://doi.org/10.19181/inter.2023.15.1.4>

of whom 35 have minor children (*Fig. 1*). They constituted our sample. The sample includes 21 women and 14 men; 22 are married, 13 are not.

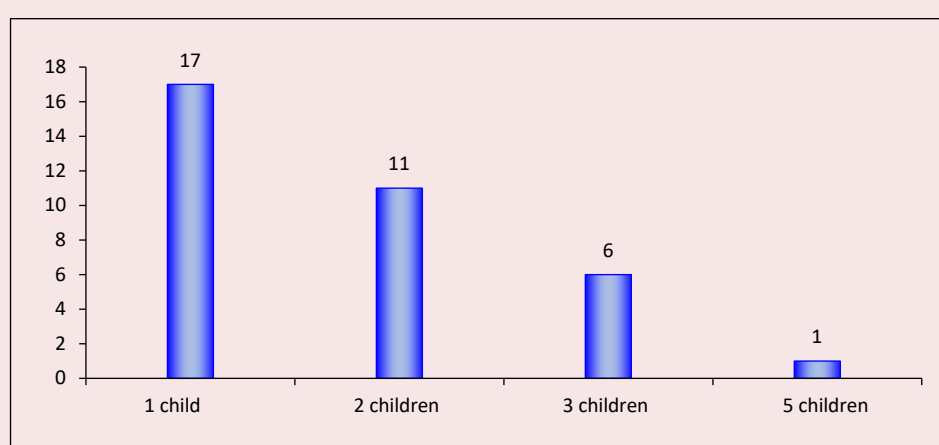
Places of residence of the respondents: Moscow, Krasnogorsk (Moscow Region), Saint Petersburg, Yekaterinburg, Ufa, the village of Buzdyak (Republic of Bashkortostan), Novosibirsk, Krasnodar, Stavropol, Sochi, Aksay (Rostov Region), Rostov-on-Don.

The education level of the respondents is presented in *Figure 2*.

The article utilizes the theoretical tenets of boundary theory, gender contract theory, and rational choice theory, as well as the concept of downward adaptation of expectations.

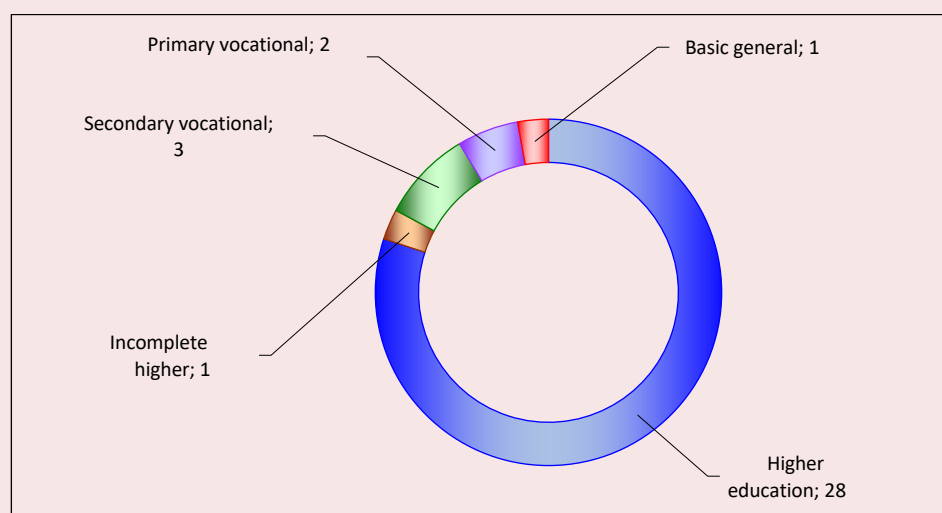
The limitations of the study consist of the small sample size and the focus on platform workers. We also recognize that respondents' answers could have

Figure 1. Distribution of respondents by number of children, persons



Source: own compilation.

Figure 2. Distribution of respondents by education level, persons



Source: own compilation.

been influenced by the phenomena of “downward adaptation of expectations” and the “survivor effect”, which we cannot control. The concept of downward adaptation explains how individuals, faced with limited structural opportunities, lower their expectations to maintain a level of subjective satisfaction (Chernykh, 2025).

Research results and discussion

One of the research questions is how respondents characterize their work schedule, whether it is truly “flexible”, and what determines their work and rest time. What opportunities does platform work offer for family people with minor children?

First and foremost, the interviews showed that working on the platform allows for self-regulation of employment, and for the respondents, a “flexible” work schedule represents a paramount value.

“...I regulate my own workload... Meaning, if I feel like taking a job today, I take it. If I don’t feel like it, I don’t. So, accordingly, I had enough of the allotted time, so to speak, to rest properly. Obviously, with official employment you get paid annual leave, that exists. As for the Profi.ru platform, here I regulate my own employment. ... This platform gives me, let’s say, a very flexible way to handle tasks from clients. ...And I also know that in two weeks I might want to take a vacation or just rest. Accordingly, I can plan all that. That’s why I really like this platform. I find clients myself, we discuss all the details, come to an agreement, and so on. There’s no kind of strict urgency, like if you took a job today, you absolutely must finish it and file a report by tomorrow. That doesn’t happen here” (male, 39, electrician, Yekaterinburg, 1 child).

“Overall, my work schedule is completely flexible. I’m the one calling all the shots. I can work more or less, it’s totally up to me” (male, 47, business consultant, Moscow, married, 3 children).

“I choose a schedule that suits me, I adapt things... I’ve set a trend for myself where I don’t adapt my life to work, I adapt work to my lifestyle”

(female, 35, web designer, Krasnodar, married, 1 child).

“I can adjust my workday anytime and pick the projects I actually like” (Female, 37, photo/videographer, Sochi, married, 2 children).

“I wanted a flexible schedule, to choose my own working hours” (female, 34, stylist, Saint Petersburg, single, 2 children).

“That’s why I’m hoping to build up my presence more over time and work more via the platform. Because platform work is exactly what allows you to maintain that work-life balance” (female, 36, tutor, musician, Aksay, Rostov Region, married, 2 children).

“That feeling of being able to plan your own time? It’s priceless” (female, 37, lawyer, Moscow, 1 child, on parental leave, left an office job).

A key opportunity of platform work is the ability to work fewer (or more) hours than in a full-time office job. Interviews show this opportunity is typically used by women, who reduce their working hours to fulfill family responsibilities.

“I have three kids, so I only work on weekdays. And I don’t work that many hours. That’s another limitation – not as many orders, like I said. Because I can only work in the mornings, 2 PM at the latest. After that, I have other things, my other ‘job’ – the kids, picking them up from kindergarten” (female, 34, copywriter, Yekaterinburg, married, 3 children).

“I set my own schedule. For example, today I’m completely free until 3 PM. I have time for myself, for the gym, and now I’m giving you this interview. So there’s enough time. And I can adapt – my son’s starting first grade soon. I already know roughly when his classes will be, so the time I drop him off at school, I can block off for client appointments. Then there’s after-school care, extracurriculars, and so on” (female, 30, brow stylist, Sochi, single, 1 child).

“So I’d like to shift the focus a bit. Cut back here, increase there instead. Also because the kids are growing, but they still need attention. It’s not

just about dropping them off, picking them up, feeding them – you also need to talk, discuss things, go to parent-teacher meetings, go on trips. All that is necessary. And when you're swamped at your main job from start to finish, you just can't manage – your child, roughly speaking, becomes a latchkey kid, right? They let themselves in, feed themselves. So that's exactly why maintaining this balance is easier on Profi.ru" (Female, 36, tutor, musician, Aksay, Rostov Region, married, 2 children).

"To be honest, I have a small child. I'm not aiming to work from dawn till dusk... Like I said, I have a little one, so my focus isn't really on working a lot. I've delegated the breadwinning to my husband – I told him, 'You go earn, I'll work for pleasure'" (female, 35, cosmetologist, masseuse, Yekaterinburg, married, 2 children).

"Well, in winter, when the kids are here or there... you know, or mostly when I need to stay home with a child – God forbid if they get sick – then I don't take any orders at all" (female, 44, cleaner, Saint Petersburg, married, 3 children).

Conversely, men more often speak about the opportunity to work more, since "the pay depends directly on how much time you put in" (male, 50, driver, married, 1 child).

This finding about different gender strategies is also confirmed by large-scale empirical studies with big datasets (Oshchepkov, 2020).

Platform work allows tailoring one's schedule to one's family's rhythm, choosing the time of day that works best – accommodating children's school hours, daycare schedules, and the availability of other family members.

A respondent who is a lawyer works from 9 AM to 2 PM daily while her child is at school: "...that's why this schedule suits me perfectly. Basically, I get my work done while my child is in school, and then after noon I can... focus on my own things at home" (female, 37, lawyer, Moscow, 1 child).

Another respondent, a graphic design specialist, quit her job to freelance with a flexible schedule and

gets orders through a platform because "it's easier to work calmly from home than to commute to an office on a fixed schedule every day. It's just more compatible with having a child" (female, 39, graphic designer, Saint Petersburg, married, 1 child).

The absence of a fixed schedule is articulated as a special value by family-oriented female respondents: "I don't have a set, concrete schedule. If, say, my child is sick and I'm home with him, I dedicate myself to him almost completely. When he naps, I sit down to work. Sometimes I also work night hours" (female, 35, web designer, Krasnodar, married, 1 child).

Vacation time can also be aligned with family needs:

"The summer break is definitely tied to school... to the kids' school holidays. Yeah, exactly. It's all tied to that (*the two breaks the respondent allows himself per year*), absolutely right. Either to summer break, winter break, or the May holidays" (male, 47, business consultant, Moscow, married, 3 children).

"As a rule, I plan my time off around my husband's vacation schedule" (female, 35, web designer, Krasnodar, married, 1 child).

Respondents highlight the high importance of being able to connect with family under platform employment conditions: "Thanks to this work, I spend more time with my family, especially with my son. Because when I worked at a community center, I had a completely irregular schedule, with constant concerts and trips. I'd leave at 8 in the morning and come back at 8 or 9 in the evening, sometimes even later. So I barely saw my child at all. Now I have the opportunity to, say, go for a walk with him on weekdays, or spend weekends with the family. It's important. Or rather, it's very important to me" (male, 36, event host, Ufa, married, 1 child).

Interview participants also noted the opportunities for geographic mobility that platform work provides in achieving a work-family balance.

"It's the ability to work on the go, from anywhere – on transport, on a plane, on a train, in

a taxi. If you have some free time and there's an order you can complete, you can do it and get paid" (female, 37, photo/videographer, Sochi, married, 2 children).

"...For instance, my husband's parents live outside the city, about 100 kilometers away. They're quite elderly now and need care, so we visit them often. I just take my laptop, we go, and I can work right there. I'm nearby, I can help with something, and it doesn't interfere at all with combining things. There are even times when, say, we go away for a weekend somewhere – out of town, to the mountains, to the seaside. I can easily take my laptop with me and work, so to speak, while on vacation. That doesn't bother or stress me out in the least" (female, 35, web designer, Krasnodar, married, 1 child).

A "flexible" schedule, which allows one to regulate their own employment, can be a motive for leaving office-based salaried work and choosing platform employment: "I can't see myself as an office employee anymore... I don't think I'm ready to go back to office work now..." (female, 37, lawyer, Moscow, 1 child, on parental leave after leaving an office job).

"You know, I don't like the schedule: five days a week, eight hours or more, it's really tough. And now I have a flexible schedule" (female, 34, stylist, Saint Petersburg, single, 2 children).

"I decided a long time ago that it's hard for me to work in a clinic setting, in a team, for a number of reasons" (female, 52, masseuse, Moscow, single, 2 children).

"I wasn't scared (*to leave my office job*), because it coincided with me going on maternity leave. I went on leave and started trying myself out as a tutor" (female, 43, primary school tutor, Moscow, married, 3 children).

The respondent, working as a self-employed individual, when asked about her willingness and desire to get a job in an organization, demonstrated

an extremely categorical position: "Honestly, no. I set my own schedule, I can give myself sick leave, vacation, a day off. I don't depend on anyone, and no one depends on me. I get exactly what I want, and that suits me. The salaries they offer here, even in a resort city, are peanuts for 10–12 hours of work. When I sometimes think, maybe I should get a regular job, it seems like they pay, but then I start counting the working hours and the daily rate, and I realize I'd rather take on one client, even two, and I won't burn myself out as much. It's enough for me, in principle. So, I don't want a regular job at all. Not for any position, not for any salary" (female, 30, brow stylist, Sochi, single, 1 child).

An even more categorical opinion about salaried work followed: "It's like prison. Or slavery" (male, 42, design and installation of engineering systems in private houses, plumber, Shchelkovo, Moscow Region, married, 2 children).

However, the "flexible" schedule of platform work entails not only significant advantages but also risks. These risks limit the freedom to choose working hours and volume, turning a flexible schedule into an inflexible one, or at least making it only conditionally free. As the interviews show, a major influencing factor is the desire to maintain a certain income level, which necessitates building and sustaining a client base.

The first risk is that during the initial period on a platform, or when completely switching from office/production work to obtaining orders via a platform, workers are forced to build up their client base. This, in turn, forces them to intensify their workload: they must constantly monitor service requests, respond to them, and secure orders in a competitive environment. The following respondent comments illustrate this scenario. A woman providing accounting services, who previously had her own office-based business, fully transitioned to offering services through a platform and is currently very intensively building her client base.

Interviewer: And in terms of your time, did your schedule change (after closing the office)?

Respondent: ...Yes, I started spending more time on this platform. I have to respond constantly. Well, I'm practically always sitting there, checking if there are new requests. I monitor them all the time, and where I'm qualified in that matter, I submit my proposal.

Interviewer: So it turns out you didn't become more free; on the contrary, you started spending more time?

Respondent: Well, basically, yes. I knew what I was getting into, as they say, because I need to increase my number of clients. Until I build up a client base, I'll be glued to this platform. Only when I'm swamped with clients, as they say, can I put things on hold. For now, I'm taking on everything I can get.

"Right now I'm in a pretty intense mode, these two months... I get up in the morning and start monitoring those requests right away. And until I go to bed, as they say, I keep checking periodically – are there new requests or not – while still doing my actual work. And, accordingly, if there are requests and the client agrees, I start working with them right away" (female, 48, accounting services, Saint Petersburg, 3 children).

The respondent regretfully shares her story that the current insufficient number of clients on the platform prevents her from fully transitioning to this form of employment: "I wish this could be my main activity because I really like it. But since I don't have that many clients right now, I can't dive into it completely yet" (female, 30, stylist, Novosibirsk, married, 1 child).

Some professionals are initially forced to lower their prices on the platform to attract clients and build their base: "Well, I guess it also depends on how ready a specialist is to make concessions. Because the first clients I took were either... well, for free, or for really laughable money, but specifically

to get the person interested, so they would come to me and leave a review, so that later I could promote my services somehow. In principle, I could afford it at that time, and so I built up a certain number of reviews fairly quickly, maybe in 3–4 months. It was visible that orders were completed, that people were satisfied, and working became much more comfortable" (female, 37, lawyer, Krasnogorsk, Moscow Region, in a common-law marriage, 1 child).

At the same time, respondents note that later, having built their client base and positive reviews, they gain the opportunity to raise their prices: "Now I've gathered a few reviews from satisfied people, and I can even afford to be a bit choosy. Look how good I am. And you want to hire me on the cheap? No way" (male, 34, system administrator, Ufa, married, 2 children). This, accordingly, can allow them to reduce the number of hours worked and make greater use of the advantages of a flexible schedule.

The second risk is that the work schedule, namely the number of hours worked, is largely determined by the desired income level. The absence of a "fixed salary" and the desire to earn as much as necessary for living dictate more active behavior on the platform – a constant search for and completion of orders. This is especially relevant for married men fulfilling the role of "family breadwinner", as well as for single women with children. Thus, a respondent engaged in business consulting, working, as he reported, 4–5 hours a day (20–25 hours a week), considers this number of hours insufficient because, with such a workload and the existing rates for orders, it is impossible to achieve the desired earnings: "If you could work 20 hours a week and earn a sufficient amount of money, then that (20 hours a week) might be enough. There's no proper ratio between the number of clients and the income level. ... To reach the figures I'm interested at with the same rates, my workload

shouldn't be 4 hours a day, but 6 hours a day" (male, 47, business consultant, Moscow, married, 3 children).

A man combining platform work with his main employment notes that he is about 80% satisfied with his schedule because "naturally, you have to push the family aside a little, not to have the opportunity, but to provide for that family financially, to give them everything they need. Spending more time now, today, on work duties is essential so that tomorrow... our whole family can sit down at the table and eat not just bread and butter, but also have tea to go with it" (male, 38, voice-over artist, Sochi, married, 1 child).

Male respondents quite often, even when having main employment outside the platform, demonstrate a desire to maximize their free time with platform work: "The thing is, I work a 'two-on, two-off' shift pattern at my main job. I work two days, well, two days at home. On the two days when I'm working, I can also go see a client in the evening or morning, or do something remotely for someone before my shift. And those days when I'm off from my main job, I naturally pack them full of work on Profi.ru" (male, 41, system administrator, Rostov-on-Don, married, 1 child).

The third risk is performing orders on weekends and holidays, driven by the fear of losing clients and/or the desire to earn money and maintain a certain income from work. It should be noted that quantitative research shows the prevalence of such practices, which is not exclusive to platform employment. Almost every second Russian worker has to work on weekends or holidays at least once or several times a month (Kozyreva et al., 2024, p. 36).

Almost all respondents spoke about working on weekends and holidays, and the following dialogue is typical.

Interviewer: Do you only work on weekdays or on weekends as well?

Respondent: No, sometimes on weekends too.

Interviewer: What about holidays?

Respondent: Sometimes. And on top of that schedule, sometimes something urgent pops up, like a client asking me to do something ASAP (female, 37, lawyer, Moscow, in a common-law marriage, 1 child).

Sometimes workers try to stick to their own rule of not working on weekends, but it's not always possible: "Well, clients do ask (*to work on weekends*), but I mostly don't work on weekends" (male, 47, business consultant, Moscow, married, 3 children); "I communicate directly with the client, so we agree on everything (*the deadlines*). And they're real people. Obviously, if there's some urgency, an emergency, then... It gets done" (male, 39, electrician, Yekaterinburg, married, 1 child); "...Lately, I've been trying to stick to a weekday schedule and take a couple of days off, at least one day off. But my work, as I said, is mostly in the evenings, at night. If there's some urgent order, then I work non-stop" (female, 39, graphic designer, Saint Petersburg, married, 1 child).

Even if orders aren't fulfilled on weekends, there might still be time spent monitoring service requests on the platform: "Now I've just stopped working on Saturdays and Sundays. ... But I still check for orders on Saturday and Sunday. Because orders come in on weekends, you can just message the client..." (male, 47, business consultant, Moscow, married, 3 children). And although this respondent doesn't perceive such activity as work ("I consider it work when you're already working directly with a client. But just responding to an order isn't work. I just clicked a button..."), it still requires time, effort, and technical capability. The vast majority of those surveyed demonstrate a similar position: "It doesn't matter if it's a weekend, doesn't matter if it's a weekday. If I don't have any requests, I'm checking for them" (female, 35, web designer, Krasnodar, married, 1 child); "On Profi.ru, I can even check for some orders during my vacation, write to clients,

and we just schedule for when I'm back in town, that's all" (female, 34, copywriter, Yekaterinburg, married, 3 children).

The next risk is working while sick or in poor health, which is also dictated by fears of losing a client or the need to earn a desired income: "To be honest, I've only canceled (*lessons*) once when my dog got lost and I had to look for her. If I feel bad, have a fever, I still conduct lessons at any time. I even gave lessons when I was in the maternity hospital" (female, 32, marketer, teacher of English and journalism, Sverdlovsk Region – work region, resides in Nizhny Novgorod, married, 1 child). Respondents work while sick because "sometimes deadlines are tight, you have to deliver urgently. Sometimes you need the money..." (female, 39, graphic designer, Saint Petersburg, married, 1 child).

The negative practice of working while unwell is also characteristic of office/production workers; in those settings, it can be driven not only by the desire not to lose income but also by the unspoken norms of the employer or team. Almost every second person works through illness due to their work situation; returns to work before fully recovering; every third person – skips doctor visits because of work (Burhanova, Baimurzina, 2025, p. 291).

All respondents interviewed spoke about having to work while unwell. Here is one of the dialogues.

Interviewer: Does it happen that you have to complete orders despite feeling unwell, being sick, for example, and you work anyway?

Respondent: It happens, of course, yes.

Interviewer: Why do you do it?

Respondent: If I've taken an order and promised the client to complete it by a certain deadline, then I will.

Interviewer: So you don't want to lose clients, your reputation comes first?

Respondent: Yes, of course (female, 37, lawyer, Moscow, in a common-law marriage, 1 child).

It was precisely reputation that platform workers cited, explaining the need to work while sick: "And even if you're sick, you still take as many pills as you can and go to work. Because there's no other way, reputation is too important" (male, 36, event host, Ufa, married, 1 child); "As my husband likes to say, first you work to build your name, then your name works for you. Right now I'm at the stage where I'm building the name" (female, 35, web designer, Krasnodar, married, 1 child).

However, respondents also noted other factors, such as interest in the work, a desire to fill free time, and, of course, earning money: "To be honest, I was in the hospital once, for example, I was bored, had nothing to do there. And here I can work, I don't cancel on the person, and I earn money. And it's good for me too, I just get a kick out of it" (female, 32, marketer, teacher of English and journalism, Sverdlovsk Region – work region, resides in Nizhny Novgorod, married, 1 child); "It's a matter of price. If it's very urgent for someone, really needed, you can push yourself and get it done. It's just that most people need it fast and cheap. If a person is willing to pay for urgency, then why not?" (male, 34, system administrator, Ufa, married, 2 children); "the necessity of earning money" (female, 39, swimming coach, masseuse, physical therapy, Sochi, single, 3 children); "Because you can lie in bed, if your head and eyes don't hurt, lie there and earn money" (female, 37, photo/videographer, Sochi, married, 2 children).

Some explain the reasons for working while sick differently – as stemming from a generational sense of duty and responsibility. A respondent combining main and platform employment, when asked why she works while sick, noted: "Because I'm 40 years old, and I've always done it this way. You'd need to take lessons from 25-year-old university graduates on how not to work when you're sick" (female, 40, HR management, SMM specialist, Ufa, single, 1 child).

During the interviews, respondents were asked if they managed to achieve a balance between work and personal/family life. The majority of those surveyed answered affirmatively, which suggests a positive influence of a flexible schedule on life organization. However, the stories of those dissatisfied with the “work – personal/family life” balance show that a self-regulated work schedule, especially when working from home, can lead to a persistent blurring of boundaries between work and the rest of life. This, in consequence, results in acute conflict between life spheres, and even to decisions about the need to replace working from home with office work.

This is likely largely connected to another risk of platform employment – the formation of an “always on” phenomenon, where the boundaries between work and personal life blur, which can often lead to misunderstandings, resentment, and even serious conflicts within the family.

Story one: A woman, 39, graphic designer, married, fulfills orders at home. Due to her 9-year-old son, she is forced to work in the evenings or at night: “Because of my child, I end up working more at night... Because I can’t... For example, my child is at home, he’s like a radio, and I can’t concentrate, I need quiet to work.” The result is conflict with her husband: “I think the main conflict between me and my husband is because of work, because when he’s home, I’m sitting at the computer. So, there’s probably a lack (*of time for family duties*). Well, it’s maybe just poor time management on my part, but I can’t do it any other way.” She rates her satisfaction with the distribution of time between work, rest, and family duties as follows: “Well, on a ten-point scale, maybe a three” (Saint Petersburg).

Story two: A man, 35, who over ten years progressed from a tutor to the head of his own online tutoring school for schoolchildren and

students, constantly lives in a situation where the boundaries between work and family life are violated. He realizes this problem is common for many freelancers with flexible schedules, has discussed it with his wife to develop a common approach, but sees no other solution than to move work outside his home. From his interview:

Interviewer: At this point in time, can you say you are satisfied with how your time is distributed between work, family, and all other areas of life?

Respondent: Strictly speaking, I’d say no. But I’m very self-critical. To be fair, sometimes yes, sometimes no, but in general, no.

Interviewer: And what causes the greatest concern? Where do you feel you’re falling short?

Respondent: Yes, I’ve thought a lot about this, I’ve realized. Because I work from home, I don’t have a specific schedule. I need an office, I’ve realized that now, and a specific timetable. It doesn’t necessarily have to be 8 hours a day. The main thing is to simply allocate a certain amount of time in a specific work place. I don’t have that. If I solve that, then...” (Yekaterinburg, married, 1 child).

Story three: A male entrepreneur, 37, who moved from Moscow to Stavropol (leaving his office behind), explains how this circumstance became a stumbling block in his relationship with his then-fiancée: “Right now, the only thing is, we agreed just last week, to the point where I’m renting an office. I’ve already found one, I’ll sign the contract tomorrow. I’m renting an office to work from there, because ... it’s not convenient when you sleep, work, eat, relax, and do everything in the same place. And as a woman, I think you’ll understand perfectly – you come home, and your man hasn’t gone anywhere, and there’s this feeling that he isn’t really doing anything” (male, 37, system administrator, Stavropol, single, 2 children).

However, even among respondents who did not mention the need to rent an office for platform work, opinions were voiced about the risk of family conflicts due to high workload and the inability to refuse another order: “It’s just that if I see a request, for example, that I can do quickly, well, I wouldn’t refuse it like that, nothing prevents me from doing it. Get paid for it, first of all. Secondly, add a plus to my profile, so to speak, and leave a good impression of myself. I know I can do it quickly and correctly. I practically always respond to requests because I see I can do them quickly. It’s very rarely when I don’t respond. Well, if it’s late, I do sometimes stay up, till one or two AM, it’s a big problem for me, I just can’t calm down about these requests... Conflicts do arise. Problems, conflicts arise. Well, let’s just say... I won’t go into it” (male, 41, system administrator, Rostov-on-Don, married, 1 child).

Conclusions

Microdata from the Comprehensive Survey of Living Conditions for 2024, published by Rosstat in September of this year, indicates a growth in working citizens’ satisfaction with all aspects of their work, including their work schedule: 87.55% of workers are satisfied with it (compared to 85.45% in 2022). At the same time, no clear correlation is observed between an individual’s work schedule (full-time, part-time, or flexible) and their level of satisfaction.

Our analysis confirms the hypothesis about the dual nature of platform employment. On the one hand, a flexible work schedule, by providing workers with a high degree of autonomy, is an important factor contributing to the achievement of work-family balance, fitting well within rational choice theory. However, it carries certain risks that can negatively affect workers.

The positive impact of a flexible schedule lies in: the ability to independently regulate one’s employment and choose convenient working times; flexibility in combining work with family duties and

personal interests; increased job satisfaction and improved quality of life for workers.

It was noted that none of the interviewees consider returning to traditional employment, even given the prospect of social guarantees and greater job security. The main reasons cited are low salary and inconvenient work schedules. The preference for platform employment, even with an awareness of its structural flaws, can be explained from the standpoint of rational choice theory, which views action as the result of individuals calculating perceived costs and benefits to maximize personal utility within a social context. Platform workers essentially engage in a rational exchange: they forgo institutional stability (social guarantees, fixed salaries, and job security) in favor of functional flexibility and autonomy. For workers burdened with family responsibilities and raising minor children, the ability to independently regulate their employment in all dimensions – i.e., in time and space (geographic mobility, or “working on the go from anywhere”) – and to adapt it to the family’s rhythm (e.g., working from 9:00 AM to 2:00 PM while the child is at school) is a critical resource that allows them to effectively manage the “work-family” role conflict (Weer, Greenhaus, 2024).

The categorical rejection of traditional employment, expressed through sharp metaphors (“it’s like prison or slavery”), indicates that workers who have gained agency and control over their time perceive a rigid schedule as a direct loss of control. The fixed schedule, born in the era of mass industrial production and often accompanied by unpaid overtime, fails to account for modern needs (e.g., the ability to take a weekday off) and family rhythms. Platform employment, by offering an alternative, becomes a tool of resistance against the forced standardization of working time, which further reinforces the rational preference for this type of activity.

Risks of a flexible schedule:

- the necessity for intensive work in the initial period to build a client base;
- constant monitoring of requests and order fulfillment can lead to overwork and disruption of balance;
- working on weekends, holidays, and while sick negatively impacts health and personal life;
- it often implies foregoing career advancement;
- the blurring of boundaries between work and personal life⁴ (the “always on” phenomenon) can lead to family conflicts, chronic fatigue, and a reduced quality of life.

Platform employment, especially when performed remotely from home, inevitably leads to boundary blurring. Unlike a traditional office, where work time and space are clearly separated from home, platform workers are constantly under pressure to monitor for orders. This monitoring, even if not perceived as full-fledged work (“I just clicked a button”), requires time and mental engagement, disrupting free time and creating the “always on” phenomenon.

A flexible schedule leads to self-exploitation, manifesting in work during non-standard hours – late evenings, nights, weekends, and holidays. The absence of a fixed salary and the direct impact of the number of completed orders on income force workers to internalize the control function. Traditional forms of disciplinary control (a manager, the risk of dismissal) are replaced by algorithmic pressure, the primary tool of which is reputational

capital (reviews and ratings). The fear of losing one’s rating and, consequently, future income becomes a key imperative, compelling workers to ignore physical needs (fulfilling orders while sick, with a high fever; one respondent conducted lessons from a maternity hospital). The reputational imperative on a platform can be harsher than the unspoken norms in traditional employment, demanding a voluntary sacrifice of rest and health.

Respondents who have successfully built a client base can afford to raise their prices (as noted in interviews), which makes them inclined to idealize the advantages of autonomy, attributing their success solely to personal initiative. This can lead to a cognitive bias that underestimates the systemic risks of precarity faced by less successful colleagues (Tartakovskaya, 2019).

Gender norms and expectations, deeply embedded in the concept of the gender contract – an unspoken social agreement defining the division of paid and unpaid labor between genders – influence work behavior and schedule choices. For women, the flexibility of platform work serves as a mechanism to compensate for structural inequality, since the traditional labor market often discriminates against mothers with young children (Kalabikhina, 2017; Oshchepkov, 2020). The platform allows a woman to remain in the labor market, but at the cost of voluntarily foregoing career advancement and accepting lower income. This mechanism effectively reinforces the traditional gender contract, making it easier for women to meet social expectations regarding domestic labor.

Men, especially those responsible for the financial support of the family, strive to work more than the standard 40 hours, combining platform work with a main job or packing their days off, using the flexible schedule to maximize labor intensity, which exacerbates their own work-life imbalance.

⁴ Boundary Theory is a set of concepts that explain how people and systems establish and manage boundaries between different areas of life, such as work and personal life, the psyche and the outside world, or different social groups. Boundaries are regulated through the processes of segmentation (separation of spheres) or integration (fusion), researchers analyze the impact of these boundaries on human behavior and well-being.

The observed growing demand for flexibility among workers conflicts with current Russian trends toward import substitution and the development of key economic sectors, which imply an “industrialization” of employment and a standardization of labor relations in crucial production sectors⁵.

The flexible schedule in the platform economy represents one of the paradoxes of the modern labor market. It becomes a powerful source of agency for workers, offering them the necessary autonomy to manage family and personal responsibilities. However, this freedom is a form that may conceal a new type of precarity, where external control by a manager is replaced by internalized control through mechanisms of reputational capital and financial instability.

To mitigate the negative consequences of “flexible” platform employment, workers need constant control over the number of orders and

urgent tasks. Platform workers must learn to manage their time effectively and consciously to avoid self-exploitation, burnout, stress, and overload. It is crucial for them to establish clear boundaries between work and personal life to prevent family conflicts and maintain balance, ensuring that a flexible schedule remains a true benefit rather than a mechanism for compensating structural inequality.

At this stage, platform employment is not integrated into the legal framework governing labor. However, the research results have shown that platform workers are in acute need of a social protection system. Given that associations of platform workers in Russia are weak and often engaged not in protecting labor interests but in addressing isolated cases, it is necessary to develop alternative forms of solidarity (cooperative platforms, digital unions, guilds).

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The Impact of Employment Digitalization on Parenting Strategies



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Abstract. The aim of this study is to conduct a comparative assessment of the number of children and the time spent on childcare among Russians of reproductive age working in non-digital and digital (including remote) employment formats. The data source is the Rosstat sample observation database on the population's use of daily time budgets (N=27,082). The research methodology is based on a comprehensive approach to studying the digitalization of employment, the key feature of which is the use of information

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and communication technologies (ICT) at work. According to the All-Russian Classifier of Occupations, digital employment includes: 1) IT specialists; and 2) specialists who actively use ICT in their activities. Statistically significant differences in the average number of children were identified between groups with digital and non-digital employment, between remote and non-remote workers, and between representatives of flexible and other work schedule formats. Hypotheses that the time spent on childcare would differ depending on the level of employment digitalization were also tested. The conducted analysis of variance showed that the fertility rate in the group of workers with digital employment is lower than among those who work without using ICT. The remote work format does not have a statistically significant effect on the number of children; however, the flexibility of the work schedule demonstrates a certain influence: the digitalization of employment positively affects the amount of time devoted to children, both by mothers and fathers. The main conclusions of the study are as follows: the digitalization of job content does not have a direct impact on reproductive behavior; expanding access to remote work formats can positively affect fertility, provided there is flexibility in the work schedule. This aspect should be taken into account when developing corporate social support measures for employees with family responsibilities.

Key words: digitalization of employment, remote work, IT specialists, work-life balance, fertility, time for children, working parents.

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Introduction

Digitalization is rapidly permeating all spheres of human activity, including socio-labor relations. The share of remote employment and employment in the information and communication technology (ICT) sector is growing. The introduction of digital technologies into the world of work opens up both new prospects and new challenges related to finding appropriate approaches to socially regulating work schedules, the nature of work, workspace organization, and the legal nuances of formalizing non-standard employment contracts (Kolesnikova, Strebkov, 2020, p. 63).

The stage of analyzing the outcomes of the forced transition of a portion of the workforce to remote employment has now been completed. Findings from international, national, and regional sociological studies on the well-being of employees working remotely have been published (Gurova, 2020). A coherent framework of perceptions regarding the advantages and disadvantages of

remote and hybrid employment has emerged, incorporating the views of both employees and employers. The most frequently cited key advantages include time savings on commuting and the ability to manage one's work schedule flexibly (Rudenko, Dolzhenkova, 2020, p. 52). The main drawbacks of the remote format – such as the lack of a properly organized workspace at home, the blurring of boundaries between work and personal life, and issues with tracking working hours leading to overwork and constant overtime – have been identified (Konobevtsev et al., 2019, pp. 11–12). Nevertheless, the accumulated body of empirical knowledge does not provide complete answers to questions concerning the future development of remote employment and digital technologies. Specifically, the question of how social standards and labor rights will evolve in the context of advancing digitalization remains unresolved. Given that traditional forms of personnel control

and management are losing their effectiveness in a remote work environment, there is a pressing need to develop new approaches to assessing labor productivity, ensuring work discipline, and protecting data (Zvyagintseva, Isaenko, 2019, p. 154).

Currently, it has been completed the stage of understanding the results of the force majeure transfer of part of the staff to the remote field of employment. The results of international, national and regional sociological studies on the well-being of remote workers have been published (Gurova, 2020). A framework of ideas about the advantages and disadvantages of remote and hybrid forms of employment has been formed, taking into account the opinions of both employees and employers. The main advantages most often include saving time on the road and the ability to flexibly manage their working hours (Rudenko, Dolzhenkova, 2020, p. 52). The main disadvantages in the context of the remote format are the lack of proper organization of the workspace at home, blurring the boundaries between work and personal life, problems with time management – they cause overemployment and constant overwork (Konobevtsev et al., 2019, pp. 11–12). The resulting body of empirical knowledge does not provide complete answers to questions about the future development of remote employment and digital technologies. In particular, the question of how social standards and labor rights will change in the context of growing digitalization remains unresolved. Given that traditional forms of personnel control and management are losing their effectiveness in remote employment, it is necessary to develop new approaches to assessing labor productivity, compliance with labor discipline and data protection (Zvyagintseva, Isaenko, 2019, p. 154).

From the employers' point of view, digitalization brings new challenges. In particular, there is an increasing need for information security, especially

when employees work from home using personal devices to access corporate systems. Moreover, employers face difficulties in maintaining corporate culture and employee engagement, which can negatively affect team spirit, reduce the level of interaction among colleagues, and affect overall work efficiency (Minchenkova et al., 2023).

The global penetration of modern technologies into the world of work has brought up to date the problems of work-family-personal balance, as well as the issues of effectively combining digital employment with time devoted to children. Modern research is beginning to form a new direction in population economics, focusing on the impact of digitalization of socio-economic and labor relations on demographic processes and the transformation of reproductive attitudes (Mosakova, 2023; Baranova, Kataev, 2022). Few studies have examined the impact of access to the high-speed Internet in professional activities on women's reproductive behavior (Kalabikhina et al., 2020). Remote employment enables women to combine family and professional responsibilities more effectively, which is consistent with the context of national priorities. At the same time, the lack of clear boundaries between work and personal life, a sense of social isolation and an increase in stress levels can act as negative factors contributing to a decrease in fertility (Rusanova, 2020).

The relevance of studying the impact of digitalization of employment on demographic behavior is emphasized by a number of modern studies aimed at identifying cause-and-effect relationships between life satisfaction, including the number of children in a family. The results obtained require further research due to their inconsistency. For instance, based on data from the Russian Longitudinal Monitoring Survey of the National Research University Higher School of Economics (RLMS-HSE), the research of A.R. Kalinin and D.V. Yustratov found an average negative

relationship between having at least one child and life satisfaction. However, the opposite relationship is observed in the Northwestern and Ural Federal Districts: the probability of higher life satisfaction increases among respondents with three or more children (Kalinin, Yustratov, 2025). In conditions of low fertility and aging, it is important to identify significant factors influencing the formation of reproductive attitudes of the population toward increasing the birth rate, which is necessary for further adjustments to the state demographic policy.

Our study is a continuation of a series of studies on the impact of digitalization of employment on the social and demographic processes of society's development. Earlier, the author's team at the Ural school conducted research on the problems of digitalization of employment based on RLMS-HSE materials for 2011–2020, the results of which demonstrated the presence of positive socio-demographic effects of digitalization in the labor sector: among parents who actively use the Internet at work, the average number of children under 18 is significantly higher compared to those who do not use; The groups of parents using Internet technologies have a higher level of satisfaction with life, work and well-being (Akulova, Tonkikh, 2023). However, a certain conditionality of the obtained results was revealed, due to the specifics of the RLMS-HSE open materials. The database available to researchers allowed only an indirect assessment of the contribution of the growth of remote forms of employment to the socio-demographic well-being of society. This paper is devoted to verifying the results of an analysis of the socio-demographic effects of digitalization of employment, carried out by the authors based on data from the RLMS-HSE.

The aim of our study is to conduct comparative estimates of the number of children and the time to care for them among working Russians of reproductive age, non-digital and digital, including remote, employment formats.

Theoretical and methodological framework of the study

Combining paid employment with household responsibilities, including child care, is an urgent research topic in the field of socio-economic and demographic processes, as well as issues of gender equality in families of working parents. Such studies use the theory of work-life balance (WLB) as a theoretical and methodological basis, as well as the provisions of the theory of the social construction of gender (Lorber, 2018), viewed through the prism of the gender-role concept of the double “burden of responsibility” that arises between paid work and personal life. employment and unpaid domestic work (Kurowska, 2020). The main body of gender studies of the division of domestic and parental labor is carried out using sociological methods of collecting empirical data. Surveys and studies are conducted by both government statistical organizations and initiative research groups.

The results of sample statistical surveys of the population in the 21st century show that women still take on most of the housework and child care. For example, in India, women spend an average of 4.47 hours per week caring for children and the elderly, sick or disabled, while men spend only 0.88 hours per week on these duties (Hirway, Jose, 2011). A study of the time budgets of Australian parents raising children with disabilities showed that caring for such children reduced the leisure time of working mothers, while fathers' time to take care of themselves remained unchanged (Brandon, 2007).

However, in countries with a high level of female paid employment or its dynamic growth, the number of hours spent by women and men on domestic work is converging. The factors regarding such convergence are also the growing level of women's education and processes of transformation of gender roles. Canadian studies have shown that the time spent on child care for parents of both sexes increased between 1986 and 2015, despite a decrease in the average number of children in a family. This

is probably due to the transition to more intensive parenting methods. Nevertheless, the traditional gender division of domestic work persists, with women still taking on most of the child care work (Frank, Frenette, 2021).

In the conclusions of most studies conducted in the pre-pandemic period, it is argued that working from home helps to facilitate the combination of professional and family responsibilities. This, in turn, has a positive effect on the balance between work and family, since there is no need to travel to work (Crosbie, Moore, 2004). However, in situations where parents work from home, mothers, unlike fathers, experience an increase in the time spent on household chores and child care (Hilbrecht et al., 2008). Some studies have identified negative consequences, such as disruption of boundaries between work and family life, as well as increased tension and stress associated with multitasking (Sullivan and Lewis, 2001). Nevertheless, supporters of working from home emphasize the main advantage of this employment model — flexibility in combining work responsibilities not only with family and parental functions, but also in other areas of life (Gregory, Milner, 2008).

It is important to note that the COVID-19 pandemic has contributed to an increase in interest in the issue of work-family balance in remote employment. A comparative analysis of the effects of remote work from home on parents with dependent children in Poland and Sweden, which differ in their models of gender division of domestic work, showed that men in both countries have higher opportunities to balance work with household and parental responsibilities compared to women. However, the difference between genders is less pronounced in Sweden. In society with a relatively equal distribution of gender roles (Sweden), the negative impact of working from home on the ability to balance professional and personal obligations affects representatives of both genders (Kurowska, 2020).

Cross-national assessments of responses from parents raising children under the age of 12, according to the 2021 online survey in Canada, Germany, Italy, Poland, Sweden, and the United States, revealed a positive relationship between telecommuting conditions, work-family balance, and life satisfaction. Fathers and mothers' self-assessment of satisfaction with the work-family balance was significantly higher in cases where parents worked in a standard mode before the pandemic and switched to remote work only during the pandemic. In the groups of respondents who worked from home before the pandemic, satisfaction with the work-family balance was higher only if they did not work overtime (Kurowskaj, Cukrowska-Torzewska, 2025).

In Russia, where significant interest in remote employment emerged in the context of the pandemic (remote work began developing much later than in the developed countries of America and Europe), research also demonstrates both negative and positive social and demographic effects (Loginov, Lopatina, 2021; Nabershukina, 2021). A gender analysis of the consequences of Russians transitioning to remote work during the pandemic showed that many men and women, who encountered remote work for the first time during this period, evaluated the remote work conditions predominantly positively. However, men provided positive assessments more often than women. This may be due to the fact that for women, the reduction in commute time led to an increase in time spent on childcare and household management, while for men, the most noticeable improvement was in the domain of leisure and social interaction (Tonkikh et al., 2025).

Pioneering studies of the influence of broadband Internet on fertility have revealed a positive relationship. In particular, in the work of Francesco C Billari, Osea Giuntella and Luca Stella "Does broadband Internet affect fertility?" conducted on panel data from population surveys in Germany, it

was found that among women aged 25–45, access to broadband internet has a positive effect on the birth rate within the group of highly educated women proficient in digital literacy. In the context of low fertility rates characteristic of Europe, access to broadband internet significantly increases the share of women working remotely or part-time. Furthermore, an increase in time spent with children and a rise in life satisfaction are observed (Francesco et al., 2019).

In the work by I.E. Kalabikhina, “The Impact of High-Speed Internet on Reproductive Behavior in Russia”, which utilized panel data from the Russia Longitudinal Monitoring Survey – Higher School of Economics (RLMS-HSE) using a similar methodology, it was identified a similar positive correlation. Among women with secondary specialized or higher professional education who have access to high-speed internet, fertility rates are significantly higher, especially in the 25 to 49 age group. Given that the average age at first birth has shifted closer to 28 years, it can be concluded that the technical and professional ability to work remotely positively impacts fertility (Kalabikhina et al., 2020).

Thus, when analyzing the digitalization of employment specifically within the context of remote or hybrid work formats, a number of studies can be identified that confirm the existence of positive socio-demographic effects. These effects are associated with increased satisfaction with work-life balance and with making positive decisions regarding having children.

However, considering employment digitalization solely through the lens of digital work formats means ignoring the complex nature of this phenomenon. Bibliographic analysis of scientific publications has allowed identifying two broad approaches to defining digital employment.

1) “Narrow” approach: digital employment is understood exclusively as remote / distance work.

2) “Comprehensive” approach: the digital segment includes employment involving the use of

ICT and digital platforms in the process of performing job functions (Kamarova, Tonkikh, 2023, p. 569).

We share the position of a number of scholars and practitioners who include in the concept of employment digitalization the integration of information and communication technologies into job functions, which leads to a transformation in the content of labor and is reflected in the labor market through increased demand for workers’ digital competencies (Alekseeva, Sazonov, 2019). Digitalization of employment implies not only the use of digital work formats, but also the creation of digital products, as well as the transformation of the substantive essence of job functions due to the application of information and communication technologies (hereafter ICT).

This study is based on a theoretical premise assuming a comprehensive approach, according to which the key criterion for classifying a type of employment as digital is the use of digital technologies in the labor process; the organization of labor for digital workers can be standard or remote. This understanding aligns with foreign classifications and, in particular, does not contradict the methodology of Eurofound¹.

This theoretical framework determines the specific requirements for the methodology of forming an empirical database. The data should enable the assessment of time expenditures on children and also allow for the grouping of respondents into categories of digital and non-digital employment. Furthermore, it is necessary to identify respondents who are raising children.

Considering these requirements, the most suitable source of information is sample population surveys conducted using the self-observation method, where respondents record their time expenditures on various activities throughout the day (using time-use diaries).

¹ Eurofound (2020). New forms of employment: 2020 update. New forms of employment series. Luxembourg: Publications Office of the European Union.

Such sample household surveys, in comparison with traditional methods of population survey, allow obtaining more reliable information about the time spent on paid employment and parental work. The fact is that when conducting questionnaires, respondents often rely on their memories, which distorts the real picture. The method of consistent recording of respondents' activities in self-observation diaries is based on the use of a short-term period of memories (a day), which helps to minimize distortions in the reports. In addition, the classification of activities for which time is recorded in self-observation diaries is more detailed. For example, a comparative analysis of surveys of the Indian population on social and labor issues performed using different methods has shown that the use of diaries for monitoring the use of daily time has advantages over a questionnaire survey in terms of detail and completeness of data on labor activity. An alternative labor force survey (survey), conducted in accordance with the recommendations of the International Labor Organization (ILO) and the United Nations, records the main job and one or two secondary jobs, but does not take into account minor jobs performed in a short time as an employee, as well as unpaid activities for their own needs, and also does not record the costs of parental labor (Hirway, Jose, 2011).

The methodology of sample surveys of the time use survey of the population (TUS) is a widespread international practice. Filling out diaries of self-observation of activities during the day allows you to collect information about the time spent not only on paid work, but also on household production, social, community, parenting and other activities, including recreation. Data on how people allocate 24 hours a day is used to assess the impact of time expenditure patterns on household incomes, financial security, work-life balance, physical health, emotional well-being, and overall happiness.

The classification and types of activities during the waking period have national specifics. For

example, the American survey methodology takes into account the time spent on "ponds, pools, and jacuzzis". We should note that the time spent caring for children is highlighted and detailed in any self-monitoring diaries. Using detailed TUS codes and personal information about respondents, it is possible to evaluate parental investments in children, aggregate and detail time use by demographic characteristics, and test hypotheses about women's roles in the labor market and at home (Hamermesh et al., 2025).

In conclusion of the theoretical and methodological review, we should say that at present the relationship between employment in professions with a high level of information technology use and the parental sphere of life remains insufficiently studied and represents a gap in existing scientific knowledge. The application of an integrated approach determines the scientific novelty of this study aimed at identifying the socio-demographic effects of digitalization of employment both in the context of remote work formats and in the context of traditional work formats characterized by the intensive use of information and communication technologies (ICT) in professional activities.

Materials, methods and hypotheses of the research

Taking into account the above, the empirical base of the author's research was formed on the basis of microdata from the last sample observation of the use of the daily time fund by the population for 2019 at the time of writing this article (the previous survey was conducted in 2014). The methodology for organizing selective surveillance is presented on the Rosstat website in the sections "Description of surveillance" and "Surveillance materials"². According to the methodology of the sample survey, the respondents recorded in their observation diaries their main activities in

² Selective monitoring of the use of the daily time fund by the population. Federal State Statistics Service. Available at: https://rosstat.gov.ru/free_doc/new_site/population/urov/sut_fond19/index.html (accessed: 06.09.2024).

each 10-minute interval from 19:00 to 22:00. For example, the recordings could include the following phrases: “Taking the children to kindergarten”, “Waking the children”, “Helping the children get dressed”, etc. When processing the data from the observation diaries, all activities related to children were summarized. Thus, in our study, time spent with children (in child care) is understood as time related to parenting and communication, transportation and child care.

We used the following methodological approach to study the relationship between the type of employment of respondents and the socio-demographic parameters of parenthood:

1) export data from the “Individual Questionnaire for persons aged 15 and over” (file “IND.sav”) and the “Time Use Diary for Persons aged 15 and over” (file “DIARYSMODO.sav”) in sav format. The data is available on the website of the Federal State Statistics Service “Selective monitoring of the use of the daily time fund by the population” in the “Microdata” / “Access Policy” section;

2) combining tabular data by a field containing the individual code of a household member; the following R language libraries were used to read and

combine the data: Hmisc library for downloading SPSS files (files with the extension sav); the dplyr library for joining tables. An internal join was used (INNER JOIN type), which excludes rows that do not match in the linked table;

3) the selection of data for the study was carried out taking into account the following criteria: age of respondents – from 18 to 49 years; participation in economic activity – working/employed in the economy.

Thus, the array of observations included the personal characteristics and budgets of daily working hours of men and women aged 18 to 49 years, employed in paid employment. A total of 27,082 observations were selected, which is 82% of the total number of participants in the specified age group.

Next, we grouped the respondents by employment type in accordance with a comprehensive approach to understanding the phenomenon of digitalization of employment, reflected in the theoretical materials of this article (*Tab. 1*).

The list of specific professions of the first and second groups of digital employment correlates with the list of professions related to the intensive use of information and communication technologies by

Table 1. Grouping principle and characterization of observations selected into digital and non-digital employment groups

Digital employment		Non-digital employment
1 group: IT-specialists	2 group: ICT Specialists	3 group: Non-digital employment
Principle of selection		
Specialists whose profession is related to information technology: development, implementation, improvement and maintenance of software products and computer systems	Specialists who intensively use information and communication technologies (Internet technologies) in their work, but are not IT specialists	Respondents who work without the use of ICT in their work
Examples of selection		
Selection by All-Russian Classifier of Occupations (OKZ) codes: OKZ 251 – Software and application developers and analysts OKZ 252 – Database and network specialists	Selection by All-Russian Classifier of Occupations (OKZ) codes: OKZ 241 – Financial activity specialists OKZ 231 – University teaching staff ...	The group includes observations that are not included in the digital employment category (based on the residual principle)
Source: own compilation.		

occupation groups, which are published annually by the Higher School of Economics in short statistical collections on the digital economy³. The selection of observations was carried out according to the codes of the “All-Russian Classifier of occupations”, which are indicated in the microdata of observations. The OKZ code was determined by Rosstat specialists based on the answers to question 10 of the individual questionnaire: “Who did you work for? Please indicate the name of your profession and position”.

In the observations related to the category of digital employment (IT and ICT Specialists), it was also identified subgroups of respondents who work remotely and those who work in other formats.

The selection of observations for the remote employment group was based on the answers to question 12 K 10: “Do you spend most of your working time at this job ...?” with the answer option “you work remotely (using the Internet)”.

Table 2 presents the research hypotheses which indicates the test respondent groups. To test hypotheses H3 and H4, it was formed male and female subsamples of respondents with children under the age of 18. In these subgroups, women and men working in the flexible schedule format, as well as in other modes, were also distinguished. The grouping was based on the answers to question 14 and 11: “What is your work schedule?” – with one of the possible answers “Flexible working hours”.

ANOVA analysis of variance was used to test hypotheses, and Tamhaine’s criterion was used for pairwise comparison. Statistical data processing was performed using the R programming language in the RStudio development environment. Comparative assessments did not take into account the factor concerning redistribution of time spent on child care within the family if the respondents belong to the same household. This is a limitation for the conclusions of this study.

Table 2. Correlation of the hypotheses put forward with the test subgroups of the sample

Hypotheses put forward	Verification subgroups
H1: The average number of children under the age of 18 per 1 respondent will differ statistically significantly in the digital and non-digital employment groups.	1. IT-specialists; 2. ICT specialists; 3. Employees who do not use ICT in their work (hereinafter referred to as “non-digital employment”)
H2: The average number of children under the age of 18 per 1 respondent will differ statistically significantly in the digital employment group of remote workers and respondents working in other employment formats.	1. IT and ICT specialists who specified the remote work format; 2. IT and ICT specialists who have indicated other non-remote work formats.
H3: The average number of children under the age of 18 per 1 respondent will vary statistically significantly depending on the work schedule.	1. IT and ICT Specialists, and employees of “non-digital employment” group who indicated flexible working hours; 2. IT and ICT Specialists, and employees of “non-digital employment” group who did not specify a flexible work schedule
H4: The average amount of time spent by working women caring for children per child under the age of 18 will vary between digital and non-digital employment groups.	Women with children under 18 years of age in groups: 1. IT-specialists; 2. ICT specialists; 3. Employees who do not use ICT in their work / non-digital employment
H5: The average amount of time spent by men caring for children per child under the age of 18 will vary between digital and non-digital employment groups.	Men with children under 18 years of age in groups: 1. IT-specialists; 2. ICT specialists; 3. Employees who do not use ICT in their work / non-digital employment
Source: own compilation.	

³ Abdrakhmanova G.I., Vasil’kovskii S.A., Vishnevskii K.O. et al. (2023). Digital Economy: 2023: Short Statistical Collection. Moscow: HSE.

Let us present the gender and age characteristics of the identified groups of digital and non-digital employment (*Tables 3 and 4*).

The average age of the respondents in the IT specialist group was 33.67 years, which is statistically significantly lower than the average age of employees in other selected groups (Tab. 3). The highest age among the respondents is observed among those who belong to the category of “non-digital employment” (do not use ICT and the Internet in their professional activities). There is a significant predominance of men in the IT Specialists group (83.2% of the total number of specialists in this category). At the same time, the groups “ICT Specialists” and “non-digital employment” are dominated by women, their share is 64.3% and 53.3%, respectively. Differences in the proportions of men and women are statistically significant for all groups (Tab. 4). The proportions were compared using the χ^2 criterion, the results of which showed the significance of differences at the level of $p = 0.000$.

Of the 3,789 observations in the digital employment segment, 6.5% worked primarily remotely. Among the total number of respondents with children under the age of 18, 8.8% of the survey

participants in the female group worked on a flexible schedule, while in the male subsample this figure was 17.9% of the participants.

Results and discussion

1. As a result of testing the H1 hypothesis about the difference in the number of children among respondents representing digital and non-digital employment groups, we revealed statistically significant differences. In a pairwise comparison using the Tamhain criterion, we found that the average number of children in the families of specialists in the “non-digital employment” group is statistically significantly higher than in the families of the “IT specialists” and “ICT Specialists” groups and the “Uses the Internet for work” group 2 ($p = 0.014$ and 0.012 , respectively). *Figure 1* shows the spread of the average number of children by type of employment.

There were no statistically significant differences between the number of children in the digital employment subgroups ($p = 0.294$). Thus, the H1 hypothesis was partially confirmed. The difference in the number of children in the selected subgroups can be explained by a statistically significant difference in age between representatives of digital employment and representatives of non-digital

Table 3. Descriptive statistics on the age of respondents by employment groups

Employment groups	Number of respondents, people	Average age, years	Standard deviation
1. IT – specialists	519	33.67	6.505
2. ICT specialists	3 270	36.09	7.160
3. Non-digital employment	23 293	36.73	7.523
Total	27 082	36.60	7.475

Source: own compilation based on the Federal State Statistics Service. Results of the sample observation “Use of the daily time fund by the population”. Available at: https://rosstat.gov.ru/itog_inspect.

Table 4. Structure of observations by gender in the context of employment groups, %

Employment groups	Gender	
	Male	Female
1. IT – specialists	83.2	16.8
2. ICT specialists	35.7	64.3
3. Non-digital employment	46.7	53.3
Total	46.1	53.9

Source: own compilation based on the Federal State Statistics Service. Results of the sample observation “Use of the daily time fund by the population”. Available at: https://rosstat.gov.ru/itog_inspect.

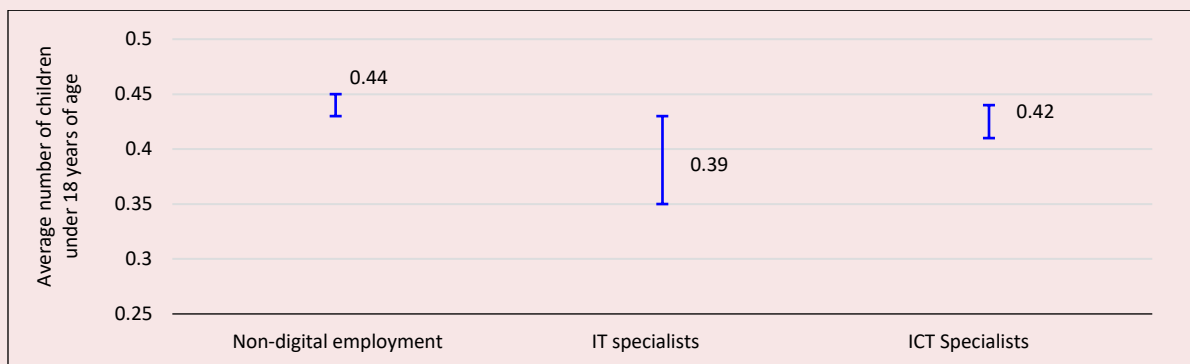
employment. Modern demographic statistics show an increase in the average age of mothers at first birth. There is a possibility that parents working in the digital employment segment will “catch up” with representatives of non-digital employment in terms of the number of children born.

2. To test the H2 hypothesis that there are differences in the number of children among respondents depending on the remote work format, data was collected and analyzed, limited to the digital employment subgroups of “IT specialists” and “ICT Specialists”. This is due to the fact that remote work is impossible for non-digital employment respondents.

Figure 2 shows the graphical ratio of the average number of children in the families of remote employees and all other respondents related to digital employment.

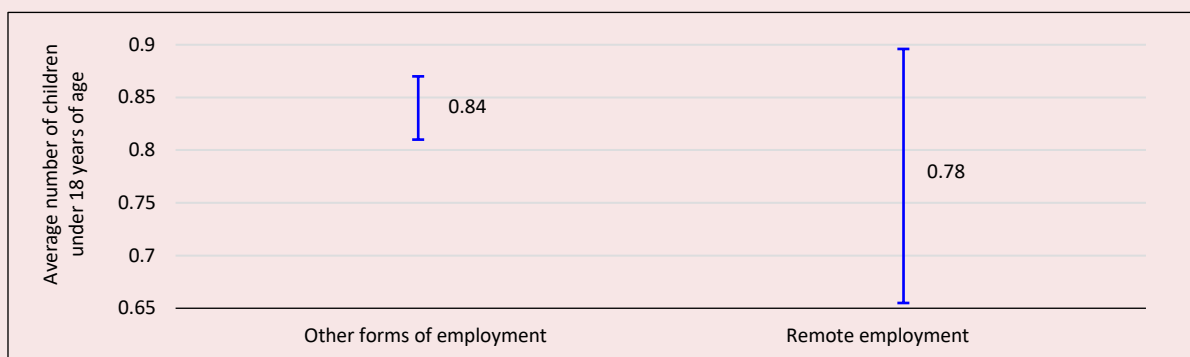
The value of the p-criterion, equal to 0.279, indicates that the differences in the number of children in the families of remote employees and all other respondents are not statistically significant. The null hypothesis cannot be rejected, and the alternative hypothesis H2 has not been confirmed. The hypothesis of differences depending on remote work was also tested among parents raising children under the age of 2 and at the age of 3–6 years. There were also no statistically significant differences.

Figure 1. Average number of children in the families of respondents with different types of employment



According to: results of the sample observation “Use of the daily time fund by the population”. Available at: https://rosstat.gov.ru/itog_inspect

Figure 2. Average number of children in the digital employment group by job format



According to: results of the sample observation “Use of the daily time fund by the population”. Available at: https://rosstat.gov.ru/itog_inspect

3. The study tested whether there were statistically significant differences in the number of children depending on the flexibility of the work schedule (hypothesis H3). There were no statistically significant differences in the groups of parents with children under the age of 18. However, when the subsample was narrowed down to parents raising children under the age of three, such a difference was revealed. In the group of parents with flexible working hours, the average number of children per respondent is statistically significantly higher (Fig. 3).

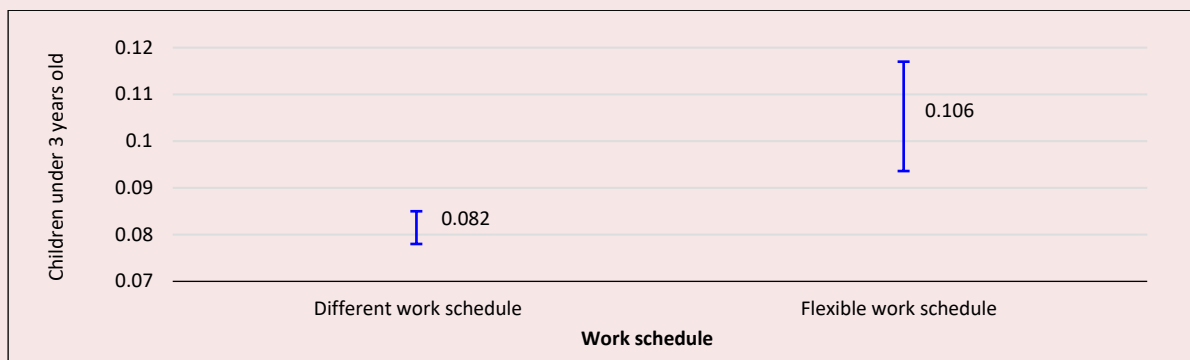
It is worth saying that testing the hypothesis in the subgroups of digital and non-digital employ-

ment showed that the digitalization of labor content does not affect the number of young children in families. The dependence shown in Figure 3 is also observed among “non-digital” employment representatives.

4. As part of the testing of the H4 hypothesis, we created a graphical representation of the data that visualizes the time spent ratio on child care (in minutes per day) per child under the age of 18 for women with different employment types (Fig. 4).

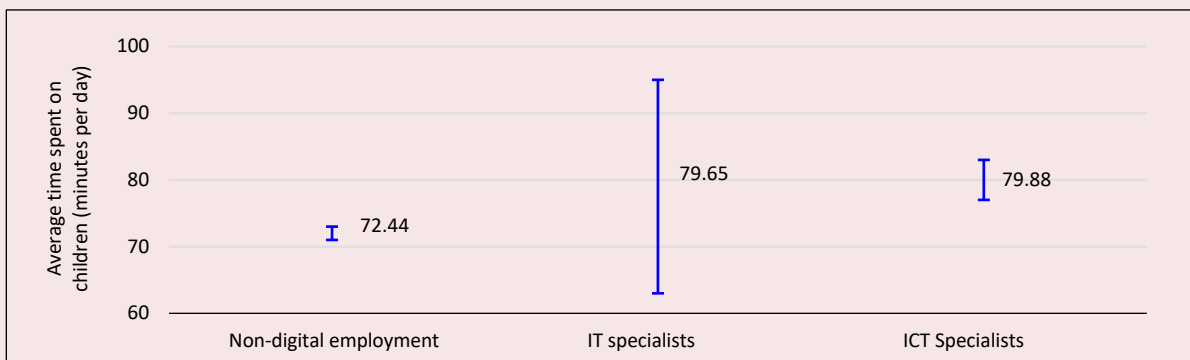
When testing the null hypothesis about the equality of the average time spent on childcare per 1 child under the age of 18 for women with different types of employment, the following result was

Figure 3. Average number of children aged 0–3 years per respondent in terms of work schedule



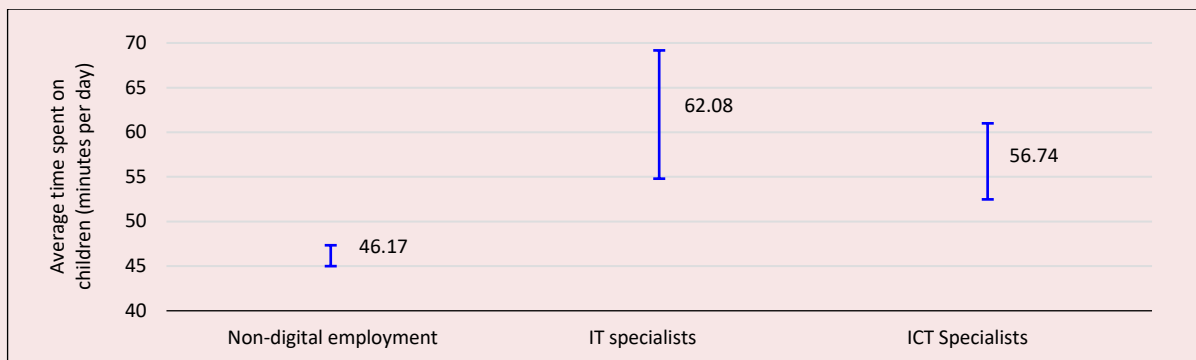
Source: own compilation based Federal State Statistics Service. Results of the sample observation “Use of the daily time fund by the population”. Available at: https://rosstat.gov.ru/itog_inspect.

Figure 4. Time spent ratio on child care (in minutes per day) per 1 child under the age of 18 for women with different employment types



Source: own compilation based Federal State Statistics Service. Results of the sample observation “Use of the daily time fund by the population”. Available at: https://rosstat.gov.ru/itog_inspect.

Figure 5. Time spent ratio on child care per 1 child under the age of 18 for men with different employment types, minutes per day



According to: Results of the sample observation "Use of the daily time fund by the population". Available at: https://rosstat.gov.ru/itog_inspect.

obtained: women in group 2 "ICT specialists" spend more time with children than women in group 3 "Non-digital employment" ($p = 0.06$). There were no statistically significant differences between the average time spent on child care per 1 child under the age of 18 for women in group 1 "IT specialists" and group 3 "Non-digital employment" ($p = 0.114$). There were no statistically significant differences between the average time spent on child care per 1 child under the age of 18 for women in group 1 "IT specialists" and group 2 "ICT specialists" ($p = 0.569$). The H4 hypothesis has not been confirmed.

5. Figure 5 graphically presents the results of testing hypothesis H5 on the presence of differences in the time devoted to children by working fathers of different types of employment.

We obtained the following results in the course of testing the null hypothesis about the equality of the average time spent on childcare per child under the age of 18 for men with different types of employment: men from the "Non-digital employment" group spend less time on children than men from the "IT specialists" and "ICT Specialists" groups ($p = 0.000$ for each comparison pair). At the same time, there were no statistically significant differences between the average time spent on childcare for men from the "ICT

specialists" and "Use the Internet for work" groups ($p = 0.511$). Thus, the H5 hypothesis was confirmed. Fathers working in the digital employment segment spend more time with their children than those who work without the use of ICT technologies.

It is worth noting that in each of the identified groups of working parents, women spend on average twice as much time caring for children. In the groups of "Non-digital employment" and "ICT Specialists" this ratio is 2:1, while in the group of IT specialists it is 1.8:1.

Conclusion

The research results confirmed most of the hypotheses put forward by us, including the hypothesis of the relationship between fertility and digitalization of employment. However, the nature of this relationship turned out to be negative, not positive, as was assumed from the theoretical materials. The average number of children under the age of 18 among parents in the digital employment group is statistically significantly lower than among parents who work without the use of digital and the Internet technologies. At the same time, no statistically significant differences in the number of children were found within the digital employment groups (IT specialists and specialists who actively use ICT in their work). The explanation for

the revealed difference can be a statistically significant difference in the age of the respondents: representatives of digital employment, as a rule, are younger. Given the current trend toward an increase in the age of mothers at first birth, it is likely that parents from the digital employment sector will “catch up” with representatives of the non-digital sphere in the number of children born in the future. However, the risks of reducing the birth rate associated with further digitalization should also be taken into account. These risks are caused by the increasing qualification requirements for workers in the digital sectors, which leads to the need to increase the duration of professional training, and an increase in the women’s education level can have a negative impact on fertility.

The hypothesis that there are differences in the number of children among respondents in digital employment depending on the format of work (remote or traditional) has not been confirmed. This applies to both parents raising children under 2 years of age and those raising children aged 3–6 years, where there were also no statistically significant differences. However, among parents with flexible working hours, there was a statistically significant excess of the average number of children aged 0–3 years per respondent.

The results of the analysis of the time use survey of working parents indicate the preservation of the traditional gender model of parental responsibilities in Russia. Working mothers in each of the employment groups under consideration devote twice as much time to their children as fathers in the same groups.

We revealed positive impact of digitalization of employment on the amount of time devoted to children. Men and women in digital employment groups spend significantly more time with children than parents working in traditional sectors. We can conclude that digitalization of employment provides more flexibility in organizing one’s time, which makes it possible to spend time with children together.

The results obtained do not confirm the conclusions of our previous work based on materials from the Russian Longitudinal Monitoring Survey – Higher School of Economics (RLMS-HSE) for 2011–2020, which found that the average number of children under 18 among respondents who use the Internet in their professional activities is statistically significantly higher than those who does not use the Internet for work purposes (Akulova, Tonkikh, 2023). The results of our study do not refute or confirm the conclusions of colleagues about the positive impact of broadband Internet availability on fertility through the indirect opportunity to work remotely (Francesco et al., 2019).

In our opinion, the comparative estimates of the relationship between the remote work format of fathers and mothers with the average number of children presented in this article have a higher relevance. This is due to the fact that the database of a sample survey of daily time spent by the population allows accurately identifying a group of remote workers. The conclusions on the RLMS-HSE for 2011–2020 were made with the assumption that respondents who use the Internet at work have the opportunity to work remotely. Similar assumptions have also been made in studies devoted to comparative estimates of fertility depending on access to broadband Internet.

Thus, it can be concluded that the digitalization of labor content does not have a direct impact on reproductive behavior. However, expanding access to remote work formats can have a positive impact on fertility only if the work schedule is flexible. By itself, the deleted format does not affect the parent scope. It is precisely the flexibility of the work schedule that is an important factor for the successful combination of paid work with the upbringing of young children and can have a positive impact on reproductive plans. We believe that this aspect should be taken into account when developing corporate social support measures for employees with family responsibilities. Within

the framework of corporate social programs, it is recommended to introduce support measures, such as providing flexible working hours and remote work formats. As promising areas of research, it is advisable to consider monitoring calculations based on materials from a future sample survey of the use of the daily time fund by the population, as well as a “dynamic” panel analysis of changes in the employment format in the context of the appearance of a child, using data from the Russian Longitudinal Monitoring Survey – Higher School of Economics.

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The Environmental Phillips Curve hypothesis for Russia: The Relationship between the Levels of Environmental Pollution and Unemployment

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Abstract. The environmental Phillips curve hypothesis reveals a negative relationship between unemployment and environmental pollution. In this study, we examined whether the environmental Phillips curve hypothesis is valid for Russia. In the analysis covering the period 1992–2022, Fourier Augmented ARDL approach was applied. CO₂ emissions, which are used as an environmental pollution indicator, are the dependent variable of the model. The independent variables are the unemployment rate, economic growth, total energy supply and urbanization rate. According to the results of the analysis, there is a negative relationship between the unemployment rate and environmental pollution in Russia. This result demonstrates that the environmental Phillips curve hypothesis is valid in Russia. Moreover, it was found that the increase in economic growth reduces environmental pollution. The effects of the

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total energy supply and urbanization on environmental pollution are positive. However, the effect of the urbanization rate on environmental pollution is statistically insignificant. Russia should harmonize its employment policies and environmental policies with each other. The share of renewable energy use and total energy supply should be increased, and green job policies should be established. By increasing employment opportunities in sectors that use environmentally friendly technologies, Russia can reduce environmental pollution without suffering high unemployment rates.

Key words: Environmental Phillips curve, unemployment, pollution, Russia.

Introduction

The industrial revolution that emerged in the late 18th century brought with it many economic and social changes (Philbeck, Davis, 2018). With the industrial revolution, the production of goods and services increased rapidly, economic growth rates and welfare levels increased, developments in science and technology accelerated, population increases occurred, and cities became the centers of life (Dogaru, 2020). Although the industrial revolution had positive effects, it is also a fact that it had negative effects. Increases in the production of goods and services have not only brought about the rapid depletion of natural resources but also caused the accumulation of environmentally harmful waste because of production (Dimanov, 2024). Countries have long ignored the environmental damage caused by increased production to achieve high growth rates in a short time. However, over time, the damage caused by economic activities to the environment has reached great levels (Smolovic et al., 2023). The increase in environmental pollution threatens human health, causes a decrease in biological diversity, harms the quality of soil and water, and increases air pollution (Li et al., 2025). This has produced a necessity to pursue a new goal. Countries have begun to develop policies aiming to reduce environmental pollution (Winter, 2024). New concepts and policy approaches have emerged, such as sustainable growth, sustainable development, green economy, green growth, and circular economy. All these concepts are based on the relationship between the economy

and the environment and aim to restructure production systems in a way that does not increase environmental pollution (Adamowicz, 2022).

Since the main reason for the increase in environmental pollution is humans, a wide literature has been formed on the effect of economic indicators on environmental pollution (Osuntuyi, Lean, 2023). Various theories aiming to explain the economy-environment relationship have emerged. There are hundreds of empirical studies examining the environmental Kuznets curve, the pollution haven hypothesis, and the pollution halo hypothesis, which are among these theories (Abbass et al., 2022).

The environmental Kuznets curve hypothesis is an improved version of the Kuznets curve introduced by Simon Kuznets (1955). In his study, Kuznets concluded that there is an inverted U-shaped relationship between per capita income and income inequality (Rayhan et al., 2020). Income inequality increases as per capita income increases. However, over time, per capita income reaches a turning point, and after this point, as per capita income increases, income inequality begins to decrease. In their study, (Grossman, Krueger, 1991) found an inverted U-shaped relationship between per capita income and environmental pollution. As income per capita increases, environmental pollution increases (Adhikari et al., 2024). After per capita income reaches a certain level, as per capita income continues to increase, environmental pollution decreases (Nica et al.,

2025). This hypothesis is called the environmental Kuznets curve because the relationship between income increases, and environmental pollution is similar to the relationship between income increase and income inequality (Wang et al., 2024).

According to the pollution haven hypothesis, some companies located in developed countries and operating in industries that create pollution direct their investments to developing countries (Murshed, 2025). The main reason for this is that developing countries generally lack strict environmental regulations and have low environmental standards (Bagchi, Sahu, 2025). Thus, foreign direct investment goes from developed countries to developing countries. While direct foreign investments are increasing in developing countries, environmental pollution is also increasing. Developing countries are becoming pollution havens for developed countries (Niu, Wang, 2024). According to this hypothesis, as foreign direct investment increases, environmental pollution increases and environmental quality decreases (Sreenu, 2025).

The pollution halo hypothesis, on the other hand, argues that an increase in foreign direct investments will reduce environmental pollution (Mishra et al., 2025). Foreign direct investments flowing from developed countries to developing countries bring with them new technologies (Achuo, Ojong, 2025). With the transfer of newer and more advanced technologies to developing countries, these countries have less polluting production processes. Environmental pollution is decreasing in developing countries with the adoption of non-polluting production technologies. In other words, the pollution halo hypothesis states that there is an inverse relationship between foreign direct investments and environmental pollution (Ali, Wang, 2024).

A new one has been added in recent years to the hypotheses explained above, which examine the relationship between economic indicators and

environmental pollution. Based on the Phillips curve (1958) theory, M. Kashem and M. Rahman (Kashem, Rahman, 2020) put forward a new hypothesis called the environmental Phillips curve. The Phillips curve is a theory that reveals the relationship between the inflation rate and the unemployment rate. According to the Phillips curve theory, there is a negative relationship between inflation and unemployment (Rayhan et al., 2020). The work (Kashem, Rahman, 2020) examining the relationship between environmental pollution and unemployment, found a negative relationship between these two variables. Due to the negative relationship between unemployment and environmental pollution, they named this hypothesis the environmental Phillips curve hypothesis (Shastri et al., 2023).

Environmental pollution and unemployment are two important problems that countries are struggling with. However, reducing environmental pollution and reducing unemployment are two objectives that cannot be achieved at the same time. For this reason, countries must choose which of these two tasks to solve. The environmental Phillips curve is extremely important as it gives a new perspective to the traditional Phillips curve and reveals the negative relationship between unemployment and environmental pollution (Shang, Xu, 2022). With the emergence of the environmental Phillips curve hypothesis in 2020, the number of studies testing the validity of this hypothesis has started to increase rapidly. However, since the environmental Phillips curve hypothesis is a relatively new hypothesis, it can be stated that empirical studies on this subject are still inadequate and more studies testing the hypothesis are needed. To compare the results and reach correct conclusions about the countries, studies should be conducted on different countries or country groups. To fill the gap in the literature, analyses that focus on countries or country groups that have not been examined before should be preferred. This

study investigates the environmental Phillips curve hypothesis for Russia. Because of the literature review, no empirical study was found that tested the environmental Phillips curve hypothesis for Russia. It is thought that this study will contribute to the literature in this respect.

Russia is a country that has a great impact on the increase in CO₂ emissions and greenhouse gases. The countries that emit the most greenhouse gases in the world are China, the United States, and India. After these countries, Russia comes. In terms of CO₂ emissions, Russia causes CO₂ emissions in the world to increase by approximately 7% (Magazzino et al., 2023). For this reason, analyzing indicators related to environmental pollution in Russia is important in terms of establishing environmental policies. Factors that increase environmental pollution must be reduced, and factors that contribute to the improvement of environmental quality must be supported. If the degree of impact of factors related to environmental pollution and the direction of the impact are determined correctly, more sound decisions can be made for the future policies. CO₂ emissions were used as the dependent variable (an indicator of environmental pollution). The independent variable is the unemployment rate. Besides, different indicators that affect environmental pollution are also included in the model as independent variables: economic growth, urbanization, and total energy supply. The analysis covers the period after the dissolution of the Soviet Union: 1992–2022. The method Fourier Augmented ARDL approach was used.

Literature review

Although there are many studies testing the environmental Kuznets curve hypothesis in the literature, this issue continues to attract attention today (Biyase et al., 2024; Amankwa et al., 2024; Horobet et al., 2024; Rabbi, Abdullah, 2024; Khalid et al., 2025; Kolasa-Wiecek et al., 2024; Menegaki et al., 2025; Naqvi et al., 2025; Odei et al., 2025; Porto et al., 2025). Similarly, the number of studies on the

pollution haven hypothesis and the pollution halo hypothesis continues to increase (Gogoi, Hussain, 2024; Padhan, Bhat, 2024; Forson, 2024; Kumar et al., 2024; Balla, Lokonon, 2024; Holtbrügge, Raghavan, 2025; Al Numan et al., 2025; Ekesiobi et al., 2025; Dar et al., 2025; Soti et al., 2024).

As noted earlier, the environmental Phillips curve hypothesis was proposed in the article (Kashem, Rahman, 2020). When the studies in the literature are examined, it is seen that different indicators such as CO₂ emission, ecological footprint, and load capacity factor are used as indicators of environmental pollution. Additionally, the models include different independent variables: economic growth, foreign direct investments, renewable energy consumption, population growth, urbanization, and globalization; their impact is compared with the impact of unemployment. Below, information about studies on the environmental Phillips curve hypothesis is presented.

(Bhowmik et al., 2022) examined the validity of the environmental Phillips curve hypothesis for the United States. They used CO₂ emissions as a pollution indicator. By applying ARDL analysis, the relationship between environmental pollution and unemployment was researched for both the short and long term. In the United States, the environmental Phillips curve hypothesis is valid eventually but not in the short run. For this reason, it appears that the relationship between environmental pollution and unemployment differs in the short and long term (Bhowmik et al., 2022).

(Tanveer et al, 2022) investigated the relationship between environmental pollution and unemployment in Pakistan. In the study, three different environmental indicators were used: CO₂, CH₄ and the ecological footprint. In addition to unemployment, energy consumption, foreign direct investments, economic growth, and globalization were added to the model as independent variables. According to the results of the analysis covering the

period of 1975–2014, the environmental Phillips curve hypothesis is valid for Pakistan. In the long run, direct foreign investments affect environmental sustainability positively, while globalization negatively affects it.

(Tariq et al., 2022) tested the validity of the environmental Phillips curve hypothesis for southern Asian countries. The dataset includes the period 1991–2019. The ecological footprint was used to represent environmental pollution, and ARDL analysis was performed as the method. Population growth, renewable energy use, non-renewable energy use and GDP are other independent variables in the model. The results of the analysis reveal that the environmental Phillips curve hypothesis is valid for south Asian countries. There is a negative correlation between unemployment and environmental pollution (Tariq et al., 2022).

(Hacııııamoğlu, 2023) tested the validity of the environmental Phillips curve hypothesis by examining the relationship between environmental pollution and unemployment in the Next-11 countries. The ecological footprint was used as an environmental pollution indicator. In the Next-11 countries, there is a negative relationship between environmental pollution and unemployment. This result indicates that the environmental Phillips curve hypothesis is valid.

(Durani et al., 2023) tested the validity of the environmental Phillips curve hypothesis in their analysis for the BRICS-T countries. The dataset used in the study covers the 1990–2020 period. CO₂ emissions were used as environmental pollution indicators. In addition to employment, indicators regarding economic policy uncertainty, renewable energy use, financial development, technological progress and natural resource rents are included in the model. Employment and financial development in BRICS-T countries increase CO₂ emissions while the use of renewable energy and economic policy uncertainty decrease them.

(Addison et al., 2024) studied the relationship between environmental quality and unemployment in Ghana. ARDL analysis was applied using a data set covering the 1990–2019 period. According to the analysis results, the effects of the total unemployment rate, female unemployment, and male unemployment on environmental quality are different. Therefore, the study concluded that the environmental Phillips curve hypothesis is not valid for Ghana (Addison et al., 2024).

(Yavuz et al., 2024) tested the environmental Phillips curve hypothesis for Türkiye. The load capacity factor was used in the study instead of the carbon emission or ecological footprint. Thus, it aimed to focus on environmental quality rather than environmental pollution. A dataset covering the period 1982–2022 was used. A-ARDL was used as a method. The analysis results show that the environmental Phillips curve hypothesis is valid for Türkiye (Yavuz et al., 2024).

(Kinnunen et al., 2024) explored the validity of the environmental Phillips curve hypothesis for Finland. ARDL analysis was applied using data covering the 1990–2022 period. In addition to the unemployment rate, renewable energy consumption, urbanization, and GDP per capita are included in the model. The environmental Phillips curve hypothesis has been found not to be valid in Finland (Kinnunen et al., 2024).

(Daştan, Eygü, 2024) tested the validity of the environmental Kuznets curve and the environmental Phillips curve for Türkiye. The A-ARDL method was applied using data covering the period 1980–2018 from Türkiye. The ecological footprint has been included in the model as an indicator of environmental pollution. According to the analysis results, both hypotheses are valid for Türkiye. In addition, while urbanization, which is one of the other independent variables added to the model, helps to increase the environmental quality, natural resource rents deteriorate the environmental quality by increasing the ecological footprint (Daştan, Eygü, 2024).

(Golkhandan, 2024) explored the relationship between environmental pollution and unemployment for countries in the MENA region. There is an analysis covering data from 11 countries in the MENA region for the period 2000–2022. The load capacity factor was preferred as an environmental pollution indicator. For this reason, the validity of the load capacity curve hypothesis was also examined in the study. It was concluded that the environmental Phillips curve hypothesis cannot be rejected in the examined countries. Additionally, the load capacity curve hypothesis was found to be valid. The panel causality analysis shows that there is a two-way causality between unemployment and the load capacity factor (Golkhandan, 2024).

(Azimi, Rahman, 2024) investigated whether the environmental Phillips curve hypothesis is valid in the G7 countries. CO_2 emissions were used as environmental pollution indicators. The data set covered the period 1990–2022. CS-ARDL, wavelet coherence, and wavelet causality analyzes were applied. The obtained findings show that the hypothesis is valid in the G7 countries.

(Ayad, Djedaïet, 2024) present another study that examines the environmental Phillips curve hypothesis for G7 countries. Unlike (Azimi, Rahman, 2024), the study used the load capacity factor as an environmental indicator. Therefore, analysis was conducted to test both the environmental Phillips curve hypothesis and the load capacity curve. According to the results of the PMG-ARDL and CS-ARDL analysis, both hypotheses are valid in the G7 countries (Ayad, Djedaïet, 2024).

(Sahin et al., 2025) used data from the 10 developing countries with the highest carbon emissions to test the environmental Phillips curve hypothesis. The dataset covered 1990–2019. They applied ARDL analysis and found an inverse relationship between unemployment and environmental degradation. Thus, the environmental Phillips curve hypothesis is valid in the examined countries (Sahin et al., 2025).

(Koyuncu Çakmak et al., 2025) tested the environmental Phillips curve hypothesis for developed and developing countries for the period 1990–2020. According to the results of the analysis, the environmental Phillips curve hypothesis is not valid in both the short and long term in high-income countries. However, the environmental Phillips curve hypothesis is valid in upper middle and lower middle-income countries (Koyuncu Çakmak et al., 2025).

The research results described above are summarized in *Table 1*. According to the data presented, the environmental Phillips curve hypothesis is generally confirmed, while the number of countries where it is refuted is decreasing.

Data and methods

In this study, Fourier Augmented ARDL Bounds Test approach was used to analyze the long-run relationship between unemployment and environmental pollution in Russia. The analysis covers the 1992–2022 period. Carbon emissions were used to represent environmental pollution and as the dependent variable. The independent variable is the unemployment rate. Moreover, economic growth, total energy supply, and urbanization was added to the model as control variables. Logarithmic conversions of the variables were used in the analysis. The model of the study, which was created based on the studies carried out in (Kashem, Rahman, 2020; Kinnunen et al., 2024; Daştan, Eygü, 2024), is shown with equation (1).

$$CO_{2t} = \beta_0 + \beta_1 GDP_t + \beta_2 ES_t + \beta_3 URB_t + \beta_4 UNP_t + \varepsilon_t, \quad (1)$$

where: CO_2 – carbon emissions (metric tons per capita); GDP – economic growth (GDP per capita, constant 2015 USD); ES – total energy supply (million tons of oil equivalent); URB – urbanization (% of total population); UNP – unemployment (percentage of the labor force); ε_t – error term. *Table 2* contains descriptions of the variables and data sources.

Table 1. Studies testing the environmental Phillips curve hypothesis

Author/Authors (Year)	Country/Countries	Method	Findings
(Kashem, Rahman, 2020)	30 industrialized countries	OLS	The environmental Phillips curve hypothesis is valid for industrialized countries.
(Bhowmik et al., 2022)	United States	ARDL	The environmental Phillips curve hypothesis is eventually valid but not in the short run.
(Tanveer et al., 2022)	Pakistan	ARDL	The environmental Phillips curve hypothesis is valid in Pakistan.
(Tariq et al., 2022)	Southern Asian countries	Panel ARDL	The environmental Phillips curve hypothesis is valid for South Asian countries.
(Hacıımamoğlu, 2023)	Next-11 countries	AMG, DCCE	The environmental Phillips curve hypothesis is valid.
(Durani et al., 2023)	BRICS-T countries	FMOLS, DOLS	The environmental Phillips curve hypothesis is valid for the BRICS-T countries.
(Addison et al., 2024)	Ghana	ARDL	The environmental Phillips curve hypothesis is not valid in Ghana.
(Yavuz et al., 2024)	Türkiye	A-ARDL	The environmental Phillips curve hypothesis is valid for Türkiye.
(Kinnunen et al., 2024)	Finland	ARDL	The environmental Phillips curve hypothesis is not valid in Finland.
(Daştan, Eygü, 2024)	Türkiye	A-ARDL	The environmental Phillips curve hypothesis is valid in Türkiye.
(Golkhandan, 2024)	11 countries in the Middle East and North Africa	PMG-ARDL, PMG-NARDL	The environmental Phillips curve hypothesis is valid in the countries examined.
(Azimi, Rahman, 2024)	G7 countries	CS-ARDL, Wavelet Coherence, and Wavelet Causality	The environmental Phillips curve hypothesis is valid in the G7 countries.
(Ayad, Djedaiet, 2024)	G7 countries	PMG-ARDL, CS-ARDL	The environmental Phillips curve hypothesis is valid in the G7 countries.
(Sahin et al., 2025)	10 developing countries	Panel ARDL	The environmental Phillips curve hypothesis is valid in the countries examined.
(Koyuncu Çakmak et al., 2025)	Developed and developing countries	Dynamic Panel ARDL	In high-income countries, the environmental Phillips curve hypothesis is not valid in both the short and long term. However, the environmental Phillips curve hypothesis is valid in upper middle and lower middle-income countries.
Source: own elaboration.			

Table 2. Variable specification

Acronym	Variable	Measurement Unit	Source
CO ₂	Carbon emission	Metric tons per capita	World Bank
GDP	Economic growth	GDP per capita, constant 2015 USD	World Bank
ES	Total energy supply	Million tons of oil equivalent	OECD
URB	Urbanization	Urban population (% of total population)	World Bank
UNP	Unemployment	Percentage of the labor force	World Bank
Source: own elaboration.			

In time series analysis, it is important to examine the stationarity characteristics of the series. Classical unit root tests (Augmented Dickey – Fuller, ADF) can give misleading results in the presence of structural breaks in the series. Especially if there are structural breaks that are not sudden, have a smooth transition, or change over time, the explanatory power of these tests' decreases. To solve this problem, the authors (Christopoulos, León-Ledesma, 2010) developed the Fourier ADF (Augmented Dickey – Fuller) unit root test. This test is an extension of the traditional ADF test, aiming to show possible structural breaks and periodic components in the time series more clearly. This test models the deterministic trend component flexibly using Fourier series terms. It can also add structural changes to the model without requiring prior knowledge of the number, location, and shape of the breaks (Enders, Lee, 2012). Fourier series have a high ability to reveal potentially complex trends and seasonality. For this reason, it is a more flexible approach than the traditional linear or polynomial trends (Gallant, Souza, 1991). The Fourier ADF test is based on the regression model below:

$$\Delta y_t = \alpha_0 + \alpha_1 t + \sum_{k=1}^n \left[\gamma_1 \sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 \cos\left(\frac{2\pi kt}{T}\right) \right] + \rho y_{t-1} + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_t, \quad (2)$$

where: $\Delta y_t = y_t - y_{t-1}$ – first difference of the series; t – time trend; k – frequency; T – number of observations; $\sin\left(\frac{2\pi kt}{T}\right)$ ve $\cos\left(\frac{2\pi kt}{T}\right)$ – Fourier series terms; ρ – autoregressive coefficient; p – number of augmented terms (lagged differences); ε_t – error term. The main purpose of the test is to test the null hypothesis $\rho = 0$. If the null hypothesis is rejected, it is concluded that the series does not contain unit roots and therefore is stationary. Fourier terms were added to the model to capture potential structural breaks and nonlinear movements in the series. The number of frequencies

(k) is determined empirically and is usually chosen based on information criteria or the significance of the test statistics (Christopoulos, León-Ledesma, 2010).

The Fourier Augmented ARDL (FAARDL) approach is a method developed to analyze long term co-integration relationships between variables and aims to overcome some limitations of the traditional ARDL model. The standard ARDL bounds test (Pesaran et al., 2001) can lose reliability, especially in the presence of non-stationary structural changes, making it difficult for the model to accurately detect long term relationships. Furthermore, the traditional ARDL model has significant disadvantages, such as the requirement that the dependent variable be I (1) and the disregard for degenerative structures and structural breaks that may arise when a large number of independent variables are included in the model. In this context, the extended ARDL approach developed in (McNown et al., 2018) and (Sam et al., 2019) allows for the detection of degenerative situations by adding the F_B test for the lagged levels of the independent variables. The Fourier ARDL model, on the other hand, integrates Fourier terms into this structure, making it possible to model structural breaks with particularly smooth transitions, thus significantly increasing the model's flexibility (Enders, Lee, 2012; Yilanci et al., 2020; Syed et al., 2023; Apergis et al., 2023).

Thanks to this advanced structure, FAARDL not only considers structural breaks but also offers the flexibility to work with different levels of stationarity. This feature provides a significant advantage, particularly in the analysis of time series in complex economic systems. It also offers effective solutions to problems encountered in traditional ARDL models, such as small sample size and low test power. The bootstrap simulations used in the FARDL model allow for a more reliable assessment

of the significance of test statistics and eliminate the uncertainties encountered in tests based on asymptotic critical values (Wu et al., 2022; Lin, Wu, 2022). The model can produce more robust results, both theoretically and empirically (Kumar, Patel, 2024).

As a result, the Fourier-augmented ARDL approach stands out due to its advantages, such as its ability to flexibly model structural breaks, to work with series with different degrees of integration, and to offer high test power even in small samples (Nazir, 2024; Goh et al., 2017). In this way, the potential for the existence of structural breaks in time series analyses to negatively affect the reliability of traditional cointegration tests and standard ARDL results can be eliminated, and the relationships between variables can be analyzed on a more solid basis (Yilanci et al., 2020; Bozatlı, Akça, 2024). The FAARDL method is distinguished from similar models by its ability to flexibly represent structural breaks within the model without requiring any prior knowledge about the timing of these breaks. This flexibility allows researchers to conduct more accurate and reliable analyses, especially in economic systems experiencing sudden regime changes, thus contributing to the development of more accurate predictions for policy and decision makers (Georgescu, Kinnunen, 2024).

The model created in (Pesaran et al., 2001) based on equation (1) is as follows:

$$\begin{aligned} \Delta CO2_t = & \alpha_0 + \sum_{i=1}^k \beta_i \Delta CO2_{t-i} + \sum_{i=1}^l \gamma_i \Delta GDP_{t-i} + \\ & + \sum_{i=1}^m \delta_i \Delta ES_{t-i} + \sum_{i=1}^n \varphi_i \Delta URB_{t-i} + \sum_{i=1}^p \theta_i \Delta UNP_{t-i} + \\ & + \lambda_1 \Delta CO2_{t-1} + \lambda_2 \Delta GDP_{t-1} + \lambda_3 \Delta ES_{t-1} + \lambda_4 \Delta URB_{t-1} + \\ & + \lambda_5 \Delta UNP_{t-1} + \varepsilon_t \end{aligned} \quad (3)$$

where: α_0 – constant coefficient; Δ – first differences; $\beta_i, \gamma_i, \delta_i, \varphi_i, \theta_i$ – short-term coefficients; λ_i ($i = 1, 2, 3, 4, 5$) – long-term coefficients; k, l, m, n, p – lag length according to the AIC information criterion (Akaike, 1979); ε_t – error term.

M. Pesaran and co-authors (Pesaran et al., 2001) presented two co-integration tests.

T-test for the dependent variable:

$$H_0 : \lambda_1 = 0 \quad (4)$$

F_A-test for all variables:

$$H_0 : \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0. \quad (5)$$

The work (Sam et al., 2019) proposed a F_B test for independent variables at the lagged level in the Augmented ARDL method to support t and F tests.

F_B-test for independent variables:

$$H_0 : \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0. \quad (6)$$

(Sam et al., 2019) proposed these three ways to define cointegration, non-cointegration, and degeneration. If these three tests (t-test, FA-test, FB-test) reject the H₀ hypothesis, cointegration occurs. In the Augmented ARDL model, the deterministic component in equation (7) was added to the model in order to take breaks into account with smooth transitions. Because of this arrangement, equation (8) was finally obtained (Yilanci et al, 2020).

$$d(t) = \gamma_1 \sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 \cos\left(\frac{2\pi kt}{T}\right). \quad (7)$$

$$\begin{aligned} \Delta CO2_t = & \alpha_0 + \gamma_1 \sin\left(\frac{2\pi kt}{T}\right) + \gamma_2 \cos\left(\frac{2\pi kt}{T}\right) + \sum_{i=1}^k \beta_i \Delta CO2_{t-i} \\ & + \sum_{i=1}^l \gamma_i \Delta GDP_{t-i} + \sum_{i=1}^m \delta_i \Delta ES_{t-i} + \sum_{i=1}^n \varphi_i \Delta URB_{t-i} + \\ & + \sum_{i=1}^p \theta_i \Delta UNP_{t-i} + \lambda_1 \Delta CO2_{t-1} + \lambda_2 \Delta GDP_{t-1} + \lambda_3 \Delta ES_{t-1} + \\ & + \lambda_4 \Delta URB_{t-1} + \lambda_5 \Delta UNP_{t-1} + \varepsilon_t \end{aligned} \quad (8)$$

In equation (8): $\pi = 3.14$ – constant; k – number of selected specific frequencies, t – trend; T – number of observations.

In the study, first the descriptive statistics of the variables were examined (Tab. 3). GDP has the highest mean (8.901), while UNP has the lowest mean (1.931). UNP has the highest standard deviation (0.317) while URB has the lowest standard deviation (0.007). This shows that the urbanization rate is fairly stable throughout the sample. Skewness values indicate the direction and degree of deviation

Table 3. Descriptive statistics

Variables	CO ₂ (tons per capita)	GDP (GDP per capita, constant 2015 USD)	ES (million tons of oil equivalent)	URB (urban population,% of total population)	UNP (percentage of the labor force)
Mean	2.411	8.901	6.529	4.301	1.931
Median	2.422	9.034	6.534	4.298	1.883
Maximum	2.581	9.231	6.712	4.319	2.585
Minimum	2.295	8.415	6.377	4.295	1.352
Std. dev.	0.067	0.284	0.088	0.007	0.317
Skewness	0.32	-0.446	0.302	1.214	0.422
Kurtosis	3.063	1.594	2.297	3.32	2.4
Jarque–Bera	0.534	3.579	1.111	7.747	1.383
Probability	0.766	0.167	0.574	0.021	0.501
Source: own calculation.					

from the symmetry of the distributions of the variables. For example, the positive skewness of URB (1.214) indicates that the distribution is skewed to the right, while the negative skewness of GDP (-0.446) indicates a skewness to the left. The kurtosis value of GDP is 1.594; therefore, it is platykurtic. The Jarque – Bera test and probability values test whether the variables exhibit a normal distribution. The low probability value of the URB variable (0.021) indicates that this variable deviates significantly from the normal distribution. Since the probability values of the other variables are above the 5% significance level, the normal distribution hypothesis of these variables cannot be rejected.

The correlation matrix (*Tab. 4*) shows the relationships between the variables. According to

the matrix, there are significant linear relationships between the macroeconomic variables examined. In particular, the high positive correlation between ES and CO₂ emissions ($r = 0.906$) supports the energy-environment relationship hypothesis in the literature. The positive correlations between GDP and CO₂ and GDP and ES ($r = 0.563$ and $r = 0.725$, respectively) indicate that economic growth may have environmental impacts. Strong negative correlations between UNP and all other variables create an expectation that unemployment may decrease as economic performance improves and energy consumption increases. These correlation findings highlight the importance of examining potential co-integration relationships and causality relationships between variables in more depth through econometric analyses.

Table 4. Correlation matrix

	CO ₂	GDP	ES	URB	UNP
CO ₂	1.000				
GDP	0.563	1.000			
ES	0.906	0.725	1.000		
URB	0.458	0.751	0.749	1.000	
UNP	-0.829	-0.852	-0.915	-0.748	1.000
Source: own calculation.					

Results

In order to empirically determine the stationarity properties of the series in the study, modern approaches that consider structural breaks were applied in addition to traditional unit root tests. The Augmented Dickey – Fuller (ADF) unit root test (Dickey, Fuller, 1981) was used to test the stationarity of the series. In addition, in order to obtain more reliable results by considering the effects of possible structural breaks in the time series, the Fourier ADF unit root test proposed in (Christopoulos, León-Ledesma, 2010) was also applied. The stationarity test results are given in *Table 5*.

The Fourier ADF test results indicate the presence of non-linear trends in the all-time series examined, as the F test statistics are above the 5% critical value (Becker et al., 2006). However, the FADF statistics of the same test reveal that no variable is stationary at the level when the 5% critical value is considered. This shows that the variables contain a unit root in their original form even when the Fourier terms are considered.

The findings of the traditional ADF test also support this result. None of the variables are stationary at the 5% significance level, but when the first differences of all the variables are taken, they become stationary at the 5% significance level. Therefore, both the Fourier ADF and traditional ADF test results show that the examined variables are stationary in their first differences, that is, $I(1)$. These results show that the variables are suitable for the Fourier augmented ARDL bounds test analysis and that potential long-run relationships (cointegration) between the variables can be examined.

Since the series were determined to be stationary in the first difference, the Fourier Augmented ARDL bounds testing approach was used in the analysis of the long-term relationships between the variables. This method can be used in series with different degrees of stationarity ($I(0)$ or $I(1)$). Moreover, thanks to the soft structural breaks included in the model provide more reliable cointegration results by considering the effects of possible economic and political changes over time (Aliyev et al., 2024).

Table 5. Fourier ADF and ADF unit root test results

Variables	Fourier ADF			ADF	
	Level			Level	First difference
	Frequency (k)	FADF test statistics	F test statistics	Test statistics	Test statistics
CO ₂	1	-3.466	11.636	-2.499 (0.125)	-4.181(0.002)***
GDP	1	-0.944	63.820	-0.974 (0.748)	-3.332 (0.022)**
ES	1	-2.541	24.070	-1.345 (0.595)	-4.498 (0.001)***
URB	1	-0.551	20.484	-2.354 (0.999)	-3.286 (0.025)**
UNP	1	-2.366	26.045	-0.729 (0.824)	-3.811 (0.007)***
Critical values	FADF test statistics			F test statistics	
k: 1	%1 [4.43], %5 [3.85], %10 [3.52]			%1 [6.730], %5 [4.929], %10 [4.133]	
Note: *** p<0.01, ** p<0.05, * p<0.1. Source: own calculation.					

Table 6 shows the Fourier-augmented ARDL bounds test results. The optimal lag lengths used in the model are specified separately for the dependent and independent variables. In this study, CO₂ emissions are the dependent variable and all other variables (GDP, ES, URB, UNP) are independent variables. The Fourier frequency (k) is determined as 1.3. This value is assumed to represent the frequency of the potential structural breaks and nonlinear movements in the series.

The table includes F_A statistics (Narayan, 2005), t-statistics (Pesaran et al., 2001) and F_B statistics (Sam et al., 2019). The F_A statistic (45.543) is considerably larger than the upper bound critical values (6.670, 4.774 and 3.994, respectively) at the 1%, 5% and 10% significance levels presented for both I (0) and I (1). This result shows that the null hypothesis (that there is no long-run relationship between the variables) is strongly rejected at all significance levels. Therefore, there is a long run co-integration relationship between CO₂ emissions and GDP, ES, URB and UNP.

The t-statistic (-11.275) is greater than the lower and upper critical values (-3.43 and -4.60; -2.86 and -3.99; -2.57 and -3.66, respectively) at the 1%, 5% and 10% significance levels for both I (0) and I (1). This means that the coefficient of the dependent variable CO₂ is not zero and is significantly included in the long-term model.

The F_B statistic (49.809) is the result of the additional F-test applied to the lagged levels of the independent variables to test for degenerative states. This statistic is also significantly greater than the upper critical values (6.83, 4.70 and 3.84, respectively) at all significance levels. This result shows that there is no degenerative situation in the model and the co-integration results obtained are reliable.

As a result, the Fourier Augmented ARDL bounds test findings prove the existence of a statistically significant and robust long run cointegration relationship between CO₂ emissions and economic growth (GDP), energy supply (ES), urbanization (URB), and unemployment (UNP). The fact that the model includes Fourier terms means that possible structural breaks are also considered when testing the existence of this long-term relationship. High F_A and F_B statistics indicate that the model strongly supports co-integration and is free from degenerative problems.

Table 7 shows the long-term coefficients of the Fourier Augmented ARDL bounds test. According to the table, the long-term coefficient of economic growth (GDP) is -0.241 and this coefficient is statistically significant at the 1% significance level ($p=0.000$). In Russia, a 1% increase in GDP eventually leads to a decrease in CO₂ emissions of approximately 0.241%, all other variables being

Table 6. Fourier Augmented ARDL cointegration test results

Lag Length	Frequency (k)			F_A		t-Statistic	F_B
1, 0, 0, 0, 0	1.3			45.543***		-11.275***	49.809***
Table critical values	Lower bound I (0)			Upper bound I (1)			
	%1	%5	%10	%1	%5	%10	
F_A	4.768	3.354	2.752	6.670	4.774	3.994	
t-Statistic	-3.43	-2.86	-2.57	-4.60	-3.99	-3.66	
F_B	4.15	2.80	2.22	6.83	4.70	3.84	
Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Source: own calculation.							

Table 7. Fourier Augmented ARDL long-term coefficient results

Model: $CO_2 = f(GDP, ES, URB, UNP)$				
Variables	Coefficient	Std. error	t-statistic	Prob.
GDP	-0.241	0.061	-3.970	0.000***
ES	0.663	0.104	6.402	0.000***
URB	2.654	2.008	1.470	0.156
UNP	-0.108	0.031	-3.547	0.001***
CointEq (-1)	-0.945	0.056	-16.719	0.000***

Note: *** p<0.01, ** p<0.05, * p<0.1.
Source: own calculation.

constant. While a positive relationship is generally expected between economic growth and CO₂ emissions, the negative coefficient obtained here is striking. This situation can be related to factors such as the shift of industrial production to less polluting sectors with economic development, increases in energy efficiency, technological advances, or the effectiveness of environmental regulations. The results highlight the complexity and country-specific dynamics of the relationship between growth and environmental quality.

The long-term coefficient of energy supply (ES) is 0.663, which is statistically significant at the 1% significance level ($p=0.000$). In the long run, a 1% increase in the energy supply increases approximately 0.663% in CO₂ emissions, with other variables remaining constant. Considering that energy production and consumption are one of the main determinants of CO₂ emissions, this positive and significant relationship is an expected result. The fact that Russia is an energy-intensive economy and production relies heavily on fossil fuels supports the finding that increases in energy supply directly and significantly increase CO₂ emissions. This result reveals the importance of measures targeting the energy sector in CO₂ emission reduction policies.

The long-term coefficient of the urbanization rate (URB) is 2.654, but this coefficient is not statistically significant ($p=0.156$). Although the coefficient is positive, there is not enough evidence to prove that urbanization has a statistically

significant effect on CO₂ emissions eventually within the framework of the model used in the study. The environmental impacts of urbanization are often complex. On the one hand, urbanization can increase energy consumption and emissions from transportation, and on the other hand, it can enable the development of more efficient infrastructures and public transportation systems.

The long-term coefficient of unemployment (UNP) is -0.108 and this coefficient is statistically significant at the 1% significance level ($p=0.001$). In the long run, a 1% increase in the unemployment rate decreases CO₂ emissions of approximately 0.108%, other variables being constant. This finding reflects the expected negative relationship between economic activities and environmental pollution. The analysis results support the validity of the environmental Philips curve hypothesis in Russia. The environmental Phillips curve hypothesis claims that there is a negative relationship between unemployment and environmental pollution. An economic recession or slowdown can have environmental impacts. The finding that the environmental Philips curve is valid for Russia supports the studies (Kashem, Rahman, 2020; Bhowmik et al., 2022; Tanveer et al., 2022; Tariq et al., 2022; Hacıımamoğlu, 2023; Durani et al., 2023; Yavuz et al., 2024; Daştan, Eygü, 2024; Golkhandan, 2024; Azimi, Rahman, 2024; Ayad, Djedaiet, 2024; Sahin et al., 2025; Koyuncu Çakmak et al., 2025).

The error correction term of the model is -0.945 and is significant at the 1% level. According to this finding, there is a strong long-term co-integration relationship between the variables in the model. Approximately 94.5% of the deviations occurring in the short term are corrected in the next period and the system rapidly approaches the long-term equilibrium. Russia should align its economic growth with environmental sustainability by investing in energy efficiency and clean energy technologies.

The diagnostic test results in *Table 8* reveal the reliability and validity of the Fourier ARDL model applied in the study. The Jarque – Bera (JB) test shows that the residual terms are normally distributed, the Breusch – Godfrey – Lagrange Multiplier (BG-LM) test shows that there is no autocorrelation in the model, and the Breusch –

Pagan – Godfrey (BPG) test shows that there is no heteroscedasticity. The Ramsey RESET (RR) test indicates that the functional form of the model is established correctly.

The stable results of the CUSUM and CUSUM of Squares (CusumSq) tests in the *Figure* indicate that the model coefficients remained stable over time and there was no structural break. These findings prove that the estimated model is statistically robust and reliable.

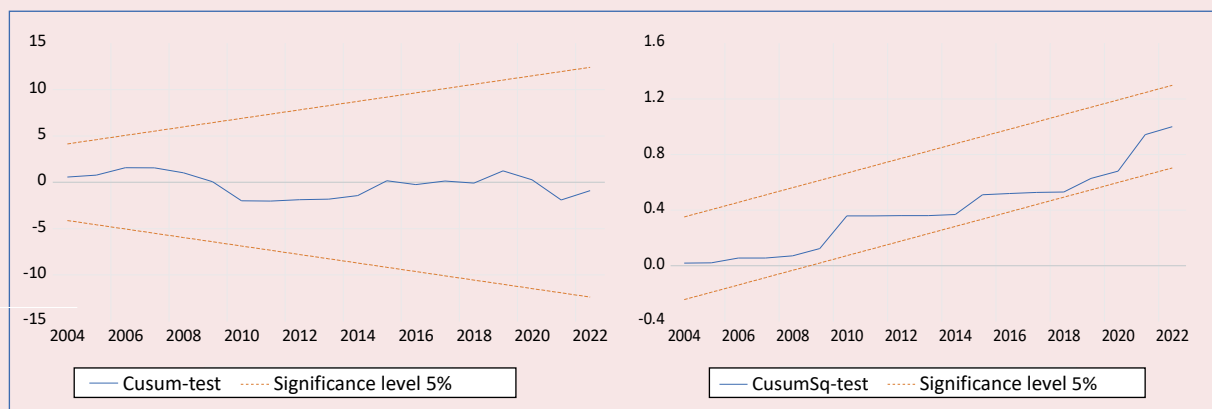
Conclusion and recommendations

The environmental Phillips curve hypothesis reveals an inverse relationship between unemployment and environmental pollution. In this study, the environmental Phillips curve hypothesis was examined for Russia. Fourier Augmented ARDL analysis was applied using data covering the period 1992–2022. CO₂ emissions, which are

Table 8. Diagnostic tests

Tests	Test statistics	Prob.
JB	0.396	0.820
BG-LM	0.286	0.753
BPG	0.492	0.830
RR	0.494	0.626
Cusum: stable		CusumSq: stable
Source: own calculation.		

Cusum and CusumSq graphs



used as an environmental pollution indicator in the model, are the dependent variable. The independent variables are the unemployment rate, urbanization rate, total energy supply and economic growth. According to the analysis results, the environmental Phillips curve hypothesis is valid in Russia. There is an inverse relationship between the unemployment rate and environmental pollution. An increase in economic growth decreases environmental pollution. However, urbanization and the increase in the total energy supply increase environmental pollution.

Reducing unemployment and lowering environmental pollution are priority goals for many countries. However, according to the environmental Phillips curve hypothesis, it is impossible to achieve both these goals simultaneously. The most optimal step in this direction is improving employment policies while considering environmental objectives. Possible measures include increasing investments in renewable energy sources, especially in regions with high unemployment, and expanding production in sectors that do not lead to increased pollution levels. Changing the employment structure through the reallocation of labor from heavily polluting economic sectors to more environmentally friendly ones is also an option. This process requires time and should be implemented gradually. Its successful completion necessitates long-term planning and a clear outline of the process stages.

In recent years, new professions called green jobs have emerged in line with the goals of sustainable development, a green economy and growth. Green jobs both protect the workforce by embodying features befitting human dignity and include production activities that attach importance to the protection of the environment. Establishing employment policies focused on green jobs in Russia could be an important step in combating environmental pollution. Since green jobs require

characteristics such as the use of technology, environmental awareness, technical knowledge, creativity, teamwork, and easy adaptation to new conditions, the education system can be rearranged to meet these requirements. Manufacturers who contribute to increasing green employment can be supported with various incentives. Advantages such as tax reductions and tax exemptions can be provided to companies that use production techniques that do not pollute the environment. Financial support can be provided to investors who want to invest in green technologies and green production systems. Because transforming production systems and integrating non-polluting technologies into the production process requires high costs. In order to cover this cost, producers can be offered long-term credit opportunities under suitable conditions. Since it is difficult for the necessary investments to be met by the private sector alone, practices that increase cooperation between the public and private sector can be implemented. The number of companies that use energy and natural resources more efficiently and increase their use of renewable energy should be increased. In this way, both environmental quality and new employment opportunities can be created.

Furthermore, within the framework of sustainable development policy, the share of renewable energy sources in the overall energy supply must be increased.

Although the level of urbanization positively correlates with the level of environmental pollution, this dependence is statistically insignificant. Nevertheless, the reorganization of urban policy and the establishment of a priority for creating “green cities” are extremely important directions for sustainable development. Such cities are more livable. In them, renewable energy sources power the transportation system, accumulated waste is converted into energy, water consumption is

reduced, rainwater is collected and used efficiently, and the number of electric vehicles is growing. The spread of green cities can reduce the negative impact of urbanization processes on the environment. At the same time, implementing green city projects can create many new jobs and, consequently, contribute to the fight against unemployment.

Thus, the inverse relationship between the unemployment rate and the level of environmental pollution in Russia, which confirms the environmental Phillips curve hypothesis, can

be used in the country's interests through the adoption of appropriate measures. In other words, shaping employment policy in accordance with sustainable development principles can help combat environmental pollution without increasing the unemployment rate. It is necessary to conduct similar studies across Russia's regions as well. Further research on the environmental Phillips curve hypothesis will contribute to a deeper investigation of this issue and fill gaps in the literature.

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Culture and Traditions as Drivers of Territorial Development: The Experience of Russia and China



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Abstract. The study reveals the significance of culture and traditions for territorial development through key perspectives of integrating culture with tourism and the production of unique goods possessing cultural-historical and artistic value. It is proven that the cultural and historical heritage of a territory contributes to economic development by enhancing its tourist appeal and stimulating consumer demand.

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The article systematizes current examples of practices implemented in the regions of Russia (Vologda Region) and China (Jiangxi Province) that are based on the cultural potential of the territory. These practices not only foster economic development but also possess a social effect of reproducing cultural patterns through socialization, upbringing, and familiarization with culture via verbal and non-verbal channels of information transmission. The analysis of the implemented areas of activity shows that both the Vologda Region and Jiangxi Province have significant cultural and historical potential for developing tourism and traditional industries. Considerable attention is paid to the formation of traditional values, including patriotism, social consolidation, and civic engagement. In conclusion, the article outlines common vectors of state policy for both territories, aimed at further developing the cultural-historical potential and its realization in the economy and in the reproduction of national cultures.

Key words: culture, connection between culture and economy, cultural and historical heritage, cultural and educational tourism, traditional folk crafts and handicrafts, Russia, China, Vologda Region, Jiangxi Province.

Introduction

A new stage of global development, characterized by an increased focus on preserving ethno-national sovereignty and identity against the background of significant changes, requires reflection and the search for new foundations for economic growth and social stability. As E.V. Balatsky notes: “The year 2022 witnessed the onset of an active phase of de-globalization with its inherent geopolitical turbulence. During this period, many countries that are more or less under pressure exerted by the world hegemon (the United States) are beginning to use the increasing uncertainty for defending their political sovereignty and strengthening their geopolitical and economic positions. The world’s former monocentricity is being replaced by multipolarity, as new regional centers of power are emerging. The countries that will manage to “ride” the wave of changes will later exit the periphery and semi-periphery and join a group of states at the core of the world economic system. And vice versa – some core countries may find themselves on the sidelines of world history” (Balatsky, Ekimova, 2023). In these conditions, scientific research with a relevant theoretical and methodological arsenal for identifying new patterns and determinants of social development is of particular importance.

Scientists see the need to gain knowledge about the new social reality in the creation of new scientific directions and foundations of social development, such as, for example, socionomics – the science of principles and rules of constructing social systems (Balatsky, 2022), noonomics – a non-economic way of organizing the economy to meet the needs, which is carried out by a person who has gone beyond the limits of material production (Bodrunov, 2018, Bodrunov, 2019).

In the empirical field, there is a search for economic growth drivers among poorly studied non-economic factors defined in terms of “culture”, “mentality”, “traditions”, etc. Many works are known about the connection between economics and socio-cultural characteristics, on the one hand, and culture as an industry, on the other. The systematization of such studies was carried out by V.Yu. Muzychuk. She emphasizes that “in the research of economists, culture does not appear in a broad socio-cultural context, but in a narrow professional way: how it affects economic development, economic relations, economic behavior, etc.” (Muzychuk, 2022) and identifies the following approaches to culture: culture as a “residual phenomenon”, a latent factor in unexplained discrepancies between theoretical expectations and real factors, as a regulator of

economic behavior, and as preferences of economic agents (Muzychuk, 2022). V.Yu. Muzychuk also highlights the role of cultural economics as a sphere responsible for introducing cultural values to the general public and improving the cultural component of human potential in general.

The issue of cause-and-effect relationships is equally important. “All works on culture and economics face the problem that the causal relationship most likely operates in both directions – from culture to economics and from economics to culture” (Guiso, Sapienza, Zingales, 2006). For the most part, researchers believe that culture influences economic behavior through norms, values, and traditions. For example, M. Weber comes to the conclusion that it was the values of diligence, asceticism, and rationality shared by Protestants that contributed to the development of Western European capitalism (Weber, 2004).

In his model of cultural change, G. Hofstede identified their relationship to economic behavior, including consumer preferences, investment decisions, labor relations, and entrepreneurial activity. In his opinion, cultures with a high power distance may be less inclined to entrepreneurship due to fear of risk and lack of initiative. Cultures with a high level of individualism may show a greater interest in innovation and new technologies (Hofstede, 1980).

Another explanation of the nature of the influence of culture on the economy is given in the concept of social capital. R. Putnam, assessing the level of social capital, the effectiveness of democratic institutions and the economic development of Italian regions, showed that in territories with higher social capital, economic indicators are also higher (Putnam, 1993). The methodology for measuring the social capital of a regional community was developed by T.A. Guzhavina, D.V. Afanas'ev, and A.A. Mekhova, showing its adaptive potential in the event of crises and determining the manageability of this intangible resource of socio-economic development (Afanas'ev et al., 2016, Guzhavina, 2023).

Dutch researchers identify four areas of cultural application to explain economic phenomena: entrepreneurship, trust, international business, and corporate governance (Begelsdijk, Maseland, 2016). The American modern researchers L. Harrison and S. Huntington (Harrison, Huntington, 2000) integrate into the concept of culture such categories that affect economic and social development as ethics, respect for the law, trust, and tolerance.

In a narrower sense, culture, especially traditional folk culture, acts as a source of getting acquainted with the history of the nation, preservation and revival of ancient methods of production, rituals and customs accompanying the stages of the economic cycle and the human life cycle.

V.A. Ilyin and M.V. Morev note that in Russia “today, the President and the Government continue to actively take measures aimed at strengthening the Russian economy, supporting the population and restoring order in the country, which ultimately allows Russia to continue to fight for its national sovereignty, or rather for the preservation of its statehood, culture, and territorial borders” (Ilyin, Morev, 2024). One of the landmark decisions was the adoption of Presidential Decree 809, dated November 9, 2022. “On the approval of the foundations of state policy for the preservation and strengthening of traditional Russian spiritual and moral values”. They include a strong family, patriotism, respect for the older generations and the traditions of their people.

Traditional Chinese culture is an expression of the wisdom of the people throughout its five-thousand-year history. Local archives are an important component of preserving traditional Chinese culture. They serve as a source of historical information, a political and educational resource, playing a huge role in the development of Chinese civilization. J. Needham, a well-known British scientist, once noted that neither ancient Greece nor modern Britain left archives similar to the local archives of China. In the context of our study, we present the experience of Jiangxi Province in using

traditional Chinese culture to promote high-quality economic development of the province.

The aim of the work is to carry out a comparative analysis of the experience of the Vologda Region and Jiangxi province in using the potential of traditional culture as a driver of socio-economic development of territories.

The scientific novelty of our research consists in substantiating the prospects of using cultural heritage, traditions and crafts for the economic development of territories. The practical significance lies in the systematization of experience and the development of specific areas and tools for integrating the scientific results of traditional culture into the socio-economic policy of the territories.

Research design

The research uses a set of general scientific methods, in particular comparative analysis and synthesis to achieve the aim.

For both countries, taking into account the available data, a review of sources related to the use of cultural heritage in economic sectors was conducted. Tourism is a key industry that uses cultural objects and restored traditions and rituals. In this regard, we analyze the Vologda Region and Jiangxi province experience on the integration of cultural heritage and tourism. The second direction is the creation of unique products based on ancient technologies. In the Russian reality, they are classified as folk crafts; in China, fairly large enterprises have been established based on restored production processes. For example, working with archival data has made it possible to restore ancient Chinese recipes for making ceramics and establish its production. Such activities need government support, as does the cultural sector as a whole. The study and preservation of traditions and recipes, production technologies, and cultural practices is an integral part of not only developing the economy and increasing the tourism potential of territories, but also an important source of reproduction of traditional national values, the formation of patriotism, and social consolidation.

In this regard, the third stage of the study was the analysis of institutional support for culture in both countries.

Research results

Experience of Russia

The main projections of the integration of culture and tourism in the Vologda Region

The diversity of cultural and historical resources of the Vologda Region forms the basis for the development of cultural and educational tourism. There are over 3,500 cultural heritage sites in the region. Of these, 759 objects are listed in the official lists of historical and cultural monuments and are under state protection. Among these monuments, 214 ones have the status of federal significance, and 545 objects are classified as monuments of regional significance. Museums of federal, regional or municipal significance operate in most districts of the region. As of 2022, the main museum collection totaled 1.7 million items, including archaeological finds; collections of manuscripts and old printed books, iconography, paintings and sculptures; objects of decorative, applied and folk art.

The historical and cultural heritage of the region includes noble estates of the 17th – 19th centuries, 34 of them are objects of cultural heritage of federal and regional significance. For example, the Bryanchaninov Estate is located in the village of Pokrovskoye, which is part of Gryazovetsky Municipal District of the Vologda Region. This family estate was built in the early 19th century in the style of early classicism, recognized as a monument of history and culture of federal significance, as well as a monument of landscape art. The architectural ensemble of the estate includes several elements: a noble manor with wings and galleries, a church, the Bryanchaninov family necropolis, as well as a park with a pond and a stable. Another famous estate is the Galsky Estate, located in Cherepovets. After the restoration work, it functions as a museum, which includes a manor house and outbuildings such as a stable, barns, workshop, etc. The building is designed in the style

of provincial classicism. One of the largest historical and architectural ensembles of manor culture in the Vologda Region is the Spasskoye-Kurkino Estate. Most of the buildings have been preserved on its territory: a mansion, an outbuilding, a music pavilion, a wooden almshouse for the disabled and orphans. Most of the estate's territory is occupied by an English park with a cascade of ponds, which has the configuration of a double-headed eagle.

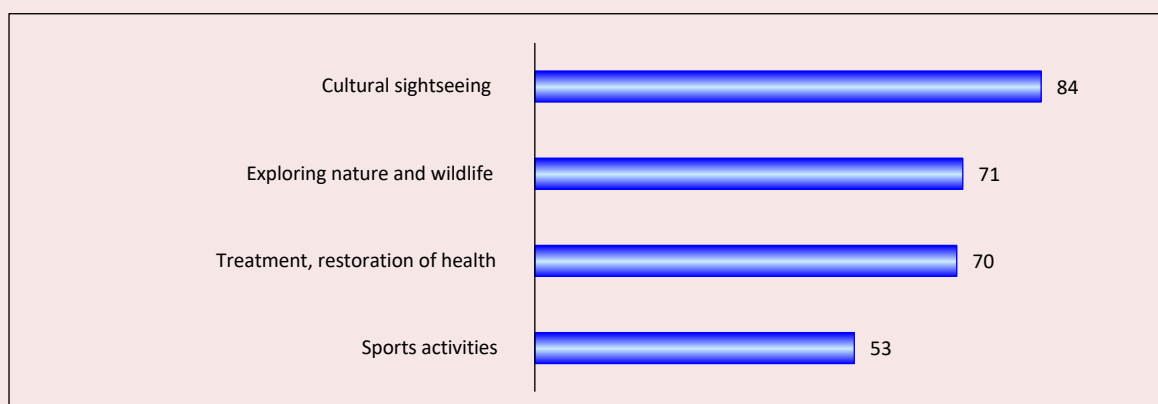
Architectural ensembles of monasteries have been preserved in the historical cities of the Vologda region: in Vologda – the ensemble of the Spaso-Prilutsky Dimitriev Monastery (16th – 18th century), the Convent of the Assumption on the Hill (17th – 18th century), parts of the Holy Spirit Monastery (17th, 19th centuries, partially two temples), Ilyinsky Monastery (17th, 18th centuries, two temples); in Veliky Ustyug, there are fully preserved Monastery of the Archangel Michael, the Holy Trinity Gledensky Monastery, and fragments of the Monastery of the Transfiguration of the Savior (two churches); in Totma, there are fragments of the Sumorin Monastery of the Transfiguration of the Savior (18th–19th century). The region contains UNESCO World Heritage sites. The largest number of churches and monasteries is noted in Vologda,

as well as in Velikoustyugsky, Cherepovetsky, Kirillovsky and Vologodsky municipalities (Structural and Technological Drivers..., 2025).

This potential provides the basis for the development of ethnographic and estate tourism in the Vologda Region. We should note that cultural and educational tourism in Russia is very popular, according to a study by the Russian Public Opinion Research Center: 84% of Russians noted the purpose of their trips to visit cultural attractions (*Fig. 1*).

Event tourism is another area of cultural and travel integration. The ability of event tourism to cause repeated visits to the region by tourists is higher than, for example, cultural and educational tourism. According to experts, the more unique the cultural and historical resources, the less likely it is to ensure that tourists come to the region again, since their need for knowledge will already be satisfied. The program of event tourism can be replenished with new entertainment elements every year, which provides organizers with ample opportunities to create a tourist product due to the inexhaustibility of the resource base. Thus, event tourism acts as a universal direction that can be developed in almost any territory (Leonidova, 2016).

Figure 1. Distribution of responses to the question "Imagine that right now you have the opportunity to travel anywhere in Russia. Which region would be most interesting for you to go with the aim of..." (open-ended questions, up to three answers), %



Source: data from the All-Russian Center for the Study of Public Opinion.

Events are often based on local traditions reflecting the specialization of the venue. For example, the Boat Festival is held in the village of Ustye, because the village is located on the banks of the Kubena River and the locals are traditionally engaged in fishing (*Tab. 1*). Near the walls of the Kirillo-Belozersky Monastery, a reconstruction of the battles that took place on these lands is held on a regular basis, with the participation of historical clubs and folk musicians.

Such events allow participants to plunge into the atmosphere of the past years, get acquainted with the traditions and rituals of their native people, feel like part of a great history, descendants of wise distant ancestors.

Folk crafts: preservation of ancient technologies for the production of unique products

The potential of the region's folk crafts is important for the development of tourism. Some crafts have gained international fame. The brands "Severnaya chern'" (northern niello), "Shemogod birch bark carving", "Moroz po zhesti" (frost on tin), "Vologda lace", "Velikoustyugskaya finift'" (Veliky Ustyug enamel) (Structural and Technological Drivers..., 2025) are widely known. The preservation of the technology of these crafts is facilitated by the presence of relatively small

industries with the status of a legal entity, recognized as economically feasible and receiving government support. A plant for the production of products using silver blackening technology is operating in Veliky Ustyug – the closed joint-stock company Veliky Ustyug Plant "Severnaya Chern'". The first mentions of the technology date back to 1683. The factory produces about 2,000 items of 925 sterling silver: table settings, interior items, religious worship, as well as jewelry. The products have an officially confirmed status of "folk art products of recognized artistic merit"¹.

In the 1830–1840s, the Ustyuzhskaya finift' appeared in Veliky Ustyug, which is distinguished by its unique artistic originality. The surface of the products, usually made of copper, was completely covered with enamel of the same, more often white, color and decorated with silver or gold curly overlays on the last layer of enamel, which, when fired, were firmly sintered with it. There were other types of technique as well. Thus, in Ustyug, products were created that combined finift' (colored enamel) and filigree (an interweaving of twisted double ("scanned") silver wire), in which the filigree pattern was soldered onto the surface of the product, covered with a multicolored glaze, which formed the so-called "cloisonne enamel", or filigree scanned.

Table 1. Examples of event tourism in the Vologda Region

Place	Event	Number of tourists, people
Veliky Ustyug	Veliky Ustyug –Home of Father Frost	up to 33 thousand people in winter holidays
Vologda	Vita Lace Festival	100,000
	Vologda – New Year Capital of the Russian North	200,000
	Voice of Crafts Festival*	100,000
	Voices of History Festival	4,000
	VOICES Theatre and Film Festival	5,000
Village of Ustye, Ust-Kubinsky District	Boat Festival*	10,000
Kirillovsky District	Military History Festival «Kirillo-Belozersk Siege»*	5,000
	Sugorye Historical Festival*	4,000
Village of Yerofeika, Vologodsky District	Horse Festival*	5,000
Selo imeni Babushkina Village	Spasskaya Fair	No data
* Events based on local cultural traditions. Source: Leonidova E.G. (2016).		

¹ Official website of CJSC Veliky Ustyug Plant "Severnaya Chern'". Available at: <https://sevchern.ru/about/>

Cloisonne enamel of the 16th–17th century had characteristic colors: blue, green, brown on a white background. The products of Ustyuzhskaya finift', made in the Baroque style, have a shape rich in plastics and picturesque contours, which is very well combined with rocaille-shaped overlays, sometimes complemented by scenes. Ustyug masters gradually developed their own style of such works. It is distinguished by a rich floral ornament with lilies, decorated with black, green and turquoise enamels on a white background. Such elegant miniature mosaics covered the crowns and frames of icons, crosses, incense burners and other items of church utensils². The revival of enamel craft in the Vologda Region began at the turn of the 1960s and 1970s. In Veliky Ustyug, at the Kuzinsky Factory of Mechanical Products of the Ministry of Defense Industry, a workshop of souvenirs and handicrafts was opened, which existed until 1985.

In 1970, the Vologda Experimental and Artistic Products Factory was opened in Vologda with the support of the Moscow Scientific Research Institute of the Art Industry, where it was decided to focus on restoring the ancient technology of cloisonne and picturesque Usolsky enamels. For this purpose, a group of enamel artists from Veliky Ustyug was invited. Despite the fact that the artists and craftsmen have achieved a lot, the plant has not stood the test of the market economy.

In 2003, the *Vologodskaya finift'* creative workshop³ was established, where the artistic craft of cloisonne and painted enamels is preserved and developed.

The “frost on tin” technology is another industry that has been actively developing in Veliky Ustyug. The earliest information about “frost” dates back to 1837, when a work by Nikolay Nasonovsky, a resident of Veliky Ustyug, was presented at the Vologda provincial exhibition – 12 sheets of iron

“tinned in a special way”, which had a frosty, silvery sheen. The “frost on tin” reached its heyday in the 19th century. The secrets of the “frost” were inherited⁴. It was not unique: there is information about the production of chests and caskets using this technique in the Urals (Pudov, 2022).

The technology of Shemogod birch bark carving is passed on from master to pupil, and today there are only a few masters of his craft. Various household utensils were made from birch bark in the taiga regions of Russia, and birch bark was also used as a writing medium. The desire to decorate household items, the possibility of obtaining thin, beautiful sheets of birch bark, its pliability to processing and relatively long-term preservation served as prerequisites for the creation of slotted elements that were glued to some kind of base (more often soft wood products), sometimes the background was tinted or foil was applied, creating a two-dimensional pattern. The typical Ustyug folk art craft has been known here since the end of the 18th century. Its place of residence was not a city, but suburban villages located on the opposite bank of the Northern Dvina River from Veliky Ustyug. By the name of the Shemogsa River flowing here, birch bark carving is sometimes referred to as “Shemogod carving”. In the villages along the shores of the Shemogsa River, back in the 18th century, peasants learned the art of through-cutting and stamping on birch bark⁵.

However, the most famous brand in the region is Vologda lace. The artistic features of Vologda lace were formed already in the 17th – 18th century. Until the 19th century, lace-making was mainly a domestic artistic craft. In the 1820s, a lace factory was founded in the vicinity of Vologda, where dozens of serf lace girls worked. In the middle of the

² Culture of the Vologda Region. Available at: <https://cultinfo.ru/art/decorative-and-applied-art/enamel-enamel-ustyug>

³ Vologodskayafinift' LLC. Available at: <https://finift35.ru/>

⁴ “Frost on tin” has been developed in Veliky Ustyug since the end of the 18th century. Available at: https://www.xn--b1aqxu.xn--p1ai/articles/culture/remeslo_moroz_po_zhesti_bylo_razvito_v_velikom_ustyuge_s_kontsa_xviii_veka/

⁵ Culture of the Vologda Region. Shemogod birch bark carving. Available at: <https://cultinfo.ru/art/decorative-and-applied-art/shemogodskaya-thread-on-the-bark/>

19th century, lace-making on Vologda land turned into a craft, which was practiced by thousands of craftswomen in different counties. The lace industry in Vologda province reached its peak in the second half of the 19th century. If in 1893 four thousand craftswomen were engaged in weaving, then in 1912 there were almost forty thousand of them. The fame of Vologda lace has crossed the borders of the country. The fashion for it has spread to many European countries. A distinctive feature of the traditional Vologda paired lace is the clear division of the lace's "structure" into a pattern and a background. Today Vologda lace is distinguished by a variety of ornaments, monumental nature of the forms and the predominance of floral motifs⁶. In 2010, a Lace Museum was opened in Vologda. The museum's exposition is located in the building of the 19th-century city estate, which is an object of cultural heritage of federal significance. Currently, unique lace is created at the Vologda Lace Factory "Snezhinka" (Snowflake), the lace museum and various lace-making studios, for example the

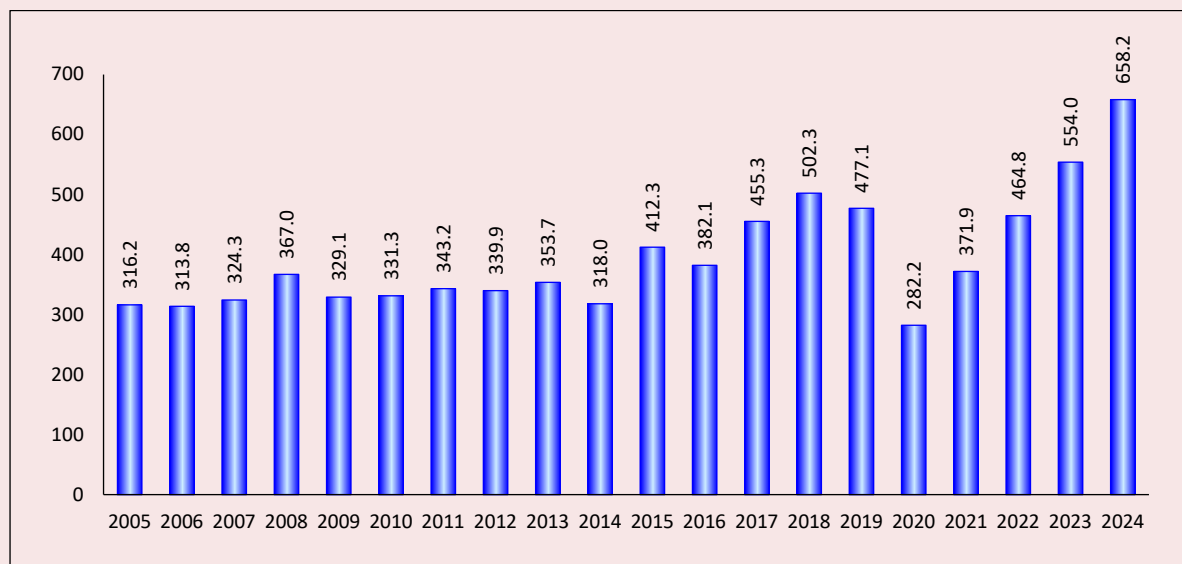
creative lace-making workshop at the Vologda Folk Culture Center.

The uniqueness and originality, artistic value of the products ensures their high status and allows them to act as brands of the Vologda Region, increasing its recognition and tourist attractiveness.

In the rating of tourist attractiveness among the regions of the Russian Federation in 2024, the Vologda Region took 43rd position, while in 2023 the subject was in 38th place. This indicates that the tourism potential of the region has not been sufficiently realized, and that the competition for consumers between the regions is growing (Balandina, 2025).

The efforts of the state and the region to develop tourism are reflected in the growing tourist flow to the Vologda Region. Between 2005 and 2024, the number of tourists doubled, reaching 658.2 thousand people in 2024 (Fig. 2). This indicates a significant increase in interest in the region and confirms the success of the measures taken to develop tourism.

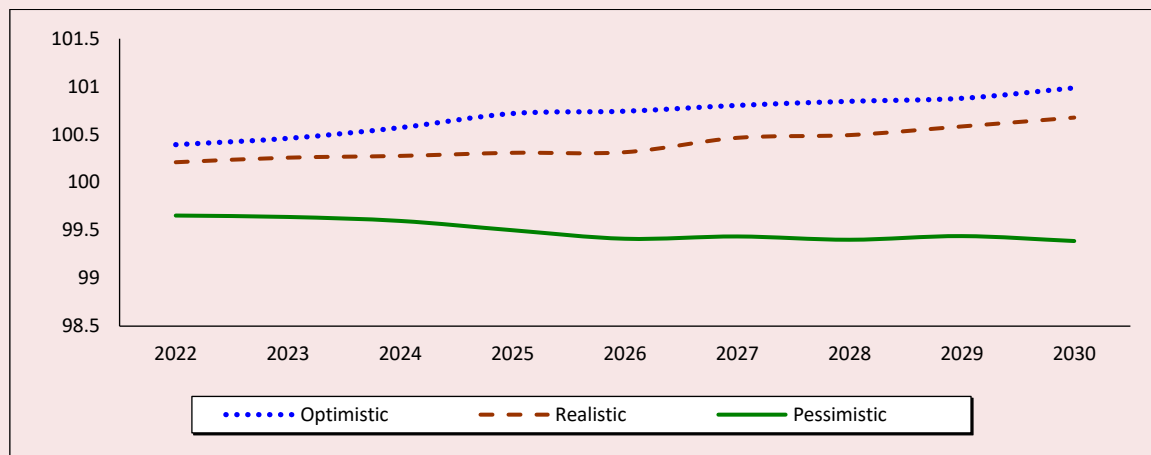
Figure 2. The dynamics of the tourism flow in the Vologda Region, thousand people



Source: Rosstat data.

⁶ Culture of the Vologda Region. Vologda lace. Available at: <https://cultinfo.ru/art/decorative-and-applied-art/vologda-lace/>

Figure 3. Forecast of the rate of change in output in the Russian economy depending on changes in domestic tourism consumption, % compared to the previous year



Source: (Tourism as a Driver..., 2023, p. 62.).

The impact of tourism on the economic development of the region was assessed by VolRC RAS scientists E.G. Leonidova (Leonidova, 2024) and N.M. Rumyantsev (Leonidova, Rumyantsev, 2023) using their own methodology and input-output modeling, they calculated the effect on the country's economy when implementing three different scenarios of changes in the volume of domestic tourist consumption (Fig. 3).

The calculations carried out by the team of authors of the monograph under the leadership of T.V. Uskova on the basis of the formed input-output model of the Russian economy, taking into account the multiplicative effects generated by the tourism industry, made it possible to determine the importance of stimulating citizens' trips around the country. When the conditions for the implementation of a pessimistic scenario occur, gross output will decrease by an average of 0.5% annually. At the same time, the active development of tourism in an optimistic scenario will give the economy an additional 0.7% increase in gross output per year. This is almost twice as much as if the current rates of domestic tourist consumption were maintained under a realistic scenario (Tourism as a Driver..., 2023).

Thus, cultural and educational tourism is a driver of the territory's development. Forecasts show an increase in the expenses of event tourists from 2,700 thousand rubles in 2014 to 4,728 thousand rubles in 2030. This, in turn, will lead to an increase in tourist arrivals to the Vologda Region, stimulating the economic development of the region (Tourism as a Driver ..., 2023).

Institutional support for culture

The state's policy of strengthening traditional Russian values is taking on a program and targeted form. An updated package of national projects has been implemented in the country since 2024. Its fundamental difference from the previous ones is the inclusion of a number of educational events aimed at the formation and strengthening of traditional Russian values.

The federal project "Family Values and Cultural Infrastructure" of the national project "Family" provides for the development of the cultural industry infrastructure:

- renovation of theater facilities and equipment;
- creation of virtual museums;
- providing the opportunity to attend performances and concerts online;

- digitalization of book collections to ensure readers' access to rare and unique books;
- modernization of the library network.

Every year, thanks to the national project “Culture”, implemented in 2019–2024, model libraries are created throughout Russia. These are the libraries of the future because they are not just book repositories, but modern cultural centers where you can have fun, gain new knowledge, work, study and visit digital cultural resources for free, such as the National Electronic Library. Today, more than 1,080 model libraries have already been opened in Russia⁷.

The federal project “We are Together” is being implemented in the national project “Youth and Children”, within the framework of which historical and patriotic education of children and youth is carried out.

Thousands of schoolchildren, students, activists of family clubs and associations, teachers, artists and scientists meet at two venues of the Youth Historical and Patriotic Center “Istoki” (“Origins”) – in Pechory and Sevastopol. Lectures, team competitions, and field trips are held for them for several days. In 2025, the cross-cutting topics in “Istoki” were the study of the history of our country and the achievements of great Russian figures, the 80th anniversary of Victory in the Great Patriotic War.

Children's and youth associations introduce the traditions of the peoples of Russia, its history and culture in such a way as to awaken in the participants a sincere interest, respect and love for their country. Since 2021, the program “Orlyata Rossii” (“Eaglets of Russia”) has brought together more than five million schoolchildren; by the spring of 2025, the initiative “Dvizhenie pervykh” (“Movement of the First”) has brought together more than ten million children and young people from six to 25 years old and about 1.8 million of their mentors. Children are happy to participate in sports competitions, in the

military-patriotic game “Zarnitsa 2.0”, in family festivals and hiking trips.

Another program of the federal project is “More Than a Journey”. In the framework of the program, useful youth tourism is being developed in Russia: on trips, children help the regions: for example, they participate in environmental campaigns or create unusual souvenirs that have every chance of becoming a local brand. By 2025, more than 235,000 young people have already discovered the country in seven thematic areas⁸.

The Vologda Region has created unique institutions – Centers of Traditional Folk Culture⁹ (CTFCs), the purpose of which is to preserve traditional folk culture, recreate its individual elements and phenomena, and introduce them into the modern cultural life of society. The work of the centers is carried out in four main areas: scientific research, experimental and experimental, scientific and methodological, cultural and educational.

As a result of many years of expeditionary work, funds of folklore and ethnographic materials have been formed, reflecting the content and current state of folk traditions of the region's districts, as well as a museum exhibit featuring samples of unique crafts, and traditional folk costume. For example, the catalog “Traditional ceramics of Erga”, the collection “Fairy tales of the Vologda Region in the records of the late 20th – early 21st century”, the publications “Peasant costume of the Kichmeng land”, “When there's bread on the table, the table becomes an altar” (traditional cuisine of the Kichmeng land), “It's not the red gold that's dear, but the hand of a master skilled and true” (traditional towels of the Kichmeng land), methodological materials “Preservation of the rolled industry in Nikolsky District”, “The originality of Nikolsk brewing”, “Hand weaving of linen rugs on four footboards”.

⁸ <https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/new-projects/molodezh-i-deti/my-vmeste/>

⁹ According to the Ministry of Culture, 20 centers are operating in 2025, covering almost all districts of the Vologda Region. Available at: <https://cultinfo.ru/folk-culture/the-centers-of-traditional-folk-culture/>

⁷ Official website of the national projects of the Russian Federation. Federal project “Tourism and Hospitality”. Available at: <https://xn--80aapampemcchfmo7a3c9ehj.xn--p1ai/new-projects/turizm-i-gostepriimstvo/>

CTFCs also employ craftsmen who not only produce unique products, but also teach the craft to everyone. For example, in the CTFC in the town of Babaevo, there is a weaving workshop, workshops “Painting on wood”, “Folk doll”, a workshop for sewing and reconstructing traditional folk costumes of the Ledeng region and making souvenirs; in Kichmengsky Gorodok there is weaving (multicolored homespun fabric; patterned weaving with supplementary weft; rug weaving), embroidery, crocheting and knitting, weaving from birch bark and willow, making traditional dolls, splint pictures and clay toys, artistic processing and painting on wood, patchwork sewing.

Folklore and ethnographic materials are actively being introduced into the field of educational and cultural-educational practice. Methodological developments created by the staff of the centers make it possible to spread the existing experience of mastering folklore and craft traditions, upbringing and educating children based on the values of folk culture.

Thus, in the context of the federal agenda and with the support of the state, centers for the preservation and transmission of the traditions of the native land have been formed in the region, the production of traditional regional products has been established, anchored by the brands “Made in Vologda Region” and “The real Vologda product”. The preservation of folk crafts is one of the important tasks. In this aspect, it is necessary to establish work on the transfer of skills by craftsmen, to create and develop schools of folk crafts, including those that are fading (Shemogod birch bark carving) and those that are no longer being realized (such as frost on tin). For example, in the field of lace-making and painting, the training of craftsmen takes place on the basis of a specially created governor’s college of folk crafts. But it is also important to support the masters who, as cultural and leisure practitioners, teach those who wish without age restrictions. The knowledge and experience of the ancestors, the use of objects created by the hands of folk craftsmen,

contribute to the reproduction of the cultural code, territorial and generally socio-cultural identity, and social consolidation. With proper management and initial support, the integration of cultural heritage into the economy, taking into account the identified multiplier effects (Leonidova, 2024), can act as a driver of socio-economic development of territories.

Experience of China

Jiangxi Province has implemented many successful practices for more effective integration of culture and tourism

To demonstrate and leverage Jiangxi’s fine traditional Chinese culture and promote the high-quality development of Jiangxi’s economy, the province, since the previous year, has begun organizing the Jiangxi Cultural Industries Fair annually. At the second fair, which took place from April 30 to May 5, 2025, products representing both traditional culture and modern creativity aroused great demand among visitors, directly contributing to the growth of consumption and the economy.

The Nanchang Pavilion of the Fair featured “stamp collecting”. Stamps with pictures of Tengwang Pavilion, Nanchang Uprising Memorial Hall, Ruzi Library and other scenic spots were provided for visitors to collect. Visitors imprinted these distinctive stamps on a scroll one by one, thereby getting a sense of accomplishment for having the scroll stamped by so many historical and cultural stamps with pictures of landmarks. In the Pavilion’s shopping area, more than two hundred popular products demonstrated the integration of culture and tourism and brought novelty to visitors. In particular, over 30 products characterized by Bada Shanren’s paintings from Nanchang Bada Shanren Memorial Hall excelled in creativity and craftsmanship, bringing the collections of the hall back to life and picking up popularity among young people.

In the Xinyu Pavilion of the Fair, an embroiderer named Gao Yuqin showed her embroidery techniques with grass cloth. Embroidery on grass fabric is a cultural heritage of the national level,

as well as handbags, fans, hats, perfume boxes and other exhibits presented in the pavilion. It is worth noting that compared to previous year, visitors to the exhibition in 2025 showed significantly more interest in the intangible cultural heritage. New products were displayed every day, and their turnover increased significantly.

Jiangxi's culture of ceramics is renowned both at home and abroad. In the Jingdezhen Pavilion of the Fair, the cultural and creative products for daily use from Taoxichuan enabled visitors to get close to the integration of ancient crafts and modern creativity, and therefore many visitors bought these products. An exhibitor said that this year, they brought porcelain sets made by different techniques, such as color-glazed porcelain, blue and white porcelain, and blue and white rice grain porcelain, to show the new expression of traditional Chinese culture. Thus, the integration of the ceramic industry and the culture of ceramics production continues, which contributes to the development of the traditional ceramic industry, culture and tourism industries. Many cultural and creative products were not only uniquely designed, exquisite and useful, but also rich in Jiangxi cultural elements. Each product seemed to tell a piece of history or a story, making the participants deeply feel the charm of Jiangxi's traditional culture.

It can be seen that the skillful combination of a creative product with traditional Chinese culture and functionality, as well as the integration of cultural elements into everyday life, makes it possible to make traditional culture "trending" and the local economy flourishing.

Jiangxi departments of local records gave full play to their advantages to promote local economic development

First, compiling books of local records and historical materials contributes to expanding the popularity of local industries. Jiangxi Institute of Local Records has organized the compilation of the Records of Jiangxi's Tea Culture, the Records of Hakka Culture, the Records of Ceramics Culture

and the Records of Academy Culture to enhance the visibility of these cultures and promote the economic development of Jiangxi. The Office of History and Records of Jingdezhen City has been playing an active role in the major cultural mission of building itself into the national ceramic culture inheritance and innovation pilot zone and has compiled and published the Brief History of Jingdezhen Porcelain, the Story of Jingdezhen Porcelain, and the 72 Steps to Make Jingdezhen Porcelain. The Records of Dexing's Herbal Medicine, whose compilation was organized by Dexing City of Shangrao City, was published, and it is Jiangxi's first county-level book of herbal medicine records, which greatly enhance the visibility of the local industry of herbal medicine and promote the development of the industry.

Second, exploring and organizing local elements of fine traditional Chinese culture contributes to the development of the economy and society. The Office of History and Records of Jiujiang City was awarded the Best Contributor to Jiujiang's application for the National Famous Historical and Cultural City, and it also provided details on local conditions, history and local records for organizing the Conference on Building and Developing Jiangxi's Cultural Strength 2023, building the Yangtze River National Cultural Park, constructing the Pipa Pavilion, etc. Ganzhou Office of Local Records Research carried out research activities on Hakka genealogy. Longnan Office of History and Records Research at the municipal level participated in the preparation of the Meeting Ganzhou Exhibition at the 32nd World Hakka Conference, showing Ganzhou's history, culture, geography, customs, development and achievements to Hakka people from all over the world, and therefore lots of Hakka people were attracted to invest in Ganzhou. The Office of History and Records of Yichun City improved the distribution map and roadmap of Yichun's ruins and remains and provided historical materials to support the organization of targeted preservation and utilization. It also cooperated with the Municipal Bureau of Culture, Radio,

TV, Press, Publication and Tourism to carry out the recognition, preservation and development of ancient towns, which advanced the exploration of ancient towns and contributed to the integrated development of culture and tourism in ancient towns.

Third, the work has been going on concerning the development of cultural products related to local records while focusing on carrying forward fine traditional Chinese culture. In recent years, the departments of local records in Jiangxi have intensified efforts to explore, organize, compile and research local records, local history and local culture. Through the careful selection of themes, they have produced a series of local record-related cultural outcomes in various forms that are readable and informative.

For example, the compilation of a number of books and historical materials on local conditions and culture and the filming of related videos have been organized. It has been published such books such as the Records of Jiangxi's Intangible Cultural Heritage, An Introduction to Hakka Dialects, and Dream-Seeking in Fuliang; and it has been completed the first drafts of books like Learning About Jiangxi Through Local Records, Continuous History and Culture of Pingxiang, Stories of Yuehu, and Yuanzhou Library.

Continuous efforts have been made to compile the books of local records such as Chinese Nuo: History & Temples of Nuo in Pingxiang. In addition, the Hometown of Members of the Hanlin Academy, a video made by the Office of History and Records of Pengze County, has won the Outstanding Winner Award in the Beautiful Countryside in Jiangxi Competition organized by the Publicity Department of the Communist Party of China (CPC) Jiangxi Provincial Committee, contributing a lot to rural revitalization and economic development.

Professional advantages are also leveraged to explore local culture and promote economic development. The Office of History and Records of

Zhangshu City, Yichun City, together with the Publicity Department of the CPC Municipal Committee and museums, created a special column named The Zhangshu You Never Knew on the Jiangxi channel of the People's Daily app. They published 25 articles that received more than 2.2 million views, which explored cultural elements hidden in local chronicles of the past. In particular, they found a record of A.D. 1688 in the Records of Linjiang Prefecture of the Qing Dynasty, which showed that Zhangshu, formerly known as Qingjiang, boasted all kinds of Chinese medicinal herbs and that Chinese medicinal herbs processed in Qingjiang produced the strongest efficacy. This record provided the basis for Zhangshu's success in being awarded the title of China's only Capital of Medicine. In 2022, Zhangshu saw a GDP of 53.695 billion yuan, ranking among top 10 in Jiangxi.

Research and promotion of cultural products based on local history and archives data in Jiangxi Province

It is the creation and publication of cultural products:

- book publishing: for example, the publication of works such as Records of the Intangible Cultural Heritage of Jiangxi and the Large Directory of Hakka Dialects is aimed at preserving and popularizing the local cultural heritage;
- making videos: the production of short videos, such as the Homeland of the Hanlin Academy Members, which showcase the unique features of the region and contribute to the development of rural areas and the economy.

It is the comprehensive work with local historical and cultural materials:

- in-depth research: actively analyzing and examining local records from various aspects, including natural ecology, customs, economics, and history;
- information systematization: compilation and organization of historical data into readable and informative formats such as books and videos, which contributes to the preservation and dissemination of knowledge about the region.

It is the integration of culture and tourism for economic development:

- cultural tourism promotion: the use of cultural products to attract tourists, which contributes to the economic growth of the region\$
- examples of successful practices: Zhangshu City has successfully gained the status of “China’s Capital of Medicine” thanks to historical records demonstrating the richness of the region’s medical traditions.

It is the use of modern technologies and new media:

- new platforms for information dissemination: creating special columns on platforms such as the People’s Daily app makes it possible to effectively disseminate information about local culture to a wide audience;
- high audience engagement: for example, the column “What You Didn’t Know about Zhangshu” attracted 2.2 million views, demonstrating the potential of using new media to promote culture and tourism.

It is economic benefits from the development of local culture:

- increasing the popularity of the city: drawing attention to the unique cultural aspects helps to increase the recognition of the city and attract tourist resources;
- promoting economic development: the development of cultural tourism and related industries contributes to the overall economic activity and prosperity of the region;
- creating diverse, readable, and informative cultural outcomes based on local records.

Conclusion

The research experience shows the importance of studying and promoting local history and traditions as a key factor in the preservation of cultural heritage, development of cultural tourism and, consequently, economic development of the region. These examples and successful projects

demonstrate how an integrated approach to managing local cultural resources can lead to significant socio-economic benefits.

Taking into account the general trend of the state policy of Russia and China toward the preservation of tradition and the reproduction of cultural values to form a cohesive, patriotic and healthy nation, it is necessary to continue this work in the following directions:

- first, promote scientific research on culture and cultural and historical heritage by forming a state request, allocating grants and subsidies;
- second, continue strengthening the material base of cultural institutions at all levels;
- third, continue developing new formats for the provision of cultural services to ensure wide access to the cultural and historical heritage of the country and the region of residence for all socio-demographic groups;
- fourth, continue working with children and youth to introduce them to the historical memory and cultural values of the nation;
- fifth, continue working on the search and restoration of traditional technologies for the production of goods of cultural and artistic significance, to support the development of folk crafts through the creation of schools, direct support for craftsmen and small workshops (grants for the purchase of equipment, provision of premises, creation of craft workshops and schools at the centers of folk traditional culture);
- sixth, continue developing cultural and educational tourism, event tourism based on traditions that allow immersing oneself in the atmosphere of national culture.

Taking into account the cultural and traditional characteristics of the territory in strategic development planning will contribute to both the social and economic well-being of the population, which is ultimately the goal of national policy for every country.

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The Logic of Development of Civil Society Studies at VolRC RAS



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Abstract. The article presents the formation and development of a research field dedicated to the study of civil society at Vologda Research Center of the Russian Academy of Sciences (VolRC RAS; previously known as VSCC CEMI RAS, ISEDT RAS). The Center's research tradition, originating in 1993 with the launch of a public opinion monitoring, has allowed for the creation of a unique long-term empirical database. Building upon this foundation in the 2010s, under the leadership of Doctor of Sciences (Economics), RAS Corresponding Member, Professor V.A. Ilyin, a systematic study of civil society from a regional perspective was initiated. The formation of this research field is revealed through three key research vectors. First, the analysis of civil society through the lens of social capital. The research team developed and tested an original indicator model for its quantitative measurement, enabling the study of the dynamics, structure, and characteristics of the bearers of this resource. The social capital of a regional

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community is considered a condition for civil society development. Second, monitoring and assessment of one of the key institutions of civil society – the non-profit sector – is conducted, and its role in the socio-economic development of the region is investigated. Methodologies for assessing its contribution to the gross regional product and balanced regional development have been developed; models of economic behavior of organizations and key barriers to their functioning have been identified. Third, the phenomenon of civic participation is conceptualized, external and internal barriers to its realization are identified, and mechanisms for overcoming them are proposed, including in the context of digitalization. Overall, the research approach of VolRC RAS staff to the study of civil society can be characterized as an applied, empirically rich, and regionally-oriented school. The principal value of the team's scholarly work lies in translating abstract philosophical and political science concepts into the language of concrete social indicators and practices applicable to Russian realities, especially at the regional level. The accumulated body of data and the developed methodological tools for assessing elements of civil society create a basis for evidence-based analysis and the formulation of practical recommendations for public authorities.

Key words: monitoring, region, public opinion, research field, civil society, social capital, civic participation, non-profit sector.

Introduction

The establishment and formation of Vologda Research Center of the Russian Academy of Sciences (VolRC RAS) occurred in the 1990s – an era of radical change that affected all spheres of society, but was especially pronounced in the economy and politics. Based on the liberal management model adopted at that time, the transition to a market economy was declared incompatible with the previous Soviet system, which was built on a planned economy. Management began to rely exclusively on market mechanisms, which resulted not simply in a worsening crisis, but in a deep systemic decline in the country's and its regions' economic and social spheres (Uskova, 2020). A sharp decline in living standards, rising unemployment, delays in wages and social benefits, as well as the criminalization of society, caused feelings of hopelessness and alienation from the authorities among the population (Shabunova et al., 2015). Under these circumstances, there arose an acute need for an in-depth understanding of society's reaction to the ongoing transformations. Consequently, in 1993, the first monitoring surveys of public opinion on the assessment of the

political and economic situation in the country and region¹ were initiated in the Vologda Region. The initiator and organizer of this project was Doctor of Sciences (Economics), Professor V.A. Ilyin. Thus, the foundations for sociological research at VolRC RAS were laid, with significant contributions to its formation made by staff of the Institute of Socio-Political Research of the Russian Academy of Sciences (ISPR RAS) and personally by its Director, Academician G.V. Osipov. The methodological and procedural framework developed by ISPR RAS specialists laid a solid foundation for organizing and conducting independent sociological monitoring studies in the region.

¹ The first public opinion measurements were conducted in 1993 in the cities of Vologda and Cherepovets and three municipal districts of the region. Since 1996, a region-wide sample has been constructed: regularly, once every two months (6 times a year), 1,500 people aged 18 and older are surveyed. The surveys are conducted in Vologda, Cherepovets, and eight districts of the region. The sample is purposive and quota-based. The representativeness of the sample is ensured by maintaining proportions between urban and rural populations, proportions between residents of different types of settlements (rural settlements, small and medium-sized towns), and the gender-age structure of the adult population of the region. Approximately 9,000 residents of the region are surveyed annually.

Under the leadership of Doctor of Sciences (Economics), Professor V.A. Ilyin, a comprehensive, systematic approach was formed at VolRC RAS, encompassing not only conducting research on public opinion in the region but also publishing the monitoring data. Starting in 1994, the results of population surveys were presented in the form of the print publication “*Monitoring obshchestvennogo mneniya*” (Public Opinion Monitoring). From 2013 to the present, the information-analytical bulletin “*Effektivnost’ gosudarstvennogo upravleniya v otsenkakh naseleniya*” (Efficiency of Public Administration as Assessed by the Population) has been published regularly six times a year. Its issues, prepared based on the results of each population survey, contain illustrative materials and an analysis of public opinion dynamics in the Vologda Region on various topical issues. The popularization of monitoring results is facilitated by their regular publication in VolRC RAS journals: “*Ekonomicheskie i sotsial’nye peremeny: fakty, tendentsii, prognoz*” (Economic and Social Changes: Facts, Trends, Forecast), “*Problemy razvitiya territorii*” (Problems of Territory’s Development), and “*Sotsial’noe prostranstvo*” (Social Area).

In line with the demands of the time and research objectives, the monitoring toolkit was gradually expanded, incorporating new thematic blocks. To date, the study covers more than ten key topics, including assessments by the population of the political and economic situation in the country and region; levels of support for federal and regional authorities and local self-government bodies; levels of social tension and the potential for protest activity. Regular public opinion surveys help to understand how citizens perceive current social problems, their own material well-being, and the prevailing social sentiments. Furthermore, the state of social capital and the potential for civil society development are examined, the work of law enforcement institutions and the sense of personal security are analyzed, and the population’s attitude toward the media and prevailing cultural orientations are identified.

Thanks to decades of experience in conducting monitoring studies, it has become possible today to perform a multifaceted analysis of public life in the region, examining retrospective dynamics over more than thirty years of observation. It is important to emphasize that the sociological data obtained from the study are analyzed across 14 socio-demographic categories of the population. The ability to study social well-being and social perception within specific social strata allows VolRC RAS to provide authorities with concentrated information about the most pressing problems concerning representatives of a particular category, as well as their reactions to various events occurring in the country and the region.

The creation of extensive databases from surveys accumulated over a long observation period became an impetus for identifying new independent research directions. One such high-demand direction became the comprehensive study of the phenomenon of civil society and its institutions. However, the interest in this topic is driven not only by a unique empirical base but also by demand from society and the state. A unique combination of scientific and public interest, as well as attention from authorities at various levels, can be observed, creating favorable conditions for in-depth scientific analysis.

This article provides an overview of research on various aspects of civil society development conducted by scholars at Vologda Research Center of RAS.

The evolution of understanding the phenomenon of civil society

Before addressing the contribution of Vologda scholars to the study of civil society, it is necessary to trace the evolution of this concept. As one of the central and most debated concepts in the social sciences, it is not a single dogma but a “fluid concept” whose content has changed depending on historical context and political challenges (Diskin, 2024). In Russia, the evolution of civil society studies is not merely a shift in academic paradigms but a direct reflection of the country’s profound political,

social, and economic transformations, as noted in the works of VolRC RAS scholars (Ilyin, 2012).

Until the 1990s, the term “civil society” was scarcely used in Russian scholarship in its Western liberal sense — as a sphere of private life autonomous from the state — which is undoubtedly linked to the history of Russian statehood. During the Imperial period, concepts such as “*obshchestvennost*” (the educated public), “*zemstvo*” (local self-government assemblies), and “*obshchina*” (peasant commune) were discussed. Russian philosophical and social thought (e.g., the debates between Westernizers and Slavophiles) engaged in discourse on the relationship between the state and society. The paradigm of a strong, paternalistic state predominated. In the Soviet period, the concept was almost never applied, as it was considered an attribute of bourgeois relations (Shamshura, 2017). However, real social activism existed in two forms: official structures such as trade unions, the Komsomol (Young Communist League), and voluntary people’s patrols, which were part of the state apparatus, and informal practices/dissidence (unsanctioned literary, human rights, and environmental circles).

The collapse of the USSR and the transition to a market economy and democracy triggered an explosive interest in the topic. The 1990s can be described as the “golden age” or a period of liberal-democratic idealism in civil society studies. Research was marked by euphoria over “liberation” from the state and faith in the rapid construction of Western-style democracy. Civil society was viewed as an integral and unquestionably positive part of the democratic transition. This was an “import” of Western theories without serious adaptation to Russian realities. Study was primarily reduced to analyzing the growth of the “third sector” — non-profit organizations (NPOs), which were and still are considered the main actors of civil society (Kosygina, 2022a). By the mid-1990s, researchers began to note that the predicted boom in civic activity had not materialized. Key reasons cited

for this phenomenon were, firstly, historical legacy, manifested in the lack of self-organization traditions and the prevalence of paternalistic attitudes. Secondly, the economic crisis played a crucial role, forcing people to focus on survival problems at the expense of public activity (Gorshkov et al., 2018). Finally, many NPOs of that period existed on grants from foreign foundations, which often detached their activities from the real needs of the population.

In the 2000s, with the rise to power of Vladimir Putin and the beginning of the “strengthening of the vertical of power” policy, the context began to change radically. Against the backdrop of economic stabilization and the strengthening of the state’s role in all spheres of life, a paradigm shift occurred in civil society studies. A state-centric approach began to prevail (Ilyin, 2012). In the 2000s–2010s, “new” public structures such as Public Chambers began to be established in Russia and its regions. Furthermore, public councils were formed at all levels under government bodies, state-oriented public movements (e.g., “*Molodaya Gvardiya*” [Young Guard] of United Russia) emerged, and non-governmental organizations began to receive more active state funding.

Systematic study of civil society development issues at VolRC RAS was initiated by Doctor of Sciences (Economics), Professor V.A. Ilyin in the 2010s. Two key factors facilitated the start of these studies: firstly, a substantial empirical base of sociological surveys accumulated by Vologda scholars since 1993, and secondly, the active involvement of VolRC RAS in analyzing the state of regional civil society. The personal experience of V.A. Ilyin, who served as Chairman of the Public Chamber of the Vologda Region from 2009 to 2013, played an important role in this process. With his direct involvement, Center staff participated annually for five years in preparing reports on civil society development in the region. These documents were presented to federal and regional authorities, as well as to the Public Chamber of the Russian Federation.

Some of the first works on the theoretical conceptualization of the civil society phenomenon were carried out by staff of the Laboratory of Socio-Economic Research (Cherepovets) in cooperation with the Department of Sociology and Social Technologies of Cherepovets State University. In 2011, T.A. Guzhavina, a laboratory staff member, prepared and defended a Candidate of Sciences dissertation titled “*Sotsial’no-filosofskie osnovaniya grazhdanskogo obshchestva (obshcheteoreticheskie podkhody i regional’naya praktika)*” (Socio-Philosophical Foundations of Civil Society: General Theoretical Approaches and Regional Practice) in social philosophy, based on VolRC RAS public opinion monitoring data. In it, civil society is viewed as a specific social space where individuals interact as actors independent of each other and the state, united by principles of freedom and voluntariness, self-organization, and self-governance. Based on a deep analysis of theoretical models, the work introduces the concept of “regional civil society,” which represents a polyvariant system of interactions and interrelations arising between social, economic, ideological, and cultural actors and institutions of a given region². A number of publications substantiate the conclusion that civil society in its modern form is actively forming primarily in the regions (Grazhdanskoe obshchestvo..., 2015).

An important step in studying civil society from a regional perspective was the collective monograph by Vologda scholars “*Regional’noe grazhdanskoe obshchestvo: dinamika razvitiya*” (Regional Civil Society: Development Dynamics) (V.A. Ilyin, A.A. Shabunova, D.V. Afanasiev, T.A. Guzhavina, T.P. Kozhina, I.N. Dementieva, D.A. Lastovkina). An undoubted merit of the work is that it presented

a comprehensive characterization of civil society at the regional level (using the Vologda Region as an example). The work utilized official statistics and sociological measurements, which allowed for an analysis of public institution activities, identification of population categories constituting the core and periphery of civil society, demonstration of the specifics of institutional and interpersonal trust, and identification of features of the population’s protest behavior. It is noted that characteristic features of civil society in Russia and its regions include: imperfection of the legislative framework; poor awareness among the majority of the population about the activities of various public organizations; lack of conviction in the effectiveness of such activities; low levels of interpersonal trust among citizens, who do not consider themselves capable of significantly influencing social development; and an absence of a sense of responsibility for events outside the family sphere. The authors conclude that the institutionalization of new forms and mechanisms of civil society activity in Russia at the present stage of development occurs primarily “from above” (Regional’noe grazhdanskoe obshchestvo..., 2015).

A subsequent result of research on regional civil society was the collective monograph “*Grazhdanskoe obshchestvo – obshchestvo grazhdan*” (Civil Society – A Society of Citizens), prepared by a team of scholars and staff of VolRC RAS under the scientific guidance of RAS Corresponding Member, Doctor of Sciences (Economics), Professor V.A. Ilyin. The main idea the authorial team sought to convey is that the primary factor of development and foundation of civil society is, above all, the civic consciousness and civic activity of broad segments of the population, rather than the number and diversity of existing civil society institutions. In this regard, the authors paid increased attention to the problems of contemporary, post-Soviet society: psychological, socio-economic, cultural-moral, and others (Morev et al., 2018).

² Guzhavina T.A. (2011). *Sotsial’no-filosofskie osnovaniya grazhdanskogo obshchestva (obshcheteoreticheskiye podkhody i regional’naya praktika)* [Socio-Philosophical Foundations of Civil Society (General Theoretical Approaches and Regional Practice)]: Cand. Sci. (Philos.) Dissertation Abstract. Arkhangelsk.

A significant place in VolRC RAS research is occupied by the analysis of civil society as a factor promoting social consolidation. In the monograph *“Sotsial’naya konsolidatsiya regional’nogo soobshchestva”* (Social Consolidation of the Regional Community), prepared under the scientific guidance of Doctor of Sciences (Economics) A.A. Shabunova by a team of authors (M.V. Morev, O.B. Molodov, T.P. Kozhina, I.N. Dementieva, E.O. Smoleva, V.S. Kaminsky), an important conclusion was drawn that two countervailing processes are occurring simultaneously in Russian society: on the one hand, an improvement in social mood and growing life satisfaction is observed, and on the other – a narrowing of citizens’ interests to private, family matters. This duality underlies social atomization. Consequently, in a society with high levels of atomization and deconsolidation, problems of social inequality and injustice become a key factor shaping a high level of latent social tension (Morev et al., 2017).

A productive approach proved to be viewing civil society through the lens of sociocultural analysis, the foundations of which were laid by P. Sorokin. This allowed civil society to be considered both as a form of organizing social life and as a result of a system-forming process, accomplished evolutionarily with the active participation of various actors. From this perspective, civil society can be viewed as a special area of social space, emerging at the stage of industrial development in Western and Eastern countries and creating real cultural, personal, and socio-organizational preconditions for the dynamic, balanced interaction of the “systemic” and “lifeworld” realms of modern society. The spatial metaphor allows for delineating the boundaries of civil society and distinguishing it from other spheres, which is highly productive for analyzing this phenomenon³.

³ In 2014, 2016, and 2022, the results of VolRC RAS research concerning the state of regional civil society were presented at the International Scientific Conference “Pitirim Sorokin and Paradigms of Global Development in the 21st Century (on the 125th Anniversary of his Birth)”.

Research devoted to the phenomenon of trust has been an important aspect within the study of civil society. Studies on trust have been conducted in a monitoring mode since 1996 and continue to the present day. The phenomenon of trust is a crucial fundamental element for the very existence of civil society. Based on ongoing observations and analysis of accumulated data, it was concluded that “the most important characteristic of the state of civil society is the degree of the population’s trust in government bodies” (Ilyin, 2012, pp. 9–10). Speaking about possible prospects for civil society development at that time, V.A. Ilyin noted: “The formation of an effectively functioning civil society is ensured only when its elements are structurally organized both vertically and horizontally, when it is strong both by the state and by its civic foundation” (Ilyin, 2012, p. 11). Developing this direction, T.A. Guzhavina examines the problem of the role and significance of trust for the development and functioning of civil society. Prioritizing trust in abstract systems, and based on an analysis of public opinion monitoring data, the author identifies the institutional structures that enjoy the greatest trust among residents of the Vologda Region (Guzhavina, 2012).

Research on trust has also examined its role in the modernization development of the region. It has been shown that trust shapes the economic environment, influences economic processes, and serves as a basis for developing state policy (Guzhavina, 2014). Trust (both at the institutional and interpersonal levels) is a non-economic factor of development. Its role increases during crisis periods (Shabunova et al., 2015a).

Analysis of the state of trust in the regional society has allowed for the identification of factors that generate it, as well as the characterization of groups of individuals differentiated by their level of trust. Particular interest was drawn to the “distrustful” group, identified during empirical studies at VolRC RAS. A special methodology for creating a sociological portrait

was developed to characterize this group, making it possible to highlight the significant features of its representatives (Guzhavina, Silina, 2018).

Overall, the research approach of VoIRC RAS scholars to understanding civil society can be characterized as an applied, empirically rich, and regionally-oriented school. The principal value of the team's research work lies in translating abstract philosophical and political science concepts into the language of concrete social indicators and practices applicable to Russian realities, especially at the regional level. Among the key indicators of civil society development that have received the most attention in VoIRC RAS research are social capital, assessment of the non-profit sector's activities as an institution of civil society, and the potential and actual practices of civic participation.

Civil society and social capital

The study of civil society – its structure, functions, actors, and its understanding as a social space where fields and the habitus that form them intersect – has generated interest in examining the deeper structural foundations of regional society. Scholars became interested in the topic of social capital, which began to appear in scientific publications in the early 2000s and later evolved into a full-fledged research direction with grant-funded studies and unique monitoring measurements in society. This is especially relevant since the concepts of civil society and social capital occupy special positions in attempts to describe and define the informal and often immaterial social structures and interconnections that can help solidify democratic practices. Social capital is a necessary condition for the normal functioning of civil society, democracy, and economic relations.

Analytical research of a theoretical nature on social capital issues enabled researchers to make a certain contribution to the concept by proposing their own authorial approach to measuring social capital. Within this framework, an indicator model for measuring social capital was developed and methodologically substantiated. An indicator

model is a set of indicators formed on a specific conceptual basis, allowing for systematic information about the phenomenon under study and revealing interconnections between its components (Afanasiev et al., 2016).

When constructing the indicator model, a methodologically crucial point was recognizing it as an integral-type indicator and as a generalizing concept encompassing a set of operational concepts such as trust, networks, values and norms, solidarity, and the ability to influence the state of affairs. To measure an indicator like trust, metrics were used that characterize respondents' state of mind regarding trust in the actors and institutions around them with which they interact. These types of trust are commonly characterized as interpersonal and institutional. Indicators of embeddedness in social networks are statements characterizing respondents' state of mind regarding agreement, solidarity, and readiness to unite. Measurement of network interaction is possible based on indicators of inclusion, responsibility for the state of affairs, and solidarity. The sufficiency of the selected indicators is determined by their ability to assess the state of the identified metrics (trust, networks, solidarity, influence) characterizing a certain type of social capital.

The algorithm for constructing the indicator model of social capital includes the following analytical steps: identifying the generalizing concept containing a set of operational concepts, delineating these concepts, selecting the necessary number of indicators determined by the research hypothesis, and applying analytical mathematical methods (Guzhavina, Vorobyeva, 2017). The empirical base for the first analysis was data from a survey conducted in June 2016 within the framework of the Russian Foundation for Humanities grant "Regional Social Capital in Crisis Conditions".

Based on the indicator model, an integral index of social capital is calculated for each respondent, which allows for identifying groups of its bearers and assessing the level of accumulated social resources.

All respondents are distributed into five groups – from the minimum to the maximum level of social capital accumulation. These groups are sufficiently stable, providing insight not only into the state and dynamics of social capital and its susceptibility to external factors but also into the structure of regional society, which opens possibilities for social forecasting. The methodology has been tested and has demonstrated its validity. The relevance of studying regional aspects of social capital is particularly noteworthy, which is important for countries with significant territorial and ethnic diversity. The results of the research were published in the collective monograph “*Regional’nyi sotsial’nyy kapital v usloviyakh krizisa*” (Regional Social Capital in Crisis Conditions), edited by T.A. Guzhavina (D.V. Afanasiev, I.N. Vorobyeva, A.A. Mekhova, M.V. Morev, I.N. Dementieva) (Guzhavina et al., 2018).

The developed methodology has enabled the study and analysis of the state of social capital across various social groups: urban populations (Guzhavina, 2018a), rural populations (Guzhavina, 2018b), and youth (Yasnikov, 2019). Through the lens of social capital, it has been possible to examine the value system of the region’s population (Guzhavina, Vorobyeva, 2018), volunteering practices (Guzhavina, 2019), social participation (Vorobyeva, Guzhavina, 2022), digital practices (Guzhavina, 2021), and a number of other aspects.

Further study of social capital focuses on its interrelation with collective action. Within this direction, the grant project “*Kollektivnye deystviya i sotsial’nyy kapital v rossiyskom obshchestve*” (Collective Action and Social Capital in Russian Society) was implemented with support from the Russian Science Foundation (RSF) (T.A. Guzhavina, K.E. Kosygina, I.N. Dementieva, Yu.V. Ukhanova, D.V. Afanasiev, N.N. Yasnikov, D.A. Lastovkina). Collective actions are considered the basis of social interaction, representing a system of organized actions by individuals in groups.

Virtually every person is involved in them in one form or another. At the same time, social capital acts as a key factor determining the intensity, effectiveness, and scale of these actions, while itself being formed and strengthened under their influence. During the research, based on theoretical analysis, an indicator model measuring actors’ readiness for collective action was developed. This model was tested using the example of the territorial community of the Vologda Region, which made it possible to identify the dynamic characteristics of social capital and collective action. Comparative analysis of survey data from Kaliningrad, Murmansk, Petrozavodsk, Vologda, and Cherepovets helped determine territorial specifics in the formation of collective actions. An important result of the work was a detailed characterization of the subjects and practices of collective action, as well as an analysis of the impact of the pandemic on them. The research findings are presented in a monograph (Guzhavina et al., 2022).

Civil society in socio-economic dimension: The role of the non-profit sector

Within the framework of civil society studies conducted at VolRC RAS, monitoring and assessment of one of its key institutions – the non-profit sector – has been carried out since 2017. An important result of this work was the successful defense of two Candidate of Sciences dissertations: in 2021 – K.E. Kosygina’s “*Razvitiye nekommercheskogo sektora v ekonomike regiona*” (Development of the Non-Profit Sector in the Regional Economy) (supervisor: Doctor of Sciences (Economics) A.A. Shabunova); in 2025 – A.S. Artamonova’s “*Sotsial’no orientirovannyye nekommercheskiye organizatsii kak instrument upravleniya sbalansirovannym razvitiyem regional’nykh ekonomicheskikh system*” (Socially Oriented Non-Profit Organizations as a Tool for Managing Balanced Development of Regional Economic Systems) (supervisor: Doctor of Sciences (Economics) E.V. Bazueva).

In her research, K.E. Kosygina employs a comprehensive approach, forming a systemic vision of the role of the non-profit sector in the regional economy. A central contribution of the author is the proposed interpretation of the non-profit sector as an economic subsystem of the region. It is defined as a set of non-state, non-profit organizations whose activities are aimed at achieving common goals of socio-economic development. The main results of this authorial approach are presented in the monograph “*Nekommercheskiy sektor v ekonomike regiona*” (The Non-Profit Sector in the Regional Economy) under the scientific editorship of A.A. Shabunova (Kosygina, 2022a).

The works analyze trends, features, and patterns of this sector’s development. In particular, they reveal a significant unevenness in its development across Russian regions (Kosygina, 2018; Kosygina, 2019a), a high level of territorial differentiation in the presence of the non-profit sector within a single region, and its narrowing scope in small territorial units (Kosygina, 2023). For quantitative analysis, the author adapts business demography methodology, proposing the calculation of birth and death rates applied to non-profit organizations (Kosygina, 2019b). Within the research, a methodological approach was developed for the comprehensive assessment of risks and development factors of the non-profit sector, based on a combination of expert surveys and mass sociological studies. According to a survey of heads of socially oriented NPOs in the Vologda Region, key problems include insufficient financial and economic resources of organizations, a shortage of qualified personnel, internal fragmentation of the non-profit sector, and dysfunctions in the system of interaction with authorities (Kosygina, 2018). Mass population surveys helped identify additional social barriers: low public awareness of NPO activities; insufficient level of trust in them; weak involvement of residents in the work of non-profit organizations (Ukhanova, Kosygina, 2019; Ukhanova et al., 2020; Kosygina, 2022b).

Of particular practical interest is the developed methodological toolkit that allows for assessing the role of socially oriented non-profit organizations (SONPOs) as economic actors and determining their contribution to the regional economy. It is based on three models of economic behavior of organizations: “SONPO as a Consolidated Philanthropist”, “SONPO as a Social Entrepreneur”, and “SONPO as a Volunteer Center”. It has been determined that the contribution of SONPOs to the gross regional product (GRP) of subjects in the Northwestern Federal District varies within 1.5% (Shabunova, Kosygina, 2019a). The developed methodological toolkit can be used in public administration practice. Its application allows for comparative measurements of the sector’s economic contribution across different territories, identifies which of the three models predominates in a region, and can serve as a basis for regional authorities in developing measures to support and engage non-profit sector organizations in addressing regional development issues.

Research in the field of civil society and the non-profit sector has been expanded through the analysis of interactions between the state, business, and the non-profit sector. As a result, the main forms of cross-sector partnerships have been systematized, and a key trend has been identified: cooperation is actively expanding to the regional and municipal levels, which allows for effectively combining the resources of all parties for territorial development (Kosygina, 2020b). It has been shown that the state has generally created legal conditions and organizational-economic tools to attract new service providers – socially oriented non-profit organizations – into the social sphere, including in the regions, although the share of state funding remains insignificant. It has been proven that SONPOs are not recipients of state support but rather act as donors, accumulating funds from various sources to address social problems, which confirms their economic significance (Shabunova, Kosygina, 2019a). Based on the analysis, practical

tools have been developed to improve state management of the non-profit sector in Russian regions through mechanisms of cross-sector social partnership (Kosygina, 2021b).

Issues regarding the role of SONPOs in ensuring balanced territorial development were examined in the works of Candidate of Sciences (Economics) A.S. Artamonova and Doctor of Sciences (Economics) E.V. Bazueva. The authors conclude that the participation of the non-profit sector in socio-economic processes contributes to solving a number of key tasks, such as reducing inequality (involving SONPOs helps diminish imbalances in the accessibility of socially beneficial services for the population); enhancing efficiency (the activities of SONPOs increase the overall efficiency of the regional economy); and mitigating differentiation (in the long term, engaging the non-profit sector leads to a reduction in spatial differentiation within the national economy) (Artamonova, Bazueva, 2022a). The analysis showed that SONPOs focus their work on such priority areas as education, healthcare, and social support. These areas address the basic needs of the population, which the state is not always able to fully satisfy, especially considering territorial remoteness and individual citizen demands. When evaluating the effectiveness of their activities, SONPOs primarily focus on their social significance, applying targeted mechanisms to address the pressing problems of specific target groups. The research also identified and detailed a set of potential socio-economic effects from the systemic and long-term work of SONPOs in their key areas of activity (Artamonova, Bazueva, 2022b).

A.S. Artamonova and E.V. Bazueva developed and tested an authorial approach to assessing the influence of SONPOs on the balanced development of the regional economy. Unlike existing methods, it views SONPOs as active economic agents performing a wide range of functions. Econometric models were constructed based on the Mankiw –

Romer – Weil model of economic growth. Modeling that accounted for spatial structure and time lags showed that the direct influence of SONPOs on economic growth is diminishing. However, their contribution to the social sphere is significant: on average, they increase a region's Human Development Index by 0.3 points. Since the analysis confirmed the high importance of human capital for economic growth, it can be concluded that SONPOs exert an indirect yet important influence on the economy (Artamonova et al., 2025).

Based on their ability to diversify funding sources and the spectrum of tasks they address, conventional types of SONPOs were identified. For their sustainable development, measures to optimize their external and internal environment were proposed, along with an organizational-economic mechanism. Its key features include cyclical stimulation and the adaptation of management methods according to the organization's lifecycle stage (Artamonova, Bazueva, 2024).

Thus, while the non-profit sector is an integral and economically significant institution of civil society, makes a direct contribution to the regional economy, and plays an important role in ensuring balanced development by reducing social inequality, enhancing economic efficiency, and fostering human capital development, it also serves as an associated form of civic participation (Kosygina, 2020a).

Civic participation

The level of civic activity and population engagement in the activities of civil society institutions largely depends on the model of its formation – “from above” or “from below”. As V.A. Ilyin emphasizes, the emerging trend toward the development of grassroots civic activity or civic participation is particularly important for Russia. This phenomenon finds expression in a wide spectrum of initiatives – from local improvement projects to participation in federal competitions (Ilyin, 2017).

Active research in this area has been conducted at VolRC RAS since 2018. During this time, a group of researchers has successfully implemented a series of projects supported by leading Russian scientific funds⁴. These projects cover both fundamental theoretical and methodological aspects of the phenomenon and applied problems, including the digitalization of civic practices and the resolution of social contradictions.

During the implementation of the 2020 grant project “*Fenomen grazhdanskogo uchastiya v nauchnom diskurse: teoreticheskiye i metodologicheskiye osnovaniya issledovaniya*” (The Phenomenon of Civic Participation in Scientific Discourse: Theoretical and Methodological Foundations of Research) (Yu.V. Ukhanova), the theoretical and methodological approaches to studying civic participation presented in the works of foreign and domestic scholars were examined. Civic participation is interpreted as a process through which public organizations or individuals engage in relationships with the state (vertical interaction) and other socio-political institutions (horizontal interaction) to solve socially significant tasks (Ukhanova, 2020).

The conclusions and results obtained from the conceptualization of the term “civic participation” served as the basis for new research projects. As part of the project “*Bar'yery grazhdanskogo uchastiya i mekhanizmy ikh preodoleniya na regional'nom urovne*” (Barriers to Civic Participation and Mechanisms for Overcoming Them at the Regional Level) (Yu.V. Ukhanova, K.E. Kosygina, T.A. Guzhavina, E.O. Smoleva, I.N. Dementieva, A.S. Artamonova),

the research team developed and tested a methodological approach for the comprehensive study of civic participation, taking into account the specifics of its forms of manifestation, barriers to its realization, and ways to overcome them at the regional level.

The project involved: a comparison of the conditions for the development of civic participation in Russia and foreign countries; a study of factors influencing citizen and public organization participation in solving socially significant problems in global and Russian practice; identification of features of the civic participation environment at the regional level; and an assessment of the impact of civic participation practices on the development of urban space in the studied regions.

A conclusion was drawn that for the development of civic participation in the regional community, the active use of information resources is timely. A comprehensive methodology for measuring barriers to civic participation was developed. As a result of typologization, external barriers to participation were identified, which are of an institutional (normative-legal, organizational, informational, socio-technological) and sociocultural nature, and internal barriers, directly related to the value-motivational and socio-psychological orientations of the subjects of participation and interpersonal communications in the implementation of socially beneficial activities.

Based on the typology of civic participation barriers, mechanisms for overcoming them at the regional level were developed. Their implementation will contribute to enhancing the effectiveness of realizing the potential of civic participation in addressing pressing local population problems (Ukhanova et al., 2022).

Within the project “*Dizhitalizatsiya grazhdanskogo uchastiya: progress v dostizhenii sotsial'nykh effektov vs imitatsiya obshchestvenno poleznoy deyatel'nosti*” (Digitalization of Civic Participation:

⁴ Projects supported by scientific foundations: “The Phenomenon of Civic Participation in Scientific Discourse: Theoretical and Methodological Foundations of Research”; “Barriers to Civic Participation and Mechanisms for Overcoming Them at the Regional Level” (RFBR, 2019–2021); “Digitalization of Civic Participation: Progress in Achieving Social Effects vs. Imitation of Socially Beneficial Activities” (RFBR, 2021); “Overcoming Social Contradictions in Small Territories: Participation of the Local Community” (RSF, 2023–2024).

Progress in Achieving Social Effects vs Imitation of Socially Beneficial Activities) (Yu.V. Ukhanova, K.E. Kosygina, M.A. Gruzdeva, A.V. Popov, E.O. Smoleva), the research field regarding the specifics of civic participation was expanded. The work involved: assessing digital inequality as a key threat to the digitalization of civic participation at regional and municipal levels (Gruzdeva, 2020); analyzing the potential for adapting foreign experience in digital civic participation to Russian conditions (Popov, 2022); identifying main trends and regional features of civic participation in Russia's digital space (Smoleva, Popov, 2022); evaluating the applicability and effectiveness of information and communication technologies in the work of non-commercial organizations as a form of civic participation (Kosygina, 2021a).

The focus of the next research phase was civic participation at the municipal level, within the framework of the project "*Preodoleniye sotsial'nykh protivorechiy malyykh territoriy: uchastiye mestnogo soobshchestva*" (Overcoming Social Contradictions in Small Territories: Participation of the Local Community), implemented with the support of the Russian Science Foundation (Yu.V. Ukhanova, K.E. Kosygina, E.O. Smoleva, E.D. Kopytova). The work not only systematized existing methodological approaches to studying social contradictions in small towns and settlements in contemporary scientific discourse but also proposed original methods for their diagnosis. A comprehensive measurement of the socio-economic development level of small territories was conducted. Tested on 96 small towns across seven regions of the Northwestern and Central Federal Districts, the authorial methodology helped identify key problems and determine potential growth points (Ukhanova et al., 2024). A meticulous analysis of the dynamics of the Urban Environment Quality Index, supported by sociological survey data, provided a clear picture of main social contradictions, including those seen through

the eyes of the residents themselves (Smoleva, Kosygina, 2024). As a result, existing mechanisms for engaging local communities in the development of small territories were summarized, and the contribution of such participation to resolving social conflicts was analyzed in detail. The outcome of the research was the development of individual development trajectories for small territories, based on the principle of active involvement of the local community in transformation processes.

On the prospects of the research field development

Overall, the scientific contribution of VolRC RAS lies in forming a holistic and evidence-based picture of civil society development in Russian regions. A comprehensive interdisciplinary approach, integrating sociology, economics, philosophy, and political science, has allowed not only for describing the structural components and dynamics of civic institutions but also for developing practical tools for their assessment and support. The accumulated unique body of data and the developed methodologies create a foundation for further research, including in the field of interconnections between culture, values, and civic activity, which defines promising directions for future scientific work within the study of civil society.

Of particular significance in this context is the moral fabric of civil society, the study of which is becoming not merely one of the future directions of analysis but a key element in understanding its essence. Civil society is not only a network of institutions and organizations but, above all, a community of citizens united by shared values. These include solidarity, mutual respect, trust, a sense of personal and collective responsibility for events in the country and region, and a commitment to the principles of justice. Essentially, civil society is an environment where moral and ethical norms and values are born and sustained.

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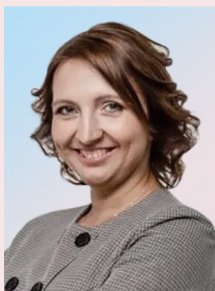
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Abstract. The article provides a review of current research analyzing the social determinants of the aging process, which begins as early as middle age and is the result of an individual's personal development. While scientists primarily note biological markers as its fundamental mechanisms, a trend has recently emerged toward understanding aging as a multifaceted process that includes social and psychological markers and is influenced by environmental factors that can be controlled by the will of the individual. In this regard, the issues of interdisciplinary approaches in studying aging as a bio-socio-psychological process, as well as identifying factors amenable to modeling, have gained relevance. Various classifications exist for the factors influencing the functional capacity of older adults. In most cases, they are divided into three groups: individual, social, and environmental. Factors not related to internal capabilities and health quality are usually classified as social determinants of health, which can be modified. In recent years, the idea of the possibility of constructing old age has developed, representing a set of strategies for creating and realizing an image of desired old age. This has opened a positive perspective for research and new vectors for social policy development, the goal of which is to create conditions for successful aging and healthy longevity. In the 21st century, the concept of successful aging has become an alternative to the idea of decline in old age and reflects a social demand, as the demographic shift has led to an annual increase in the number of people of retirement age. It is projected that by 2030, every sixth person in the world will be over 60 years old.

Key words: demographic shift, successful aging concept, modeling of old age, social determinants of aging, aging trajectories.

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Introduction: new perspective on aging process

Population aging represents a unique demographic shift affecting virtually all aspects of public life. By 2030, according to forecasts, every sixth person in the world will be over 60 years old, by 2050 the number of people in this age group will double to 2.1 billion people, and the number of people over 80 will triple, reaching 426 million people¹. At the same time, the expected duration of healthy life may not change, which will lead to increasing number of years spent with poor health, reduced physical and mental abilities, and often in poverty and exclusion, which will have negative effects for the entire society. Already in 2017, according to

world statistics, the number of diseases related to aging accounted for 51.3% of the total global disease burden (Chang et al., 2019). The problem of the growth of neurodegenerative disorders such as Alzheimer's disease has become particularly acute. Therefore, maximizing healthy life expectancy is becoming one of the main tasks of public health.

The aging process is biologically complex and heterogeneous, and it is characterized by significant differences in people's life experiences, including physical, social, and psychological functioning (Cosco et al., 2017). Biological aging is described as a gradual or progressive deterioration of health, including functional impairment of physiological systems and diseases, which eventually leads to death (Lopez-Otin et al., 2013). Understanding the

¹ Ageing and health. World Health Organization. Available at: <https://who.int/news-room/fact-sheets/detail/ageing-and-health> (accessed: 14.08.2025).

biological foundations of the aging process itself and the ability to “manipulate” them are the basis for geroscience, according to which there is no fixed aging program; this process can be controlled (Kirkwood, 2017). Aging can be achieved with preserved health reserves, and longevity itself is not only the key to strong genetics, but the result of a purposeful fight against modifiable risk factors: environmental, behavioral, occupational, social, and biological.

Thus, aging has become not only a biological, but also a socio-behavioral phenomenon. Unlike biological aging, social aging is conceptualized as a process that is shaped by social factors and is subject to social construction (Kunkel, Settersten, 2021), in other words, it is the process of assuming new social roles and behavioral practices in the interaction between people and their physical and social environment.

Gradually, gerontological concepts began including data obtained by psychological and social sciences, which expanded the understanding of aging processes, and scientists are now talking about its different vectors: pathological, typical and successful. The term “active” aging is most often used to refer to successful aging (Walker, 2002; Fritzell et al., 2021; Tajvar et al., 2022), as well as “healthy”, “productive”, “harmonious”. If they are not completely synonymous, they are very close in meaning. The emergence of the successful aging concept has led to the search for determinants of compensatory mechanisms in old age, as well as to the fight against the stigma associated with aging. In Russia, following European countries, the concept of active aging and longevity has been consolidated, which has been operationalized and calculated since 2010 using the Active Aging Index (Sinyavskaya, Chervyakova, 2022).

In 1997, J. Rowe and R. Kahn defined successful aging as a high level of cognitive and physical functions, involvement in life, and the absence of disease and disability (Rowe, Kahn, 1997). This

approach has been criticized for its narrow biomedical focus and unrealistic expectations of disease absence in old age. In 2015, the World Health Organization (WHO) proposed a more realistic concept of healthy aging as a continuous process of developing and maintaining functional abilities that ensure well-being in old age (Beard, Bloom, 2015). This definition shifted the focus from a disease-based approach to a function-based approach. At the same time, a view of aging as a quality of life in old age began developing in line with modern humanistic gerontology (Pashina, 2024). This concept is based on people’s subjective perception of the aging process; it means that in its mainstream, successful aging is defined as a state in which a person achieves a sense of well-being, high self-esteem of quality of life, and a sense of self-fulfillment even in conditions of illness and disability (Young et al., 2009).

Scientific concepts, as well as a large amount of research on how to promote healthy aging, have offered an optimistic view of addressing the challenges of aging, which has led to policy initiatives aimed at preventing physical deterioration with age by encouraging older people to stay physically active. Back in 2002, WHO documented the concept of “active aging” as “the process of optimizing opportunities for health, participation and safety to improve the quality of life as people age”². At the same time, the word “active” refers not only to the ability to be physically active, but also to support the prospects of people’s participation in social, economic, cultural, spiritual and civic affairs to improve the quality of life. In the same year, the United Nations developed the Madrid International Plan on Aging³, which proposed a turn in the understanding of old age, free from obligations and work, toward old age, where an important role is

² Active ageing: A policy framework (2002). WHO reference number: WHO/NMH/NPH/02.8. P. 12.

³ Madrid International Plan of Action on Aging, 2002. Available at: https://www.un.org/ru/documents/decl_conv/declarations/ageing_program.shtml

given to labor market participation and equal access of older people to consumer practices (Galkin, 2022). In other words, the Madrid Plan, unlike the earlier Vienna International Plan on Aging (1982), not only offers measures to meet the needs of the elderly, but also aligns the aging processes of society with its sustainable development. Twenty years later, WHO named 2021–2030 the decade of healthy aging, during which it is planned to undertake a number of coordinated and joint actions aimed at improving the lives of older people, their families and the local communities in which they live⁴. In Russia, however, since 2019, the Concept of an active longevity policy is being developed, and the Federal Project “The Older Generation” is designed to help ensure the well-being of elderly citizens and improve their quality of life⁵.

From the WHO point of view, healthy aging is the development and maintenance of functional abilities that ensure well-being in old age. Functional abilities are determined by a person's own potential (i.e., the totality of all physical and mental abilities of a person) and the environment (physical and social) in which he or she lives. This concept assumes a view of a person as an active subject who implements a conscious approach to their lifestyle and preventive measures from an early age, but at the same time takes into account that the socio-economic resources and opportunities available to people throughout their lives strongly influence the ability to make the right choice regarding health and education, and support if it necessary. Thus, healthy aging is closely linked to social and economic inequality.

Problems concerning healthcare, education, employment, and earnings reinforce each other and accumulate over the course of lifetime. Cultural,

gender, and ethnicity are important factors of inequality and lead to completely different ways of aging, so in this article we want to emphasize the importance of including social factors in understanding the problem of aging along with biological and psychological ones, as well as to emphasize that aging is a multifaceted and individual process. And the study of risk factors and health protection will make it possible to implement the prevention of early aging. The problem remains how to increase social integration for all senior citizens and improve their quality of life. The concept of healthy aging should help to understand that it is necessary to prepare for it from the third decade of life, forming healthy habits and attitudes.

The article provides an overview of interdisciplinary research on the aging process with an emphasis on the social determinants of health. The method chosen is a descriptive review, which in foreign literature is referred to as a “narrative review” or “state-of-the-art” (Sukhera, 2022). It helps to synthesize different points of view and approaches to form and present the author's view of the problem, depending on the context in which the review is conducted. In this case, we have focused exclusively on the description of interdisciplinary studies of the aging process, the authors of which adhere to the view that aging is a constructed process that can be influenced throughout life, and not only during old age itself, when it is too late to prevent abnormalities. This was done to identify the social determinants of aging that can be influenced and changed over the course of life, as well as to prove the possibility of including sociological aspects in a joint (interdisciplinary) methodology for analyzing the aging process, in particular the cognitive population aging as a multidimensional process influenced by many internal and external factors, and which, in such way, becomes not only a medical problem, but also an area of application of social policy efforts. The sources included in the review were selected based on keywords such as

⁴ Decade of Healthy Aging. WHO. Available at: <https://who.int/ru/initiatives/decade-of-healthy-ageing> (accessed: 14.08.2025).

⁵ Eternal youth: How Russia is transitioning to active longevity. Available at: <https://www.gazeta.ru/business/2019/09/13/12647245.shtml> (accessed: 21.07.2025).

“designing aging”, “modeling aging”, “successful aging”, “healthy aging”, etc. in scientific libraries and databases Google Scholar, E-library, Pubmed, as well as using the “snowball” method. In total, we analyzed about 200 papers, of which 78 were the most relevant. Theoretical analysis methods were used to achieve this aim: induction, deduction, and synthesis.

Searching ways for aging healthily

In the 2010s, the prevalence of healthy aging ranged from 12 to 37% in different countries and regions due to the lack of a standardized approach to its assessment (McLaughlin, 2010; Arias-Merino et al., 2012; Meng, D’Arcy, 2014; Feng et al., 2021). And although this problem is relevant for the whole world, only a few countries are actively preparing for the future, conducting massive interdisciplinary research in an attempt to find the key to a successful longevity, taking into account national characteristics. Large-scale studies of the aging population have been conducted, for example, in China, where a fifth of the world’s elderly already live today (Chen et al., 2022). Special emphasis is placed on the cognitive aspect of the aging process and its relationship to socio-economic factors such as social engagement, activity (Fu et al., 2018; Zhou et al., 2020) and income (Feng et al., 2020).

The results of modern research show that health in old age is the result of the cumulative effect of behavior and events in an earlier period, so it is necessary to pay attention to the practices and attitudes of the middle-aged population (starting from the third decade of life and up to 59 years⁶), who still have the opportunity to prepare for aging in advance (Lachman et al., 2015). In this regard, interdisciplinary groups of scientists are developing a new line of research to initiate primary or bottom-up prevention of aging, providing a guideline for

developing effective medical and socio-economic strategies to preserve youth to allow more middle-aged people to achieve a long and healthy life (Wang et al., 2024). The Chinese study shows that the trend toward healthy aging among the middle-aged population may change over time. This means that by improving certain parameters, it is possible to increase the likelihood of healthy aging.

It is also known about studies of population aging in Korea (Korean Longitudinal Study of Aging), Great Britain (English Longitudinal Study of Aging), Ireland (The Irish Longitudinal Study on Aging), Mexico (Mexican Health and Aging Study), Japan (Japanese Study on Aging and Retirement). To a greater extent, they are based on socio-economic statistics, as well as information about the cognitive functions of the population, since the purpose of such studies is to create the basic data necessary for the development and implementation of effective policies to anticipate and address the problems that arise in the aging process.

Designing the aging process

In the 21st century, one-dimensional models of aging that focus on the idea of decline in old age have given way to developmental models that span the entire life span and examine how specific processes and strategies contribute to adaptive aging. In part, this shift was triggered by the contrast between the results, which clearly demonstrate a decrease in biological, physiological, and cognitive abilities, and evidence that people are generally satisfied with life in old age and experience relatively high levels of emotional well-being (Charles, Carstensen, 2010).

Although scientists primarily note biological signs as the fundamental mechanisms of aging, recently there has been a trend in gerontology toward understanding aging as a multifaceted process involving social and psychological signs, as well as being influenced by environmental factors. Therefore, the issues of interdisciplinarity in the study of aging as a biosociopsychological process

⁶ In our work, we are guided by the WHO gradation, according to which the limits of the average age are 44–59 years, but since studies show that cognitive decline begins at the age of 35 (see, for example, Hartshorne, Germine, 2015), we consider it necessary to lower the lower limit to 35 years.

are being actualized. In this regard, the idea of the possibility of constructing old age, which is a set of strategies for creating and implementing its desired image, has been developing in recent years, which has opened up a positive prospect for research in gerontology (Belekhova et al., 2024). Mathematical modeling of aging has been of great interest for many years (Yashin et al., 2007; Akushevich et al., 2023). In addition to studying various aspects of the aging process, attention is paid to the mechanisms of adaptation to it, its various scenarios, taking into account the possibility of early prevention.

There are different classifications of factors affecting the functional capabilities of the elderly (Zhang, Wang, 2025). In most cases, the factors are divided into three groups: individual, social, and environmental. Individual factors include demographic data (age, gender, marital status, education level, and income level), internal capabilities (activity function, sensory function, cognitive function, psychological state, state of vitality and adaptability, etc.), and health characteristics (physical and mental health, diseases, lifestyle, coping methods, physical activity, body weight, healthy habits, etc.). Social factors include social status, social participation and relationships, social security, public services, etc. Environmental factors include economic conditions, living environment, social and political environment, etc. In research, these factors are grouped in different ways, but in most cases, those that do not relate to internal abilities and quality of health are classified as social determinants of health.

Russian researchers O.Yu. Strizhitskaya and M.D. Petrash examined biological, psychological, and environmental factors from the point of view of their modelability, which is understood as the possibility of creating, controlling, and eliminating certain mechanisms depending on their role in the design of aging (Strizhitskaya, Petrash, 2022). The authors present that the mechanisms of subjectivity are at the heart of the possibilities of constructing

aging, and adequate and positive ideas about one's own old age serve as the basis for forming strategies. Genetic and physiological mechanisms are not absolute predictors of aging and can be partially modified, but not modeled, since a person cannot completely exclude or change them. Psychological and social factors can only be modeled conditionally, and a variety of environmental factors are considered the most flexible for modeling, allowing significant adjustments to aging trends. The fact that the increase in life expectancy in the 20th century became possible primarily due to environmental factors (lifestyle, medicine, social security, etc.) confirms the authors' conclusions. And this suggests that there are various factors and mechanisms that a person can use to accumulate resources for a long-term active life, and the activation of such resources requires the initiative of the person themselves.

But opportunities to engage in activities that can increase the likelihood of healthy aging are not always fair and may depend on social and environmental factors beyond human control. This can lead to an uneven distribution of cumulative advantages or disadvantages throughout a person's life and have a strong impact on the trajectory of their aging. Therefore, a thorough study of how the various socio-economic indicators that WHO has identified as a broad group of social determinants of health (SDH) affect healthy aging as a multidimensional concept may have important implications for health and social policy.

The search for the causes of "unequal" aging has led to increased interest in the interaction between cumulative socio-economic inequality and biological aging. P. Gellert and E. Alonso-Perez proposed a taxonomy of aging models, dividing them into four classes depending on the type of relationship between biological and psychosocial factors and their impact on health: mediation, regulation, interaction, independence (Gellert, Alonso-Perez, 2024).

Below, we will take a closer look at modifiable factors, as well as their effect on the biological signs of aging.

Social determinants of health and biological aging

In 2005, WHO identified SDH as the structural factors and conditions of daily life that significantly contribute to health inequities. The SDH is classified into five domains: access and quality of healthcare, access and quality of education, social context, economic stability, as well as the area of residence and man-made environment (Zhang, Zhang, 2023). Thus, the term “social determinants” serves as a short description of the social, political, economic, environmental and cultural factors affecting health.

From WHO’s point of view, health indicators are subject to the law of social gradient: the lower the socio-economic well-being of a territory, the lower the incomes, educational achievements, health status and healthy life expectancy of its population⁷.

Of particular relevance in this regard are studies on the impact of the SDH on cognitive functions and intelligence (Marmot et al., 1991), which is understood as a complex hierarchy of skills reflecting the interaction between the social context and the individual throughout life. Socio-economic factors serve both as factors and defenses for cognitive health. As a rule, the higher the socio-economic status of a person, the higher the cognitive performance and the slower the cognitive decline (Brunner, 2005). For example, food insecurity (Portela-Parra, Leung, 2019) and unfavorable housing conditions demonstrate a negative relationship with cognitive performance (Cobb-Clark, Kettlewell, 2021). Limited access to healthcare is a serious risk, which can delay the diagnosis and treatment of cognitive disorders

(Mullins, 2021). There is also a detrimental relationship between long-term unemployment and cognitive indicators: decreased literacy, memory, executive functions, and information processing speed (Vélez-Coto et al., 2021). The mechanisms underlying these effects are multifaceted and include the psychological burden of unemployment, which contributes to stress and negatively affects brain health over time.

On the contrary, access to green spaces throughout life can slow down cognitive decline later in life (Cherrie et al., 2018). But the education level plays a crucial role in the state of cognitive health. People with higher levels of education and income demonstrate significantly better cognitive performance: improved working memory and executive function (Nutakor et al., 2021), the same applies to attention (Pengpid et al., 2019) and delayed verbal tasks (Chen et al., 2021). The educational level primarily shapes cognitive skills by contributing to individual differences in memory, executive function, and information processing speed, which are established in early adulthood and persist into old age, contributing to sustained cognitive performance over time (Lövdén, 2020).

Most modifiable risk factors and defenses against cognitive decline and dementia show gender differences in their rate and/or manifestation of risk, and these differences are often more pronounced in developing countries. V. Gilles and colleagues studied how age-related cognitive decline, estimated using a spatial navigation video game, varies among participants from 39 countries (Gilles et al., 2024). The authors found that the social, economic, and environmental well-being of older people, as measured by the Quality of Life Index of Older People, is negatively associated with age-related declines in spatial abilities, and gender differences in spatial navigation skills increase with age, especially in countries with large gender inequalities.

⁷ Social determinants of health. WHO. Available at: <https://who.int/ru/news-room/fact-sheets/detail/social-determinants-of-health> (accessed: 15.08.2025).

Behavioral aging factors

The next group of factors subject to change is related to behavior and lifestyle. Behavioral factors such as physical activity, a healthy diet, and stress management have already been shown to modulate the aging process and age-related changes in health (Picard, 2011).

Behavioral factors include, first of all, nutrition and dietary preferences, which over the years form the body structure and availability of micro / macronutrients; second, physical and athletic activity, which provides the necessary level of energy expenditure, metabolic health and physical tone; further, compliance with sleep patterns that allow the body to recover and rest; and adherence to bad habits that have a destructive contribution to the level of future health.

A clear example of the influence of lifestyle on the quality of health was found in the study of the links between diabetes, the SDH and cognitive tests. People struggling with diabetes showed better cognitive performance compared to participants who did not have the disease, which the researchers attributed to the proactive lifestyle of the former. This lifestyle includes a healthy diet, regular exercise, blood glucose control, and more frequent medical monitoring and treatment, which together can help maintain cognitive performance and mitigate cognitive decline (Dove et al., 2021).

Another example related to behavioral practices is the accumulation of cognitive reserve (CR) (Lachman, Agrigoroaei, 2010), which allows preserving cognitive functions. Physical activity, training and education, regulation of emotional state, and involvement in social activities are identified as mechanisms contributing to the preservation of these functions (Agrigoroaei, Lachman, 2011). To date, many CR studies have been conducted, and conclusions about the effects of digital transformation on human cognitive functions are of particular interest. In particular, there is evidence that the use of digital devices for

various purposes (reading, accessing social networks, gaming, and other activities that require great cognitive effort), and not just for communication, has a positive effect on the CR (Liang et al., 2023). There is evidence of the benefits of using digital devices for the elderly, including slowing cognitive decline, strengthening social networks, implementing basic daily activities and supporting health services (Jin et al., 2019), which became relevant during the COVID-19 pandemic and is especially noticeable in dynamically developing Asian countries, such as Malaysia (Pazim et al., 2021). Of particular interest to us is the conclusion that the quality and volume of social networks in which a person is included strongly influence the CR. Interpersonal relationships provide access to a variety of social stimuli, which enhances the brain's ability to cope with damage to neurons (Perry et al., 2022).

Social interactions as aging factor

Social relationships are recognized as a key element of well-being and have a cumulative impact on health throughout a person's life, playing an important role in adaptation and mental well-being (Bardhan, 2024). However, the relevance of social relations to the study of aging has not always been as widely recognized as it is today. Social relationships have an emotional or psychological component that determines their importance, as well as a true cause-and-effect relationship with such objective results as, for example, the development and course of diabetes, heart and vascular diseases, brain stroke outcomes, immune system reactions, life expectancy, and the risk of death caused by any cause (Lebedev et al., 2024).

R. Kahn and T. Antonucci developed a model of social convoy based on research on attachment and social roles (Kahn, Antonucci, 1980). The term "convoy" is used to describe the duration and nature of social relationships, and special attention is paid to emotional intimacy (Antonucci, 2001). According to the model under consideration,

people are surrounded by other people who support them and who move together throughout their life cycle. Social relationships differ in proximity, quality (positive/negative), function (help, affect, exchange) and structure (size, composition, frequency of contacts, geographical proximity). The structure, function, and quality of convoys depend on personal (e.g., age, gender) and situational (e.g., role requirements, norms, values) characteristics, while having a significant impact on health and well-being.

The way in which social exchange processes are related to biological aging has been studied in detail in the research of the group of J.P. Kiecolt-Glaser. They investigated how social support within married couples is associated with biomarkers of aging (Wilson et al., 2021), and described potential pathways from chronic marital distress to mental health problems such as depression, which then increase the risk of obesity, cardiovascular and cardio-metabolic diseases (Kiecolt-Glaser et al., 2019). The research shows that divorce in middle age can negatively affect cognitive abilities, especially memory and orientation, increasing the risk of dementia later in life (Brown et al., 2021). A study conducted in China shows that people who are married are on average 0.6 years younger than their single peers (in terms of biological rather than chronological age), and those who have lost their spouse are 0.3 years older (Galkin et al., 2022).

Social relationships (social support and frequency of contacts) have been proved to affect immune function, chronic diseases, and mortality risk (Holt-Lunstad et al., 2010). People who know that friends and family members are ready to support them in difficult times feel a more pronounced sense of meaning in life (Krause, 2007). In addition, people with developed social networks report higher emotional well-being in daily life, as well as in stressful situations (Cohen and Wills, 1985). That is, both the structural (number and type of social partners) and functional (perceived

or actual support) aspects of social media contribute to emotional well-being.

Increasingly, studies show that older people who are in strong social networks and maintain a high level of social activity are less likely than their less socially engaged peers to experience cognitive decline (Zunzunequi et al., 2003), as well as older people engaged in volunteer activities (Singh-Manoux et al., 2003). Prosocial behavior is generally positively associated with successful aging (Sparrow et al., 2021).

It has long been proven that increasing social support and frequency of contacts over time, especially with loved ones, has a positive effect on health, reducing the physiological effects of stress (Carstensen et al., 1999). Support and contacts with friends are particularly important for biomarkers of aging (McHugh Power et al., 2019), since relationships with them are usually voluntary, unlike relationships with family members (Sharifian et al., 2019).

Positive emotions experienced during social contacts are considered to be the main reason why social interactions can contribute to improved cognitive function (Blanchard-Fields et al., 2008). People who report less satisfaction with their networks show more pronounced cognitive decline over time (Hughes et al., 2008). The effect of developed social networks is comparable to traditional medical indicators such as high cholesterol and smoking.

Emotional factors affecting the quality of aging

It has been proven that the emotional component of personality also seriously affects the quality of aging. The inclusion of social and behavioral sciences in the field of vision of gerontology, where attention to biological processes has traditionally prevailed, has led to the use of social constructionism in the analysis of the aging process. From the point of view of constructionism, age is a social construct embedded in social norms and culture (Bytheway, 2011; Hoepner, Urban,

2019; Twigg, Martin, 2014; Zhang et al., 2017). People interpret aging in different ways depending on the context and the discourses available to them (Holstein, Gubrium, 2008). Positive self-perception also influences the formation of a “healthy old age” and longevity, which is confirmed by many years of psychological research.

According to the theory of stereotype embodiment proposed by B. Levy, positive and negative stereotypes about age in society are embodied through internalization processes (Levy, 2009). These stereotypes may be conscious or unconscious, but they become noticeable through the manifestation of social signals that define “old age”. Internalized stereotypes about age are assumed to affect health through behavioral (e.g., sedentary behavior, medication adherence), psychological (e.g., expectations that alter behavioral responses such as cognitive and physical functioning), and physiological (e.g., increased cardiovascular stress response) pathways.

A comparative longitudinal analysis of the influence of genetic (APOEε2) and environmental factors (ideas about cognitive functions) on the preservation of cognitive functions has shown that positive ideas about one’s own cognitive abilities have a statistically significant reinforcing effect on the functioning of the APOEε2 gene, while negative ideas have a negative effect; at the same time, the contribution of positive ideas to the level of preservation of cognitive functions is 15 times higher than the genetic factor (Levy et al., 2020).

The main conclusion is that people who are positive about aging experience it more easily (Róin et al., 2021) and live 7.5 years longer than those who perceive aging less positively. This effect is partially mediated by the will to live (Levy et al., 2002).

Conclusion

In the presented review, we show many arguments in favor of the intersection of socio-economic, behavioral, and environmental factors with the biology of aging, which demonstrates

interdisciplinarity in studying the determinants of healthy aging and strategies for its design. An example of such a successful interdisciplinary collaboration is socio-genomics, which integrates social factors into biological aging research by untangling complex interactions between innate genetic susceptibility and exposure to the social environment (Joo et al., 2022). Population aging trends have led to the emergence of biodemography, which has revealed new knowledge about the nature of human longevity, including the postponement of mortality and aging, healthy life expectancy, and the demography of healthy aging (Vaupel, 2010). Thus, it becomes clear that it is impossible to study the issues of aging within the framework of a narrowly disciplinary approach. Interdisciplinary barriers limit the adequate use of accumulated knowledge about the mechanisms and factors influencing this process (Yashin et al., 2007). The position of scientists is that an interdisciplinary research program should be based on the agreement of central terms, in particular, what is meant by “normal”, “successful” and “pathological” aging, as well as offer practical recommendations for individual behavior strategies in the formation of “desired” old age (Strizhitskaya, Petrash, 2022).

In our review, we tried to place special emphasis on the aging process as a delayed result of the influence of the identified determinants throughout life. In other words, we focused not on old age itself, but on preparing for it, which made it possible to avoid describing ways of adapting people to old age and focus on lifelong prevention by taking into account modifiable factors, which researchers primarily include social, behavioral, and environmental determinants of health.

Recent statistics have proved that the health level in the middle age group is far from ideal. This means that there are limited functional reserves that have a low chance of creating a high quality of life in the process of aging in the future. In other words, there is an urgent need to focus on the health of the

middle-aged population, especially in vulnerable groups (i.e., among people with lower levels of education, life satisfaction, and monthly income living in urban areas); it focuses on educational activities, the prevention of inequality in education and healthcare, and, as O.Yu. Strizhitskaya and M.D. Petrash write, on creating positive ideas about old age and shaping the subjectivity of the population for planning their old age (Strizhitskaya, Petrash, 2022). Particular attention should be paid to cognitive aging as a process closely related to environmental and social factors.

Understanding the importance of the subjectivity of the population in shaping their old age, at the moment we can only provide a small cross-section of Russian research on how our fellow citizens prepare for old age.

The topic of aging is as relevant in Russia as it is all over the world. According to Rosstat, by 2046, the elderly will make up 27% of the population, which, on the one hand, carries the risks of crises in the economy and healthcare, and, on the other, the growth of markets for goods and services for the elderly, and the development of technologies to prolong active life.

For 2024–2030, the country has launched the national project “Long and active life”, aimed at increasing life expectancy to 78 years by 2030 and to 81 years by 2036, primarily due to the fight against cardiovascular diseases, hepatitis C and diabetes mellitus. To improve the quality of public health, it is also planned to expand the diagnosis of cancer diseases thanks to modern devices for video gastroscopy in the regions, modernize primary health care, expand the possibilities of medical rehabilitation, eliminate the shortage of doctors, develop emergency care and digital systems in medicine. In 2024, the national project “New technologies for saving health” was launched, which includes the federal project “Regenerative biomedicine, preventive medicine technologies, ensuring active and healthy longevity”. But, as

confirmed by many studies, the contribution of a healthy lifestyle to the formation of health is up to 50%, while the contribution of accessibility of medical technologies, genetics and the environment totals the remaining 50%. In this regard, healthy habits are the key to longevity and the foundation for successful aging (Kolosnitsyna et al., 2019).

On average, with their current lifestyle and circumstances, Russians plan to live to 79 years of age (women to 80, men to 78)⁸. In the near future, it is the “silver” generation that will become the main consumer in many sectors of the economy⁹, although this is a group that, according to Russians, has to face serious problems: poverty, low pensions (71%), deteriorating health, various diseases (44%), as well as a feeling of uselessness and lack of demand (19%) and loneliness (17%)¹⁰.

In Russia, the aging process is problematized through negative stereotypes existing in society that entry into old age deprives a person of any prospects, and a good old age, as Dmitrii Rogozin writes, is just the retention of youth (Rogozin, 2012). Activity and youthfulness are considered the emerging standard of active longevity in society, while only 43% of Russians note that it is necessary to make efforts and struggle with age. Strangely enough, young people aged 18–24 (50%), those with higher education (50%), as well as residents of large and metropolitan cities (49%) are more likely to advocate for the fight against aging.

Every second Russian (48%) takes some measures to prolong youth and slow down age-related changes. They are more often women (54% versus 40% among men). Among those who

⁸ Live long, live well! Available at: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/zhit-dolgo-zhit-khorosho> (accessed: 17.07.2025).

⁹ Shopping 50+: How, what and why? Available at: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/shopping-50-kak-chto-i-zachem> (accessed: 24.04.2025).

¹⁰ Life expectancy in Russia: Desires and reality. Available at: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/prodolzhitelnost-zhizni-v-rossii-zhelaniya-i-realnost> (accessed: 24.04.2025).

are convinced of the need to fight aging, 74% personally make some efforts to do so. Although representatives of different socio-demographic groups have different strategies for combating aging, Russians mainly resort to sports (56% in the group taking measures to combat aging), proper nutrition (29%) and care procedures (27%), healthy lifestyle and hardening (13%) to preserve youth. One in ten in this group also mentioned giving up bad habits and taking walks in the fresh air (10%)¹¹.

Thus, we can draw a general conclusion that the idea of preparing for a successful old age in Russia is not yet very widespread, but it tends to develop, since government policy is aimed at improving the quality and duration of a healthy life for older citizens, stimulating their social activity and taking care of their health. In April 2025, the country approved a Strategy for actions in the interests of older citizens until 2030¹².

Based on the above, we can draw the following conclusions. First, the aging process is multifactorial and complex, inevitable, but partly manageable, which requires an interdisciplinary approach for its successful study. Second, citizens

are insufficiently aware of the principles and trajectories of healthy aging and, accordingly, are insufficiently motivated to adhere to it, which requires more educational activities of medical and sociological specialists.

Aging is not a hopelessness or a sentence, but a pattern of life that it is necessary to prepare for in advance, saving your health and resources, forming a stable “rear”, a positive attitude, and actively working on issues of saving mental, cognitive, and physical health through healthy lifestyle, regular medical checkups, and timely treatment of diseases. Social well-being, social stability, social engagement, and active social interaction can delay the onset of old age. The active position of the state in health-saving issues will help in the current demographic situation of the “aging population” to create the prerequisites and conditions for the formation of a large stratum of economically active, working-age older generation with a high level of health, which, in turn, will reduce the burden on social and insurance services, that is, it will positively affect the domestic economic situation in the country.

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¹¹ Aging: Accept or fight. Available at: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/starenie-prinjat-ili-borotsja> (accessed: 24.04.2025).

¹² The Government has approved a Strategy for actions in the interests of older citizens until 2030. Available at: <http://government.ru/docs/54753/> (accessed: 04.09.2025).

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Public Opinion Monitoring of the State of the Russian Society

As in the previous issues, we publish the results of the monitoring of public opinion concerning the state of the Russian society. The monitoring is conducted by VolRC RAS in the Vologda Region¹.

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 round of the monitoring (December 2025) and for the period from December 2024 to December 2025 (the last seven surveys, that is, almost a year).

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), 2012 (the first year of Vladimir Putin's third presidential term), 2018 (the first year of Vladimir Putin's fourth presidential term), 2023 (the last full year of the fourth presidential term).

The annual dynamics of the data are presented for 2007–2025².

In October – December 2025, the President's approval rating did not change significantly and amounted to 65–66%. The share of negative judgments is 19–20%.

Over the past 12 months (from December 2024 to December 2025), the share of positive assessments of the activities of the head of state has also not changed significantly (65–67%).

In general, in 2025, compared with the average annual data of 2024, there is a stability of opinions regarding the work of the President of the Russian Federation: the share of positive ratings was 66–67%.

¹ The surveys are held six times a year in the cities of Vologda and Cherepovets, in Babayevsky, Velikoustyugsky, Vozhegodsky, Gryazovetsky, Tarnogsky Kirillovsky, Nikolsky municipal okrugs, and in Sheksninsky Municipal 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 Region's adult population. Sampling error does not exceed 3%.

More information on the results of VolRC RAS surveys is available at <http://www.vscs.ac.ru>.

² In 2020, four rounds of the monitoring were conducted. Surveys in April and June 2020 were not conducted due to quarantine restrictions during the spread of COVID-19.

How would you assess the current work of...? (% of respondents)

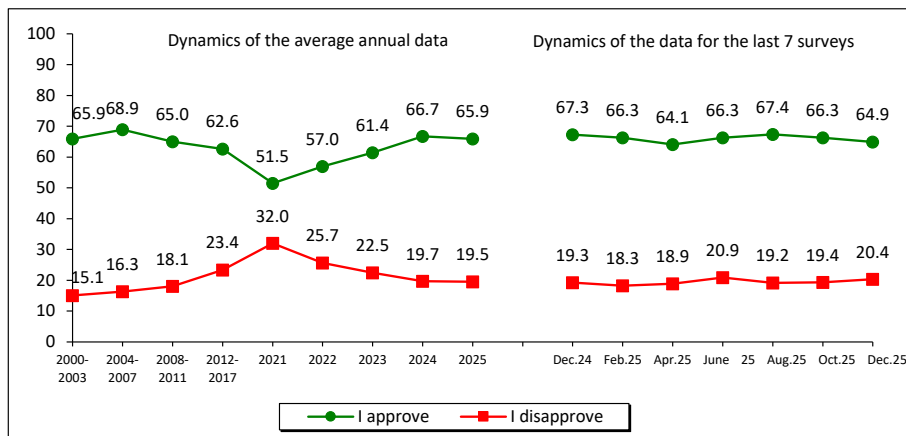
Response	Dynamics of the average annual data									Dynamics of the data for the last 7 surveys							Dynamics (+/-)		
	2007	2012	2018	2021	2022	2023	2024	2025		Dec. 2024	Feb. 2025	Apr. 2025	June 2025	Aug. 2025	Dec. 2024	Dec. 2025	Dec. 2024	Oct. 2025	2025 to 2024
RF President																			
I approve	75.3	51.7	66.4	51.5	57.0	61.4	66.7	65.9		67.3	66.3	64.1	66.3	67.4	66.3	64.9	-2	-1	-1
I disapprove	11.5	32.6	21.7	32.0	25.7	22.5	19.7	19.5		19.3	18.3	18.9	20.9	19.2	19.4	20.4	+1	+1	0
Chairman of the RF Government																			
I approve	–	49.6	48.0	39.9	45.4	50.1	54.1	54.4		55.6	54.7	53.9	53.0	55.1	55.7	54.0	-2	-2	0
I disapprove	–	33.3	31.6	37.6	32.0	27.6	24.8	22.5		25.3	23.8	22.3	22.9	20.6	23.1	22.2	-3	-1	-2
Vologda Region Governor*																			
I approve	55.8	41.9	38.4	36.7	40.9	48.1	51.7	42.5		50.8	46.8	42.9	39.9	41.0	41.8	42.8	-8	+1	-9
I disapprove	22.2	33.3	37.6	40.5	35.8	30.9	28.4	37.2		29.8	31.4	34.6	37.2	39.1	41.3	39.3	+10	-2	+9

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

Wording of the question: "How would you assess the current work of ...?"

* October 31, 2023 according to the Presidential Decree, Georgy Yu. Filimonov was appointed acting Governor of the Vologda Region. Following the results of the regional election held on September 6–8, 2024, Filimonov won 62.3% of the vote and became the elected Governor of the Vologda Region.

How would you assess the way that the RF President is handling his job? (% of respondents, VolRC RAS data)*



Response	Dynamics (+/-)		
	Dec. 2025 to Dec. 2024	Oct. 2025	2025 to 2024
I approve	-2	-1	-1
I disapprove	+1	+1	0

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

* Here and elsewhere, all graphs show the average annual data for 2000, 2020, 2021, 2022, 2023, 2024, 2025, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017 that correspond to presidential terms.

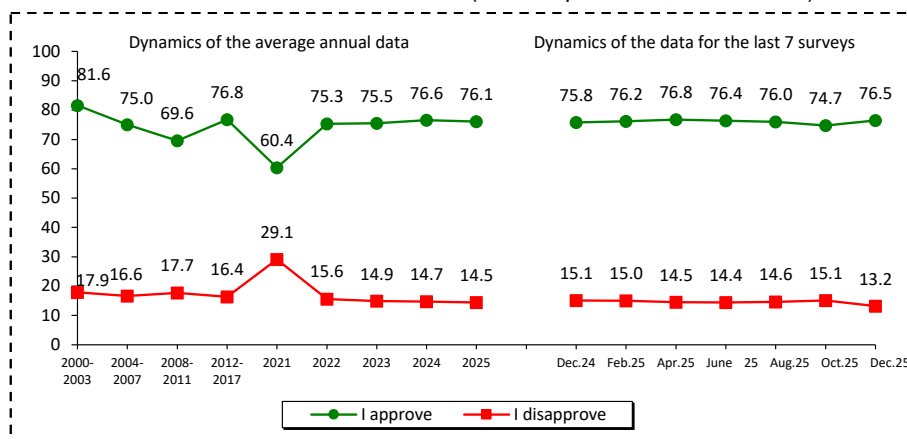
For reference:

According to *VCIOM*, the approval rate of the President of the Russian Federation for the period from October to the 1st half of December 2025 was 75–76%. The proportion of negative assessments is 13–15%.

The estimates of the population in December 2025 are identical to those of December 2024 (the President's approval rating was 76–77%).

There are no changes in 2025 compared to the average annual data of 2024.

Do you approve or disapprove of the way that the RF President is handling his job?
(% of respondents; VCIOM data)



Response	Dynamics (+/-)		
	Dec. 2024 to Dec. 2025	Oct. 2025 to Dec. 2025	2025 to 2024
I approve	+1	+2	-1
I disapprove	-2	-2	0

Wording of the question: "In general, do you approve or disapprove of the way that the Russian President is handling his job?"
Data for December 2025 – for one survey as of December 7, 2025.

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

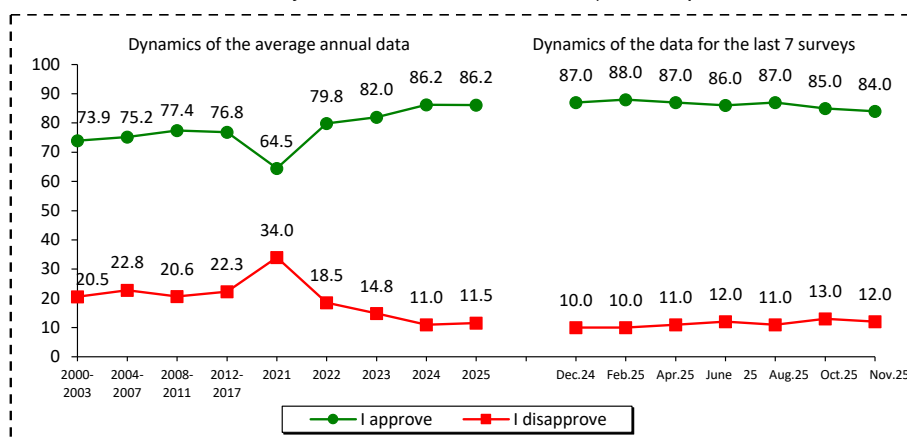
Source: VCIOM. Available at: <https://wciom.ru/>

According to Levada-Center, The share of positive assessments of the activities of the President of the Russian Federation in October – November 2025 was 84–85%; the share of negative characteristics was 12–13%.*

From December 2024 to November 2025, the approval level of the country's leader decreased slightly (by 3 percentage points, from 87 to 84%).

Compared to the annual average of 2024, no significant changes were recorded in 2025.

In general, do you approve or disapprove of the way that Vladimir Putin is handling his job as President of Russia? (% of respondents; Levada-Center* data)



Response	Dynamics (+/-)		
	Nov. 2025 to Dec. 2024	Oct. 2025 to Nov. 2025	2025 to 2024
I approve	-3	-1	0
I disapprove	+2	-1	+1

Wording of the question: "In general, do you approve or disapprove of the way that Vladimir Putin is handling his job as President of Russia?"

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

Source: Levada-Center*. Available at: <https://www.levada.ru/>

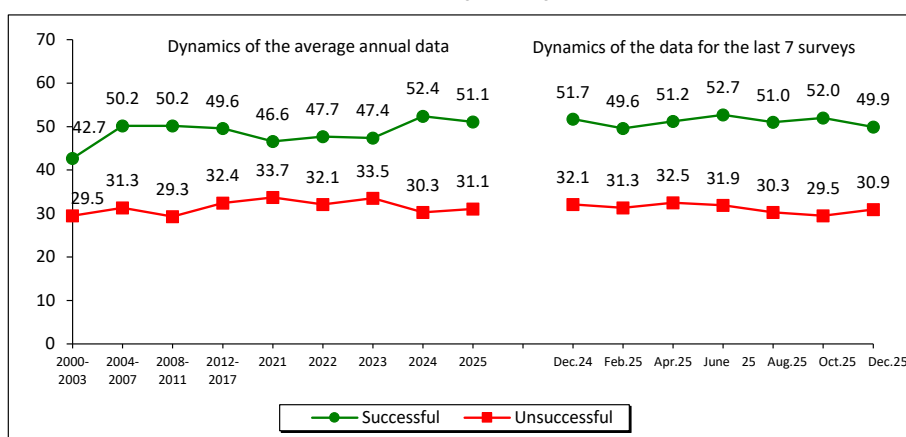
* Included in the register of foreign agents.

The share of residents of the region who consider the actions of the President of the Russian Federation to strengthen Russia's international position to be successful was 50–52% in October – December 2025. The proportion of those who adhere to the opposite point of view is significantly less (31%).

Compared to December 2024, as well as the average for 2024–2025, the estimates of the region's population regarding the success of the Russian President coping with problems in the country have not changed.

In your opinion, how successful is the RF President in handling challenging issues? (% of respondents; VoIRC RAS data)

Strengthening Russia's international position



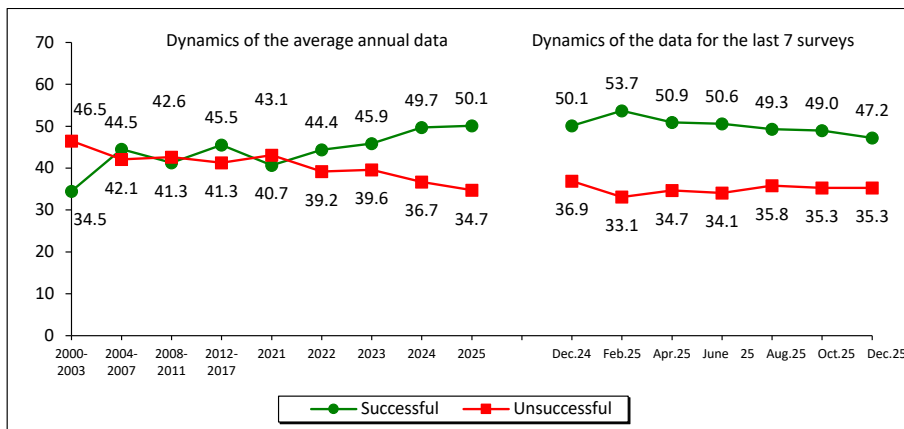
Response	Dynamics (+/-)		
	Dec. 2024 to Dec. 2025	Oct. 2025 to 2025	2025 to 2024
Successful	-2	-2	-1
Unsuccessful	-1	+1	+1

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

Over the past two months, the opinion of the residents of the region about the activities of the head of state to restore order in the country has remained the same: the share of positive judgments was 47–49%, negative – 35%. At the same time, since February of this year, the level of support has decreased by 7 percentage points (from 54 to 47%).

During the year (from December 2024 to December 2025), the share of positive assessments of the head of state's activities to restore order in the country decreased slightly – by 3 percentage points, from 50 to 47%. For the period 2024–2025, population estimates remained at the same level.

Imposing order in the country



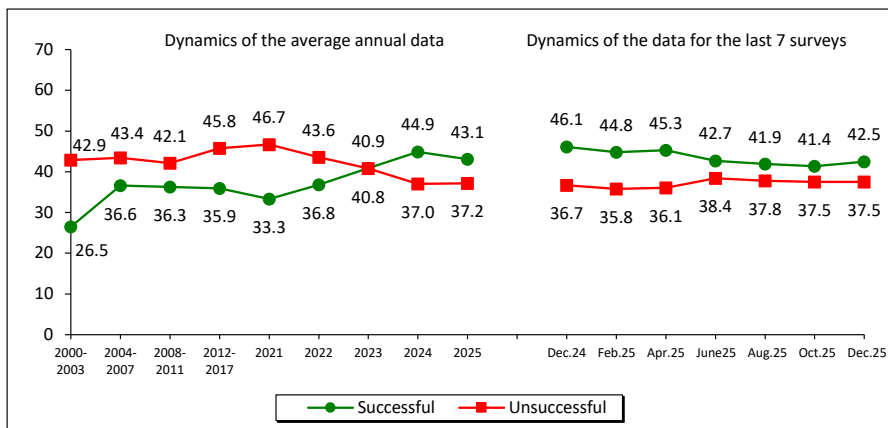
Response	Dynamics (+/-)		
	Dec. 2025 to		2025 to 2024
	Dec. 2024	Oct. 2025	
Successful	-3	-2	0
Unsuccessful	-2	0	-2

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

In October – December 2025, the share of residents of the region who positively assessed the activities of the President of the Russian Federation to protect democracy and strengthen citizens' freedoms was 41–42%; the proportion of opposing opinions was 38%.

From December 2024 to December 2025, the proportion of positive ratings decreased by 4 percentage points, from 46 to 42%. The average annual data for 2025 correspond to the level of 2024.

Protecting democracy and strengthening citizens' freedoms



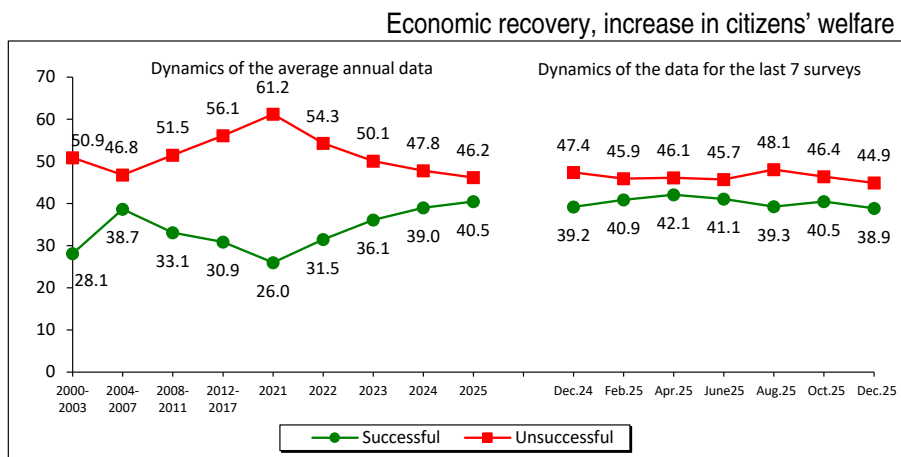
Response	Dynamics (+/-)		
	Dec. 2025 to		2025 to 2024
	Dec. 2024	Oct. 2025	
Successful	-4	+1	-2
Unsuccessful	+1	0	0

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

The share of positive assessments of the success of the Russian President's coping with the problem of economic recovery and the growth of citizens' well-being over the past two months has been 39–41%.

During the period from December 2024 to December 2025, the share of negative assessments of the head of state's activities to boost the economy and increase the welfare of citizens decreased slightly – from 47 to 45%.

On average, there are no significant changes in 2024 compared to 2025.



Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

The structure of political preferences of the residents of the region remained stable in October – December 2025. The share of people whose interests are expressed by the United Russia party was 38–40%, the Communist Party – 10–11%, the Liberal Democratic Party – 8–9%, Just Russia – 3–4%, New People – 2%.

During the year, the share of supporters of the United Russia party decreased by 4 percentage points (from 42 to 38%). A similar trend is typical for the average annual data: from 2024 to 2025, the number of supporters of United Russia decreased by 3 percentage points, from 43 to 40%. There are no significant changes in estimates for the remaining parties.

Which party expresses your interests? (% of respondents; VoIRC RAS data)

Party	Dynamics of the average annual data													Dynamics of the data for the last 7 surveys							Dynamics (+/-)		
	2011	Election to the RF State Duma 2011, fact	2012	2016	Election to the RF State Duma 2016, fact	2018	2020	Election to the RF State Duma 2020, fact	2021	2022	2023	2024	2025	Dec. 2024	Feb. 2025	Apr. 2025	June 2025	Aug. 2025	Oct. 2025	Dec. 2025	Dec. 2025 to		2025 to 2024
																					Dec. 2024	Oct. 2025	
United Russia	31.1	33.4	29.1	35.4	38.0	37.9	31.5	49.8	31.7	35.2	39.5	42.9	40.3	42.3	39.9	40.5	41.6	41.2	40.5	38.1	-4	-2	-3
CPRF	10.3	16.8	10.6	8.3	14.2	9.2	8.4	18.9	9.3	10.1	9.6	8.9	9.6	9.1	8.8	8.0	9.1	11.5	10.5	9.7	+1	-1	+1
LDPR	7.8	15.4	7.8	10.4	21.9	9.6	9.5	7.6	9.9	7.3	7.0	7.1	8.2	8.8	7.5	7.1	9.4	8.7	7.8	8.6	0	+1	+1
Just Russia – Patriots for the Truth	5.6	27.2	6.6	4.2	10.8	2.9	4.7	7.5	4.7	4.9	4.4	3.5	3.5	4.4	2.3	2.9	3.9	4.2	3.4	4.1	0	+1	0
New People*	–	–	–	–	–	–	–	5.3	2.3	1.5	1.9	2.0	2.5	2.3	3.1	3.0	2.5	1.8	2.2	2.5	0	0	+1
Other	1.9	–	2.1	0.3	–	0.7	0.5	–	0.2	0.3	0.1	0.2	0.1	0.3	0.3	0.0	0.1	0.1	0.1	0.2	0	0	0
None	29.4	–	31.3	29.4	–	28.5	34.2	–	33.9	30.6	26.5	25.2	25.8	26.3	28.4	27.7	24.9	23.3	24.3	26.1	0	+2	+1
Difficult to answer	13.2	–	11.7	12.0	–	11.2	11.1	–	10.0	10.1	11.1	10.3	10.0	6.5	9.7	10.8	8.5	9.2	11.3	10.7	+4	-1	0

* 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.

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

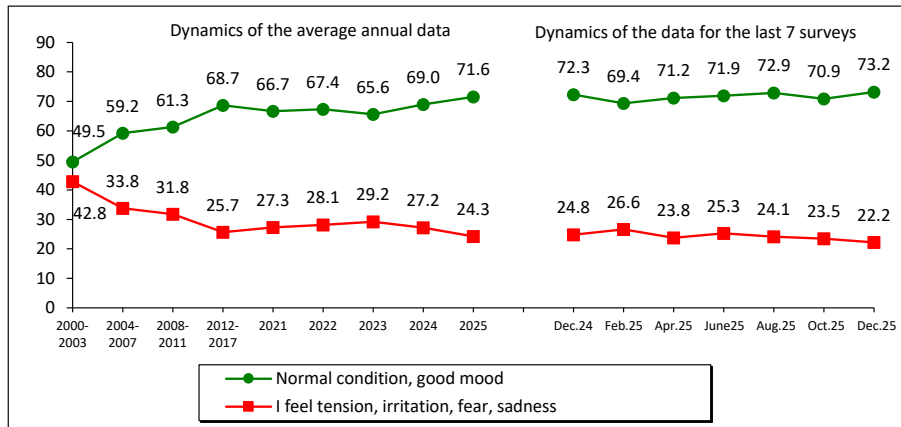
Over the past two months, the share of positive social mood assessments has been 71–73%; the share of negative characteristics has been 22–23%.

From December 2024 to December 2025, the proportion of people who said they were in a «normal, wonderful» mood was 71–73% and remained unchanged. The proportion of those who experience «tension, irritation, fear, and longing» more often remains stable (22–23%).

According to the average annual data for 2024–2025, the share of negative assessments by the population of their daily emotional state decreased slightly – by 3 percentage points, from 27 to 24%.

Estimation of social condition (% of respondents; VolRC RAS data)

Social mood



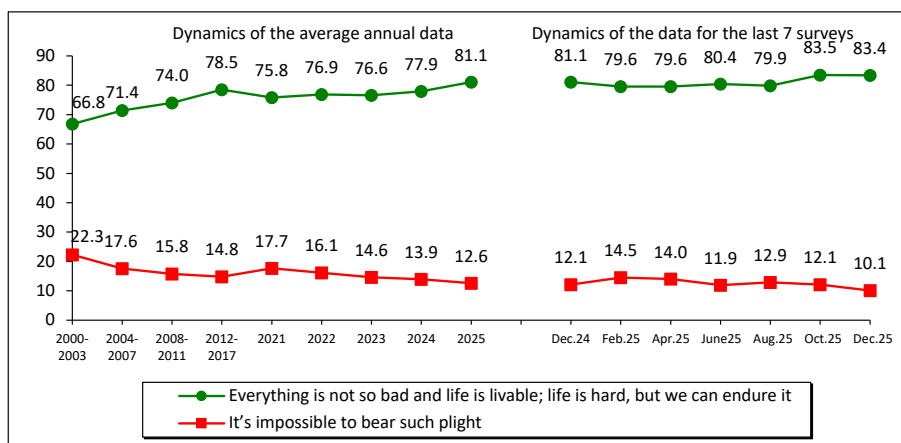
Response	Dynamics (+/-)		
	Dec. 2024	Oct. 2025	2025 to 2024
Normal condition, good mood	+1	+2	+3
I feel tension, irritation, fear, sadness	-3	-1	-3

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

The reserve of patience remains at a consistently high level: 83% of residents of the region in October – December 2025 noted that “everything is not so bad and life is livable”. The proportion of those who believe that it is “no longer possible” to tolerate their plight was 10–12%.

Similar estimates of the residents of the region were noted in December 2024, as well as on average for 2024–2025.

Reserve of patience



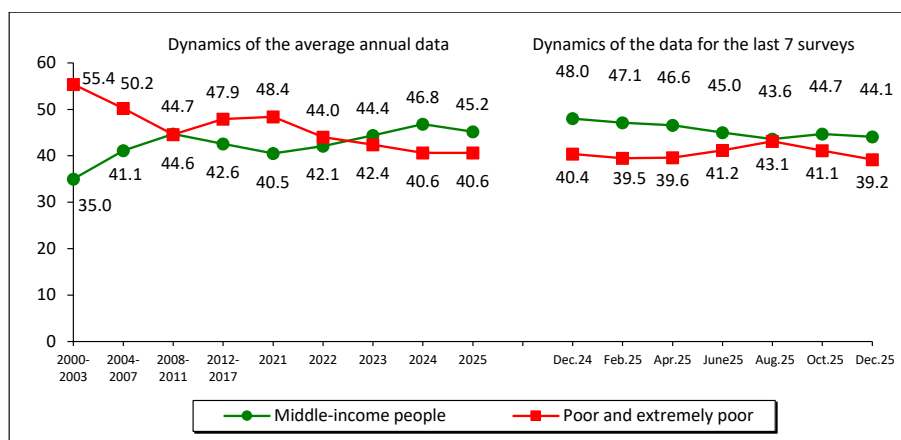
Response	Dynamics (+/-)		
	Dec. 2024	Oct. 2025	2025 to 2024
Everything is not so bad and life is livable; life is hard, but we can endure it	+2	0	+3
It's impossible to bear such plight	-2	-2	-1

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

As in October, in December 2025, the share of residents of the region subjectively classifying themselves as “middle-income” people was 44–45%. The proportion of the “poor and extremely poor” also remained unchanged (39–41%).

Over the past 12 months, the proportion of those who consider themselves middle-income people has decreased by 4 percentage points (from 48 to 44%). This decrease is especially noticeable in the groups of respondents with higher education, among the 20% of the most affluent citizens and among residents of Vologda. The proportion of people who identify themselves as “poor and extremely poor” has decreased among people with secondary vocational education and among the 20% of the least well-off. In 2025, there are no significant deviations from the annual average of 2024.

Social self-identification



Response	Dynamics (+/-)		
	Dec. 2025 to Dec. 2024	Oct. 2025	2025 to 2024
Middle-income people	-4	-1	-2
Poor and extremely poor	-1	-2	0

Wording of the question: “What category do you belong to, in your opinion?”.

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

Proportion of “middle-income” people in various socio-demographic groups
(% of respondents; VoIRC RAS data)

Population group	Dynamics of the average annual data								Dynamics of the data for the last 7 surveys							Dynamics (+/-)		
	2007	2012	2018	2021	2022	2023	2024	2025	Dec. 2024	Feb. 2025	Apr. 2025	June 2025	Aug. 2025	Oct. 2025	Dec. 2025	Dec. 2025 to		2025 to 2024
																Dec. 2024	Oct. 2025	
Gender																		
Men	50.4	45.7	43.2	40.0	41.5	45.0	46.6	47.1	49.8	49.5	50.0	47.1	43.7	45.3	46.7	-3	+1	+1
Women	46.4	43.9	41.5	40.8	42.6	43.8	46.8	43.7	46.5	45.2	43.9	43.3	43.5	44.1	42.0	-5	-2	-3
Age																		
Under 30	57.1	52.8	43.9	39.1	43.8	44.9	49.3	46.2	50.2	52.6	44.8	45.7	45.7	42.4	46.2	-4	+4	-3
30–55	50.4	45.0	44.0	42.1	42.3	46.4	49.2	47.4	50.4	51.5	47.4	47.2	43.3	48.3	46.6	-4	-2	-2
Over 55	36.6	37.4	39.4	39.0	41.3	41.7	42.8	42.2	44.2	39.7	46.4	42.2	43.2	41.1	40.3	-4	-1	-1
Education																		
Secondary and incomplete secondary	37.1	33.3	35.7	34.7	35.0	34.0	38.0	36.4	39.1	40.5	40.3	38.4	35.3	30.4	33.5	-6	+3	-2
Secondary vocational	50.9	42.7	46.2	43.0	45.1	47.8	48.5	48.1	49.4	47.6	47.4	47.2	46.5	48.8	50.8	+1	+2	0
Higher and incomplete higher	58.3	57.0	44.1	43.5	47.1	50.2	54.1	51.1	55.3	53.7	53.1	49.2	48.6	54.9	47.3	-8	-8	-3
Income group																		
Bottom 20%	25.7	20.8	24.7	28.4	24.3	23.0	24.8	22.4	25.6	25.4	21.3	15.1	23.6	24.4	24.6	-1	0	-2
Middle 60%	46.3	42.6	42.7	37.3	41.5	42.1	44.3	44.1	45.4	44.6	45.7	44.6	41.2	44.6	43.6	-2	-1	0
Top 20%	76.1	74.9	61.3	60.5	61.2	67.2	70.1	66.0	71.4	68.8	63.7	70.5	62.7	65.9	64.5	-7	-1	-4
Territory																		
Vologda	57.5	43.7	42.0	36.0	35.5	44.6	51.5	47.9	52.2	51.5	49.5	47.1	46.4	48.1	44.8	-7	-3	-4
Cherepovets	63.8	58.6	40.3	41.0	42.0	44.0	46.1	44.0	46.7	45.2	45.2	44.2	43.7	44.4	41.2	-6	-3	-2
Districts	36.2	38.1	43.6	42.7	45.9	44.4	44.4	44.2	46.3	45.7	45.6	44.2	41.8	42.7	45.3	-1	+3	0
Region	48.2	44.7	42.3	40.5	42.1	44.4	46.8	45.2	48.0	47.1	46.6	45.0	43.6	44.7	44.1	-4	-1	-2
Total number of groups: positive changes / no changes / negative changes															14: 0 / 5 / 9	14: 1 / 12 / 1	14: 0 / 12 / 2	
Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.																		

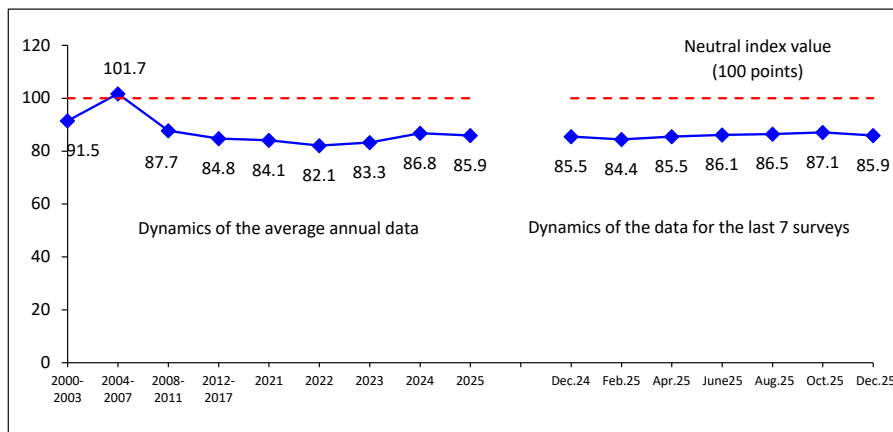
Proportion of those who identify themselves as “poor and poor and extremely poor”
in various socio-demographic groups (% of respondents; VoIRC RAS data)

Population group	Dynamics of the average annual data								Dynamics of the data for the last 7 surveys							Dynamics (+/-)		
	2007	2012	2018	2021	2022	2023	2024	2025	Dec. 2024	Feb. 2025	Apr. 2025	June 2025	Aug. 2025	Oct. 2025	Dec. 2025	Dec. 2025 to		2025 to 2024
																Dec. 2024	Oct. 2025	
Gender																		
Men	39.8	42.7	43.3	48.0	44.7	40.5	40.1	39.4	37.3	37.4	37.3	38.9	43.6	41.6	37.7	0	-4	-1
Women	44.6	45.9	47.0	48.8	43.5	43.8	41.1	41.6	43.0	41.2	41.5	42.9	42.7	40.8	40.3	-3	-1	0
Age																		
Under 30	32.4	36.6	40.4	47.2	40.2	38.9	36.3	37.7	33.5	35.4	39.6	38.6	38.5	38.1	35.7	+2	-2	+1
30–55	40.0	44.0	43.2	45.4	42.5	39.0	37.6	37.7	38.7	35.4	36.9	37.2	41.4	38.5	37.0	-2	-2	0
Over 55	55.5	51.9	50.6	52.5	47.4	47.9	45.9	45.1	45.0	45.9	42.8	46.8	46.6	45.4	42.9	-2	-3	-1
Education																		
Secondary and incomplete secondary	52.6	56.0	53.5	55.4	50.2	50.7	48.4	48.8	47.7	46.8	46.6	46.4	50.5	52.5	49.9	+2	-3	0
Secondary vocational	39.9	46.4	42.0	46.0	41.5	39.3	39.3	37.0	39.9	38.6	38.1	39.6	37.9	38.2	29.5	-10	-9	-2
Higher and incomplete higher	33.1	32.3	41.1	44.0	39.7	38.1	34.0	36.1	33.7	32.7	32.9	37.5	41.6	32.5	39.4	+6	+7	+2
Income group																		
Bottom 20%	64.5	67.2	62.9	61.2	59.0	58.9	63.2	61.5	63.3	61.8	63.3	69.4	59.1	64.8	50.8	-13	-14	-2
Middle 60%	45.0	48.0	46.5	53.0	46.6	46.0	42.9	42.7	42.2	41.7	41.4	43.3	45.9	42.1	41.6	-1	-1	0
Top 20%	15.9	16.7	28.6	27.8	27.9	21.3	20.0	21.5	23.0	20.2	24.3	14.0	28.8	20.7	21.2	-2	+1	+2
Territory																		
Vologda	32.3	44.1	40.4	47.9	47.0	40.9	34.3	33.7	35.5	33.9	33.3	33.6	32.8	33.8	35.0	-1	+1	-1
Cherepovets	31.4	31.9	52.4	49.1	46.7	45.8	43.7	44.8	47.2	46.2	44.9	45.5	44.4	43.4	44.1	-3	+1	+1
Districts	52.5	51.1	44.2	48.3	40.8	41.2	42.6	42.4	39.4	39.0	40.4	43.3	48.6	44.3	38.7	-1	-6	0
Region	42.5	44.5	45.4	48.4	44.0	42.4	40.6	40.6	40.4	39.5	39.6	41.2	43.1	41.1	39.2	-1	-2	0
Total number of groups: positive changes / no changes / negative changes																14: 2 / 11 / 1	14: 4 / 9 / 1	14: 0 / 14 / 0
Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.																		

The Consumer Sentiment Index (CSI) in October – December 2025 amounted to 86–87 points.

In December 2025, the value of the CSI corresponds to the data of December 2024 (85–86 points). Compared with the annual average of 2024, no significant changes were recorded in 2025.

Consumer Sentiment Index (CSI, points; VoIRC RAS data for the Vologda Region)



Response	Dynamics (+/-)		
	Dec. 2025 to		2025 to 2024
	Dec. 2024	Oct. 2025	
Index value, points	0	-1	-1

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

Dynamics of the Consumer Sentiment Index in various socio-demographic groups (points)

Population group	2023	Feb. 2024	Apr. 2024	June 2024	Aug. 2024	Oct. 2024	Dec. 2024	2024	Feb. 2025	Apr. 2025	June 2025	Aug. 2025	Oct. 2025	Dec. 2025	2025	Dynamics (+/-)		
																Dec. 2025 to		2025 to 2024
																Dec. 2024	Oct. 2025	
Gender																		
Men	84.2	82.8	85.8	84.3	89.1	85.5	85.7	85.5	86.2	85.5	87.2	86.8	88.9	87.1	87.0	+1	-2	+2
Women	82.6	85.8	87.6	89.2	88.7	88.4	85.5	87.5	83.0	85.4	85.4	86.2	85.8	85.1	85.2	0	-1	-2
Age																		
Under 30	89.9	90.9	90.2	96.8	98.4	95.5	91.8	93.9	95.2	87.9	93.1	94.5	92.0	88.9	91.9	-3	-3	-2
30–55	84.5	85.2	88.4	85.9	91.2	88.3	87.1	87.7	87.3	86.7	89.3	87.2	89.4	87.8	88.0	+1	-2	0
Over 55	79.4	81.4	83.5	84.9	82.4	82.5	81.5	82.7	76.9	83.1	79.9	82.8	82.6	82.8	81.4	+1	0	-1
Education																		
Secondary and incomplete secondary	79.8	80.0	83.6	86.9	85.4	86.3	82.1	84.1	82.7	83.1	82.9	85.5	88.4	85.4	84.7	+3	-3	+1
Secondary vocational	85.8	85.1	88.3	86.2	88.8	89.0	89.7	87.9	84.4	88.2	89.0	86.0	86.6	88.5	87.1	-1	+2	-1
Higher	83.3	87.5	88.4	88.2	92.9	85.7	84.4	87.9	86.3	84.9	86.2	88.0	86.4	83.2	85.8	-1	-3	-2
Income group																		
Bottom 20%	70.3	71.7	72.3	74.2	69.4	79.0	76.6	73.9	69.2	66.2	63.0	74.8	76.8	69.2	69.9	-7	-8	-4
Middle 60%	83.9	84.0	88.3	85.2	89.9	87.2	85.3	86.7	84.8	88.0	87.2	86.5	88.3	87.8	87.1	+3	-1	0
Top 20%	95.4	97.7	97.9	101.9	99.7	97.6	91.2	97.7	96.9	94.8	104.7	94.7	93.9	97.1	97.0	+6	+3	-1
Territory																		
Vologda	73.2	76.7	79.7	78.8	80.8	77.3	76.5	78.3	75.2	77.7	75.8	71.9	73.4	74.5	74.8	-2	+1	-4
Cherepovets	87.0	90.4	92.4	93.0	93.0	93.0	92.0	92.3	91.5	93.8	94.7	98.3	99.5	98.0	96.0	+6	-2	+4
Districts	86.9	85.7	87.7	88.4	91.2	89.6	87.3	88.3	85.7	85.4	87.6	88.6	88.4	86.0	87.0	-1	-2	-1
Region	83.3	84.5	86.8	87.0	88.9	87.1	85.5	86.6	84.4	85.5	86.1	86.5	87.1	85.9	85.9	0	-1	-1
Total number of groups: positive changes / no changes / negative changes															14: 2 / 11 / 1	14: 0 / 13 / 1	14: 1 / 11 / 2	
Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.																		

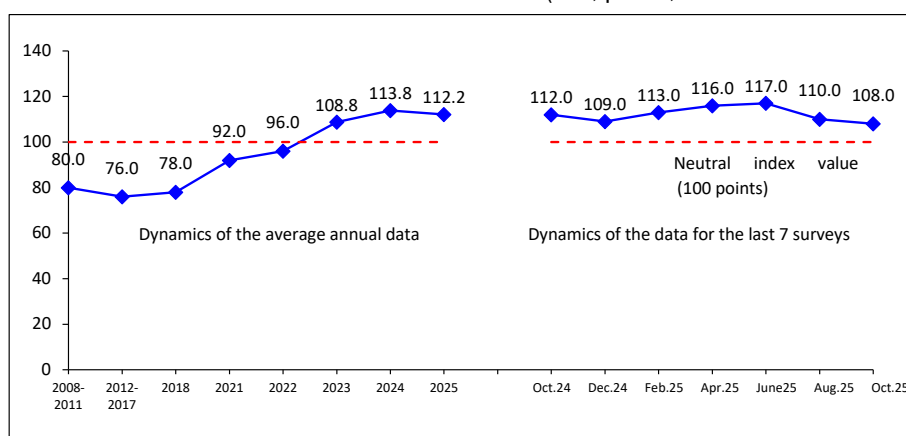
Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

For reference:

According to the latest data from the all-Russian Levada-Center surveys* (for the period from August to October 2025), the Consumer Sentiment Index decreased and amounted to 110–108 points. A more significant decline has occurred since June 2025 – by 9 points, from 117 to 108.

Negative changes have been observed over the past 12 months (CSI decreased by 4 points, from 112 to 108 points). According to the average annual data for 2024 and 2025, no significant changes are recorded.

Consumer Sentiment Index (CSI, points; Levada-Center* data for Russia³)



Response	Dynamics (+/-)		
	Oct. 2024 to Oct. 2025	Aug. 2025 to Oct. 2025	2025 to 2024
Index value, points	-4	-2	-2

The index is calculated since 2008.

The latest data – as of October 2025.

Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.

Source: Levada-Center*. Available at: <https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/>

During the period from October to December 2025, there were no significant changes in the dynamics of the share of positive assessments of social mood on average in the region. However, positive changes are recorded in five socio-demographic groups. The share of positive ratings increased by 5 percentage points among men (from 68 to 73%), people aged 30–55 (from 74 to 78%), people with higher and incomplete higher education (from 73 to 78%), according to subjective self-assessments of income level belonging to the group of 20% of the most affluent citizens (from 84 to 89%); by 4 percentage points – among those with secondary vocational education.

³ Since March 2025, Levada-Center* has updated data on the CSI. The CSI in Russia has been calculated since 1993 on the basis of five questions, similar to the index developed in the 1940s by the Institute for Social Research at the University of Michigan. The individual indices for each question are calculated as the difference between the proportions of positive and negative responses plus 100. The cumulative CSI is the arithmetic mean of individual indices (range 0–200, where >100 is the predominance of positive ratings). In 2009, the CSI was linked to the values of March 2008 (100% base), which was associated with a change in the methodology of surveys and the economic crisis. However, this led to the fact that the index began to reflect changes only relative to 2008. Since March 2025, it was decided to return to the original method of calculating the CSI, abandoning the link to 2008, because in 2023, many indicators exceeded the peaks of 2008 and the old version of the index ceased to adequately reflect the current situation. A return to the original methodology is intended to solve this problem. Source: Updated Consumer Sentiment Index: February 2025 Figures. Available at: <https://www.levada.ru/2025/03/26/obnovlennyj-indeks-potrebitelskihnastroenij-pokazateli-fevralya-2025-goda/>.

*Included in the register of foreign agents.

From December 2024 to December 2025, there were no significant changes in most socio-demographic groups. The share of positive ratings increased only in three categories: among men, people aged 30–55 years, and those belonging to the group of 20% of the most affluent citizens. There was a deterioration in mood among young people under 30 (by 7 percentage points, from 81 to 74%) and in the low-income group (by 5 percentage points, from 56 to 51%).

In general, the situation is stable in 2025, estimates correspond to the average annual data of the previous year.

Social mood in different social groups
(Response “Wonderful mood, normal, stable condition”, % of respondents; VoIRC RAS data)

Population group	Dynamics of the average annual data								Dynamics of the data for the last 7 surveys							Dynamics (+/-)		
	2007	2012	2018	2021	2022	2023	2024	2025	Дек. 2024	Фев. 2025	Апр. 2025	Июнь 2025	Авг. 2025	Окт. 2025	Дек. 2025	Dec. 2025 to		2025 to 2024
																Dec. 2024	Oct. 2025	
Gender																		
Men	65.9	69.1	72.8	65.7	66.8	65.5	66.5	70.7	69.2	70.1	68.8	71.6	72.1	68.2	73.3	+4	+5	+4
Women	61.7	65.8	69.8	67.4	67.9	65.7	70.9	72.3	74.7	68.8	73.1	72.2	73.5	73.1	73.1	-2	0	+1
Age																		
Under 30	71.3	72.3	79.9	73.5	77.6	75.0	76.6	76.8	81.3	79.9	76.7	76.7	78.1	75.2	74.3	-7	-1	0
30–55	64.8	67.9	72.6	69.5	69.4	68.8	71.3	74.3	73.2	70.2	74.1	74.1	74.9	73.9	78.4	+5	+5	+3
Over 55	54.8	62.1	65.2	60.5	61.1	58.2	63.3	66.5	67.8	64.6	65.8	67.6	68.6	65.9	66.6	-1	+1	+3
Education																		
Secondary and incomplete secondary	58.4	57.2	64.8	62.1	64.6	62.0	64.6	67.2	65.5	64.6	65.6	68.4	70.3	68.4	66.1	+1	-2	+3
Secondary vocational	64.6	66.7	72.1	66.7	68.3	66.1	70.3	73.6	76.5	71.8	74.8	74.1	73.6	71.4	75.6	-1	+4	+3
Higher and incomplete higher	68.6	77.0	76.7	71.5	69.5	68.8	72.3	73.9	74.2	71.4	73.4	73.0	74.7	73.1	77.6	+3	+5	+2
Income group																		
Bottom 20%	51.6	51.5	57.2	54.6	57.0	50.1	53.5	55.2	55.7	55.9	56.9	56.1	58.3	53.3	50.7	-5	-3	+2
Middle 60%	62.9	68.7	72.1	67.3	68.1	67.4	70.7	73.2	74.2	70.5	72.6	74.4	73.1	73.1	75.2	+1	+2	+3
Top 20%	74.9	81.1	82.4	79.9	78.3	73.9	77.6	83.6	80.6	77.9	81.3	84.1	83.8	84.8	89.4	+9	+5	+6
Territory																		
Vologda	63.1	73.6	71.0	60.3	59.8	59.6	66.0	70.2	69.6	66.7	68.6	69.5	72.9	71.4	71.9	+2	+1	+4
Cherepovets	68.1	76.2	75.7	71.0	71.2	68.1	69.8	73.1	73.0	69.9	71.5	72.5	75.0	73.2	76.3	+3	+3	+3
Districts	61.6	59.8	68.6	67.8	69.5	67.7	70.2	71.6	73.4	70.7	72.7	73.1	71.6	69.3	72.2	-1	+3	+1
Region	63.6	67.3	71.2	66.6	67.4	65.6	69.0	71.6	72.3	69.4	71.2	71.9	72.9	70.9	73.2	+1	+2	+3
Total number of groups: positive changes / no changes / negative changes															14: 3/9 / 2	14: 4/10 / 0	14: 3/11 / 0	
Positive changes are highlighted in green, negative changes are highlighted in red, and no changes – in blue. Due to the fact that the changes of +/- 3 p.p. fall within the limits of sampling error, they are considered insignificant and are marked in blue.																		

RESUME

The public opinion monitoring data for December 2025 allows us to conclude that the population's assessments of key socio-political and socio-economic indicators in the country and the region are stable. The main trends show a consolidation of opinions at the level established over the previous measurement period – October 2025.

Approval of the activities of the country's top leadership remains at a consistently high level. The support of the President of the Russian Federation during 2025 fluctuated in a narrow range of 65–67%, which is comparable to the indicators of 2024 and exceeds the level of 2023. Approval of the activities of the Chairman of the Government of the Russian Federation also remained at about 54%. **At the same time, there was a decrease in assessments of the Vologda Region Governor's performance: the share of those approving decreased from 52% in 2024 to 43% in 2025. However, in the short term, negative trends are slowing down: since June 2025, the approval rating for his work has increased from 40 to 43%.**

United Russia dominates party preferences, **although its support has decreased from 42 to 38% over the year**, which raises concerns before the elections to the State Duma of the Russian Federation of the IX convocation in 2026⁴. Other parties (CPRF, LDPR, Just Russia, New People) have maintained their positions without significant changes.

The social well-being of the population is characterized by a stable positive background. About 71–73% of the region's residents rate their mood as normal or good. The reserve of social patience ("everything is not so bad and life is livable") demonstrates a high and stable indicator (83%).

However, there has been a negative trend in subjective social identification: the proportion of those who identify themselves as "middle-income people" has decreased over the year from 48 to 44%, while the proportion of those who identify themselves as "poor and extremely poor" remains high (39–41%).

The Consumer Sentiment Index (CSI) in the region remains below the 100-point mark, amounting to 86–87 points, which indicates restrained negative expectations of the population in the economic sphere. At the same time, the CSI remained stable both in comparison with 2024 and in the short-term dynamics over two months.

A detailed analysis in the context socio-demographic groups shows that positive changes in social mood over the past year have mainly affected the most affluent categories (20% of the most affluent), men and middle-aged people (30–55 years old). At the same time, a deterioration in mood was noted among young people under the age of 30 and the least affluent citizens.

Thus, stability is a key characteristic of the Vologda Region society in 2025. The high level of support for the federal government is combined with a decrease in the approval of the regional leadership. A high level of basic social optimism and patience remains; however, economic expectations remain restrained, and the subjective perception of one's own financial situation shows a tendency to deteriorate moderately. Public sentiment is generally consolidated, and the observed changes are structural in nature, which consists in the stratification of social well-being by income and age. The overall positive background of sentiment masks a growing polarization: the improvement of the situation among the most affluent groups is taking place in parallel with a deterioration in sentiment among young people and the least affluent residents of the region.

Prepared by K.E. Kosygina and I.M. Bakhvalova

⁴ Elections to the State Duma of the Russian Federation of the IX convocation will be held on the Single Voting Day on September 18–20, 2026.

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