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ECONOMIC AND SOCIAL CHANGES: FACTS, TRENDS, FORECAST

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

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

Founder: Vologda Research Center of the Russian Academy of Sciences

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

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

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

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

MAIN RESEARCH DIRECTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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EDITORIAL

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A Difficult Road after the Rubicon

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Abstract. February 24, 2022, the RF President announced the beginning of a special military operation on the territory of Ukraine, which entailed large-scale geopolitical changes and, among other things, became a Rubicon for the internal development of the Russian Federation. The article analyzes a number of complex implications that resulted from the events occurring after February 24, 2022, and which had a significant impact on the state of Russian society. We consider in detail the dynamics of the moral state of Russian society for the period from 1996 to 2020, which (as shown by the results of the conducted research) over the past almost 25 years were negative and were developing within the framework of the existing liberal model. Analyzing the data of official statistics and sociological surveys, we rely on the assessments of experts, who, in many respects, agree that after February 2022, a new, albeit difficult, road opens up before Russia; the country has to travel this path one way or another, in order to achieve full (internal and external) national sovereignty in the contours and rules of the new geopolitical reality that are forming before our eyes.

Key words: special operation, President, the Russian idea, moral state of society, public administration efficiency.

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Fruitful creative work, which our Fatherland needs so much, is impossible in a society that is in a state of schism, that is internally divided. In a society where the main social strata, political forces adhere to various basic values and fundamental ideological guidelines...

Vladimir Putin "Russia at the turn of the Millennium" (1999)

In the Munich speech delivered in February 2007 the President of the Russian Federation announced to the international community that "Russia is a country with a history that spans more than a thousand years and has practically always used the privilege to carry out an independent foreign policy. We are not going to change this tradition today"[1]. Starting from this speech, Russia tried to convince the world community and the Collective West[2] (which includes about 40 states[3]) that the idea of a unipolar world is hopeless and futile, and that it is necessary to be guided by the norms of international law (enshrined in the UN Charter (1945), the Yalta and Postdam agreements (1945), the charters of regional collective security organizations) and take into account the national interests of all countries, including Russia.

However, these diplomatic steps were not heeded. Since 2007, the hybrid war with the Collective West has continued. In 2014, it reached

[1] Vladimir Putin's speech at the Munich Security Conference on February 10, 2007. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/transcripts/24034

[2] Some assessments of Russian and foreign experts about which countries belong to the Western world:

1. "... for us in Russia, the notion "West" includes both the USA (number one) and Western Europe, or the European Union (number two). Therefore, we often use the term "Collective West", that is, **the USA, Western European countries (including Southern European countries), Northern European (Scandinavian) countries"** (source: Tretyakov V. (2018). Russia, Eastern Europe and the Collective West. *Literaturnaya Gazeta*, 11. Available at: https://lgz.ru/article/-11-6635-14-03-2018/rossiya-vostochnaya-evropa-i-kollektivnyy-zapad/).

2. "The Western world traditionally includes the countries of Europe that were historically Catholic or Protestant – that is, **all the countries of Western Europe, as well as most or even all the countries of Northern and Central Europe,** depending on the geographical definition of these regions. Most of the countries of the European West are now part of the European Union. **The former colonies of European countries in America and Oceania** are also referred to the West, if these colonies are inhabited mainly by descendants of immigrants from Europe. These are **primarily the so-called Anglo-Saxon countries (USA, Canada, Australia, New Zealand), as well as the overseas territories of the UK, France and other European countries"** (source: Ruekspert. Available at: https://ruxpert.ru/%D0%97%D0%B0%D0%BF%D0%B0%D0%B4).

3. "Today, the most widely used definition of the Western world, also known as the "Latin West", is based entirely on culture rather than geography. In this usage, the Western world includes all the countries of Western Europe, as well as to the countries formed by Western European culture. For example, countries such as the USA and Australia, which were once British colonies and adopted Western European Christianity (Catholic and Protestant churches), which use the Latin alphabet and whose population includes many descendants of European colonists. In practice, this means that the Western world usually includes most of the countries of the European Union, as well as the UK, Norway, Iceland, Switzerland, the USA, Canada, Australia and New Zealand" (source: Western Countries 2020 (June 4, 2020). Available at: https://worldpopulationreview.com/country-rankings/western-countries).

4. **"Regions generally considered to be part of the Western World – USA, Canada European countries, Australia, and New Zealand"** (source: The Western World – World Atlas 2021. Available at: https://www.worldatlas.com/articles/list-of-western-countries.html).

[3] Opinion of political scientist P. Petrovsky (source: The influence of Western countries is becoming less tangible for us every day. *BELTA – News of Belarus*. June 8, 2022 Available at: https://www.belta.by/society/view/petrovskij-vlijanie-stran-zapada-s-kazhdym-dnem-stanovitsja-dlja-nas-menee-oschutimym-506708-2022/).

a higher level after the *coup d'etat* in Ukraine, which ended with the events of the Crimean Spring: the accession of Crimea and Sevastopol to the Russian Federation, the emergence of two self-proclaimed state entities in the east of Ukraine – the Donetsk People's Republic and the Lugansk People's Republic.

After that, for eight years, futile (as it turned out) attempts at a peaceful settlement of the war in the Donbas continued. The implementation of the Minsk Agreements was purposefully sabotaged by the new Kiev authorities, instead, regular shelling of the Donetsk and Lugansk People's Republics continued, and the Collective West continued to implement its "anti-Russia" project on the territory of modern Ukraine[4]...

In the end, this could not but lead to a forced response from Russia in the form of a special military operation announced by the President on February 24, 2022, which became the **"starting point" of a new era in the history of our country in the 21st century.**

As we noted in the previous article, the special operation announced by the President was "the edge after which the running processes become irreversible and lead to irreversible consequences"[5]. Up to this point, experts say, there was "full integration of Russia into the global world, which means the adoption of all the norms and rules of the West, which is taken as the standard of globalization. This has been the main strategy of the Russian government since 1991. Adjusting all standards of life – education, economy, culture, science, politics, technology, fashion, art, education, sports, media – to the standards of the modern West was the main goal of all the reforms"[6].

> "One of the clear results of the confrontation of the last eight years was not just a statement, but also the acceptance of the impossibility of agreeing with the West and the neo-Nazi authorities of Ukraine about anything; they basically do not comply with the agreement"[7].

And of course this new time includes both new perspectives and new challenges, determining Russia's difficult but inevitable path to achieving full national sovereignty and its place in the changing geopolitical reality.

Today most experts agree that when the Collective West publicly declares the need to "completely eradicate"[8] the "Russian world", it is, in fact, launching a direct attack that demands Russia to take appropriate steps to protect its national interests, which go far beyond the relatively local tasks set during the special operation in Ukraine (denazification, demilitarization, protection of the population of Donbass).

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[4] Putin V. About the historical unity of Russians and Ukrainians. Official website of the RF President. July 12, 2021. Available at: http://www.kremlin.ru/events/president/news/66181

[5] Ilyin V.A., Morev M.V. (2022). The Rubicon has been crossed: February 24, 2022, Russia entered a new stage in its development in the 21st century. *Economic and Social Changes: Facts, Trends, Forecast*, 15(2), 29.

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

[7] Shkolnikov A. A peace treaty on Ukraine. *Zavtra*. June 12, 2022.

[8] As Polish Prime Minister Mateusz Morawiecki noted: "... it is not enough to support Ukraine in its military struggle with Russia. **We must completely eradicate this monstrous new ideology ["Russian World"]**" (source: Gorshkova E. Polish Prime Minister insulted Russia. *Ura.ru*. May 11, 2022. Available at: https://ura.news/news/1052552416).

It is about preserving state sovereignty as such (which is of "vital importance for our country"[9]) and Russia's achievement of full state sovereignty, which, as experts note, has five components: territorial, diplomatic, military, economic and cultural. At the same time, the latter, **"as our history shows, is the most important component…; its absence announces the beginning of a path to nowhere"[10]** (ideas about the essence of state sovereignty in the assessment of the President of the Russian Federation are reflected in *Insert 1*).

It is important to note that the vast majority of Russians are aware of the essence of the historical moment and in the current conditions of external and internal threats they are consolidating around the President and around the goals of the special operation in Ukraine. According to VCIOM, the level of approval of the work of the head of state against the background of the special operation (for the period from February 20 to June 12, 2022) increased by 15 percentage points *(Tab. 1)* The share of Russians supporting the special operation increased by 7 percentage points for the period from February 25 to May 26, 2022. *(Tab. 2)*. According to the regional monitoring of public opinion conducted by VolRC RAS, for the period from February to June 2022, the share of positive judgments about the work of the head of state increased by 10 percentage points. According to experts, citizens support the President not only because the failure to achieve the goals of the special operation "will not be understood by society", but also because real threats to national security that have affected all segments of the population; because "NATO is at the gate"[12].

> "It's not about Ukraine at all, it's about aggression against everything Russian – interests, religion, culture, language, security and so on... there is a life-and-death battle going on for Russia's right to be on the political map of the world with full respect for its legitimate interests"[11].

Table 1. Attitude of Russians toward t he work of the RF President in February – June 2022, % of respondents

People's assessments	Feb. 20, 2022	June 12, 2022	Dynamics, (+/–), p.p.
Proportion of positive assessments	64,3	78,6	+15
Proportion of negative assessments	24,4	13,4	–11

Source: State institutions assessment rating. VCIOM. Available at: https://wciom.ru/ratings/dejatelnost-gosudarstvennykh-institutov/

Table 2. Attitude of Russians toward the special operation on the territory of Ukraine, % of respondents

People's assessments	Feb. 25, 2022	May 26, 2022	Dynamics, (+/–), p.p.
I support	65	72	+7
I don't support	25	18	–7
It's difficult to answer	10	10	0

Source: VCIOM analytical review "Special military operation: monitoring". VCIOM. May 30, 2022. Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/cpecialnaja-voennaja-operacija-monitoring

[9] National Security Strategy 2021 (approved by Presidential Decree 400, dated July 2, 2021). Official website of the RF President. Available at: http://www.kremlin.ru/acts/bank/47046

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

[11] *Rossiiskaya gazeta*. March 10, 2022. Available at: https://rg.ru/2022/03/10/lavrov-rf-vedet-boj-ne-na-zhizn-a-na-smert-za-mesto-na-politicheskoj-karte.html

[12] What the survey data on the special operation show. *Nezavisimaya gazeta*. June 2, 2022. Available at: https://www.ng.ru/editorial/2022-06-02/2_8452_editorial.html

Insert 1

Russian President Vladimir Putin on the essence of national sovereignty

Address of the President to the Federal Assembly of the Russian Federation January 15, 2020	"We must create a solid, reliable and invulnerable system that will be absolutely stable in terms of the external contour and will securely guarantee Russia's independence and sovereignty. At the same time, this system must be organic, flexible and capable of changing quickly in line with what is happening around us, and most importantly, in response to the development of Russian society.... This renewal is indispensable for the progressive evolution of society and stable development that may not be infallible but ensures that the most important thing – Russia's interests – remains immutable... Our nation's sovereignty must be unconditional. We have done a great deal to achieve this. We restored our state's unity. We have overcome the situation when certain powers in the government were essentially usurped by oligarch clans. Russia has returned to international politics as a country whose opinion cannot be ignored. We created powerful reserves, which multiplies our country's stability and capability to protect its citizens' social rights and the national economy from any attempts of foreign pressure".
National Security Strategy 2021 (approved by Presidential Decree 400, dated July 2, 2021)	"Against the background of the implementation of a purposeful policy to restrain the Russian Federation, it is of vital importance for our country to strengthen its sovereignty, independence, state and territorial integrity, protect the traditional spiritual and moral foundations of Russian society, ensure defense and security, and prevent interference in the internal affairs of the Russian Federation".
Vladimir Putin's speech at the meeting of the Valdai International Discussion Club October 21, 2021	"Only sovereign states can effectively respond to the challenges of the times and the demands of the citizens. Accordingly, any effective international order should take into account the interests and capabilities of the state and proceed on that basis, and not try to prove that they should not exist. Furthermore, it is impossible to impose anything on anyone, be it the principles underlying the sociopolitical structure or values that someone, for their own reasons, has called universal. After all, it is clear that when a real crisis strikes, there is only one universal value left and that is human life, which each state decides for itself how best to protect based on its abilities, culture and traditions".
Vladimir Putin's Address to Russians February 24, 2022	"The culture and values, experience and traditions of our ancestors invariably provided a powerful underpinning for the wellbeing and the very existence of entire states and nations, their success and viability. Of course, this directly depends on the ability to quickly adapt to constant change, maintain social cohesion, and readiness to consolidate and summon all the available forces in order to move forward.... having justice and truth on our side is what makes us truly strong. If this is the case, it would be hard to disagree with the fact that it is our strength and our readiness to fight that are the bedrock of independence and sovereignty and provide the necessary foundation for building a reliable future for your home, your family, and your Motherland".
Sources: Address of the President to the Federal Assembly of the Russian Federation, January 15, 2020. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/62582 National Security Strategy 2021 (approved by Presidential Decree 400, dated July 2, 2021). Official website of the RF President. Available at: http://www.kremlin.ru/acts/bank/47046 Vladimir Putin's speech at the meeting of the Valdai International Discussion Club, October 21, 2021. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/66975 Vladimir Putin's Address to Russians, February 24, 2022. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67843	

The growing support for the head of state and for the special military operation on the territory of Ukraine also proves that Russian society understands the fact that a "combined, civilizational" conflict has been unleashed against Russia; during this conflict Russia must prove not only the ability of the armed forces to protect the territorial integrity of the country and the ability of the national economy to "survive" and develop effectively in an unprecedented sanctions pressure from the Collective West, but also **"first of all, to show ourselves what kind of civilization we are. What is our uniqueness, what are our main differences?"**[13]. Experts have been saying for a long time that this is "not just about a geopolitical confrontation ..., but about something much deeper and more important"[14], which began long before the special operation on the territory of Ukraine; about our ability to preserve what is called the "Russian world", its traditions, values and worldview in the conditions of aggressive expansion of the "consumer society" cultivated by the Collective West.

> **"We all understand that the hybrid warfare is going on against Russia now.** The war is hot, because in a special military operation, the armed forces of Russia are opposed not by the Ukrainian army, but by the combined forces of NATO... There is an economic war going on: an unprecedented set of sanctions that have been adopted against our country today – there has never been such a thing. There is an informational and psychological war going on. The purpose of all this is to try to make us give up and stop defending the national interests of our country... **And this conflict is systemic and civilizational"**[15].

In this sense, it is advisable to consider the civilizational war declared on Russia in the context of two aspects.

First, in the context of the centuries-old, cultural and historical origin of the confrontation between the Anglo-Saxon and Russian civilizations, between which, as experts note, there is a "mental gulf ..., and the struggle of these two worlds is the essence of our history for the last few centuries"[16].

> "...it is necessary to take a look at the entire history of the formation of liberal ideology – starting from its roots. Only in this case we will be able to appreciate the seriousness of our situation.... Biden and the forces behind him embody the culmination of a historical process **that dates back to the Middle Ages**, reaches maturity in Modern Times with the advent of capitalist society and today is at its final stage"[17].

Even if we take only the 20th century, we will clearly see that its key events that determined the course of development not only of our country, but also of the whole world (such as the First World War

[13] Dugin and the clash of civilizations. Polit.ru. April 25, 2022. Available at: https://polit.ru/news/2022/04/25/dugin/

[14] Dugin A. About the fronts of the ongoing global war. September 26, 2017. Available at: http://ruspravda.info/Dugin-o-frontah-idushchey-globalnoy-voyni-28987.html

[15] Sources: The "Leaders of Russia" were called to join the intelligence. *Kommersant*. May 27, 2022. Available at: https://www.kommersant.ru/doc/5369367 Kiriyenko: NATO opposes the armed forces in Ukraine. Rossiiskaya gazeta. May 26, 2022. Available at: https://rg.ru/2022/05/26/kirienko-na-ukraine-vooruzhennym-silam-rossii-protivostoit-nato.html

[16] Starikov N. The confrontation of civilizations. March 6, 2012. Available at: https://nstarikov.ru/protivostoyanie-tsivilizatsij-16063

[17] Dugin A. Manifesto of the great awakening. *Zavtra*. March 7, 2021. Available at: https://zavtra.ru/blogs/manifest_velikogo_probuzhdeniya

of 1914–1918, the October Revolution of 1917, the Second World War of 1939–1945 (including the Great Patriotic War of 1941–1945), the Cold War of 1946–1991, the collapse of the USSR in 1991), were nothing more than an escalation of the conflict between the Anglo-Saxon and Russian civilizations, or rather the "attack" by the former and the "defense" of their national interests, their statehood by the latter (sometimes successful, sometimes not). Today's confrontation between the Collective West and Russia is of the same nature – the former are trying to "cancel" the latter, turning it, in fact, into a "gas station" (as one of the American senators noted)[18], which does not have the slightest chance of sovereignty, national interests, culture, values, etc.

Second, the civilizational conflict that emerged (as we noted earlier) long ago, but that reached a new level after February 24, 2022, should be considered in the context of the crisis of the capitalist system itself, liberal ideology and, in general, the unipolar world led by the Anglo-Saxons, the crisis that has been escalating throughout the 20th and 21st century.

"A number of events developing simultaneously and seemingly unrelated to each other have a common denominator. **These are elements of one global crisis – the systemic crisis of the world capitalist system"**[19].

From the collective introduction to the book (the general opinion of the authors[20]): "Capitalism, along with its creative destruction of older technologies and forms of production, has also been a source of inequality and environmental degradation. Deep capitalist crisis may be an opportunity to reorganize the planetary affairs of humanity in a way that promotes more social justice and a more livable planet.

Capitalism is a system, and that all systems have lives; they are never eternal.... The question now facing the world is not how governments can reform the capitalist system... the question arises of what will replace it"[21].

This fact is confirmed by the assessments of many foreign experts and by the results of authoritative international studies showing that in many countries (including NATO member states) more than half of citizens believe that "capitalism does more harm than good" *(Fig. 1)*.

[18] The phrase uttered by John McCain in 2014 (source: Putin refused to consider Russia a "gas station country". *RBK*. September 1, 2020.Available at: https://www.rbc.ru/politics/01/09/2020/5f4e28f29a7947582b9ef8f1

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

[20] I. Wallerstein (1930–2019) is an American sociologist, political scientist, philosopher, one of the founders of the world-system theory, winner of the Kondratiev Gold Medal "for outstanding contribution to the development of social sciences" (2004).

R. Collins is an American sociologist, PhD, professor at the University of Pennsylvania. One of the largest historical macro-sociologists and specialists in the theory of revolutions and state disintegration.

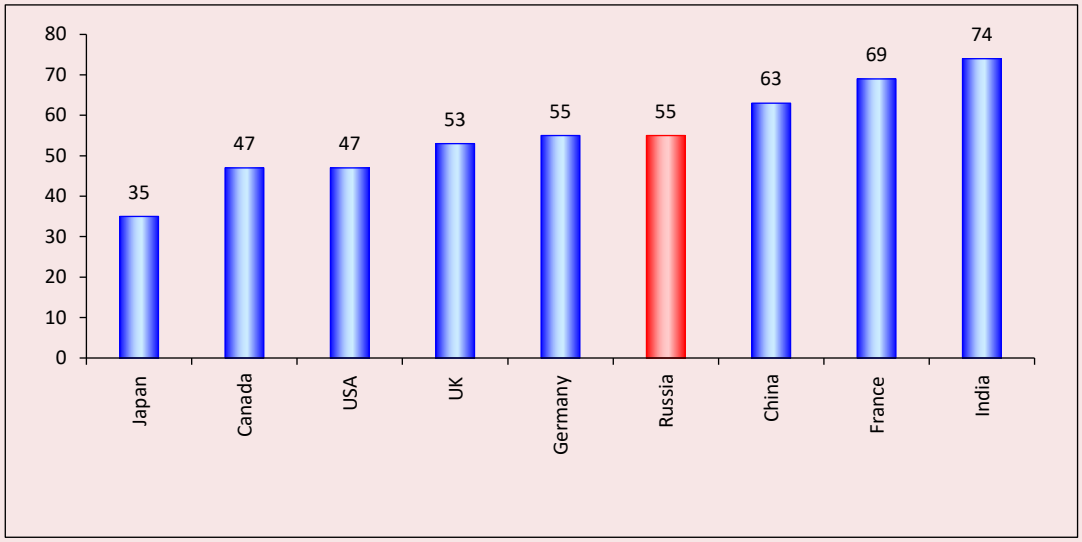
M. Mann is a British sociologist, a specialist in historical macrosociology, a representative of the neo-Weberian school of socio-political studies, PhD (1971), honorary professor at Cambridge University, member of the British Academy (2015).

G. Derluguian is a Soviet and American historical sociologist, publicist, professor at New York University Abu Dhabi.

C. Calhoun is an American sociologist and public figure, PhD from Oxford, president of the Social Science Research Council, director and president of the London School of Economics and Political Science, member of the American Philosophical Society and the British Academy.

[21] Wallerstein I., Collins R., Mann M., Derluguian G, Calhoun C. (2015). *Est' li budushchee u kapitalizma* [Does Capitalism Have a Future?] Moscow: Izd-vo Instituta Gaidara.

Figure 1. Proportion of people who believe that capitalism does more harm than good*, % of respondents



* The study was conducted in 28 countries: Thailand, India, France, Malaysia, Indonesia, China, Italy, Spain, United Arab Emirates, the Netherlands, Colombia, Brazil, Ireland, Mexico, Germany, Russia, South Africa, Kenya, Singapore, Saudi Arabia, the UK, Argentina, Australia, Canada, the U.S., South Korea, Hong Kong, Japan.

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

On average, 56% of respondents in 28 countries share this point of view. Which is quite natural in the context of growing global inequality[22], due to the fact that "it is superprofit that gives rise to a greed for gain"[23].

In this context, the uncompromising and extremely harsh rhetoric from leading representatives of the political and economic elites of the United States and NATO[24] in relation to Russia becomes quite understandable: the defeat of

[22] Novokmet F., Piketty T., Zucman G. (2018). From soviets to oligarchs: inequality and property in Russia, 1905–2016. Cambridge, MA: Journal of Economic Inequality. 79 p.

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

[24] See, for example:

1. President of the European Commission (EC) Ursula von der Leyen during the EU – Japan summit in Tokyo called Russia "a direct threat to the world order" (source: *Kommersant*. May 12, 2022. Available at: https://www.kommersant.ru/doc/5348294).

2. "*This war must be won on the battlefield*", said Josep Borrell, the High Representative of the European Union for Foreign Affairs and Security Policy, summing up his visit to Kiev (source: Ivanov A. Borrel officially declared war on Russia on behalf of the EU. The last of the masks is dropped. *Zavtra*. April 10, 2022. Available at: https://zavtra.ru/events/borrel_ofitcial_no_ob_yavil_vojnu_rossii_ot_imeni_es_poslednyaya_iz_masok_sbroshena).

3. G. Soros (speech at the World Economic Forum in Davos on May 24, 2022): *"The best and, perhaps, the only way to preserve our civilization is to defeat Putin as soon as possible"* (source: Enews. 25.05.2022. Available at: https://enews.md/publicatsia/soros-edinstvennyi-sposob-sokhranit-nashu-tsivilizatsiiu-kak-mozhno-skoree-pobedit-putina);

4. J. Stoltenberg (CNN interview): "*Our relations with Russia in the future will definitely not remain the same as before, we will not return to what could be called the former normality*" (source: *RT*. March 24, 2022. Available at: https://russian.rt.com/world/news/980836-stoltenberg-rossiya-nato); (meeting with the Head of the Ministry of Foreign Affairs of Ukraine D. Kuleba): "*Ukraine is waging a defensive war, so there is no difference between the supply of defensive and offensive weapons*" (source: *RT*. April 7, 2022. Available at: https://russian.rt.com/ussr/news/987111-nato-ukraina-vooruzhenie).

the Collective West in this civilizational war leads to the fact that "Western domination will be nullified"; new economic, political, socio-cultural "rules of the game" will be gradually established, in which there will be several sovereign world centers.

"The military defeat of Ukraine will essentially mean **the end of the West that we all know today...** No one in the world dares to challenge the power of the Collective West, although there are many who are dissatisfied. **If Moscow withstands the total pressure and wins, then others will follow, and Western domination will be nullified"**[25].

"According to the unanimous opinion of competent experts in international relations, the special military operation is **the last and decisive chord in the process of transition from a unipolar world to a multipolar one"**[26].

"For about a century, the United States of America was a global monopolist, and suddenly the mechanism stopped working. **There are contenders for the role of the world capital center** – China, Russia, maybe India. Russia has all the advantages for this: it has a huge territory, vital natural resources, military power and cultural heritage"[28].

"Multipolarity initially means that it is a dance with many players. **There is a much more complex system that becomes less manageable and more conflictual.** Moreover, we should not forget that this will be **a multipolarity with nuclear weapons**. And this is a very specific and unprecedented experience from a historical point of view... multipolarity itself suggests that it is **always a complex balance of power that is constantly changing"**[28].

And although some experts note that such a world will be "less manageable and more conflictual", one cannot but agree that this trend exists; that it is objective and inevitable.

Therefore, it is no coincidence, as international studies show, that **"negative views on Russia are mainly limited to Europe and other liberal democracies"**[29]. According to some estimates, "at the moment at least 37 countries adhere to a fairly uniform strategy of sanctions against Russia. These 37 countries account for about 55% of global GDP"[30].

The results of a public opinion poll conducted by the Alliance of Democracies Foundation in 52 countries in the spring of 2022 showed that 55% of Europeans were in favor of ending economic ties with Russia (residents of Poland, Ukraine, Portugal, Sweden, Italy, the UK, Germany and the U.S. were the most negatively disposed toward our country).

[25] The opinion of political scientist G. Mirzoyanov (source: Ozdemirov U. Russia has challenged the West. Who will the world support? *Pravda.ru*. May 1, 2022. Available at: https://www.pravda.ru/world/1704322-kogo_podderzhit_mir/).

[26] Dugin A. State-Civilization. The Continent-Russia and the multipolar world. *Zavtra*. May 31, 2022.

[27] Balatsky E.V. Return on capital as a driver of global economic transformations. May 19, 2022. Available at: http://www.vscc.ac.ru/activity/view?id=7743

[28] Sysoev T. (2022). The USA has much more at stake than Russia (materials of an interview with the historian and philosopher A. Teslya). *Ekspert*, 10.

[29] Negative views of Russia mainly limited to western liberal democracies, poll shows // *The Guardian*. 30.05.2022. URL: https://www.theguardian.com/world/2022/may/30/negative-views-of-russia-mainly-limited-to-western-liberal-democracies-poll-shows

[30] Gubanov S.S. (2022). N. Mulder: The purpose of sanctions is to change the political regime in Russia. *Ekonomist*, 4 (an opinion of the American historian N. Mulder, author of the book *The Economic Weapon: The Rise of Sanctions as a Tool of Modern War*).

At the same time, **the population of 20 out of 52 countries of the world treats Russia mostly positively and opposes the sanctions war:** two European states (Hungary, Greece), **major Asian countries** (China, India, Turkey, Indonesia, Pakistan), most Asian countries (including Thailand, Malaysia, Vietnam, the Philippines), **major African countries** (such as Nigeria, South Africa, Kenya), Mexico **(the largest country in Latin America), most of the Arab world** (Saudi Arabia, Egypt, Algeria, Morocco, etc.)[31].

According to Russian experts, "the world has divided into two unequal parts. **The anti-Russian minority is limited to the West…**; however, the special operation **did not turn either local elites or the bulk of the population** of the non-Western world against Russia (we are talking about Latin America, Africa and parts of Asia)"[32].

Today, many Russian experts[33] draw parallels between the current world situation and the period of the Great Patriotic War, noting that "Hitler, unlike the previous enemies of Russia, set the task not just of military victory, but of erasing Russians from history. **Apparently, this is the task set today by his heirs – ultra-globalists on both sides of the ocean"**[34]. However, at that moment (largely due to the industrialization carried out by Joseph Stalin in a timely manner) the Soviet Union survived and by the end of the first post-war decade was ahead of many Western countries in key indicators of industrial and agricultural development *(Tab. 3)*.

Nevertheless, the Cold War turned out to be victorious for the West; it ended in 1991 with the betrayal of the elites, the collapse of the USSR and the "immersion" of post-Soviet Russia in long decades of so-called "market transformations", perceived today as a period of slow loss of national sovereignty, the transformation of the country into a semi-colonial power, decades of moral "decomposition of society"[35].

"When we talk about the events of 1991, it is worth remembering 1917. Both then and in the nineties, our country was going through tragic days. Both in 1991 and in 1917, **the elites betrayed the interests of the people and the state"**[36].

"The basis of the global dominance of the West is built **primarily on the adoption of the Western system of values,** a kind of Western semantic code"[37].

Some findings of sociological research speak eloquently about the results of these decades (1991–2020) of existence in the coordinate system of the "consumer society" imposed by the West.

The monitoring of public opinion conducted by VolRC RAS in the Vologda Oblast since 1996 makes it possible to trace the dynamics of changes in values and moral norms of society over the entire period of market transformations (from 1996 to 2020), and to analyze the corresponding changes in the context of major socio-demographic groups.

[31] Negative views of Russia mainly limited to western liberal democracies, poll shows. *The Guardian*. May 30, 2022. Available at: https://www.theguardian.com/world/2022/may/30/negative-views-of-russia-mainly-limited-to-western-liberal-democracies-poll-shows

[32] Akopov P. Russian lesson: The world no longer believes the West. *RIA-novosti*. May 31, 2022.Available at: https://ria.ru/20220531/urok-1791878036.html

[33] See, for example: Delyagin M. Nationalization is the only peaceful language available to the Collective West. *Zavtra*. May 30, 2022.

[34] Fursov A., Titov I. At the turning point of the epochs. *Zavtra*. April 28, 2022.

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

[36] Volodin named those responsible for the collapse of the USSR. *RIA-novosti*. August 18, 2021. Available at: https://crimea.ria.ru/20210818/volodin-nazval-vinovnykh-v-raspade-sssr-1120569046.html

[37] Korovin V. The end of Western hegemony. *Izborsk Club*. August 30, 2019. Available at: https://izborsk-club.ru/17626

Table 3. Dynamics of development of the USSR in comparison with some Western countries (1937–1956)

Country	1937	1956	1956 to 1937, times
Dynamics of industrial production, % to 1913			
USSR	588	3018	5.1
Germany	116	223	1.9
France	114	179	1.6
UK	122	180	1.5
USA	172	409	2.4
Share in global industrial production, %			
USSR	9.2	19.8	2.2
Germany	8.4	7.5	0.9
France	5.5	3.4	0.6
UK	11.5	8.0	0.7
USA	37.8	39.4	1.0
Coal production, million tons			
USSR	128	429	3.4
Germany	203	230	1.1
France	44	55	1.3
UK	244	226	0.9
USA	451	459	1.0
Steelmaking, million tons			
USSR	17.7	48.7	2.8
Germany	15.6	23.1	1.5
France	7.9	13.4	1.7
UK	13.2	21.0	1.6
USA	51.4	104.5	2.0
Growth rates of gross output of mechanical engineering and metalworking, times in relation to 1913			
USSR	20.0	184.0	9.2
Germany	2.1	4.0	1.9
France	1.2	2.4	2.0
UK	2.4	5.0	2.1
USA	5.0	16.7	3.3
Electricity production, kilowatt-hours			
USSR	218	954	4.4
Germany	715	1572	2.2
France	488	1234	2.5
UK	675	1875	2.8
USA	1136	4015	3.5
Dynamics of area under crops, million hectares			
USSR	132	195	1.5
USA	132	129	1.0
Dynamics of capital construction, % to 1929			
USSR	445	2371	5.3
USA	51	427	8.4
Railway transport freight turnover, billion ton-kilometers			
USSR	355	1079	3.0
USA	528	945	1.8
Labor productivity, % to 1928			
USSR	258	726	2.8
USA	98	155	1.6
Germany	130	170	1.3
Source: The USSR and capitalist countries over 40 years. Available at: https://istmat.org/files/uploads/35057/sssr_i_kap._strany_za_40_let.pdf			

The results of the study show that over the past almost 25 years **in Russian society**:

1. The importance of the majority (14 out of 18) of moral traits reflecting people's attitude toward their life in general, their country, profession, and surrounding people has noticeably decreased *(Appendix 1A, p. 35)*.

Dynamics of people's attitude toward various moral qualities for 1996–2020*

Total number of moral qualities listed in the question	Number of negative changes	Number of positive changes	Absence of changes
18	14	2	2

* According to the estimates of people who consider the listed moral qualities "unimportant".

In particular, there has been an increase in the proportion those who consider the following traits *unimportant*:

- ✓ empathy (by 8 p.p., from 14 to 22%),
- ✓ mutual aid (by 8 p.p., from 11 to 19%),
- ✓ tolerance (by 8 p.p., from 13 to 21%),
- ✓ decency (by 7 p.p., from 6 to 13%),
- ✓ honesty (by 7 p.p., from 7 to 14%) and many others.

Moreover, during this period, negative trends were noted in 7 out of 11 socio-demographic groups, including middle-aged and older people (the proportion of people who consider more than half of the moral qualities listed in the survey *unimportant* increased by 6 and 17 p.p. respectively); residents of districts (by 18 p.p.); both men and women (by 4 p.p.; *Appendix 1B, p. 36)*.

Dynamics of people's attitude toward various moral qualities over the period from 1996 to 2020 in socio-demographic groups*

Total number of socio-demographic groups	Number of negative changes	Number of positive changes	Absence of changes
11	7	1	3

* According to the estimates of people who consider the listed moral qualities "unimportant".

2. Mainly negative trends over the past 24 years (1996–2020) are also observed in the dynamics of people's attitudes toward various moral phenomena and actions.

Ten of the 15 negative phenomena and actions listed in the survey have become "acceptable, quite normal" *(Appendix 2A, p. 37)*.

Dynamics of people's attitude toward various negative moral phenomena and actions for 1996–2020*

Total number of negative acts listed in the question	Number of negative changes	Number of positive changes	Absence of changes
15	10	0	5

* According to the estimates of people who consider these acts "acceptable, quite normal".

In particular, there has been an increase in the proportion of those who consider the following as *"acceptable" or "quite normal"*:

- ✓ laziness (by 20 p.p., from 22 to 42%),
- ✓ desire to work less and earn more (by 13 p.p., from 36 to 49%),
- ✓ arrogance and conceit (by 9 p.p., from 11 to 20%),
- ✓ sycophancy and servility (by 7 p.p., from 9 to 16%),
- ✓ bribes (by 4 p.p., from 10 to 14%), etc.

As well as with regard to moral qualities, negative changes in people's attitude toward

negative moral phenomena and actions are noted in almost all (12 out of 14) socio-demographic groups (with the exception of people under the age of 30 and those residents of the region who, according to self-estimates of income, belong to the top 20%; *Appendix 2B, p. 38*).

Dynamics of people's attitude toward various negative moral phenomena and actions for 1996–2020 in socio-demographic groups*

Total number of socio-demographic groups	Number of negative changes	Number of positive changes	Absence of changes
14	12	1	1

* According to the estimates of people who consider these acts "acceptable, quite normal".

3. Finally, we should note that along with people's general attitude toward various moral qualities, negative phenomena and actions existing in society as a whole, we observe negative changes in the dynamics of their behavior, according to the results of 1996–2020.

In total, out of the 11 negative actions and behaviors listed in the question, people began to experience feelings of guilt and remorse less often in nine cases *(Appendix 3A, p. 39)*.

Dynamics of the proportion of those who do not feel guilty when committing certain negative actions for 1996–2020*

Total number of negative acts listed in the question	Number of negative changes	Number of positive changes	Absence of changes
11	9	1	1

* According to the estimates of people who "don't feel remorse" if they commit the abovementioned negative acts.

There has been an increase in the proportion of those who *do not feel* guilt or remorse when they:

- ✓ offend someone, are rude to someone (by 19 p.p., from 16 to 35%),
- ✓ show insufficient attention to parents (by 19 p.p., from 34 to 53%),
- ✓ commit some kind of unfair act (by 16 p.p., from 25 to 41%),
- ✓ don t fulfill their promise (by 15 p.p., from 25 to 40%),
- ✓ treat children badly (by 13 p.p., from 54 to 67%), etc.

Moreover, the **only** group of the population in which the proportion of those who feel guilty when committing any negative moral acts *has not decreased* is older people (as in 1996, it was 55%; *Appendix 3B, p. 40*).

Dynamics of the proportion of people who do not feel guilty when committing certain negative acts for 1996–2020 in socio-demographic groups*

Total number of socio-demographic groups	Number of negative changes	Number of positive changes	Absence of changes
11	10	1	0

* According to the estimates of people who "don't feel remorse" if they commit the abovementioned negative acts.

We should note that concerning these negative trends in the dynamics of the moral level of society, the Vologda Oblast is not a unique Russian region, but rather is a typical constituent entity of the Russian Federation[37]. Thus, the data of VolRC RAS public opinion monitoring are confirmed by the results of all-Russian sociological surveys,

[38] At the same time, we should note that the Vologda Oblast, and in general the regions of the Northwestern Federal District, have traditionally been more critical of the activities of government bodies, which, in particular, is manifested in federal elections. For example, according to the results of the latest election to the State Duma of the Russian Federation (September 19, 2021), the turnout in Russia as a whole was 52%, on average in the NWFD – 42%, in the Vologda Oblast – 46%. Support for United Russia in these elections was 50% on average in the country, 35% in the Northwestern Federal District and 34% in the Vologda Oblast.

indicating that, compared with the Soviet period, "the basic life values of Russians, what they value in life, have undergone significant changes... The measure of a person's social status, well-being, and success in society has now been reduced to only one thing – material well-being. Other indicators of a person's social status in society have lost much of their significance"[39] *(Tab. 4)*.

Table 4. Russians' perceptions of life values and success factors in 1986 and 2006*, % of respondents

Answer option	1986	2006	Dynamics (+/–), p.p.
Life values			
Material well-being	**31**	**55**	**+24**
Family, marriage	60	53	-7
Children	55	45	-10
Respect on the part of others	27	17	-10
Interesting job	41	29	-12
Desire to be useful to society	**26**	**6**	**-20**
Success factors			
"Connections" with influential people	**7**	**30**	**+23**
Luck	**7**	**30**	**+23**
Abilities, talent	15	32	+17
Ability to adapt, flexibility	4	20	+16
Education	39	54	+15
Help from influential relatives	4	14	+10
Purposefulness	27	37	+10
Financial assistance of parents	9	16	+7
Leadership	9	16	+7
Social connections, support of neighbors	27	31	+4
Initiative	21	25	+4
Integrity	22	14	-8
Unselfishness	20	10	-10
Responsibility	46	32	-14
Honesty, decency	**63**	**41**	**-22**
Industriousness	**74**	**52**	**-22**
Human understanding, mutual assistance	**53**	**27**	**-26**
Responsiveness, kindness	**57**	**27**	**-30**

Compiled according to: Andreenkova A.V. Changes in the lifestyle and values of Russians. Available at: https://www.cessi.ru/cennosti
* Ranked by change (in percentage points). The most significant changes (more than 20 p.p.) are highlighted in bold.

[39] Andreenkova A.V. Changes in the lifestyle and values of Russians. Available at: http://www.cessi.ru/index.php?id=171
The study was conducted by the Institute for Comparative Social Research (CESSI).

CESSI is an independent research company with more than 30 years of experience (founded in March 1989) in the field of production and analysis of social information – social research, opinion polls, marketing research in Russia, as well as Belarus, Ukraine, Kazakhstan, the countries of Central Asia and the Caucasus, Mongolia and the countries of Central and Eastern Europe.

Sample parameters: 1986 – All-Union study of the population of different republics of the USSR (including the Russian Federation) on a random sample of the population aged 18 and older. The sample size in the Russian Federation is 4,400 people. The survey method is a questionnaire filled out by the respondents themselves at home. The study was conducted by the Institute of Sociology of the Russian Academy of Sciences under the guidance of I.T. Levykin.

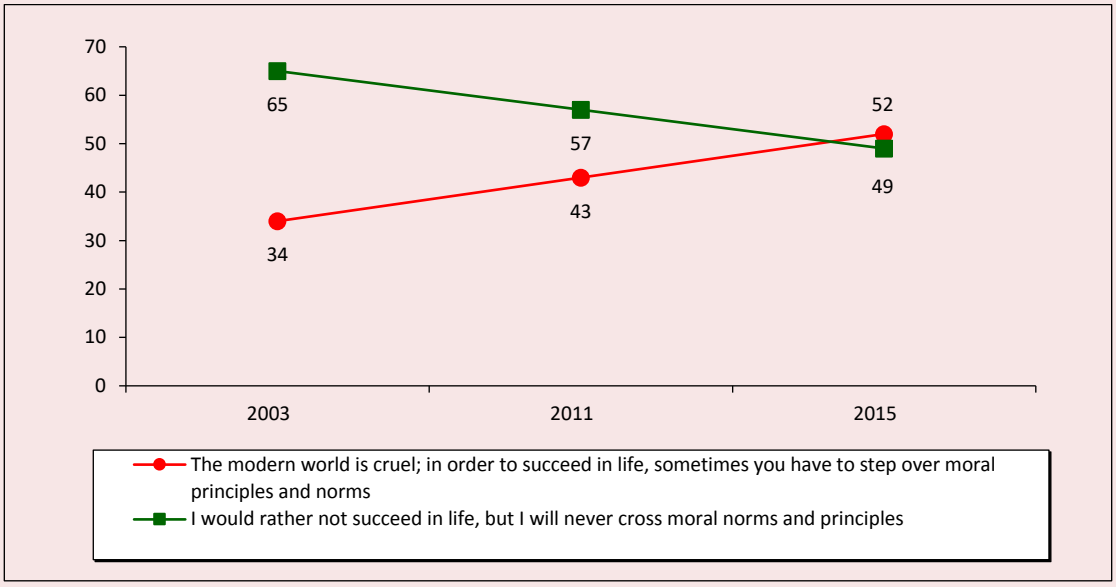
2006 – An all-Russian study conducted on a random probabilistic sample of the population of the country aged 18 and older. The sample size is 1,200 people. The survey method is personal interviews at the respondents' home. The study was conducted by the CESSI under the direction of V.G. Andreenkova.

Another Russian study conducted by RAS Institute of Sociology allows us to assess the dynamics of value changes already in the 2000s (for the period from 2003 to 2011). Thus, according to experts, the share of Russians who believe that "the modern world is cruel; in order to succeed in life, sometimes you have to step over moral principles and norms" has increased from 34 to 43%. In turn, the proportion of those who "would rather not succeed in life, but would never overstep moral norms and principles" decreased from 65 to 57% *(Fig. 2)*.

> "The processes taking place in Russia in the last two decades have changed a lot not only in the economy and politics, but also in the everyday life of every person, in relations between people, in the understanding that today there is a success in life, what goals should be set and what means can be used to achieve these goals. **Many Russians are convinced of the complete and irrevocable loss of moral norms by our society and its citizens, that the erosion of morality has reached the critical point beyond which spiritual rebirth of Russia, or rather, its degeneration, is coming"**[40].

This trend continued in the mid-2010s: for example, in 2015, experts of RAS Institute of Sociology recorded that the proportion of people "ready to step over moral principles and norms" increased to 52% (see Fig. 2), and the proportion of those who "would rather not succeed in life, but would never step over moral norms and principles" has decreased to 49%[41].

Figure 2. Moral attitudes of Russians, % of respondents



Compiled according to: Twenty years of reforms through the eyes of Russians (the experience of long-term sociological measurements) (2011): Analytical report of IS RAS. Moscow; Gorshkov M.K., Sedova N.N. (2015). "Self-sufficient" Russians and their life priorities. *Sotsiologicheskiye issledovaniya*, 12.

[40] Twenty years of reforms through the eyes of Russians (the experience of long-term sociological measurements) (2011): Analytical report of IS RAS. Moscow. 2014, 2015.

[41] Gorshkov M.K., Sedova N.N. (2015). "Self-sufficient" Russians and their life priorities. *Sotsiologicheskiye issledovaniya,* 12.

Thus, the results of both Russian and regional sociological studies empirically show that the entire post-Soviet period was characterized by the processes of decline in the moral level in Russian society, and not in some groups, but in fact in all major socio-demographic categories of the population.

"Over the past 20 years, the values of our citizens have changed a lot, and not for the better... **In the value system of Russians in modern Russia, material well-being and consumption occupy the first place...** Decades of scarcity, the ostentatious consumption of the elites and the broadcast of the values of prestigious consumption in the media logically led to the fact that the **"nation of winners" became a "nation of consumers"**[42].

Although this does not mean that over the past 25–30 years, Russian society has completely degraded morally. According to our research in 2020, as in the mid-1990s, the vast majority of Russians (from 70 to 90%) still consider such feelings as justice, decency, respect for elders, responsiveness, etc. important for themselves.

And this is of fundamental importance, because it means that "the ship has not sailed yet"; that it is quite possible to achieve cultural sovereignty with effective leadership, that is, when the orientation toward national interests (in economics, politics, culture) is confirmed not only by the public rhetoric of authorities at all levels, but also by honest steps that actually reach the broad strata of the population.

Nevertheless, if we talk about the dynamics of the changes noted so far, then in this case negative trends (in the form of an increase in egoistic attitudes, a willingness to step over the norms of morality and even the law for the sake of personal success) are obvious...

"The cultural sovereignty of a country includes the right of a country and its people to be guided by those patterns, values and norms of behavior that have been developed in the course of their history, recognized and accepted by its people ...; to counteract the spread of information products that threaten the historical and cultural identity of society ...; the duty of the state is not to allow the use of the cultural sphere to damage the national state-political sovereignty and territorial integrity of the country"[43].

And this, basically, is not surprising, since people could see examples and patterns of such "behavior" at all levels of the state hierarchy: starting with corruption at the regional, municipal,

[42] National identity and the future of Russia: Report of the Valdai International Discussion Club. Moscow, 2014.

[43] Chernyakhovsky S.F. About cultural sovereignty. *Izborsk Club*. June 7, 2014. Available at: https://izborsk-club.ru/3354#:~:text=Культурный%20суверенитет%20страны%20включает%20в,признаются%20и%20принимаются%20ее%20народом

and sometimes federal levels[44] and ending with "a scam that has no precedent in our history"[45] (as experts described the reform of collateral auctions conducted by Boris Yeltsin in 1995).

> "The deideologization of the state turned out to be the main goal in the preparation of the Constitution of the RSFSR... As a result, for almost thirty years the country has been wandering in the dark and looking for a national idea..."[46]

The RF President Vladimir Putin highlighted overcoming the processes of internal moral decay as a key landmark of the future Russian statehood, which he began to build from the moment of his first presidential term. This is evidenced by the fact that in his first program article "Russia at the turn of the Millennium" (1999), the "Russian idea" appears **first** in the list of guidelines for national development, anticipating such goals as "A strong state" and "An efficient economy"[47]. The head of state noted that "achieving the necessary growth dynamics is not only an economic problem. **This is also a political problem and, in a certain sense, an ideological one…**"[48]

Through his specific actions (such as the Munich Speech of 2007, a speech at the Valdai Forum in 2013, the Crimean Spring of 2014, amendments to the 2020 Constitution, the National Security Strategy and the draft law on traditional values of 2021, a speech at the Valdai Forum in 2021 and many others) the RF President not only personally contributed to the process of formation of a national idea in Russian society, but also stimulated the discussion of organizational and theoretical foundations of state ideology in the scientific community[49].

> **"The national idea is the main goal of the community of people united by national identity.** The national idea is not rational, it is perceived by people not only as a task on the way to something, but as an end in itself, as a mission. Only on its basis can we talk about a national strategy aimed at implementing the national idea"[50].

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[44] See, for example: the case of ex-Minister of Economic Development A. Ulyukayev, ex-head of the Ministry of Construction M. Men, ex-Minister for the Development of the Far East V. Ishaev, ex-Minister for "Open Government" M. Abyzov, ex-Minister for Atomic Energy E. Adamov, ex-Minister of Defense A. Serdyukov, Deputy Finance Minister S. Storchak, former Deputy Head of the Ministry of Agriculture A. Bazhanov, former Deputy Head of the Ministry of Emergency Situations V. Artamonov, former Deputy Minister of Culture G. Pirumov, former Deputy Minister of Science and Higher Education M. Lukashevich, former Deputy Minister of Energy A. Tikhonov, ex-Deputy Minister of Education M. Rakova, etc.

[45] Dobrenkov V.I., Ispravnikova N.R. (2013). The Russian version of "crony capitalism": Is there a way out of the impasse? *Vestnik Moskovskogo universiteta. Seriya 18. Sotsiologiya i politologiya*.

[46] Zikeev V. The ideology of a multinational people. *Ekspert*. May, 2022. Available at: https://telegra.ph/Ideologiya-mnogonacionalnogo-naroda-05-21

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

[48] Ibidem.

[49] See, for example:

1. Delyagin M. New Russian ideology. Official blog of M. Delyagin. February 5, 2021. Available at: https://delyagin.ru/articles/191-materialy-mgd/88332-novaja-russkaja-ideologija

2. Gromyko Yu.V., Krupnov Yu.V. (Eds.). (2019). *Rossiya – Noev Kovcheg chelovechestva: Filosofsko-religioznye i metodologicheskie aspekty gosudarstvennoi ideologii budushchei Rossii* [Russia – Noah's Ark of Humanity: Philosophical, Religious and Methodological Aspects of the State Ideology of Future Russia]. Moscow: LENAND.

3. Malinetsky G. Strategy and ideology of Russia in the 21st century. Available at: https://izborsk-club.ru/20772

[50] National Identity and the Future of Russia: Report of the Valdai International Discussion Club. Moscow, 2014.

Experts called some of these steps of the President the attempts to formulate a new state ideology.

"The value categories enshrined in the updated Basic Law of Russia are elements of a crystallized ideology"[51].

Experts on Vladimir Putin's speech at the Valdai Forum on October 21, 2021: "The President has actually declared war on the ideology of globalism... moreover, Putin's speech (expanded with answers to questions) became a statement of a new Russian state ideology. This is the "ideology of healthy conservatism", or "reasonable conservatism", "moderate conservatism"[52].

However, like many other initiatives of the head of state, the task of forming the "Russian idea", which the President set for himself and for the country back in 1999, was not fully realized.

And it could not be, because throughout this time there were "fifth" and "sixth" columns in the system of public administration.

Experts note that "the Russian version of crony capitalism began to take shape in 1991"[53], and in fact for 30 years (before the President announced a special military operation on the territory of Ukraine in February 2022), the ruling elites of the country were "fit in" with the liberal development paradigm, so the head of state simply did not have the opportunity to complete the task of nationalizing the elites.

"The fifth column is those who serve the interests of other countries, and who are only tools for others' political goals"[54].

"The sixth column is the bearers of liberal Westernist ideology, who at the same time hide behind the "Putin's friend" badge, with some formal position in the state system"[55].

Back in the mid-2010s, experts noted that "the main problem of the current moment is that the oligarchic-comprador state is basically incapacitated and only aggravates the dramatic systemic crisis, bringing it closer to a domestic political crisis..."; to solve this problem "it is necessary **to return the commanding heights of the economy** – the banking sector, infrastructure industries, foreign trade – to national sovereignty. The state sovereignty of Russia should be restored over the commanding bases of the economy: there must not be any foreign, private and oligarchic-comprador capital"[56].

However, in 2013 experts said that "**the real nationalization of the elites would be too cruel a punishment for officials, deputies and senators**"[57], while after the launch of the special military

[51] Zikeev V. The ideology of a multinational people. *Ekspert*. May, 2022. Available at: https://telegra.ph/Ideologiya-mnogonacionalnogo-naroda-05-21

[52] Mozhegov V. Putin formulated a new Russian ideology. *Vzglyad*. October 28, 2021.Available at: https://vz.ru/opinions/2021/10/28/1126177.html

[53] Dobrenkov V.I., Ispravnikova N.R. (2013). The Russian version of "crony capitalism": Is there a way out of the impasse? *Vestnik Moskovskogo universiteta. Seriya 18. Sotsiologiya i politologiya.*

[54] Vladimir Putin's big press conference on December 18, 2014. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/47250

[55] Trump's victory: What will happen to the liberal pandemonium in Russia? Experts on what awaits the fifth and sixth columns after the victory of Donald Trump. Available at: https://tsargrad.tv/articles/pobeda-trampa-chto-budet-s-liberalnym-zooparkom-v-rossii_34288

[56] Gubanov S.S. The comprador regime is hanging on the thread of history. *Biznes-Online*. February 24, 2015. Available at: https://www.business-gazeta.ru/article/126419

[57] Your purse and your life. *Gazeta.ru*. August 19, 2013. Available at: https://www.gazeta.ru/comments/2013/08/19_e_5597585.shtml

operation on February 24, 2022, the vector of expert rhetoric changed: they say that **"the real nationalization of the elites has begun"**[58]**; "the promised nationalization of the elites... will definitely happen how"**[59]**.**

We recall that back in 2021, A. Voloshin – a man who is called the "ideologue of the Family"[60] and the "brain" of the liberal clan"[61] left his "most significant post"[62] (as experts note) of Coordinator of the Expert Council under the Government of the Russian Federation (to which he had been appointed by the former Chairman of the Government of the Russian Federation Dmitry Medvedev[63]).

After February 2022, Presidential Adviser V. Yumashev, Boris Yeltsin's son-in-law and a member of the Board and a member of the Board of Trustees of the Yeltsin Center, left his post (in the first days of the special operation, the Yeltsin Center called for "an immediate cessation of the military actions"[64]).

According to experts, V. Yumashev was "one of the few remaining links between the Putin administration and Yeltsin's rule, the period of liberal reforms and Russia's openness towards the West ... Chubais was a manager, and Yumashev was a strategist and a guide to the policy of the remnants of the Family [actually beneficiaries of the unipolar world in Russia]... **his leaving the post means in fact a complete break in the relations between the Family and the current government**. The crisis of these relations has been maturing for a long time, since 2012, now the final end has come ... The obligations to the late Yeltsin have been recognized as fulfilled"[65].

It is premature to say that after February 24, 2022, all these problems in the public administration system will be solved by themselves. **Nevertheless, the new Russia has not yet had such a historic chance to achieve full (not only external, but also internal) national sovereignty.**

"...an oligarch is not just a billionaire, but a billionaire who determines the internal and foreign policy of the state or has a serious influence on it... **a special operation of the RF Armed Forces in Ukraine would be impossible under the conditions of oligarchic rule.** No one would have allowed the army to advance on the territory specially protected by the West, i.e. by the owners and the celestials"[66].

"The actions of the United States and its satellites open up a wide range of opportunities for Russia, which **increasingly seem to be perceived as responsibilities"**[67].

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[58] Mironov: Thanks to the sanctions, the real nationalization of the elites began. *Parlamentskaya gazeta*. May 17, 2022. Available at: https://www.pnp.ru/politics/mironov-blagodarya-sankciyam-nachalas-realnaya-nacionalizaciya-elit.html

[59] This is a good reason to get done with the parasite – foreign capital in Russia! *Biznes-Online*. March 5, 2022. Available at: https://www.business-gazeta.ru/article/542023

[60] Yeltsin's son-in-law ("mafia enforcer from the Family") resigned from the post of Putin's adviser. *Zavtra*. May 31, 2022.

[61] Alexander Voloshin became the coordinator of the Expert Council under the Government of the Russian Federation. *Nezavisimaya gazeta*. December 12, 2019. Available at: https://www.ng.ru/economics/2019-12-12/4_7751_news1.html

[62] "Music of the Spheres": Why Alexander Voloshin returns to power. *Novye izvestia*. December 14, 2019. Available at: https://newizv.ru/news/politics/14-12-2019/muzyka-sfer-zachem-vozvraschaetsya-vo-vlast-aleksandr-voloshin

[63] Delyagin M. Voloshin came out of the shadows – the liberal clan is preparing for an offensive. *IA Realist*. December 18, 2019.

[64] Yeltsin Center urged to stop the military operation in Ukraine. *RBK*. February 25, 2022. Available at: https://www.rbc.ru/politics/25/02/2022/621907ef9a7947cdd40039499

[65] Yeltsin's son-in-law ("mafia enforcer from the Family") resigned from the post of Putin's adviser. *Zavtra*. May 31, 2022.

[66] Sorokin N. Without oligarchy and oligarchs. *Zavtra*. May 30, 2022.

[67] Delyagin M. Nationalization is the only peaceful language available to the Collective West. *Zavtra*. May 30, 2022.

For the first time in the entire post-Soviet period, the internal vector of movement, set and supported by the President, completely coincided with the external conditions that had been formed and stimulated (paradoxically) by the Collective West. And in this sense, the civilizational crisis that arose in 2022 between the Russian and Anglo-Saxon civilizations is a "window of opportunity" (and which can no longer be "closed" just like that).

Currently, the state is beginning to actively "master" this "window of opportunity", as evidenced by initiatives and decisions aimed (which is important to emphasize) not only at consolidating Russian society in difficult conditions for the country, but also at future generations. By and large, this process began even earlier: in particular, *Insert 2* presents the key decisions and actions of the President since the amendments to the RF Constitution supported by 79% or almost 58 million Russian voters came into force (January 1, 2021).

Thus, the practical realization of the goal of forming the "Russian idea" in society was going on long before the special operation in Ukraine. However, the Rubicon, which Russia crossed on February 24, 2022, provides the country and its President with a unique historical chance to complete this unfinished business.

In this perspective, the special operation in Ukraine is only a tactical, although the most important, task, without the successful solution of which it will not be possible to achieve strategic goals. But the essence of the global conflict and the prospects opening up for Russia consists in a much greater thing.

Ultimately, the essence consists in the possibility of creating conditions for effective and intensive internal development; for the final eradication of the obstacles represented primarily by the "sixth column", "family" or, simply put, the liberal "past" (in the future), which throughout the post-Soviet period were not interested in finding a real solution to the problems of poverty, inequality, corruption, increasing individualism, moral degradation and many other phenomena that characterized Russia during the period of movement along a market and liberal-capitalist development path.

"Our main task is to create a new solid and, therefore, artistically strong image of the future. And if it is bright, if people believe in it, then it will slowly become a reality... Creating an image of the future is the ideological foundation for building a new Russia. After the creation of the image, a "prototype" should arise (an experimental model, a standard, and in fact – the grain of the desired social arrangement of people's lives), after which the system of replication of an acceptable scenario of the future is turned on. In a broad sense, the education system is engaged in replicating what people have achieved. **This is the sequence of development of society: "image – sample – education"**[68].

The Soviet Union "sent only 14% of the energy produced in the country to the foreign market. The main donor was Saudi Arabia, which sent almost everything to the foreign market. But since the beginning of the 2000s, when we adopted the strategy of an energy superpower, the entire increase in energy production was exported, domestic consumption stagnated. And by the end of the 2000s, Russia, having increased the volume of production by one and a half times, began to send half of the energy produced in the country to the foreign market... **Russia should become an industrial power. But can we do it?"**[69]

[68] Lebedev D. The axis of development. *Zavtra*. May 26, 2022.Available at: https://zavtra.ru/blogs/os_razvitiya

[69] Is it time to become an industrial power? Or is it not time yet? *Ekspert*, 2022, no. 22, p. 11.

Insert 2

Chronology of some actions of federal state authorities to strengthen the internal foundations of national sovereignty in 2021–2022

2021
June 9, 2021 – The Moscow City Court satisfied the claim of the Prosecutor General's Office, recognizing the FBK and A. Navalny's headquarters as extremist organizations. Activists and donors face criminal liability if they continue their activities or funding[70]. "He created conditions for the "destabilization of the social and socio-political situation", his goal was "to change the foundations of the constitutional system", "including using the scenario of a "color revolution" – this is the wording of the prosecutor's verdict. Literally in a year, the entire grid of the so-called non-systemic opposition was cleared, and Alexei Navalny himself, after numerous possible violations of the order of serving his suspended sentences, went to jail"[71].
June 30, 2021 – Former Minister of Education O. Vasilyeva was elected President of the Russian Academy of Education (RAO). According to experts, O. Vasilyeva "revives the best traditions of Russian education"[72]; "she sees ideological upbringing rather than business as the main task of education"[73]; "she is perceived as a counterweight to the liberal public"[74]; «she gives hope for overcoming the crisis phenomena that have accumulated in the domestic higher and secondary schools over the past decades"[75].
July 1, 2021 – the change of the rector of the Higher School of Economics, an establishment that is considered "the largest conductor of Western ideology in our country, the engine of liberal ideas"[76]. Rector of the Higher School of Economics (HSE) Ya. Kuzminov left his post; he had held this position since 1992 and, as some experts note, was "the ideologue of the liberal bloc in the Cabinet of Ministers of the Russian Federation and a recognized gravedigger of education"[77]. His place was taken by the former rector of the Far Eastern Federal University N. Anisimov; according to some experts, "undoubtedly, a placeman of the Presidential Administration"[78].
July 30, 2021 – the Interdepartmental Commission on Historical Education was established. The Commission was headed by V.R. Medinsky, Assistant to the President of the Russian Federation. The purpose of the Commission is to "ensure a systematic and proactive approach to the issue of defending the national interests of the Russian Federation related to the preservation of historical memory and the development of educational activities in the field of history"[79].

[70] The court recognized the FBK and Navalny's headquarters as extremist organizations. *RBK*. June 9, 2021. Available at: https://www.rbc.ru/politics/09/06/2021/608670e09a7947709c4de06c

[71] Sunset of non-systemic passionaries. *Ekspert,* 2021, no. 25, June 14–20.

[72] Opinion of M. Strikhanov, RAO Academician, rector of MEPhI (source: The only right decision. *Kommersant*. June 28, 2021. Available at: https://www.kommersant.ru/doc/4877626).

[73] Opinion of D. Zhuravlev, Cand. Sci. (Pedagogy), director general of the Institute of Regional Problems (source: Zakharkin S., Gereikhanov A., Belyi M. Liberals use attacks in schools to remove Vasilyeva. *Ura.ru*. January 22, 2018. Available at: https://ura.news/articles/1036273645)

[74] Opinion of E. Minchenko, director of Minchenko-Consulting (Source: Ibidem).

[75] Opinion of A. Lubkov, rector of Moscow Pedagogical State University (Source: Vasilyeva revives the best traditions of Russian education. *RIA-novosti*. January 13, 2020. Available at: https://ria.ru/20200113/1563347621.html

[76] Available at: https://zavtra.ru/blogs/kuz_minov_dvinulsya_v_nauchnie_rukovoditeli_vishki

[77] Available at: https://zavtra.ru/events/kuznitca_liberastnih_kadrov_obezglavlena

[78] Skrynnikova A., Yuzbekova I. "He is like a government official": Why Nikita Anisimov became Rector of the HSE. Available at: https://www.forbes.ru/tehnologii/434335-kak-gosudarstvennyy-chinovnik-pochemu-rektorom-vshe-stal-nikita-anisimov

[79] About the Interdepartmental Commission on Historical Education: Presidential Decree 442, dated July 30, 2021. Official website of the RF President. Available at: http://www.kremlin.ru/acts/bank/47084

Continuation of Insert 2

2022
January 21, 2022 – the draft decree "On the approval of the foundations of state policy for the preservation and strengthening of traditional Russian spiritual and moral values" was published, developed by the Ministry of Culture in accordance with the National Security Strategy. The document formulates a list of moral guidelines that "form the worldview of Russian citizens". Its tasks include "ensuring Russia's moral leadership in international relations as the guardian of traditional universal values", countering "destructive ideology", protecting the Russian language from abusive words"[80].
February 21, 2022 – Presidential Decrees on the recognition of the independence of the Donetsk People's Republic and Lugansk People's Republic[81]. In connection with the adopted decrees, the head of state made an appeal to the Russians, in which he noted that "each state is entitled to freely choose ways to ensure its security ..., but international documents expressly stipulate the principle of equal and indivisible security, which includes obligations not to strengthen one's own security at the expense of the security of other states... whereas Ukraine joining NATO is a direct threat to Russia's security... Russia has done everything to preserve Ukraine's territorial integrity. All these years, it has persistently and patiently pushed for the implementation of UN Security Council Resolution 2202 of February 17, 2015, which consolidated the Minsk Package of Measures of February 12, 2015, to settle the situation in Donbass. Everything was in vain.... In this regard, I consider it necessary to take a long overdue decision and to immediately recognize the independence and sovereignty of the Donetsk People's Republic and the Lugansk People's Republic..."[82]
February 24, 2022 – Address of the RF President to the citizens of Russia in connection with the beginning of a special military operation on the territory of Ukraine. The head of state noted that the purpose of the special operation is "to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime... in territories adjacent to Russia, which I have to note is our historical land, a hostile "anti-Russia" is taking shape, fully controlled from the outside.., for our country, it is a matter of life and death, a matter of our historical future as a nation... It is not only a very real threat to our interests but to the very existence of our state and to its sovereignty... we are acting to defend ourselves from the threats created for us and from a worse peril than what is happening now"[83].
March 4, 2022 – Administrative liability for public actions aimed at discrediting the Armed Forces of Russia is established[84], as well as criminal liability for public dissemination of deliberately false information containing data on the use of the Armed Forces of Russia under the guise of reliable reports[85]. According to experts, this law is necessary "in order to fight information terrorism"[86]; "the norms of direct action will force those who lied and made statements discrediting our Armed Forces to be punished, and very severely"[87].

[80] Federal portal of draft regulatory legal acts. Available at: https://regulation.gov.ru/projects#npa=123967

[81] Decree of the President of the Russian Federation on the recognition of the Donetsk People's Republic (item 4). Available at: http://publication.pravo.gov.ru/Document/View/0001202202220002

Decree of the President of the Russian Federation on the recognition of the Lugansk People's Republic (item 4).Available at: http://publication.pravo.gov.ru/Document/View/0001202202220001

[82] Address of the President of the Russian Federation to the citizens of Russia on February 21, 2022. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67828

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

[84] Federal Law "On amendments to the Code of Administrative Offences of the Russian Federation". Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67910

[85] Federal Law "On amendments to the Criminal Code of the Russian Federation and Articles 31 and 151 of the Criminal Procedure Code of the Russian Federation". Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67908

[86] Opinion of political scientist A. Asafov (source: The political scientist explained why the law on punishment for fakes was adopted. *Ura.ru*. March 4, 2022. Available at: https://ura.news/news/1052536560).

[87] Comment by Chairman of the State Duma V. Volodin (source: Responsibility for the dissemination of fakes about the actions of the Armed Forces of the Russian Federation is being introduced. Official website of the State Duma of the Russian Federation. March 4, 2022. Available at: http://duma.gov.ru/news/53620/).

Continuation of Insert 2

May 3, 2022 – Presidential Decree 252 "On the application of retaliatory special economic measures in connection with the unfriendly actions of some foreign states and international organizations"[88].
Pursuant to the Decree, a list of companies has been approved with which (and with those they control) Russian legal entities and individuals are prohibited from conducting any financial transactions and the supply of goods[89]. As the experts noted, "this clear, tough and at the same time demonstratively deliberate and so far very limited response in the gas sphere, which is the most sensitive for the aggressor countries, testifies not only to Russia's ability to defend itself, but also to the readiness to launch new retaliatory strikes both in gas and in other sensitive areas for the West"[90].

May 16, 2022 – Rimas Tuminas, former artistic director of Vakhtangov Theater was excluded from the list of persons who were awarded the 2021 prize of the Government of the Russian Federation in the field of culture[91], who planned to stage the play My Friend Bandera and declared the need "to erase Russian artists from memory"[92]. According to experts, this is "a significant, albeit symbolic manifestation of Russia's determination to defend its national interests... Previously, the high-ranking Russophobes in the sphere of culture looked fundamentally untouchable"[93].

May 24, 2022 – V. Falkov, RF Minister of Science and Higher Education, announced Russia's withdrawal from the Bologna education system.
First of all, we are talking about the rejection of the accepted two-level system of training in universities (four years of bachelor's degree and two years of master's degree) and returning to the specialty (5–6 years of study). The Ministry will prepare a new list of specialties by 2024. As V. Falkov noted, "the Bologna system should be treated as a thing of the past. The future belongs to our own unique education system, which should be based on the interests of the national economy and the maximum space of opportunities for each student"[94]. Many experts call this a "ripe decision"[95], which "will improve the situation regarding education in our country"[96].

June 7, 2022 – the RF State Duma approved the draft law "On the Russian movement of children and youth "Big Change"[97].
The movement is a mass non-profit self-governing organization. Its scale and specifics exceed the existing framework of public associations. The goals of the movement will be to promote the implementation of state policy in the interests of children and youth, participation in the upbringing of children, their professional orientation, organization of children's leisure, creation of opportunities for their comprehensive development and self-realization, preparation of children and youth for a full life in society. The Chairman of the Board of the "Big Change" is appointed by the RF President[98].
According to experts, "the fact that the State Duma adopted the draft law on the creation of the "Big Change" in the first reading is a step in the right direction. The creation of the movement will help strengthen ideological work with the younger generation"[99].

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[88] Official website of the RF President. May 3, 2022. Available at: http://kremlin.ru/acts/news/68347

[89] On measures to implement Presidential Decree 252, dated May 3, 2022: RF Government Resolution 851, dated May 11, 2022 (source: Official Internet portal of legal information. Available at: http://publication.pravo.gov.ru/Document/View/0001202205110017?index=0&rangeSize=1).

[90] Delyagin M. The Mishustin government: Going on the offensive. *Zavtra*. May 19, 2022. Available at: https://zavtra.ru/blogs/pravitel_stvo_mishustina_perehodya_v_nastuplenie

[91] RF Government Resolution 1187-r, dated May 16, 2022. Official Internet portal of legal information. Available at: http://publication.pravo.gov.ru/Document/View/0001202205160021

[92] Delyagin M. The Mishustin government: Going on the offensive. *Zavtra*. May 19, 2022. Available at: https://zavtra.ru/blogs/pravitel_stvo_mishustina_perehodya_v_nastuplenie

[93] Ibidem.

[94] Russia is leaving the Bologna system: Whom it will affect and how. *RBK*. May 28, 2022. Available at: https://www.rbc.ru/spb_sz/28/05/2022/628e29749a794747a1ee085d

[95] Opinion of A. Belsky, chairman of the Legislative Assembly of Saint Petersburg (source: Ibidem).

[96] Opinion of M. Kuzmin, member of the State Duma Committee on Science and Higher Education (source: "The system left us rather than we left it": The Ministry of Education and Science reported the exclusion of all Russian universities from the Bologna process. RT. June 6, 2022. Available at: https://russian.rt.com/russia/article/1011967-bolonskii-process-rossiya).

[97] Legislative support system. Available at: https://sozd.duma.gov.ru/bill/126405-8

[98] A draft law on the Russian movement of children and youth has been submitted to the State Duma. *Rossiiskaya gazeta*. May 19, 2022. Available at: https://rg.ru/2022/05/19/v-gosdumu-vnesen-zakonoproekt-o-rossijskom-dvizhenii-detej-i-molodezhi.html

[99] Comment by P. Krasnorutsky, chairman of the Russian Youth Union (source: Future leaders of the "Big Change" should understand the subtleties of working with children. *Vzglyad*. June 7, 2022. Available at: https://vz.ru/news/2022/6/7/1162067.html

End of Insert 2

June 7, 2022 – the RF State Duma adopted the draft law "On control over the activities of persons under foreign influence" in the first reading"[100]. As part of the implementation of the draft law, it is proposed to amend 16 existing federal laws.

The draft law provides for the emergence of a single register of foreign agents instead of several existing ones now. It is proposed to recognize Russian or foreign legal entities as foreign agents, regardless of their organizational and legal form, that is, commercial organizations can also be recognized as foreign agents. New restrictions are being introduced: foreign agents will not be able to be organizers of public events; become civil servants or municipal officials; conduct teaching, educational, educational activities in relation to minors; produce information products for minors; receive state financial support; will not be able to invest in strategic enterprises in Russia, etc. The Ministry of Justice annually submits a report to the State Duma and the Federation Council on the activities of foreign agents.

According to experts, the essence of the draft law is "to do away with an extensive and confusing set of restrictions for foreign agents, to restore order in the relevant registers, to strengthen the prohibitive norms and powers of state agencies, and finally, to tighten the responsibility of all persons involved in this legislation"[101].

June 7, 2022 – amendments were made to the law on the use of pension savings of liquidated non-state pension funds (NPFs), remaining after settlements with creditors.

The President gets the right to freeze almost any property (including cash); prohibit and restrict individual transactions (operations), including with currency; introduce requirements for the purchase or sale of financial instruments; establish "features" of currency control, introduce other temporary economic measures to ensure the financial stability of the Russian Federation, etc.

According to experts, "the fundamental meaning of the amendments is simple: the President of Russia can do anything in the financial sphere... liberals of all stripes formally remain in their places, but their real capabilities are reduced to operational, tactical, routine management... the real power in the field of finance will go to professionals who are not visible in the presidential administration (it has not been engaged in economics for a long time), but are quite obvious in the Mishustin government"[102].

[100] Legislative support system. Available at: https://sozd.duma.gov.ru/bill/113045-8

[101] Rodin I. The government was ahead of the opposition with lustration. *Nezavisimaya gazeta*. June 9, 2022. Available at: https://www.ng.ru/politics/2022-06-09/1_8458_law.html

[102] Premier Mishustin provided the legal framework for ensuring financial stability and comprehensive modernization. Official website of M. Delyagin. June 13, 2022. Available at: https://delyagin.ru/articles/183-sobytija/102696-prem-er-mishustin-obespechil-juridicheskie-ramki-obespechenija-finansovoy-stabil-nosti-i-kompleksnoy-modernizatsii

According to actual facts and public opinion polls (which we have cited in this article) show, after the start of the special operation, the activity of the President and the Government of the Russian Federation to achieve full national sovereignty by Russia, despite unprecedented political and economic pressure from the Collective West, not only did not weaken, but even intensified.

"It is difficult to overestimate the severity of the sanctions imposed on Russia now. The country is functionally cut off from the global financial system. Most of the assets of its central bank are frozen. Hundreds of private companies, from Visa to Shell and McDonald's, have left indefinitely. And this is only an incomplete list... This is an economic war. And, in particular, it is an economic war directed against civilians..."[103]

As the results of the 30th anniversary of market transformations show, there was a need to solve this problem, and today it is being actively implemented. We should note that the ongoing reforms are of a forced, urgent nature, largely dictated by external threats to national security. However, according to the results of regional and federal sociological surveys, people feel their importance and believe that over time they will have a significant positive impact on national development; that they are designed for tomorrow and will have historical consequences for the entire Russian society and the country as a whole, for future generations.

According to experts, "**Russia, after a catastrophic defeat by the West in 1991 ... is forced today, as 105 years ago, in February 1917, to start a new world perestroika from scratch.** Only this time, the perestroika will not be socialist, but structural, social and energy-related"[104].

"Major social upheavals occur in Russia once every 75–80 years (suffice it to recall in this regard the history of Soviet Russia in 1917–1991)... Russia's historical activity shows that its new, 80-year-old wave of life, which started with the beginning of the 21st century, will rise at least until the 2060s. If we count back 80 years, then we will find ourselves at a similar critical point in our history – the beginning of the Stalingrad battle against fascism"[105].

Thus, the country that crossed the Rubicon on February 24, 2022 and began a new stage in its history has a long and difficult way to go.

Staying on this path (especially at this crucial moment) will depend not only on how all the key actors of social development (broad segments of the population, ruling elites, civic associations, academia, cultural figures, etc.) will be able to consolidate around the President, but also on whether they will be able to "**think sovereign**", that

[103] Gubanov S.S. (2022). N. Mulder: The purpose of sanctions is to change the political regime in Russia. *Ekonomist*, 4.
[104] Dobrocheev O. Physical laws of life and death of "historical bodies". *Nezavisimaya gazeta*. April 26, 2022.Available at: https://www.ng.ru/nauka/2022-04-26/13_8427_life.html
[105] Ibidem.

is, not just to offer Russian analogues of Western standards, but to be guided by their own, unique, national values, traditions, management decision-making practices, human and scientific potential, and its practical achievements corresponding to our "gene code".

We agree with one of the leading participants of the Izborsk Club, philosopher A. Dugin, who notes that "it is no longer possible to continue copying the West and its norms, standards and rules. Borrowing liberal Western standards… will lead us to ideological convulsions"[106].

References

Balatsky E.V. (2021). Return on equity as an economic growth driver. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 14(1), 26–40 (in Russian).

Wallerstein I., Collins R., Mann M., Derluguian G, Calhoun C. (2015). *Est' li budushchee u kapitalizma* [Does Capitalism Have a Future?] Moscow: Izd-vo Instituta Gaidara.

Gorshkov M.K., Sedova N.N. (2015). "Self-sufficient" Russians and their life priorities. *Sotsiologicheskiye issledovaniya*, 12, 4–16 (in Russian).

Gubanov S.S. (2022). N. Mulder: The purpose of sanctions is to change the political regime in Russia. *Ekonomist,* 4, 20–39 (in Russian).

Twenty years of reforms through the eyes of Russians (the experience of long-term sociological measurements) (2011): Analytical report of IS RAS. Available at: https://www.isras.ru/analytical_report_twenty_years_reforms.html (in Russian).

Dobrenkov V.I., Ispravnikova N.R. (2013). The Russian version of "crony capitalism": Is there a way out of the impasse? *Vestnik Moskovskogo universiteta. Seriya 18. Sotsiologiya i politologiya,* 26–55 (in Russian).

Zikeev V. The ideology of a multinational people. *Ekspert,* 20, 68–70 (in Russian).

National identity and the future of Russia: Report of the Valdai International Discussion Club. Moscow, 2014 (in Russian).

Gromyko Yu.V., Krupnov Yu.V. (Eds.). (2019). *Rossiya – Noev Kovcheg chelovechestva: Filosofsko-religioznye i metodologicheskie aspekty gosudarstvennoi ideologii budushchei Rossii* [Russia – Noah's Ark of Humanity: Philosophical, Religious and Methodological Aspects of the State Ideology of Future Russia]. Moscow: LENAND.

Sysoev T. (2022). The USA has much more at stake than Russia (materials of an interview with the historian and philosopher A. Teslya). *Ekspert,* 10, 28–29 (in Russian).

Novokmet F., Piketty T., Zucman G. (2018). From soviets to oligarchs: Inequality and property in Russia, 1905–2016. *Journal of Economic Inequality*, 16(1).

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

APPENDICES

DYNAMICS OF THE MORAL STATE OF SOCIETY FOR THE PERIOD FROM 1996 TO 2020

Appendix 1A (to page 20)

Importance of moral qualities*, % of respondents

Phenomena / acts	Important						Unimportant					
	1996	1999	2000	2012	2020	Dynamics (+/–), 2020 to 1996, p.p.	1996	1999	2000	2012	2020	Dynamics (+/–), 2020 to 1996, p.p.
Responsiveness, sensitivity to other people	86.5	81.4	87.1	82.7	78.1	-8	13.6	18.6	12.8	17.3	21.9	+8
Mutual assistance	88.1	84.0	84.8	83.2	80.6	-8	11.9	16.0	15.2	16.8	19.4	+8
Tolerance, respect for the views and opinions of other people	86.7	80.7	82.5	83.5	79.0	-8	13.3	19.3	17.6	16.5	21.1	+8
Decency	93.7	87.5	91.2	90.2	87.1	-7	6.3	12.6	8.7	9.8	13.0	+7
Honesty, truthfulness	92.9	85.3	90.3	90.0	86.2	-7	7.1	14.7	9.6	10.0	13.8	+7
Self-esteem	91.2	87.4	91.4	88.4	84.5	-7	8.7	12.7	8.7	11.7	15.5	+7
High professionalism	85.3	76.0	78.1	82.5	78.5	-7	14.7	24.0	21.9	17.4	21.5	+7
Respect for parents, loved ones	93.3	89.9	92.9	91.5	88.4	-5	6.8	10.1	7.1	8.5	11.5	+5
Respect for the team	85.9	81.8	86.5	83.7	80.9	-5	14.1	18.2	13.4	16.3	19.1	+5
Performance of official duties	87.8	79.8	80.6	82.6	82.6	-5	12.2	20.2	19.4	17.4	17.4	+5
Showing compassion, mercy	80.4	75.6	78.5	79.1	76.0	-4	19.6	24.3	21.6	20.9	23.9	+4
Compliance with laws, law-abiding	80.6	72.4	72.6	79.7	77.0	-4	19.3	27.5	27.4	20.2	23.0	+4
Justice	91.8	83.1	90.1	88.3	88.7	-3	8.1	16.8	9.9	11.7	11.3	+3
Respect for someone else's (private, state) property	78.3	68.4	66.6	74.9	75.2	-3	21.8	31.6	33.4	25.1	24.8	+3
Being useful to society, to fulfill the duties of a citizen	71.5	67.5	72.1	74.8	72.1	+1	28.5	32.5	27.9	25.2	27.8	-1
Respect for elders	84.2	83.7	87.1	88.7	85.9	+2	15.7	16.3	12.9	11.3	14.1	-2
Respect for people of other nationalities	62.7	56.2	55.7	65.7	69.9	+7	37.2	43.8	44.3	34.3	30.1	-7
Equality between people	65.5	59.9	64.0	68.1	73.7	+8	34.6	40.0	36.1	31.9	26.3	-8

* Ranked by the change in the proportion of those for whom the listed moral qualities are unimportant. The wording of the question: "People evaluate different life phenomena in different ways. For some, one thing is important, for others – another...Which of the following is important to you and which is not?"

Here and further, Appendices 1–3 present the data of monitoring of the labor potential of the population of the Vologda Oblast, which has been carried out since 1996. The survey is conducted once a year. The representativeness of the data is ensured by using a model of multi-stage zoned sampling with quota selection of observation units. The zoning structure includes two cities (Vologda and Cherepovets) and eight municipal districts with different levels of socio-economic development (Sheksninsky, Gryazovetsky, Velikoustyugsky, Tarnogsky, Kirillovsky, Babaevsky, Nikolsky and Vozhegodsky). The surveyed population is of working age – from 16 years old to retirement age (men – up to 59 years, women – up to 54 years inclusive; due to the increase in the retirement age from 2020 – 61 and 56 years respectively).

During the period from 1996 to 2020, 14 of the 18 moral qualities presented in the question became less important to people. There has been a noticeable increase (by 7–8 percentage points) in the share of those who consider the following qualities unimportant: "responsiveness, sensitivity" (from 14 to 22%), "mutual assistance" (from 11 to 19%), "respect for the views of other people" (from 13 to 21%), "decency" (from 6 to 13%), "honesty" (from 7 to 14%), "self-esteem" (from 9 to 16%), "high professionalism" (from 15 to 22%).

Appendix 1B (to page 20)

Importance of moral qualities in various socio-demographic groups, % of respondents

Population group		Important*						Unimportant**					
		1996	1999	2000	2012	2020	Dynamics (+/–), 2020 to 1996, p.p.	1996	1999	2000	2012	2020	Dynamics (+/–), 2020 to 1996, p.p.
Sex	Men	85.1	78.3	85.6	84.5	80.1	-5	12.9	18.7	11.1	12.5	17.3	+4
	Women	92.6	88.8	93.0	89.0	87.4	-5	6.1	9.9	5.3	9.4	10.3	+4
Age	Under 30	83.2	79.7	91.7	86.9	82.6	-1	14.4	17.3	6.8	10.7	16.4	+2
	30–55(60)	92.9	87.3	89.5	87.2	85.4	-8	5.9	11.4	8.2	10.9	12.0	+6
	Over 55(60)	98.3	92.7	84.1	82.3	77.0	-21	1.7	7.3	9.3	12.9	19.0	+17
Education	Secondary and incomplete secondary	83.9	76.5	85.7	77.9	74.5	-9	13.8	21.4	10.9	19.6	22.1	+8
	Secondary vocational	92.4	88.9	91.4	90.4	87.8	-5	6.9	9.0	6.1	7.6	10.9	+4
	Higher and incomplete higher	90.7	91.6	96.2	91.7	89.3	-1	7.2	6.8	3.8	6.0	8.4	+1
Income groups	Bottom 20%	n/a	75.2	79.2	71.7	75.7	n/a	-	22.0	15.5	26.0	20.2	n/a
	Middle 60%	n/a	87.1	92.4	91.6	83.0	n/a	-	11.3	5.9	6.4	14.8	n/a
	Top 20%	n/a	84.3	90.9	91.3	90.1	n/a	-	13.0	7.2	5.5	8.1	n/a
Territory	Vologda	96.4	89.8	90.7	86.8	95.7	-1	2.0	8.5	8.4	8.8	3.2	+1
	Cherepovets	70.9	87.0	95.1	90.1	84.5	+14	25.9	10.8	3.5	8.1	13.1	-13
	Districts	94.8	80.4	85.8	85.1	74.8	-20	4.5	17.7	10.4	13.3	22.0	+18
	Oblast	90.0	84.4	89.8	86.9	83.6	-6	8.4	13.6	7.8	10.9	14.0	+6

* Proportion of those who consider more than half (at least 10 out of 18) of the above moral qualities important.
** Proportion of those who consider more than half (at least 10 out of 18) of the above moral qualities unimportant (or "more or less important").

A decrease in the importance of most of the moral qualities listed in the survey is noted in 7 out of 11 socio-demographic groups, especially among people over 60 (in this group, the proportion of people who consider most moral qualities unimportant increased by 17 percentage points, from 2 to 19%), as well as among residents of districts (by 18 percentage points, from 5 to 22%).

More positive changes over the period from 1996 to 2020 were recorded among residents of urban areas: in Vologda, the proportion of people who consider most moral qualities unimportant has not changed (2–3%), in Cherepovets – decreased by 13 percentage points (from 26 to 13%).

Appendix 2A (to page 20)

Attitude toward negative moral phenomena and actions*, % of respondents

Phenomena / actions	Unacceptable								Acceptable, quite normal							
	1996	1999	2000	2004	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.	1996	1999	2000	2004	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.
Laziness	66.3	59.1	64.6	57.9	54.3	58.5	49.6	-17	22.3	31.0	27.4	35.9	35.6	34.7	42.6	+20
Desire to work less and earn more	52.4	47.4	46.5	55.2	50.0	44.7	41.1	-11	36.1	41.8	46.1	37.7	41	48.5	49.1	+13
Arrogance, conceit	79.4	72.1	79.3	76.1	71.5	74.0	70.0	-9	10.9	18.5	13.9	17.6	17.9	19.6	20.0	+9
Subservience, servility	81.8	76.8	83.6	78.8	75.1	78.1	73.6	-8	9.0	15.2	10.4	15.1	15.4	15.6	15.7	+7
Disrespectful attitude toward a woman	88.0	84.6	87.4	86.8	83.4	85.7	79.9	-8	5.6	8.4	6.7	9.4	9.2	9.6	11.4	+6
Bribes	80.4	76.6	85.4	84.1	83.3	81.3	76.2	-4	10.7	15.8	9.3	11.8	9.3	13.4	14.2	+4
Dodging conscription	48.6	42.9	44.6	48.0	51.4	48.0	45.5	-3	40.2	45.9	47.4	45.1	40.2	43.9	44.5	+4
Passion for things	31.2	22.9	28.9	27.7	34.7	37.7	32.7	+2	56.8	64.3	60.9	61.8	53.7	53.8	60.6	+4
Embezzlement	85.0	84.7	88.6	89.3	85.0	89.3	81.5	-4	7.8	6.5	6.0	6.3	7.7	4.8	10.7	+3
Drug addiction	92.5	91.6	95.3	92.2	90.5	91.0	88.8	-4	2.0	4.1	2.0	5.7	3.9	5.1	5.4	+3
Frivolous attitude toward the family and children	90.2	90.2	93.4	92.6	88.1	90.7	88.2	-2	3.9	4.2	2.8	3.7	5.2	4.2	6.0	+2
Ultra-high earnings	34.9	29.7	30.4	35.0	34.1	38.8	35.1	0	53.4	59.3	62.6	57.4	55.7	54.4	54.2	+1
Passion for alcohol	72.9	69.9	82.6	80.7	77.3	76.5	74.7	+2	19.6	24.4	13.3	16.5	15.6	18.6	17.9	-2
Life according to the principle “Roll my log and I’ll roll yours”	44.4	41.5	44.1	45.9	46.1	52.7	46.5	+2	46.4	48.8	48.9	47	43.3	40.4	44.7	-2
Smoking	26.5	29.0	29.7	40.9	41.0	35.5	31.7	+5	64.9	65.5	65.6	55.4	52	59.4	62.5	-2

* Ranked by the change in the proportion of those who consider the above phenomena and actions “acceptable, quite normal”.
The wording of the question is “Please, express your attitude toward the following phenomena ...” In total, there are 15 possible answers in the question.

Over the period from 1996 to 2020, the proportion of those who consider 10 of the 15 negative moral phenomena and actions listed in the survey “acceptable, quite normal” has increased. First of all, attention is drawn to the increase in the share of residents who accept laziness (by 21 percentage points, from 22 to 43%), the desire to work less and earn more (by 13 percentage points, from 36 to 49%), arrogance and conceit (by 9 percentage points, from 11 to 20%), sycophancy, servility (by 7 percentage points, from 9 to 16%).

Appendix 2B (to page 21)

Attitude toward negative moral phenomena and actions in various socio-demographic groups, % of respondents

Population group		Unacceptable*								Acceptable, quite normal**							
		1996	1999	2000	2004	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.	1996	1999	2000	1999	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.
Sex	Men	66.7	61.9	73.9	70.4	74.2	71.9	61.7	-5	17.1	20.0	15.6	18.7	14.4	19.9	25.0	+8
	Women	79.7	70.6	78.9	78.1	75.5	75.0	73.3	-6	8.3	13.2	10.1	13.3	14.3	17.3	16.6	+8
Age	Under 30	63.5	55.4	67.4	67.4	67.8	67.1	62.9	-1	21.3	27.1	22.0	21.7	22.2	24.7	22.4	+1
	30–55(60)	72.3	67.3	76.2	78.5	75.2	72.4	66.0	-6	13.6	16.0	12.0	13.2	13.7	18.9	21.7	+8
	Over 55(60)	83.1	76.5	85.9	75.4	80.7	78.3	73.3	-10	4.3	6.2	5.6	13.9	8.5	14.9	17.5	+13
Education	Secondary and incomplete secondary	73.8	66.7	81.6	74.1	69.6	74.0	66.7	-7	11.1	15.4	10.9	14.5	14.2	19.0	22.8	+12
	Secondary vocational	71.7	68.9	77.8	76.9	77.2	73.3	70.1	-2	14.6	14.4	11.4	15.5	12.6	20.4	18.5	+4
	Higher and incomplete higher	77.6	64.4	66.4	74.3	77.3	73.5	67.4	-10	11.6	20.0	16.8	16.1	16.2	15.5	19.7	+8
Income groups	Bottom 20%	80.8	67.3	79.2	72.2	72.8	76.1	68.3	-13	9.4	16.7	10.0	16.1	12.0	16.5	19.6	+10
	Middle 60%	79.8	70.8	79.0	78.3	78.5	73.2	72.4	-7	9.2	13.6	11.1	13.7	12.2	19.7	19.5	+10
	Top 20%	65.5	58.5	70.3	72.9	72.8	75.7	70.2	+5	23.2	22.6	17.9	20.1	19.9	15.1	18.5	-5
Territory	Vologda	88.9	70.5	73.6	75.3	68.6	72.8	69.6	-19	5.4	12.1	15.1	10.6	20.9	19.3	16.9	+12
	Cherepovets	61.4	63.7	71.3	81.3	82.8	56.8	52.7	-9	21.1	21.8	17.3	13.8	13.4	32.3	29.5	+8
	Districts	73.0	66.4	81.1	71.3	73.7	83.8	76.7	+4	11.3	15.4	8.8	18.8	11.7	10.0	16.7	+5
	Oblast	73.8	66.8	76.7	74.9	74.9	73.6	68.2	-6	12.3	16.2	12.6	15.5	14.3	18.5	20.3	+8

* Proportion of those who consider more than half (at least 8 out of 15) of the above negative phenomena and actions unacceptable.
** Proportion of those who consider more than half (at least 8 out of 15) of the above negative phenomena and actions "acceptable" or "quite normal".

Negative changes occurred in 12 out of 14 socio-demographic groups. The share of those who consider most of the listed negative phenomena and actions "acceptable, quite normal" has especially increased in such groups as people over 60 years old (by 13 percentage points, from 4 to 17%), people with secondary and incomplete secondary education (by 12 percentage points, from 11 to 23%), residents of Vologda (by 12 percentage points, from 5 to 17%), those who, according to self-estimates of their own income, belong to the categories of the bottom 20% and the middle 60% (by 10 percentage points, from 9 to 19%)

Appendix 3A (to page 21)

Proportion of those who feel guilty when committing negative actions *, % of respondents

Phenomena / actions	Feel remorse									Don't feel remorse								
	1996	1999	2000	2004	2008	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.	1996	1999	2000	2004	2008	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.
Unwittingly (or consciously) offending a person, rudeness	83.8	76.7	82.4	70.8	72.2	70	66.4	65.3	-19	16.2	27.4	17.6	29.2	27.8	30.1	33.6	34.7	+19
Insufficient attention to parents (mother, father)	65.6	52.7	59.8	50.9	48.5	48.5	51.1	46.9	-19	34.4	47.3	40.2	49.1	51.5	51.5	48.9	53.0	+19
Injustice you have committed under the pressure of circumstances or of your own free will	75.4	69.1	73.0	64.6	68.4	61.9	62.4	58.9	-17	24.5	31.0	27.0	35.4	31.5	38.2	37.6	41.1	+17
An unfulfilled promise made to someone	74.7	69.5	72.1	61.1	67.1	62.6	61.5	60.1	-15	25.3	30.6	28.0	38.9	32.9	37.4	38.4	39.9	+15
Bad attitude toward children (your own or others')	45.4	35.9	41.9	42.4	41.2	32.8	33.1	32.5	-13	54.5	64.2	58.1	57.5	58.8	67.1	66.9	67.4	+13
Poor performance of your official duties for any reason	73	62.1	69.9	60.9	61.9	58.1	55.8	59.7	-13	27.0	37.9	30.1	39.1	38.1	41.9	44.2	40.3	+13
Involuntary or conscious deception of someone in something	71.0	66.1	69.2	63.3	69.1	62.9	61.6	62.1	-9	28.9	34.0	30.8	36.7	31	37	38.4	37.9	+9
Cheating on your wife, husband, friend, girlfriend	33.5	35.1	39.3	38.5	38.5	28.3	30.8	26.4	-7	66.4	64.9	60.7	61.5	61.5	71.7	69.2	73.6	+7
Unintentionally (or knowingly) damaging or breaking other people's property, etc.	61.5	58.3	64.8	59.8	63.9	60.7	51.8	58.1	-3	38.5	41.7	35.2	40.2	36.2	39.3	48.1	41.9	+3
Refusal for any reason to help someone in a critical situation	54.8	52.6	60.7	57.8	57.4	55.4	59.2	55.9	+1	45.2	47.5	39.4	42.2	42.6	44.5	40.8	44.1	-1
Unintentionally (or knowingly) damaging state property	37.8	42.9	44.2	47.4	49.3	45.3	45.7	48.2	+10	62.2	57.1	55.9	52.6	50.7	54.8	54.3	51.8	-10
* Ranked according to the change in the proportion of people who do not feel guilty when committing these negative actions. The wording of the question: "Have you ever experienced guilt, remorse in the cases listed below or not?"																		

Over the period from 1996 to 2020, the proportion of those who do not feel remorse about committing the 11 negative actions listed in the survey has increased. There has been an increase in the proportion of those who are not tormented by conscience in the following cases: offending another person (by 19 percentage points, from 16 to 35%), insufficient attention toward parents (by 19 percentage points, from 34 to 53%), committing an unfair act (by 17 percentage points, from 24 to 41%), failure to fulfill a promise (by 15 percentage points, from 25 to 40%), etc.

Appendix 3B (to page 21)

Proportion of those who feel guilty when committing negative actions, in various socio-demographic groups, % of respondents

Population group		Feel remorse*									Don't feel remorse**								
		1996	1999	2000	2004	2008	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.	1996	1999	2000	2004	2008	2012	2018	2020	Dynamics (+/–), 2020 to 1996, p.p.
Sex	Men	70.1	61.4	74.1	59.4	64.8	58.0	56.9	58.3	-12	29.9	38.6	25.9	40.6	34.4	40.7	42.8	41.4	+12
	Women	70.2	63.0	69.2	63.8	66.3	58.9	56.4	56.9	-13	29.8	37.0	30.8	36.2	33.0	39.8	43.3	42.7	+13
Age	Under 30	71.3	70.3	76.9	66.5	67.3	56.1	56.3	57.1	-14	28.7	29.7	23.1	33.5	32.0	42.8	43.3	42.4	+14
	30–55(60)	70.9	57.9	68.5	59.4	64.8	60.0	56.9	58.1	-13	29.1	42.1	31.5	40.6	34.4	38.6	42.9	41.7	+13
	Over 55(60)	54.2	40.0	68.2	61.2	61.3	59.7	56.4	56.5	+2	45.8	60.0	31.8	38.8	38.7	38.7	43.6	42.5	-3
Education	Secondary and incomplete secondary	71.0	62.7	70.4	61.9	61.8	59.5	64.1	65.2	-6	29.0	37.3	29.6	38.1	37.8	39.0	35.5	34.4	+5
	Secondary vocational	68.1	61.5	69.5	62.4	65.8	58.1	51.3	53.5	-15	31.9	38.5	30.5	37.6	32.9	41.2	48.4	46.1	+14
	Higher and incomplete higher	71.5	62.8	75.9	61.7	68.4	58.1	53.1	54.2	-17	28.5	37.2	24.1	38.3	31.0	40.4	46.9	45.6	+17
Income groups	Bottom 20%	n/a	51.2	59.8	52.7	64.8	57.1	62.3	53.7	n/a	n/a	48.8	40.2	47.3	35.2	41.3	37.7	46.0	n/a
	Middle 60%	n/a	64.6	74.5	64.6	67.4	58.1	56.0	58.8	n/a	n/a	35.4	25.5	35.4	31.7	40.9	43.5	40.9	n/a
	Top 20%	n/a	67.7	75.0	58.4	63.7	60.2	54.9	56.3	n/a	n/a	32.3	25.0	41.6	35.6	38.6	45.1	43.8	n/a
Territory	Vologda	71.5	64.1	76.7	64.7	69.8	53.6	48.7	49.8	-22	28.5	35.9	23.3	35.3	29.4	43.4	51.3	50.0	+22
	Cherepovets	70.1	70.0	73.2	59.2	56.4	63.6	61.7	66.2	-4	29.9	30.0	26.8	40.8	42.8	35.6	38.1	33.3	+3
	Districts	69.3	56.9	67.2	62.0	68.2	57.7	58.6	57.5	-12	30.7	43.1	32.8	38.0	31.1	41.4	40.9	42.2	+12
	Oblast	70.2	62.3	71.3	62.0	65.5	58.5	56.7	57.7	-13	29.8	37.7	28.7	38.0	33.7	40.2	43.1	42.0	+12

* Proportion of those who feel remorse in the case of committing more than half (6 or more out of 11) of the listed actions.
** Proportion of those who do not feel remorse (or, in their opinion, have not encountered such cases) when committing more than half (6 or more out of 11) of the listed actions.

Negative changes are observed in most socioi demographic groups ™ in 10 out of 11 groups (with the exception of people over 60 years old). The proportion of those who in most cases do not feel remorse when committing negative acts has increased significantly among Vologda residents (by 22 percentage points, from 28 to 50%) and people with higher and incomplete higher education (by 17 percentage points, from 29 to 46%).

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Competition, Collaboration, and Life Satisfaction
Part 2. The Fundament of Leadership – Collaborative Advantage

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Abstract. The first part of the paper showed that the group of seven European countries leading in the life satisfaction index (happiness index) significantly outperformed other Western nations, including the United States, in the development of economic and political institutions. The Seven includes Denmark, Norway, Sweden, Finland, Iceland, Switzerland, and the Netherlands. The second part examines what qualitative features of socio-economic and political mechanisms provide leadership. It is noted that attempts to explain this phenomenon by the low size of population and its homogeneity, as well as by the small area of these countries, are inadequate. The notion of collaborative advantages is introduced, understood as relatively more developed mechanisms of collaboration in the economic, social and political spheres. Based on three different classifications of types of capitalism and on an analysis of the history of countries of the Seven we show that they have reached the leading positions due to collaborative advantages. These countries are coordinated market economies, their economic systems are characterized as stakeholder capitalism, and their political systems are consensus democracies. The Seven of European Leaders carry out reforms aimed at improving collaboration mechanisms and, as a consequence, are less affected by the crisis of competitive institutions observed in Western societies. The presented results support the hypothesis that the strengthening of the role of collaboration mechanisms while reducing the importance of competitive mechanisms contributes to higher life satisfaction. The experience of the

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Seven is used by other developed European countries as well. The question of how our findings can be used in choosing a catching-up strategy is discussed.

Key words: coordinated market economies, stakeholder capitalism, consensus democracies, collaboration, Nordicization, reforms, catching-up development.

Introduction

The first part of the paper showed that according to major socio-economic indicators the group of seven European countries including Denmark, Norway, Sweden, Finland, Iceland, Switzerland and the Netherlands significantly outperformed other Western nations, including the United States. The question arises as to what qualitative features of socio-economic and political mechanisms ensure such success. This question is the main subject under consideration in the second part of the paper.

To find the answer, we consider three well-known classifications of modern Western systems: liberal and coordinated market economies, shareholder capitalism and stakeholder capitalism, majoritarian and consensus democracies. In each pair, the former relies almost exclusively on competition mechanisms, and the latter – to a large extent on collaboration mechanisms. It turns out that in all cases, the Seven countries (if they were taken into account in the classification) belong to the second group. This observation will allow us to conclude that the leadership of the Seven is based on the advantages, which, unlike competitive advantages, are proposed to be called collaborative; they consist in more developed mechanisms of collaboration in the economic, social or political spheres. The term "cooperative advantages", which is similar but narrower in content, has been used in a number of papers (Lei et al., 1997; Strand, Freeman, 2015). The historical roots of collaborative advantages will be examined and it will be shown that the process of their expansion is also taking place in a number of other countries, including European ones. In addition, we will discuss how our findings can be used in developing catch-up strategies.

Simple but incorrect explanations[1]

Sometimes the leadership of the Seven is explained by the low population and the small area of its member states. Indeed, these factors contribute to a relative ease of coordination of efforts and low transport costs. But there are also counterarguments: small countries have a narrow resource base, insufficient size of the domestic market and, as a result, lack of economies of scale, forced narrow specialization and high volatility of the business cycle.

However, we should note that the Seven countries are by no means anti-record holders in terms of population or area. In the list of 246 countries, the Netherlands ranks 70th in terms of population, Sweden ranks 90th and even Iceland – the most sparsely populated member of the Seven – ranks 184th[2]. Among 50 European countries, the Netherlands ranks 12th and Sweden 17th in terms of population[3].

In terms of area, among 193 countries, Sweden, Norway and Finland rank respectively 54th, 60th and 64th, while the UK is on the 77th place. Switzerland, the country with the smallest area among the Seven, ranks 132nd, above Belgium and Slovenia[4].

[1] This section reproduces and somewhat clarifies the reasoning given in (Martela et al., 2020).

[2] See: https://ru.wikipedia.org/wiki/%D0%A1%D0%BF%D0%B8%D1%81%D0%BE%D0%BA_%D0%B3%D0%BE%D1%81%D1%83%D0%B4%D0%B0%D1%80%D1%81%D1%82%D0%B2_%D0%B8_%D0%B7%D0%B0%D0%B2%D0%B8%D1%81%D0%B8%D0%BC%D1%8B%D1%85_%D1%82%D0%B5%D1%80%D1%80%D0%B8%D1%82%D0%BE%D1%80%D0%B8%D0%B9_%D0%BF%D0%BE_%D0%BD%D0%B0%D1%81%D0%B5%D0%BB%D0%B5%D0%BD%D0%B8%D1%8E

[3] See: http://www.statdata.ru/europe-capitals-population

[4] See: http://ostranah.ru/_lists/area.php

According to estimations (Rose, 2006), population size does not affect economic development. Really, in (Alouini, Hubert, 2012) a negative relationship was found between GDP growth rate and the size of the country calculated as a combination of population size, GDP and the area of arable land. However, for the states within the Eurozone this connection turns out to be positive and significant. Thus, the "smallness" of the Seven countries does not provide a satisfactory explanation of their leadership in socio-economic development.

There is also no reason to refer to the homogeneity of population of the Seven. Thus, 19% of Sweden's population were born in other countries. In the ten "happiest" countries the corresponding share of population is 17.2%, twice the global average (Martela et al., 2020, p. 132). True, in the past, the Nordic countries were relatively homogeneous. But Switzerland is an example of a country that, since its formation, had different nationalities that spoke different languages.

In conclusion to this section let us consider another objection. It is generally believed that the Nordic countries have very high suicide rate per 100 thousand people. Does this not contradict the statement that their citizens perceive themselves as the happiest?

According to the 2021 data, in the list of 180 countries the Seven are located as follows: Finland – 25th, Sweden – 30th, Switzerland – 32nd, Iceland – 44th, Norway – 45th, the Netherlands – 46th, Denmark – 56th (the higher the rank, the fewer suicides). For comparison: the United States ranks 24th, Belgium – 17th, Slovenia – 16th[5]. The Seven states are not leaders in this regard, although suicide rate is really significant there.

In (Daly et al., 2011), as a result of econometric calculation, it was found that in "happy regions" the number of suicides is higher. This "dark contrast" is confirmed by the data on European countries and U.S. states. The explanation is that people endure adversity more easily when they see that it is just as hard for others, and are more likely to despair when they see that others are happy. However, the paper (Pendergast et al., 2019) argues that there is no significant relationship between happiness indices and suicide rate for U.S. states.

We note that the number of homicides per 100 thousand people in the United States is 4.5–10.5 times higher than in the Seven countries, which, however (with the exception of Switzerland and Norway), lose out to Italy, Austria, Spain by this indicator[6].

The data in Table 1 from the first part of the paper (Polterovich, 2022) indicate important features in the civic culture of the Seven: a relatively low level of corruption, higher generalized trust and trust in government. These countries have been increasing their competitiveness (Polterovich, 2022, Tab. 3) and catching up with the United States in terms of per capita GDP. The question arises: what features of the economic and political mechanisms helped them to become leaders?

To find the answer, let us turn in the next two sections to three well-known classifications of modern Western systems. According to the first one, liberal market economies and coordinated market economies should be distinguished (Hall, Soskice, 2001), the second one distinguishes between shareholder capitalism and stakeholder capitalism (Strand, Freeman, 2015), and the third one considers two types of democracy: majoritarian and consensus (Lijphart, 2012). We will show that the United States differs significantly from the Seven in the structure of mechanisms for coordinating economic and political interactions, which, apparently, explains the lag of the United States, recorded by numerous indicators.

[5] See: https://worldpopulationreview.com/country-rankings/suicide-rate-by-country

[6] See: https://www.indexmundi.com/facts/indicators/VC.IHR.PSRC.P5/rankings

Coordination of economic behavior and stakeholder capitalism

In the work (Hall, Soskice, 2001) it is proposed to distinguish between two types of capitalist systems depending on the nature of interactions between agents: liberal market economies (LME) and coordinated market economies (CME)[7]. In an economy of the first type, firms interact mainly on the basis of short-term contracts, focusing on market prices and other market signals. In a CME, firms coordinate their activity with each other, with business associations, with trade unions and banks on the basis of strategic interaction, including information exchange and negotiations. The U.S. is a typical representative of LME, as well as the UK, Canada, and Australia. All the Seven European leaders and a number of other states are CMEs, in particular Germany, Austria, Belgium (Hall, Gingerich, 2009, pp. 452–453; Hall, Soskice, 2001, p. 20). In these countries, collaboration mechanisms play a more significant role (Hall, Soskice, 2001, p. 8), mitigating competition and reducing public administration costs.

The paper (Iqbal, Todi, 2015) notes three main features of the Nordic countries that distinguish them from "standard capitalism": high taxes, higher level of development of the welfare state (health, education, unemployment benefits) and a more significant role of trade unions. It is no coincidence that the proportion of workers who are members of trade unions is higher in the Seven countries *(Table)*.

The authors of the concept of coordinated market economy deliberately avoid considering the coordinating role of the state. We should emphasize, however, that in the Seven countries the state traditionally encourages coordination of private agents and, due to skilled management, contributes to economic growth. The authors of the paper (Jäntti et al., 2006), describing the role of the state in the formation of Finland's economic miracle, indicate that the rapid growth of the Finnish economy in 1950–1970 was achieved due to the "direct intervention" of the state, which ensured a high growth rate of investments in key industries and a low interest rate for loans. At the initial stages, the state created and supported large companies and used production externalities. For example, by developing woodworking, it expanded the demand for metallurgy products, which in turn created conditions for the development of electronics. State-owned enterprises were

Trade union density, %

Country	Trade union density
Iceland	91.8
Denmark	66.5
Sweden	65.6
Finland	60.3
Norway	49.2
The Netherlands	16.4
Switzerland	14.9
U.S.	10.1
France	8.8
Source: https://stats.oecd.org/Index.aspx?DataSetCode=TUD Data as of 2018, for Sweden and Switzerland – as of 2017.	

[7] The term "coordinated market economy" is sometimes translated as "координируемая рыночная экономика". We also note that this term has a lot in common with the concept of corporatism.

established in metallurgy, electric power, and chemical fertilizer production (Jäntti et al., pp. 13, 15, 16).

Another typical example is the rapid development of the Norwegian economy after the discovery of oil fields in the late 1960s. Their development was carried out by Stateoil, the company which remained in complete ownership of the state for almost three decades. Initially, oil extraction was carried out using British and American oil platforms. But gradually, thanks to the support of the state and with the participation of Stateoil, Norwegian enterprises producing platforms were created, and the need to equip them served as an incentive for the development of the electronic industry in Norway (Ryggvik, 2015). By effectively harnessing natural resources, Norway has overtaken the United States in terms of per capita GDP.

Long before the paper (Hall, Soskice, 2001) that proposes to distinguish between liberal and coordinated market economies, a typology of Western systems, similar in many respects, was developed: shareholder capitalism and stakeholder capitalism. It emerged as a result of consideration of the issue of the company's targets. According to a postulate widely used in neoclassical theory, a firm, focusing on its shareholders, maximizes the discounted profit stream[8]. This assumption has been repeatedly criticized. According to an alternative concept, a firm's strategy should take into account the interests of not only its shareholders, but also all other stakeholders, i.e. agents somehow connected with the firm's activities: its customers, suppliers, creditors, employees, etc. (Strand, Freeman, 2015). Moreover, business should be socially responsible, i.e. contribute to the solution of social issues, in particular, take care of the environment.

As noted in (Strand, Freeman, 2015), the term "stakeholder" appeared in a memorandum of the Stanford Research Institute in 1963 and in a book by Swedish economist Eric Rhenman published a year later. At the same time, neoclassical theory continued to dominate in the U.S. and in most Western countries for many years. Managers trained by its adherents act according to the standards of shareholder capitalism, which is very slowly transforming into stakeholder capitalism. One of the main signs of such a transformation is a more frequent cooperation between seemingly competing companies[9].

Meanwhile, Rhenman and his followers created a school of researchers and teachers, which contributed to a much faster formation of stakeholder capitalism in the Nordic and some other European countries. Within the framework of this system, the success of a company is determined not so much by its competitive advantages, as under shareholder capitalism, as by cooperative advantages, i.e. the special ability of the corporation's managers to cooperate with all stakeholders, including potential competitors, and to form the most effective strategies based on this cooperation (Strand, Freeman, 2015). Unlike competition, which often turns out to be a zero-sum game, cooperation involves the development of solutions that benefit all participants.

The most important features of stakeholder capitalism are corporate social responsibility (CSR) and sustainability. The term "sustainability" means "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Corporate social responsibility is understood as "the responsibility of enterprises for their impacts on society" (Strand et al., 2015, p. 2). In the cited work, both terms are considered equivalent; however, in our opinion, the latter can be considered more general.

[8] Sometimes another criterion that is similar in content – maximization of the share value – is used (Brandt, Georgiou, 2016).

[9] This type of interaction was studied in the theory of co-opetition developed in the mid-1990s (Brandenburger, Nalebuff, 1996).

In order to compare countries by CSR, the work (Gjølberg, 2009) proposes an index that aggregates data on the country's enterprises. According to the calculations carried out for 20 developed countries, the top six places on this index were taken by the Seven countries (Iceland was not considered), while the United States ranked 20th. In the article (Skouloudis et al., 2016), the index was revised and calculated for 86 countries. This time, the six out of the Seven countries took places from 1st to 4th, 6th and 7th. Iceland occupied 54th position, and the U.S. was again 20th. Similar results were obtained with further improvement of the index calculation methodology (Amor-Esteban et al., 2019). In the work, it is called the National Corporate Social Responsibility Practices Index (NCSRPI) and is calculated for 29 countries, both developed and "catching up", among which Iceland did not appear. The other six countries of the Seven took the top six places, and the U.S. ranked only 16th, lagging behind Spain, France, Italy, and Germany[10].

High corporate social responsibility, indicating a high level of corporate culture, is an important component of cooperative advantages of a business. To a certain extent, CSR indices can serve as a measure of advantages for corporations in a particular country. However, we should note that the ability to cooperate cannot be limited only to the circle of firms' managers. It must inevitably manifest itself in the behavior of politicians and government officials and in the construction of economic and political mechanisms. It is no coincidence that the Seven countries, which, as it was shown, rank top according to the level of CSR, are coordinated market economies. In this regard, it is appropriate to introduce the concept of collaborative advantages.

We will say that country A has collaborative advantages over country B if the mechanisms of collaboration in the economic, social or political sphere are more developed in A. This definition is consistent with a theory (Polterovich, 2015; Polterovich, 2018) according to which the role of collaboration mechanisms in the development process is growing due to the decrease in the importance of competition and power mechanisms.

Further, we will show how collaborative advantages manifest themselves in the design of political mechanisms.

Consensus political institutions

The most important feature of the civic culture in the Seven is clearly manifested in the structure of their political mechanisms. To verify this, let us turn to Lijphart's classification (Lijphart, 2012), which distinguishes between majoritarian and consensus democracies. In order to characterize the differences between them, Lijphart designs two indices. The first (EP) reflects the relationship between the executive power and political parties (executives-parties dimension), and the second (FU) – the relationship between the central government and regional administrations (federal-unitary dimension). Each of the indices is an aggregate of five indicators. The EP dimension makes it possible to clearly divide democracies into two groups – majoritarian and consensus.

A majoritarian democracy is characterized by the dominance of two parties in parliament and the formation of one-party governments, the superiority of the executive power over the legislative power, and the overall competition of interest groups.

Consensus democracies usually have some variant of proportional representation; the parliament and the government include representatives of many parties, there is a balance of executive and legislative power, there is a corporatist system of relations between interest groups aimed at finding a compromise and coordinating their actions. Lijphart shows that approaching consensus democracy through the EP index has a positive effect on government efficiency, corruption, the rule of

[10] The information for the calculation was obtained from the Ethical Investment Research Services (EIRIS) database. Based on its own research, EIRIS provides investors with information about corporal social, environmental and ethical policies and practices.

law, crime, and the risk of conflict. Changing the second index does not provide unambiguous results. According to the values of the first index, all the Seven European leaders are consensus democracies, as well as Austria and Germany. The United Kingdom and the United States find themselves in the group of majoritarian democracies.

Lijphart wrote: "...the majoritarian model of democracy is exclusive, competitive, and adversarial, whereas the consensus model is characterized by inclusiveness, bargaining, and compromise" (Lijphart, 2012, p. 2).

High level of collaboration – historical heritage

Trying to explain the specific features of the civic culture in the Nordic countries, some authors turn to their history, noting that they shifted to capitalism, bypassing the stage of feudalism, so they managed to avoid the times of fierce class struggle; contradictions between the elite and the masses were resolved through the formation of institutions that ensured the search for compromise solutions (Rothstein, Uslander, 2005; Pratt, 2008; Martela et al., 2020; Sunde, 2021). The geographical factor is indicated as the most important reason for such an unusual development path. Most of the territory of the Nordic countries was covered with forests, the terrain was mountainous, and the coastline was winding. The population was engaged in hunting and agriculture on not too fertile lands. Aside from trade routes and in the absence of large mineral deposits, urbanization was extremely slow. The life of the scattered settlements was controlled by people's assemblies. Self-governing communities resisted the appropriation of their land by representatives of the elite. It turned out to be easier for governments to interact directly with the organized peasantry, including when collecting taxes, than to transfer land into the possession of close associates. Representatives of noble families held administrative posts (Rothstein, Uslander, 2005, p. 57; Sunde, 2021, pp. 56–57).

The result of the existing institutional structure was a high level of generalized trust and trust in government. Collaboration was facilitated by low inequality, which was supported by social norms. Thus, in Sweden, the attempts to stand out from the general mass were condemned (Pratt, 2008, p. 125).

The formation of the welfare state began in most European countries after the Second World War. In Nordic countries (except Finland) this happened much earlier. Already in 1928, Swedish Prime Minister Albin Hansson defined his country as a "Swedish people's home" based on a common culture and feelings, where there are no privileged or undervalued, where no one tries to gain an advantage at the expense of others (Pratt, 2008, p. 127).

Let us now turn to the historical roots of the collaborative culture of Switzerland and the Netherlands.

Switzerland as a nation state is a unique phenomenon. The republic was formed despite radical linguistic and cultural differences of its constituent parts, cantons. Trying to explain this phenomenon, the authors (Linder, Mueller, 2021) indicate economic ties between the cantons and the need to protect themselves against encroachments of major powers as the main factors contributing to the unification.

The small cantons lacked the resources to create full-fledged states. Public works, such as building roads, "were done on a community basis: every adult man was obliged to work for several days or weeks a year for the common good... Farming in rural regions and crafts in the cities were bound up in organizations which required collective decision-making. This... promoted communalism" (Linder, Mueller, 2021, p. 27).

Switzerland managed to prevent external interference thanks to the policy of neutrality, which turned out to be beneficial to its neighbors – France, Germany and Italy. The sense of unity was gradually strengthened due to the emerging

traditions. Thus, since 1981, the Swiss have been celebrating the conclusion of an alliance between three local leaders dating back to 1291 (Linder, Mueller, p. 28).

Currently, Switzerland consists of 26 cantons with different languages and denominations. The difficulties associated with heterogeneity were overcome by creating a non-standard organizational structure of the State based on the principles of consensus democracy and on granting broad autonomy to the cantons. We note three features of the Swiss decision-making system. Firstly, a significant role in it belongs to referendums, which can be held both by virtue of the requirements of the law and on the bottom-up initiative. Secondly, a "double majority" requirement applies in referendums on amendments to the Constitution. This means that in order to make a decision, it must be supported not only by a majority of all those who voted, but also by a majority of those who voted in most Swiss cantons. This eliminates the situation when the decision is made in favor of several large cantons. Thirdly, in Switzerland, the change of the president (he is also the head of government) takes place every year. The president is elected by the highest legislative body of Switzerland, the Federal Assembly, from among the members of the Government elected by the Federal Assembly – the Federal Council. The Government consists of two representatives of each of the three parties that received the majority of votes in the parliamentary elections, and one representative of the party that ranked fourth. Each of the seven members of the Government heads one of the seven ministries. The President, who is also head of the Government, performs coordination and representational functions. The rotation of the duty and the organization of discussions contribute to the adoption of decisions close to consensus[11].

The Swiss experience shows that effective coordination of interests is possible even in societies characterized by a high degree of linguistic and confessional differentiation.

In the Netherlands, as in the Nordic countries, the geographical factor influenced the development of civic culture. More than 55% of the Dutch territory is at risk of flooding, and regular construction of dams and protective structures was required to prevent them. In the Middle Ages, the relevant work was carried out by the residents of the coastal areas themselves, and coordination was carried out by special water boards. But as technology improved and the market developed, these councils began to switch to hiring third-party workers whose pay came from the taxes levied from owners of coastal plots. At the same time, the financing of the work depended on the state of the economy. When labor prices increased or economic conditions worsened (including as a result of military clashes), the amount of taxes collected became insufficient. This occasionally resulted in serious losses (Soens, 2013; Avoyan, Meijerink, 2021). The situation changed dramatically after the catastrophic flood of 1953, which claimed the lives of more than 1,800 citizens. The Delta Plan was developed for the construction and strengthening of dams, barriers and locks. Initially, a centralized management system was created for its implementation. However, over time, the role of the government declined. The modern system provides for the interaction of the country's government, provinces, municipalities and regional water management bodies, as well as their collaboration with other state bodies, private structures, and civil society organizations. It is largely based on the principles of collaborative governance (Avoyan, Meijerink, 2021).

The need to combat floods is only one of the factors that led to the formation of the Netherlands as a member of the Seven. It would be relevant to investigate the reasons why the Netherlands

[11] We note that this decision-making system is close to a two-tier collaborative hierarchy, see (Polterovich, 2021b).

embarked on the path of capitalist development earlier than other European states. The Republic of the United Provinces (Dutch Republic), which emerged in 1581 as a result of the Dutch Revolt, "was a singular phenomenon among the more or less absolutist monarchies of the period. The Republic was a highly decentralized, commercially oriented league of towns and provinces, doing without a head of state, without a ruling aristocracy, without a state bureaucracy, ... without a nobility of any consequence" (Aerts, 2010, p. 214).

During the following centuries, civil society was actively formed in Dutch cities; there emerged the district associations of residents, providing mutual assistance and security, and numerous clubs and associations of interests.

The first Constitution of the Netherlands was adopted in 1814. The Constitution of 1848, which remained in force for 135 years, turned the Netherlands into one of Europe's first constitutional monarchies with a parliamentary democracy.

As a result of the 2021 election, representatives of 17 parties filled the seats of the Second Chamber in the parliament of the Netherlands. For many decades, no party has been able to achieve an absolute majority, so coalition governments are a common thing there. Both the parliament and the government of the country actively interact with civil society organizations, including business associations and trade unions.

Thus, the collaborative advantages of the Seven countries have historical roots. They proceed, at least in part, from specific historical and geographical factors. However, we should emphasize that the absence of such conditions is not an absolute obstacle for other countries to follow the example of the leaders. A number of works emphasize that the Scandinavian countries, despite their relatively small size, have a significant impact on the policy of European states (see the analysis and references in (Long, 2017)). In (Elgström, Delputte, 2016, p. 10) it is noted that "the Nordic countries, or some of them, have acted as norm entrepreneurs within the EU, changing the priorities, positions and perhaps even values of fellow member states".

The study of the legislation of ten European states, of which only three are among the Seven, has shown that the systems of their rules promote the formation of collaboration relations between authorities, civil society organizations and business (Batory, Svensson, 2020).

Fighting the crisis: Improving collaboration mechanisms

As we already noted, Western political systems are currently in a deep crisis (see the analysis and references in (Polterovich, 2021a)). We are witnessing an increase in protest sentiments and the rise of populist destructive movements, while at the same time citizens' trust in governments reduces, as well as their participation in elections. The degrading political elite often demonstrates the inability to find effective compromise solutions, and the focus of political debates shifts from development programs to the defamation of competitors. The political crisis is directly related to the crisis of the welfare state that proved unable to prevent the growth of inequality.

Due to the specifics of civic culture, economic and political mechanisms, the Seven countries turned out to be more ready to overcome the crisis than other Western states.

According to (Aerts, 2010), Dutch citizens place a high value on democracy, but only partially associate it with politics. "In their view, democratic achievements such as equality, freedom of expression, self-fulfilment and prosperity are embedded in society and culture". Moreover, the author argues that they "dislike politics" (Aerts, 2010, p. 236) and considers the observed opposition of democracy and civil society as a paradox (which is reflected in the title of the article). In our opinion, there is nothing paradoxical here. A developed civil society is based on collaboration, and modern

democracy, even consensus democracy, relies to some extent on competitive mechanisms that are experiencing a crisis.

Aerts' observation concerning the Netherlands echoes the conclusions of the article (Kübler et al., 2020) devoted to the introduction of participatory governance in the regions of Switzerland. Participatory governance implies the involvement of groups of citizens, including business representatives, in the decision-making process, in particular, spatial planning, environmental protection, youth issues, as well as the elaboration of a common development strategy. The authors find that such reforms are most intense in municipalities characterized by acute contradictions between political parties and a lower level of political decentralization: in them, the legislative body is the parliament rather than the people's assembly that includes all citizens[12].

It can be assumed that a similar attitude – a mass preference for collaboration over competition – is also typical of other Seven countries and that it is precisely this attitude that is the most important factor in overcoming the crisis.

Denmark, Iceland and Sweden maintain a very high level of participation in elections – 85–90%. In Norway and Finland, there is a relatively small decrease – to 80 and 70% respectively (Hopmann, Karlsen, 2021). In the Netherlands, a significant proportion (78.7%) of voters participated in the election to the House of Representatives in 2021. The exception is Switzerland, where only 45.1% of voters participated in the election to the National Council in 2019, which is close to the American level. Nevertheless, Switzerland ranks first in terms of trust in government among developed countries (see Tab. 1 of the first part of the paper). Perhaps the relatively low participation of the Swiss in the election is due to the fact that in this country the most important issues are put to referendums, the number of which has recently increased. Thus, in 2020, popular votes were organized on nine issues, voter turnover averaged 52.6%; it increased slightly, amounting to 56.5% for eight referendums in 2021[13].

Having suffered less from the crisis than others, the Seven countries are making every effort to overcome it.

In the 1980s and 1990s, the economic policy of Western countries was based on the *laissez-faire* ideology, according to which, in order to ensure rapid economic growth, it is necessary to develop competition and minimize the interference of the state in the economy. Of course, in practice such interference has never stopped, but the industrial policy agenda has hardly been touched upon in strategic documents, despite the research of a number of economists who demonstrated that this tool should not be abandoned.

In line with the ideology of the minimal state was also the New Public Management (NPM) paradigm, which originated in the UK (McLaughlin et al., 2002). It became the basis of administrative reforms carried out in many countries. According to the paradigm, the administrative system should be guided by the same principles as the private sector. Instead of a rigid hierarchical organization, it was proposed to create a system of agencies with non-overlapping powers to provide services to people. The effectiveness of the agencies had to be regularly evaluated by comparing costs and results. It was proposed to privatize state property; and the possibilities of a policy to stimulate economic growth turned out to be very limited. However, by the mid-2000s, more and more evidence began to appear that NPM methods did not lead to the desired result. The Post-New Public Management concept has emerged, focusing on vertical and horizontal collaboration of government agencies and other organizations with each other and on involving consumers of services in the decision-making process (Klenk, Reiter, 2019).

[12] Swiss municipalities have either parliamentary or direct democracy (Ladner, 2005, p. 103).

[13] See: https://www.bfs.admin.ch/bfs/en/home/statistics/politics/popular-votes.html

The 2007–2008 crisis significantly contributed to the promotion of the concept and the change of the dominant ideology. In 2010, the European Commission published a communication to the European Parliament and other supreme bodies of the European Union on a new industrial policy in the globalization era. It formulated two fundamental principles of such a policy: the need for coordinated measures aimed at the development of all sectors of the national economy with an individual approach to each of them and the formation of value added chains from energy production and raw materials to recycling and maintenance of trade relations[14].

Over the past 15 years, the European Commission, the highest executive authority of the European Union, has been focusing on improving public administration in EU member states. To achieve this goal, the European Social Fund (ESF), the European Regional Development Fund (ERDF) and the European Structural and Investment Funds (ESIFs) have allocated significant amount of financing. The European Commission synchronized these efforts and initiated the EUPACK[15] project to study the results of the reforms (Thijs et al., 2018, p. 3).

Within the framework of this project, the quality of public administration in 28 EU member states was assessed by 23 indicators. The information was obtained from official sources and surveys of officials. Four of the Seven countries: Denmark, Finland, the Netherlands and Sweden, which are EU members, turned out to be leaders in the quality of administration. The table that sums up the results (Thijs et al., 2018, pp. 78–79) shows that Denmark took one of the top five places in 20 indicators out of 23; Finland, Sweden and the Netherlands – in 19, 15 and 12 indicators respectively. They are followed by UK and Luxembourg with this score equal to 10, and by Estonia that scored six points. We should particularly note the indicator "societal consultation" obtained on the basis of respondents' answers to the question "Does the government consult with economic and social actors when developing its policy?" According to this indicator, Denmark, Finland and the Netherlands shared places from 1st to 3rd, and Sweden ranked 4th.

Collaborative advantages in catch-up development

Institutions, civic culture and the level of welfare are closely related to each other. That is why modern developed countries had to travel such a long and difficult path to reach the current level. Only a few states have managed to significantly accelerate their catch-up development and implement an economic miracle over the past 75 years, and almost all of them have used similar strategies. At the initial stage of the economic spurt, they created a system of catch-up development institutions capable of launching and maintaining rapid economic growth for some time in conditions of a low level of civic culture and an inefficient market. This system was based on the principles of corporatism in the spheres of political and economic management and included a general development agency that stood above the ministries, indicative planning, and a national innovation system aimed at borrowing technologies with a gradual transition to innovative development. The initiator was the state that managed to overcome the temptation to impose its policy and not only sought to attract the private sector to collaborate with government agencies, but also supported collaboration between private firms (Polterovich, 2016).

It is interesting to compare the policy of economic development of the countries of Europe

[14] An Integrated Industrial Policy for the Globalization Era. Putting Competitiveness and Sustainability at Centre Stage. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. European Commission, Brussels, October 28, 2010. P. 4. Available at: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0614:FIN:EN:PDF.

[15] European Public Administration Country Knowledge.

and the countries of the economic miracle. Corporatism is present in both cases. At the same time, it is inherent in the Seven countries. The indicative planning system in the countries of the economic miracle, headed by the general agency, promoted collaboration between the state, business and civil society, covered the entire national economy and ensured the formation of value chains. The similarity between its functions and the recommendations of the European Commission is undeniable, although European countries can rely more on a culture of collaboration and are able to design and implement plans with more economical means, relying on modern information exchange systems and modeling techniques. It can be argued that the success of the countries of the economic miracle is based on their collaborative advantages.

Having made a "breakthrough", these countries borrowed competitive economic and political mechanisms, joining the pool of developed countries and thus finding themselves exposed to a crisis after some time. An important question is whether it is possible to avoid the stage of dominance of such mechanisms, or at least significantly reduce it[16]. In this regard, the experience of Slovenia is of particular interest. The paper (Bohle, Greskovits, 2007) emphasizes the social cohesion typical of Slovenia and notes that "Slovenia is exceptional among all East European countries in that it could pursue its transformation largely based on national institutions and actors" and managed to build a neo-corporatist regime typical of small West European states (Bohle, Greskovits, 2007, p. 106).

We should also note that the tradition of collaboration, the importance of which was emphasized above, existed in Russia; this, by the way, was reflected in the Russian philosophical thought (Kirdina-Chandler, Hall, 2017). Strengthening this tradition in the new conditions is a task of paramount importance.

Concluding remarks

In the works (Polterovich, 2015; Polterovich, 2018) we show that there is a long-term trend of substitution of mechanisms of competition and power by mechanisms of collaboration. Meanwhile, the events taking place in recent decades in a number of countries, especially in the U.S. and the UK, would seem to call this thesis into question: the crisis of political and economic institutions in these countries is accompanied by increased competition. Nevertheless, as demonstrated above, there is every reason to believe that this trend will continue. The most advanced Western countries – the Seven European Leaders – indicate the way to overcome the crisis by strengthening collaboration mechanisms. Their example also influences the strategies of other advanced countries.

The problems associated with terrorism, refugee flows and epidemics indicate that the task of reducing cross-country inequality is one of the central ones for the world community. Understanding this back in 1960 led to the unification of a group of developed countries, which in 1961 was named the Development Assistance Committee. The Seven countries are its active members. In 2019, among the 29 members of the committee, Norway, Sweden and Denmark ranked 2nd–4th in terms of the share of GNP provided as state aid to developing countries, the Netherlands and Switzerland ranked 7th and 6th respectively, and Finland and Iceland – 11th and 15th, while the United States ranked only 23rd. In the work (Elgström, Delputte, 2016, p. 3), it is noted: "Denmark, Finland, Norway and Sweden stood out as generous donors, driven by solidarity, altruism, moral and humanitarian concerns, rather than material interests". The authors show that the current level of assistance to developing countries has been achieved largely due to the influence of Nordic countries, calling this process "Nordicisation".

[16] In this regard, we note the work (Suslov, Basareva, 2020) that analyzes the economic policy of Sweden, Norway and Finland and the possibility of applying their experience to Siberia.

A similar idea underlies the paper (Jakobsen, 2009), where it is revealed that the Nordic countries play a significant role in shaping security policy in Europe due to the ability of their representatives to organize collaboration.

The Seven countries were ahead of other Western countries in implementing the general trend of development – the replacement of competition and power mechanisms by collaboration mechanisms. The results presented above give every reason to believe that it is the collaborative advantages that determine their leadership in their citizens' life satisfaction. The Seven belong to coordinated economies and consensus democracies – groups of countries where the role of collaboration in the relevant field is relatively higher, and the role of competition and power is not so great. High levels of collaborativeness (the desire for collaboration and the ability to collaborate) and civic culture in these countries in general ensure the effectiveness of decision-making systems and, consequently, high welfare.

The above analysis confirms the thesis that competition mechanisms as the basis of the organization of modern Western society are gradually exhausted.

The United States is still a leader in the creation of new technology, but in terms of the overall level of socio-economic development it is increasingly lagging behind the Seven countries, which are much less affected by the crisis and are actively looking for ways out of it.

From a leader who showed the way to other countries, as the United States was after World War II, it turned into a state that seeks to maintain its own advantage by hindering the development of other countries and thereby contributing to the intensification of crisis phenomena in the world. But all empires collapse sooner or later. In the case of the United States, this will mean abandoning the intention of the next president to "make America great again" by any means. It follows from the above analysis that Europe, based on the experience of the Seven, could become a new leader who would stand at the helm of the movement of the world community toward collaboration. We are convinced that, despite all the obstacles, Russia will still have a chance to conclude an alliance with Europe, and it should not be missed. How to combine the need to improve competitive economic and political mechanisms in today's Russia with the prospect of their subsequent decline in importance is a problem that needs to be carefully elaborated on.

We hope that the findings of our study will contribute to its solution.

References

Aerts R. (2010). Civil society or democracy? A Dutch paradox. *BMGN-Low Countries Historical Review,* 125 (2–3), 209–236.

Alouini O., Hubert P. (2012). Country size, economic performance and volatility. *Documents de Travail de l'OFCE*, 1–27.

Amor-Esteban V., Galindo-Villardon M.P., García-Sánchez I.M. (2019). A multivariate proposal for a national corporate social responsibility practices index (NCSRPI) for international settings. *Social Indicators Research*, 143(2), 525–560.

Avoyan E., Meijerink S. (2021). Cross-sector collaboration within Dutch flood risk governance: Historical analysis of external triggers. *International Journal of Water Resources Development*, 37(1), 24–47.

Batory A., Svensson S. (2020). Regulating collaboration: The legal framework of collaborative governance in ten European countries. *International Journal of Public Administration*, 43(9), 780–789.

Bohle D., Greskovits B. (2007). The State, internationalization, and capitalist diversity in Eastern Europe. *Competition and Change,* 11(2), 89–115.

Brandenburger A.M., Nalebuff B.J. (1996). *Co-opetition*. New York: Doubleday.

Brandt F., Konstantinos G. (2016). Shareholders vs stakeholders capitalism. *Comparative Corporate Governance and Financial Regulation*, 10. Available at: https://scholarship.law.upenn.edu/fisch_2016/10

Daly M.C., Oswald A.J., Wilson D., Stephan W. (2011). Dark contrasts: The paradox of high rates of suicide in happy places. *Journal of Economic Behavior & Organization*, 80(3), 435–442.

Elgström O., Delputte S. (2016). An end to Nordic exceptionalism? Europeanisation and Nordic development policies. *European Politics and Society*, 17(1), 28–41. Available at: http://dx.doi.org/10.1080/23745118.2015.1075765

Gjølberg M. (2009). Measuring the immeasurable? Constructing an index of CSR practices and performance in 20 countries. *Scandinavian Journal of Management*, 25(1), 10–22.

Hall P.A., Gingerich D.W. (2009). Varieties of capitalism and institutional complementarities in the political economy: An empirical analysis. *British Journal of Political Science*, 39(3), 449–482.

Hall P.A., Soskice D. (2001). An introduction to varieties of capitalism. In: Hall P.A., Soskice D. (Eds.). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. New York: Oxford University Press.

Hopmann D.N., Karlsen R. (2021). Elections and political communication in the Nordic countries. In: Skogerbø E., Ihlen Ø., Kristensen N.N., Nord L. (Eds.). *Power, Communication, and Politics in the Nordic Countries*. Gøteborg: Nordicom. Available at: https://doi.org/10.48335/9789188855299-11

Iqbal R., Todi P. (2015). The Nordic model: Existence, emergence and sustainability. *Procedia Economics and Finance*, 30, 336–351.

Jakobsen P.V. (2009). Small states, big influence: The overlooked Nordic influence on the civilian ESDP. *JCMS: Journal of Common Market Studies*, 47(1), 81–102.

Jäntti M., Saari J., Vartiainen J. (2006). *Growth and Equity in Finland. WIDER Discussion Paper 2006/06*. Helsinki: United Nations University, World Institute for Development Economics Research.

Kirdina-Chandler S.G., Hall J. (2017). Cooperation versus competition in works of Russian evolutionists. *Journal of Institutional Studies*, 9(1), 6–26 (in Russian).

Klenk T., Reiter R. (2019). Post-new public management: Reform ideas and their application in the field of social services. *International Review of Administrative Sciences*, 85(1) 3–10.

Kübler D., Rochat P.E., Woo S.Y., van der Heiden N. (2020). Strengthen governability rather than deepen democracy: Why local governments introduce participatory governance. *International Review of Administrative Sciences*, 86(3), 409–426.

Ladner A. (2005). Laymen and executives in Swiss local government. In: Berg R., Rao N. (Eds.). *Transforming Political Leadership in Local Government*. London: Palgrave Macmillan.

Lei D., Slocum J.W., Pitts R.A. (1997). Building cooperative advantage: Managing strategic alliances to promote organizational learning. *Journal of World Business*, 32(3), 203–223.

Lijphart A. (2012). *Patterns of Democracy. Government Forms and Performance in Thirty-Six Countries*. Second edition. New Haven: Yale University Press.

Linder W., Mueller S. (2021). *Swiss Democracy. Possible Solutions to Conflict in Multicultural Societies*. Springer Nature, Switzerland.

Lobanov M.M., Glinkina S.P. (2020). Varieties of capitalist relations in foreign emerging market countries: The problems of typology and research methodology. *Vestnik Sankt-Peterburgskogo universiteta. Ekonomika= St Petersburg University Journal of Economic Studies,* 36(1), 7–26 (in Russian).

Long T. (2017). Small states, great power? Gaining influence through intrinsic, derivative, and collective power. *International Studies Review,* 19(2), 185–205.

Martela F., Greve B., Rothstein B., Saari J. (2020). The Nordic exceptionalism: What explains why the Nordic countries are constantly among the happiest in the world. In: Helliwell J.F., Layard R., Sachs J.D., De Neve J.E. (Eds.). *World Happiness Report 2020.* New York: Sustainable Development Solutions Network.

McLaughlin K., Osborne S., Ferlie E. (Eds.). (2002). *The New Public Management: Current Trends and Future Prospects*. London: Routledge.

Pendergast P.M., Wadsworth T., Kubrin C.E. (2019). Suicide in happy places: Is there really a paradox? *Journal of Happiness Studies*, 20(1), 81–99.

Polterovich V.M. (2015). From social liberalism towards the philosophy of collaboration. *Obshchestvennye nauki i sovremennost',* 4, 41–64 (in Russian).

Polterovich V.M. (2016). Institutions of catching-up development (on the project of a new model for economic development of Russia). *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 5, 88–107 (in Russian).

Polterovich V.M. (2018). Towards a general theory of socio-economic development. Part 2. Evolution of coordination mechanisms. *Voprosy ekonomiki,* 12 (in Russian).

Polterovich V.M. (2021a). Crisis of institutions of political competition, Internet and collaborative democracy. *Voprosy ekonomiki,* 1, 52–72. Available at: https://doi.org/10.32609/0042-8736-2021-1-52-72 (in Russian).

Polterovich V.M. (2021b) Collaborative hierarchies. *Voprosy ekonomiki,* 7, 31–48 (in Russian).

Polterovich V.M. (2022). Competition, collaboration, and life satisfaction. Part 1. The Seven of European leaders. *Ekonomicheskie i sotsial'nye peremeny: fakty. tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 15(2), 31–43. Available at: https://doi.org/10.15838/esc.2022.2.80.2 (in Russian).

Pratt J. (2008). Scandinavian exceptionalism in an era of penal excess. Part I: The nature and roots of Scandinavian exceptionalism. *The British Journal of Criminology,* 48(2), 119–137.

Rose A.K. (2006). Size really doesn't matter: In search of a national scale effect. *Journal of the Japanese and International Economies*, 20(4), 482–507.

Rothstein B., Uslaner E. (2005). All for one. Equality, corruption and social trust. *World Politics*, 58, 41–72.

Ryggvik H. (2015). A short history of the Norwegian oil industry: From protected national champions to internationally competitive multinationals. *Business History Review,* 89(1), 3–41.

Skouloudis A., Isaac D., Evaggelinos K. (2016). Revisiting the national corporate social responsibility index. *International Journal of Sustainable Development & World Ecology,* 23, 61–70.

Soens T. (2013). Flood security in the Medieval and Early Modern North Sea Area: A question of entitlement? *Environment and History*, 19, 209–232.

Strand R., Freeman R.E. (2015). Scandinavian cooperative advantage: The theory and practice of stakeholder engagement in Scandinavia. *Journal of Business Ethics*, 127(1), 65–85.

Strand R., Freeman R.E., Hockerts K. (2015). Corporate social responsibility and sustainability in Scandinavia: An overview. *Journal of Business Ethics*, 127(1), 1–15.

Sunde J. (2021). The history of Nordic legal culture and court culture: The story of what should not have been, but still came to be. In: Ervo L. et al. (Eds.). *Rethinking Nordic Courts*. Springer, Cham, Switzerland.

Suslov V.I., Basareva V.G. (2020). Economic development and public policy: Scandinavia and Siberia. *Interekspo Geo-Sibir',* 3(1), 209–218 (in Russian).

Thijs N., Hammerschmid G., Palaric E. (2018). *A Comparative Overview of Public Administration Characteristics and Performance in the EU28.* Brussels: Directorate-General for Employment, Social Affairs and Inclusion under the Contract VC/2016/0492 "Support for developing better country knowledge on public administration and institutional capacity building".

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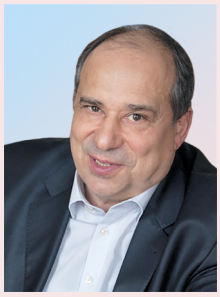
Production and Circulation in a Simple Exchange Economy



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Abstract. The article is methodological: it does not seek to analyze new economic phenomena; rather, its major aim is to study how these phenomena were formed and developed and how the market system was formed and developed with them. The actual subject of the study is a simple exchange economy model at the stage when production begins to be considered as its endogenous factor. This makes it possible to smoothly introduce the social division of labor into the analysis, to consider in the simplest form its combination with the differentiation of production functions in the framework of an individual household. We pay considerable attention to the analysis of socio-economic implications of the deepening of the social division of labor manifested in the transformation of the production of objects and means of labor into its independent links. We show why at this very stage of the study it becomes possible to provide a well-grounded substantiation for the mechanisms that form the market exchange value of consumer durables and means of labor, and, as a consequence, the interest rate. The introduction of the resource limitation factor into the analysis makes it possible to substantiate the need for the institution of ownership of such resources, the importance of absolute and differential natural rent for the normal functioning of the market economy, and to identify the specifics of formation of the market exchange value of land. We emphasize the importance of making the spatial dimension of the economy a full-fledged subject of analysis for pure economic theory. We touch upon a possible approach to the formulation of an initial model that would take into account the influence of space on the general parameters of economic activity. The main conclusion is that the model of a simple exchange economy helps to form a holistic view of all

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key categories (albeit in embryonic forms) reflecting the action of the market mechanism. At the same time, it becomes clear why further institutional transformations are required to realize all the potentials available in this form of economic activity organization.

Key words: simple exchange economy, social division of labor, comparative advantages, spatial dimension of general equilibrium, natural rent, interest rate, objective function of individual producer.

Transformation of production into an endogenous factor in a simple exchange economy

The analysis of the "pure exchange" economy (Nekipelov, 2021b) allowed us to determine the reasons that encourage free individual economic agents to engage in exchange relations with each other, and helped us to obtain an initial, essential understanding of such important phenomena and features of the market economy as current and trans-temporal exchange, exchange value, general equilibrium, competition, systems (including transaction) costs. The transformation of the sphere of production from an exogenous to an endogenous factor in an economy model based on in-kind exchange seems to be a natural next step in the framework of the research based on the "pure economic theory" paradigm (Nekipelov, 2019a).

At this new stage of analysis it becomes possible to clarify the factors leading to the formation and continuous deepening of the social division of labor, reveal the features of production relationships arising on this basis, and add to the idea of the phenomena and features of the exchange economy identified at the previous stage.

The starting point of the analysis is a model in which individual economic agents produce all the consumer goods necessary for their existence, and then use commodity exchange as a tool to further increase welfare. The analysis itself begins with a question of whether these economic agents can achieve even greater results if, at the stage of forming their production program, they will take into consideration the opportunities offered by exchange relations?

The nature of the social division of labor

Fundamentals of the social division of labor

Thus, we proceed from the fact that the economy under consideration has m economic agents, each of which autonomously produces all consumer goods in a certain amount $x_i \geq 0\ (i = 1, \ldots, n)$. The assumption means that their production activity covers all links of the technological chain from mining to the production of final consumer goods.

Generally speaking, to each of the links in any such chain corresponds its own production function. However, for simplicity, we will initially assume that all the mentioned chains are single-link chains, i.e. that there is a single production function linking the output of a consumer good to the natural resources used and the labor of an economic agent. For the same reason, we will initially assume that the factors of production used include only labor and natural resources, and the latter are unlimited.

Our first task is to identify the forces leading to the formation of the social division of labor, based on the results obtained while analyzing the Robinson Crusoe model and the pure exchange model.

Naturally, we will proceed from the fact that the objective function of the subject of economic activity is to maximize his own welfare:

$$\max U(x_1, \ldots, x_n) \qquad (1)$$

In this case an economic agent must reckon with the fact that the exchange value of the goods $y_1,\ldots,y_n$ must be equal to the exchange value of the goods produced $x_1,\ldots,x_n$, which he will possess after

the exchange, and the total amount of time $\sum_i t_i$, spent on the production of each good must be equal to the total duration of the work period:

$$\sum_i [y_i(t_i) - x_i] \cdot EV_i = 0 \quad (2)$$

$$T - \sum_i t_i = 0, \quad (3)$$

where EV_i is the exchange value of the i-th good.

In order to find the necessary conditions of the maximum of the objective function, we equate the first partial derivatives of the Lagrange function to zero:

$$\frac{\partial \Im}{\partial x_i} = \frac{\partial U}{\partial x_i} - \lambda_1 \cdot EV_i = 0 \quad (4)$$

$$\frac{\partial \Im}{\partial t_i} = \lambda_1 \cdot \frac{dy_i}{dt_i} \cdot EV_i - \lambda_2 = 0 \quad (5)$$

$$\frac{\partial \Im}{\partial \lambda_1} = \sum_i [y_i(t_i) - x_i] \cdot EV_i = 0 \quad (6)$$

$$\frac{\partial \Im}{\partial \lambda_2} = T - \sum_i t_i = 0 \quad (7)$$

It follows from the equations (*4*) that in the optimal position the marginal rate of substitution of one good for the other must be equal to the inverse ratio of their exchange values: $\frac{\partial x_j}{\partial x_i} = \frac{EV_i}{EV_j}$.

However, the equations (*5*) deserve special attention. Considering them, first of all, we can conclude that the output should be organized in such a way that the marginal value product of labor $\frac{dy_i}{dt_i} \cdot EV_i$ turns out to be equal to the ratio of Lagrange multipliers λ_2 (represents the marginal utility of the time of production activity) and λ_1 (represents the marginal utility of an exchange value). At the same time, the principle of forming the output structure, which allows an economic agent to achieve this result, boils down to the following.

In an effort to maximize the total exchange value, the agent should start with the type of activity characterized by the highest marginal value product of labor, or, what is the same, the smallest ratio of the unit time spent on production to the exchange value $\frac{a_i(t_0)}{EV_i}$, where t_0 is the zero moment of time.

If labor productivity for all the goods remains unchanged throughout the entire period of work T, that is, if $\frac{dy_i}{dt_i} = \frac{1}{a_i} = const$, then the economic agent should concentrate entirely on the production of the good chosen from the very beginning and continue this activity until the indicator is equal to the marginal utility of leisure. We note that in this case we achieve a result corresponding to the famous Torrens – Ricardo theory of comparative advantages (costs) (Torrens, 1808, p. 37; Ricardo, 1817, pp. 160–162), which, as is known, was developed for the conditions of international trade.

The situation turns out to be more complicated if the functions of the marginal products of labor used to produce different goods are variable – for example, decreasing due to fatigue accumulating in the producer. In this case, it is possible that at certain points in the working period, comparative advantages will shift from one good to another. Then and only then the economic agent will have to distribute working time on the production of more than one good.

Anyway, the solution of the system of equations (*4*) – (7) allows us to obtain vectors of output (vector y), consumed (vector x), and, consequently, exchanged (vector $z = x - y$) goods.

Let us return to the situation in which there are fixed levels of labor productivity in the output of all goods. Let the specific time spent on the production of consumer goods of the k-th subject of economic activity be given by the vector $(a_1^k, \ldots, a_n^k)$, and the exchange values of goods formed during the previous acts of "random exchange" – by the vector $(1, EV_2, \ldots, EV_n)$ (the first good is a good used as the counter). Then, as we have seen, the

economic agent in question should specialize in the production of a good that is characterized by the smallest ratio $\frac{a_i^k}{EV_i}$: in this case, the alternative ("roundabout") costs[1] of obtaining any other good will be lower that direct costs:

$$a_{j'}^k = a_i^k \cdot \frac{EV_j}{EV_i} < a_j^k, \quad (8)$$

where $a_{j'}^k$ – alternative costs, a_j^k – direct unit costs of obtaining the j-th good by the k-th producer.

It is clear that in this model, where the only limited factor of production is labor (more precisely, the time allocated for labor activity by an economic agent), in an equilibrium position, the ratio of specific alternative (labor) costs of obtaining goods through exchange to direct (labor) costs of production of the good that the economic agent specializes in are equal to the ratio of exchange values of the goods:

$$\frac{a_{j'}^k}{a_i^k} = \frac{EV_j}{EV_i} \quad (9)$$

A specific type of labor spent on the production of the good i, from the point of view of the producer k, acquires a special property in the conditions of the exchange economy. The product of this type of labor activity turns out to be any good: directly – the one that is produced, and indirectly – through exchange – any other good. In this regard, an analogy with abstract labor, as defined by Karl Marx, suggests itself (Marx, 1961, p. 47). However, this analogy has significant limitations. According to Marx, abstract labor is what all types of labor of all economic agents have in common. Such labor in the labor theory of value is considered as the basis of a special social substance inherent in any commodity – value, which, in turn, finds external manifestation in the proportions of exchange. Within the framework of our approach, each producer, figuratively speaking, has his own "abstract labor" and, accordingly, his own "cost" of goods. Moreover, this individual and abstract labor turns out to be such only due to the fact that the proportions of exchange (exchange values) already exist.

Dynamics of the social division of labor: causes and implications

Transformation of the subjects of labor into commodities

Let us now return to our assumption that natural resources are separated from consumption by only one technological processing stage. In fact, this assumption corresponds to the situation when one's production activity is reduced to "gathering" – collecting consumer goods provided by nature. The transition to independent production of consumer goods presupposes the existence of at least two technological links. The first one consists in separating certain elements from the natural environment (for example, wood, coal, ores). The second and possible subsequent links are connected with the processing of raw materials obtained at the first stage into final products.

Continuous complication of the structure of social production – first as a result of the formation of a two-tier technological structure, and then due to its continuous differentiation manifested in the emergence of new processing stages – is an inevitable consequence of the emergence of new and more advanced technology. But then the question arises: should an individual subject of economic activity continue to take on all the work aimed at producing a consumer good, or would it be wiser for him to focus on individual stages of technological processing?

In fact, this question has long been of interest to theoretical economists. Thus, Karl Marx noted internal production functions naturally turning into independent links of the social division of labor (Marx, 1961, pp. 363–372), and R. Coase put

[1] That is, the costs associated with obtaining the good j through exchange rather than as a result of its production by the k-th economic agent.

forward the idea that the boundary between the intra-company and social division of labor is where the marginal transaction costs associated with the reduction in the area of the company's production activity are equal to the marginal management costs associated with its expansion (Coase, 1937).

At the level of a simple economic model under consideration we must first of all reveal a mechanism governing the participation of the objects of labor in exchange transactions. The fact is that this type of product does not directly satisfy human needs, and therefore the proportions in which the corresponding goods are exchanged for others cannot be based on marginal utility estimates.

Microeconomic theory has formed a clear viewpoint on this issue: the participation of the factors of production (including the objects of labor) in the exchange is associated with the demand of producers, which, in turn, is derivative in relation to the demand for consumer goods produced with the use of these factors of production. This conclusion is substantiated with the help of a model of maximizing the objective function of an economic agent (usually a firm). We have only to apply this approach to the model of a simple exchange economy.

Let an individual economic agent specializing in the final stage of technological processing leading to the creation of a consumer good be able to obtain the necessary object of labor through exchange. At the same time, due to the desire for the highest possible level of satisfaction of his own needs, he is interested in choosing such a combination of factors of production (we mean labor services and objects of labor) that ensures his maximizing the net exchange value of the goods produced (gross exchange value minus the exchange value of the subjects of labor used in production):

$$Max\ NEV = Y\left(x_L^0, x_{RM_1}, \dots, x_{RM_q}\right) \cdot EV_{CG} - \\ - \sum_{q=1}^{Q} x_{RM_q} \cdot EV_{RM_q}, \quad (10)$$

where NEV – net exchange value, x_L^0 – labor services that act as a parameter in the production function of an individual producer, $x_{RM_1}, \dots, x_{RM_q}$ – raw materials (objects of labor) used in the production, $Y\left(x_L^0, x_{RM_1}, \dots, x_{RM_q}\right)$ – production function, EV_{CG} – exchange value of the consumer good, EV_{RM_q} – exchange value of the q-th raw material.

A necessary condition for the existence of the maximum of this function is the equality of the marginal value product of labor to its exchange value: $\frac{\partial Y}{\partial x_{RM_q}} \cdot EV_{CG} = EV_{RM_q}$. In relation to a given production function this means that the demand of an economic agent for an object of labor is a function of the own exchange value of the latter, the exchange value of other raw materials, and the exchange value of the final product (consumer good):

$$x_{RM_q}^* = x_{RM_q}^*\left(EV_{RM_1}, \dots, EV_{RM_q}, EV_{CG}\right) \quad (11)$$

As for the "penultimate" stage of technological processing, the demand for the objects of labor will be directly determined by the demand for its products from the "final" processing stage and, indirectly, by the demand for a consumer good produced at the final processing stage. In other words, as we move away from the final link of a technological chain, the demand for intermediate products will depend more and more indirectly on the demand for consumer goods, but this connection will remain under any condition.

Since there is a clear mechanism for the formation of demand for intermediate products, the decision of an economic agent acting within the framework of the economic model under consideration regarding the sphere of specialization can be thoroughly explained using the theory of comparative costs. The difference in comparison with the algorithm described earlier is only that

the scope of choice is noticeably expanding for an individual producer: now he can specialize not only in the production of individual consumer goods, but also the objects of labor.

We should note that the supply of intermediate products (and it is the reverse side of specialization) always comes from the previous link of the technological chain, in relation to its scope of application. It is known that the corresponding function is obtained by replacing the factors of production as independent variables in the production function with their demand functions (this ensures that the output value invariably corresponds to the task of maximizing the objective function of the economic agent):

$$Y^* = Y\left[x_L^0, x_{RM_1}^*, \dots, x_{RM_q}^*\right], \qquad (12)$$

where Y^* is the supply function (in this case, of an intermediate product).

The question arises: does the thesis on the applicability of the theory of comparative costs to the solution of the issue of specialization of an individual producer imply that the labor activity of the latter should be limited to only one link in the technological chain? This problem can be formulated in another way: how, within the framework of the approach under consideration and with the restrictions adopted within it (in particular, when analyzing the problem in relation to the conditions of complete certainty), can one explain the fact that in practice economic agents almost never limit their production activity to performing one technological operation? It is clear that with any formulation, we are talking about defining the boundary between the social division of labor and the intra-economic division of production functions.

Let there be m types of consumer goods and Q types of intermediate products that are the result of homogeneous technological processes; accordingly, the total number of goods produced is $n = m + Q$. We proceed further from the fact that the number of economic agents N exceeds the number of produced goods n, and each of the producers has a fundamental ability to produce any type of goods. Accordingly, the production function of the k-th producer in the j-th type of activity is as follows: $Y_j^k = Y_j^k\left(x_L^0, x_{RM_1}, \dots, x_{RM_q}\right), j = 1, \dots, n$.

Obviously, in accordance with the principle of comparative costs, the output of more than one good is justified only when the unit time costs[2] spent per unit of "net exchange value"[3] are the same for several types of goods. At that we should take into account that the very value of unit costs is under the influence of the forces caused by the process of specialization, moreover, the forces that are oriented in the opposite direction. The positive effect of a higher level of specialization is due to the fact that the producer gets an opportunity to increase the level of professional skill in selected activities and minimize the time spent on the transition from one of them to another. At the same time, both in the production and in the institutional area, we reveal the action of opposite forces. The first are associated with the spatial dispersion of production in the conditions of specialization and, as a result, with an increase in transportation costs[4]. The second are associated with an increase in transaction costs – the time spent on concluding market transactions due to an increase in the number of the latter. As always happens in the presence of such "costs", the producer should strive to ensure that the marginal benefits of increased specialization are equal to the marginal costs accompanying this process.

This conclusion is obviously consonant with Coase's idea. But there is a difference. A firm, unlike an individual economic agent, has a

[2] In the case of variable cost coefficients, the adjustments discussed at the beginning of the section should be made.

[3] This refers to the exchange value of the good placed on the market minus the exchange value of the objects of labor acquired elsewhere and used in production.

[4] More details about the role of the spatial factor will be given below.

fundamental ability to attract the factors of production of required quality (including workforce) for any production processes. Under these conditions, the value of the comparative advantage factor is largely leveled. At the same time, if we ignore the question of the availability of capital, a firm, unlike an individual producer, has the ability to scale output in any direction almost indefinitely. And in these conditions, the question of the costs of managing large production structures inevitably comes to the fore. Its peculiar analogue in the conditions of individual production – the losses associated with the need to switch from one type of activity to another – is significantly less important.

We should note that these differences are important from a methodological point of view: after all, they confirm how important it is to analyze not only the state in which the economic system is in a particular period, but also its development.

Transformation of consumer goods of durable use and means of labor into a commodity

In the world of goods, a special place belongs to consumer durables and means of labor: their beneficial effect (respectively in the sphere of consumption and production) extends for a more or less long time in comparison with ordinary goods. Due to this circumstance, such goods are carriers of two exchange values – the exchange value of the services they provide during a single period of time (current exchange value), and the exchange value of the flow of services for the entire period of their operation (trans-temporal, or commodity, exchange value). The first type of exchange value is realized within the framework of a lease relationship, and the second – in the framework of an exchange transaction accompanied by a change of ownership of the corresponding good.

The current demand is for the **services** provided by durable goods. Let us consider the features of such demand first in relation to consumer durables ("capital goods"), and then – in relation to the means of labor.

The demand function for the services provided by the durable good $m + 1$ will be as follows: $x'^{*}_{m+1} = x'^{*}_{m+1}(EV_1, \dots, EV_m, EV'_{m+1}, NEV)$, where x'^{*}_{m+1} – demand for the services of the $(m + 1)$-good (capital good), EV'_{m+1} – exchange value of the services of the capital good, NEV – net exchange value of the goods (good) in the production of which the economic agent[5] in question specializes. As in the case of ordinary goods, this function is formed in such a way as to maximize the utility function of the consumer. Accordingly, the desired value of the services of such goods will be set by the consumer at such a level that the marginal rate of their substitution with a good used as the counter is equal to their exchange value (rental value).

The demand for the services of the means of labor, like the demand for the objects of labor, is formed in such a way as to maximize the objective function of the individual producer. The function in the conditions under consideration will be as follows[6]:

$$Max\ NEV = Y_i\left(x_L^0, x_{RM_1}, \dots, x_{RM_q}, x'_K\right) \cdot EV_i - \\ - \sum_{q=1}^{Q} x_{RM_q} \cdot EV_{RM_q} - x'_K \cdot EV'_K, \quad (13)$$

where Y_i – output of products that the economic agent specializes in, EV_i – exchange value of a unit of goods produced, x'_K – value of services of the applied means of labor (physical capital), EV'_K – factor exchange value (exchange value of services) of capital. Accordingly, one of the necessary conditions for the maximum of this function is the equality of the marginal value service of the means of labor to its exchange value: $\frac{\partial Y_i}{\partial x'_K} \cdot EV_i = EV'_K$. The very same function of demand for the services provided by the means of labor is as follows:

$$x'^{*}_K = x'^{*}_K\left(EV_{RM_1}, \dots, EV_{RM_q}, EV_i, EV'_K\right) \quad (14)$$

[5] This indicator is an analogue of the consumer's income in the monetary economy.

[6] For simplicity, we assume that an economic agent specializes in the production of one type of good.

An economic agent chooses a capital consumer good or a means of labor as an object of specialization in exactly the same way as any other good: it is important for him that the ratio of unit costs of production to its **commodity** exchange value should be the smallest. In other words, the economic agent will produce the durable K only if $\frac{a_k}{EV_K} = min\left\{\frac{a_1}{EV_1}, \dots, \frac{a_n}{EV_n}, \frac{a_k}{EV_K}\right\}$. Accordingly, the individual supply function for such goods will be as follows:

$$y_K^* = y_K^*\left(EV_{RM_1}, \dots, EV_{RM_q}, EV_i, EV_K\right) \quad (15)$$

A seemingly contradictory situation has developed: the demand is for the services of durable goods (see formula *(14)*), and the supply is formed in relation to the goods themselves (see formula *(15)*). But we must keep in mind that the magnitude of the services of a durable good is derived from its quantity. In other words, in order to receive the services of such a good x'_K during the period under consideration, it is necessary to have it in the amount x_K. Taking this into consideration, we see that the process of forming the commodity exchange value of durable goods becomes clear.

The market function of the supply of such goods consists of the individual supply functions of economic agents; similarly, the market function of the demand for their services consists of the corresponding individual functions. Since the satisfaction of demand for services x'_K implies the availability of supply $y_K = x_K$ of these goods themselves, then in the process of market interaction of economic entities, equilibrium levels of demand for their services, production (supply) of these goods, as well as the exchange value of their services and their commodity exchange value are **formed simultaneously**. At the same time, the exchange value of capital goods services, based on a relative marginal assessment of their utility, is **logically primary** in relation to the commodity exchange value: the former is introduced into the analysis at the stage of analyzing the pure trade model, and the latter – only when taking into account the conditions prevailing in the sphere of production.

The problems associated with analyzing the process of production and circulation of durable goods do not end there. The reasons why an economic agent assumes the functions of an investor, which are inevitably required in connection with the production and circulation of such goods, demand an explanation. The investor turns out to be a manufacturer if he agrees to transfer durable goods to the consumer on the basis of a lease for the entire period of its existence. The roles will change if the consumer agrees to a transaction in which the good becomes his property.

This problem is resolved on the basis of credit relations, and the lender can be either an economic agent external to the exchange participants, or one of them. If a third party provides a loan to the manufacturer of durable goods, then the latter can, without prejudice to himself, establish rental relations with the consumer. And, on the contrary, if a loan is provided to the consumer, then he is ready to purchase the good into ownership. In the absence of an external creditor, his functions will inevitably be performed by one of the exchange participants.

If the manufacturer agrees to transfer a durable good to the consumer on the basis of a lease for the entire period of its existence, then he *de facto* becomes a creditor: after all, this case is equivalent to concluding two transactions – granting a loan to the consumer and acquiring ownership of a durable good by the latter. If the consumer agrees to purchase a durable good, then he turns out to be the actual creditor. In this case, the same result can be obtained with the help of two interrelated transactions: the provision of credit by the consumer to the manufacturer when the latter leases durable goods out (in both cases, loan servicing deliveries are repaid by deliveries against lease obligations).

Of course, so far we have simply transformed the "investment problem" into a "lending problem". However, such a transformation does not resemble "ploughing the sands". The fact is that we have at our disposal the opportunity to build a model that allows us to determine the amount of net credit that each economic agent will be interested in providing (obtaining) at different values of the exchange value of the service provided by a capital good, its commodity exchange value and interest rate (Nekipelov, 2021a, p. 16). The most important conclusion suggested by this model is that the value of the loan provided (attracted) is optimal when the ratio of the commodity exchange value for each durable good to the relative marginal valuation of its services is equal to the sum of discounts during its operation:

$$\frac{EV_K}{MRS'_{1/K}} = S, \qquad (16)$$

where $MRS'_{1/K}$ is the marginal rate of substitution of services of the capital good with a good used as the counter, $S = \sum_{t=1}^{T} \frac{1}{(1+r)^t}$ is the amount of discounts for T periods during which the "capital good" provides services (r is the interest rate for the period, t is the period number).

Since in the equilibrium position the relative marginal valuation of durable goods services $MRS'_{1/K}$ is equal to the exchange value of these services EV'_K, insofar the ratio of two exchange values of such goods – EV_K and EV'_K – uniquely identifies the value of S, and, consequently, the value of the equilibrium interest rate.

The equilibrium levels of exchange values of individual goods, exchange values of durable goods services, their commodity exchange values and interest rates are formed **simultaneously**. However, the **logical sequence**, as evidenced by the analysis, is represented by the following chain: exchange values of non-durable goods and exchange values of services of durable goods – commodity exchange values of durable goods – interest rate. Of course, in the current plan, there may be non-equilibrium levels of these important indicators, but it is important that then forces aimed at bringing the economic system into a state of general equilibrium come into play.

Thus, the development of the social division of labor associated with the transformation of durable goods into a commodity is inevitably accompanied not only by the usual (current) exchange, like in the case of non-durables, but also by credit transactions that service trans-temporal exchange occurring simultaneously with them. The total amount of credit flows turns out to be derived from the total exchange value of durable goods produced, and the current and trans-temporal exchange values of durable goods are logically primary in relation to the interest rate. The mechanism of direct and inverse relationships between the interest rate, production and, accordingly, credit, current and trans-temporal exchange values ensures the achievement of an equilibrium state.

General equilibrium in a simple exchange economy

General changes related to the transformation of production into an endogenous factor in an exchange economy

In the conditions of the social division of labor, the problem of general equilibrium undergoes certain modifications. Within the framework of pure trade, as shown by L. Walras (Walras, 1874), its most important feature was the equality of the relative marginal valuations of all goods for all economic agents to their social exchange values expressed through the exchange value of a good used as the counter. This requirement turns out to be insufficient for an economic system whose participants are not only consumers, but also producers. In such a situation, it becomes fundamentally important that each producer should specialize in the type of activity in which he has a comparative advantage.

The second most important feature of the general equilibrium in conditions when production becomes its endogenous factor is associated with the need to take into account the possibility of existence of limited natural resources. The analysis of the influence of this feature, which may be inherent in a larger or smaller number of resources, on economic decision-making was started in the framework of the Robinson Crusoe model (Nekipelov, 2019b). It was shown that in an optimal situation, the marginal return of time allocated to those types of production where such resources are used will be higher than in other types of activity. This circumstance manifests itself in a specific way in the conditions of a simple exchange economy.

The availability of limited resources leads to the fact that the second of the above-mentioned conditions of general equilibrium is violated – the opportunity for each economic agent to choose the type of activity that provides the greatest return on the labor efforts. A natural question arises: can access to limited resources in forms that do not contradict the basic conditions of a market economy be provided in such conditions?

The answer to this question has long been known to economic theory: see, for example: (Ricardo, 1817), (Marx, 1961). The solution to the problem is connected with the emergence of the institution of ownership of land and, accordingly, the arrival of the owner of natural resources. As a result, access to resources becomes paid, and the amount of corresponding payments is formed during the interaction of owners and potential users of resources and is set at a level at which the production of goods using scarce resources is equal to the public demand for such goods.

Payment for access to limited natural resources, which is an economic form of the realization of land ownership, has been called resource rent. Taking into account the fact that natural resources may differ from each other in qualitative terms, it becomes necessary to distinguish between absolute and differential resource rent. The former represents the amount of payment for access to the worst-quality natural resources, the use of which is a prerequisite for achieving market equilibrium; the latter characterizes the value of the "premium" that the market gives to owners of natural resources of higher quality.

Special attention should be paid to the analysis of the mechanism of formation of commodity exchange value for natural means of labor (land). The fact is that the approach from the standpoint of comparative costs, which was used in constructing the supply function of means of labor, which are the product of human activity, cannot be applied here. Therefore, it turns out that the emergence of transactions accompanied by a change of ownership of a natural means of labor is logically possible only when the conditions for credit relations have already been formed in the economic system and the interest rate formation mechanism is in effect. In this case, we naturally come to a well-known conclusion that the price (in our case, the commodity exchange value of land) is determined by capitalizing the flow of rent payments (in our case, the exchange value of rent deliveries). In other words, the commodity exchange value of land turns out to be derived not only from its factor exchange value (rent), but also from the interest rate.

The role of the uncertainty factor

In the framework of a Robinson Crusoe economy, possible deviations of the results of production activity from those that were planned by the economic agent were explained primarily by the unpredictability of the conditions of the natural environment surrounding him. When shifting to the study of a simple exchange economy, the problem of uncertainty undergoes some modifications. Here, the impossibility for an economic agent to accurately anticipate the behavior of other

economic participants comes to the fore. It becomes clear that uncertainty and the risks associated with it are a trait inherent in a market economy[7].

An economic agent who does not have all the information inevitably has to face the risk of the changing proportions of exchange (both current and trans-temporal). The ways in which such risks affect the behavior of a market economy agent, in particular, the amount of output he sets, are well described in standard courses on microeconomics. Here, taking into account the specifics of a simple exchange economy (individual nature of production activity and the specifics of the motivation of economic agents associated with it; in-kind exchange), it is necessary to make only a small and routine adjustment to the corresponding model apparatus.

After the Crusoe model, the focus on the uncertainty of economic activity helps to expand the idea not only about the spheres of its manifestation, but also about the possibilities of adaptation to the risks that economic agents face in a simple exchange economy. The accumulation of stocks which was the only risk reduction tool for an isolated economic entity is supplemented by the diversification of the goods produced: after all, in this case, the unfavorable dynamics of the proportions of exchange for one of the goods can be compensated by beneficial changes in the exchange value of other goods.

It is also obvious that the situation of uncertainty inherent in an exchange economy, while influencing the behavior of economic agents, directly affects the specific parameters of the state of general equilibrium.

On the spatial dimension of a simple exchange economy

The classical way of studying general equilibrium issues typically avoids the question concerning the role of the spatial factor[8]. That is why W. Isard, the renowned American scientist in the field of regional economics, stated that the corresponding models, in fact, describe the "one-point world" (Isard, 1956, p. 26). It is unlikely that such a state of affairs can be considered normal for general economic theory: after all, space, like time, sets the coordinate system in which all economic activity takes place. Therefore, the neglect of spatial problems, which M. Blaug described as "one of the great mysteries in the development of economic science" (Blaug, 1994, p. 58), causes serious damage to its integrity.

The spatial dimension of the economic system is already evident in the analysis of the Robinson Crusoe model. In (Nekipelov, 2019b), a model was formulated for an isolated economic agent to choose the optimal place of residence, taking into account the location of natural resources he used in his work. In the conditions of a simple exchange economy based on the social division of labor, the spatial problem becomes much more complicated: now the decision of each economic entity is influenced not only by the location of natural resources, but also by the location of the other members of the community. It is for a reason that problems begin to emerge already when trying to determine which model should be used as a basis in analyzing the role of the spatial factor in the conditions of the social division of labor.

It is quite natural for the general economic theory to rely on the idea of an "ideal space (state)" by von Thünen (Thünen, 1895). But here, too, an important question arises: how homogeneous should such a territory be? In other words, do we assume that this quality concerns not only the terrain and climate, but also the location of natural resources? The problem here is that the assumption of an absolutely uniform distribution of resources in the territory under consideration will inevitably lead

[7] This means that when we analyze the situation in the conditions of certainty, which is a completely justified technique, then, strictly speaking, we go beyond this economic system.

[8] It is noteworthy that the fundamental monograph (Katzner, 2006) written from the standpoint of the Walrasian theory of general equilibrium bypasses this problem completely.

us to the conclusion that any point in such a space is suitable for accommodating all producers.

In this regard, we immediately come across the following question. Is it justified to assume the possibility of a "point" location of natural resources and economic agents, that is, in fact, to assume that their localization does not require any land area. The negative answer, of course, fully corresponds to the real state of affairs, but at the same time generates intractable problems associated with the need to supplement the abstract analysis, typical of the general theory, with assumptions about the area occupied by various natural objects and economic agents. In this sense, the assumption of "point" location seems very attractive. But what about those types of activity, for example, agriculture, in which the area of land used is a key feature of the main factor of production for the relevant field of activity?[9]

With regard to the territory, the question also arises whether we should somehow limit it from the very beginning or not. Von Thünen's "ideal state", as we know, was a circle with a city in its center. But, perhaps, if we assume that natural resources necessary for production activity have a fixed location, then such a restriction is not required. In this case, the task will not be to show how economic agents are located in a given territory, but to identify the boundaries of the territory where the particular community of people live and conduct production activities. The advantage of this approach is that it can help to identify both the forces acting toward the concentration of population in a certain territory, and the forces aimed at eliminating the isolation of individual communities.

But, of course, it is not only about these purely spatial problems. From an economic standpoint, the key change associated with the inclusion of the spatial factor in the analysis is the emergence of transport costs accompanying the movement of goods between producers and consumers. The consequences of this circumstance are very diverse.

First of all, attention should be paid to the fact that the mechanism of comparative advantages undergoes serious modification in these conditions: transport costs increase the "roundabout" (alternative) costs of goods received through exchange, and therefore act as a force restraining the development of the social division of labor[10]. This very circumstance allows us to talk about the existence, at a given level of technological development, of economically rational boundaries of the territory for conducting economic activity based on available natural resources.

The most serious attention should be paid to the fact that due to the different position in space, the "final" (taking into account transport costs) exchange value of the same goods will not coincide among different consumers[11]. Moreover, it is almost inevitable that individual consumers will have to purchase the goods they need from various producers. And this means that the "final exchange value" of the same good received from producers located at unequal distances will be different.

[9] Having encountered this problem, von Thünen (Thünen, 1895) found a completely reasonable solution combining "point" and "spatial" localization of economic agents. In his model, as we know, the city in which all consumers are concentrated is located at the central point of the circle, and farmers occupy its entire area.

[10] Thus, the third reason is revealed that explains why the specialization of the producer, as a rule, is not absolute, that is, it is not reduced to the implementation of a single technological operation. The first one is the possible dynamics of comparative advantages of two or more goods; the second one is related to the influence of the abovementioned uncertainty factor.

[11] On this basis, M. Blaug actually concludes that taking into account the spatial factor "kills" perfect competition: "Classical location theory was posited on the assumption of perfect competition but if firms compete spatially by f.o.b. pricing, the market structure is one of monopolistic, not perfect competition". The consequences of this state of affairs, according to Blaug, are very serious: "Unfortunately, monopolistic competition theory offers few unambiguous implications about firm behavior and, indeed, to this day there is little agreement about what is implied by monopolistic competition models of spatial differentiation" (Blaug, 1994, pp. 582–583).

Finally, we should bear in mind that the results of the analysis will significantly depend on institutional assumptions. Apparently, at the first stage it is reasonable to proceed from the fact that economic agents have all the information concerning both their production capabilities and their systems of individual preferences, as well as the ability to draw accurate conclusions from this information. Based on the study of such a model, it is possible to come to important conclusions concerning the role of the spatial factor in the formation of general equilibrium in the complete absence of "friction" accompanying the process of formation of commodity flows between members of society. In turn, if the abovementioned assumption of the absolute rationality of economic agents is abandoned at the second stage of the study, then it will be possible to substantiate the causes of the emergence of a localized market (the so-called marketplace), within which there is direct interaction between producers and consumers. This will make it possible to introduce such an important economic category as location rent into the analysis.

A special study of the features of the formation of general equilibrium, taking into account the spatial dimension of the economic system, goes beyond the scope of the subject of this article. At the same time, it seemed absolutely necessary to draw attention to the importance of introducing this factor into the analysis already at the stage of a simple exchange economy.

Social division of labor and the objective function of an individual commodity producer

The formation of an exchange economy, the limited amount of certain types of natural resources, the transformation of objects and means of labor into commodities – all this leads to the transformation of the objective function of the actor of economic activity. Let us summarize the changes taking place in this regard.

The natural aspiration of an isolated economic agent, Robinson, was to maximize his own utility function in the conditions of limitations set by both the duration of the period under consideration and the material factors of production at his disposal.

The emergence of exchange relations and then the development of general division of labor between previously isolated economic agents lead to a certain change in the situation. Granted, even under these conditions, every economic actor is interested in maximizing his own welfare. However, now the condition for solving this problem is the choice of a production program that helps to obtain a good with the maximum net exchange value. The economic agent associates the value of the latter with his own labor contribution to the results of production activity.

Under all conditions (they will be discussed below), the search for such a production program is carried out in two stages. At the first stage, the producer calculates the net exchange value which he can obtain if he specializes in the production of each of the existing goods. At the second stage, the producer determines the sphere of activity in which, with the exchange values of goods prevailing on the market, the ratio of his labor costs to the net exchange value is minimal. The corresponding good (or any of a number of goods – if of each of them has the minimum level of the corresponding indicator) and should be selected as an object of specialization.

In conditions when the object of the division of labor is exclusively consumer goods and services, when natural resources are unlimited, and when there are no means of labor, the value of the net exchange value coincides with the (gross) exchange value of the good produced, and it is this value that the producer's labor efforts should comply with.

The presence of limited natural resources leads to the emergence of the first element of economic costs – the exchange value of the services they provide (rental deliveries). The latter represent the actual current costs for economic agents who, in the production process, use scarce resources that do not

belong to them, and the opportunity costs for the owners of these natural factors of production who conduct independent production. In both cases, the net exchange value subject to maximization, which the producer associated with his own labor contribution, will be expressed by the formula (17).

$$NEV_i = TEV_i - \sum_j Rent_j \cdot Z_j = TEV_i - Rent, \quad (17)$$

where NEV_i is the net exchange value of the good i, TEV_i is the total exchange value of the good i, $Rent_j$ is the exchange value of rental deliveries for the right of access for a single period of time to the unit of resource j, Z_j is the amount of the resource j required for the manufacturer of the good i, *Rent* is the total exchange value of deliveries against rental payments.

The situation undergoes further changes when the objects of labor become the object of exchange. Under these conditions, it is necessary to subtract from the total exchange value of the goods produced, along with rent, the exchange value of the objects of labor acquired through exchange and used in production. Accordingly, the cost of purchasing the objects of labor becomes the second element of current economic costs.

The transformation of the means of labor into an object of the social division of labor leads to further modification of the objective function of an individual producer. Now the normal return on physical capital corresponding to the exchange value of the services of the used means of labor (the exchange value of lease deliveries when renting the corresponding factors of production) should be included in the composition of economic costs. This element of economic costs, in turn, is divided into two parts – the interest return on the means of labor and depreciation:

$$\sum_i KY_i = \sum_i \left(r \cdot K_i \cdot EV_{K_i} + A_i \cdot K_i\right) = \\ = \sum_i K_i \cdot \left(r \cdot EV_{K_i} + A_i\right), \quad (18)$$

where KY_i is the normal return of the i-th means of labor, r is the interest rate, EV_{Ki} is the commodity exchange value of the i-th means of labor, A_i is the depreciation rate per unit of the means of labor.

The net exchange value with which the producer associates his labor contribution is now determined for each type of activity by the formula *(13)*, in which the normal return of the means of labor $(x'_K \cdot EV'_K)$ can be represented, as follows from the formula *(18)*, by the expression $\sum_i K_i \cdot \left(r \cdot EV_{K_i} + A_i\right)$

The metamorphoses that the objective function of an individual economic agent is going through along with the development of the social division of labor are projected onto the structure of the exchange value of the produced good. Ultimately, the exchange value of a unit of any commodity breaks up into parts, each of which is associated with the contribution of the corresponding factor of production: the exchange value of rent deliveries $\frac{Rent}{Y}$ – with the contribution of natural factors of production, the exchange value of the objects of labor used in the production $\frac{RMC}{Y}$ and the normal return of the means of labor $\frac{\sum_i K_i \cdot \left(r \cdot EV_{K_i} + A_i\right)}{Y}$ – with the contribution of physical capital, and the residual (net) exchange value $\frac{LY}{Y}$ – with the contribution of labor[12].

Conclusions

The material presented in the paper is a result of the efforts aimed at building such an intellectual model of a market economic system that would not only reflect the set of existing functional dependencies between its various parameters and describe the state of the institutional environment at a certain point in time, but also give an idea of enriching the content of economic concepts alongside the transition from simple forms of the

[12] $LY = TEV - TEC$, that is, the amount of the net exchange value associated with the labor contribution of the producer is the difference between the total exchange value *TEV* of the produced good and the total economic costs *TEC*.

object under consideration to increasingly complex ones. This approach is designed to solve not only the logical problems faced by empirical economics, but also to overcome its static nature (Nekipelov, 2019a). The task, therefore, is not to discard the knowledge accumulated during the development of our science, but, first of all, to reformat it in accordance with the principles of "pure theory".

The transformation of production from an exogenous into an endogenous factor in an exchange economy, in which individual economic entities participate, becomes an important step on this path. The exchange is still in-kind, but it becomes possible to take into account the action of forces leading to the development of the social division of labor. The latter makes the exchange relations systematic and, in this sense, promotes the transition of the economic system into a new state. It is significant, from the viewpoint of the thesis on the reformatting of economic knowledge, that a tool to justify the emergence of the social division of labor is the Torrens – Ricardo theory of comparative costs (advantages) used for addressing a more specific task – to demonstrate the benefits of international trade for countries with different levels of development.

It is important not only to see the reasons for the specialization of producers, but also to identify the dynamics of this process. Such a formulation of the question urges us to consider the technological organization of the economy, and on this basis – to search for a boundary between the division of production functions performed by an individual economic agent and the division of labor in society. The article shows that this boundary in the conditions of a simple exchange economy will gravitate toward a position in which the marginal benefits of increasing the specialization of an individual producer will be equal to the marginal costs accompanying this process. Of course, this conclusion is consonant with the one made by R. Coase regarding the issue of the boundary between the intra-firm and social division of labor. However, it is made in relation to a simpler economic system and with a different "filling" of the general principle of equality of marginal benefits to marginal costs.

Mainly due to the improvement of production processes, the shifts in the boundary between the division of functions implemented by an individual producer and the social division of labor determine the changes in the composition of the commodity world. Initially, objects of exchange include consumer goods; in the future they are joined by the objects and means of labor. As a result, the exchange value of a commodity produced by an individual economic agent splits into a part that compensates for its current costs, and a part that represents its "labor income" (net exchange value).

The analysis of the consequences of the transformation of consumer durables and means of labor into a commodity deserves special attention. When analyzing the net exchange model on the example of consumer durables, it was shown that the initial form of involvement in the turnover of such goods is rent rather than the classic exchange associated with the change of ownership of the corresponding goods. Such goods can be provided on credit, but at the same time the exchange value of deliveries for credit servicing is determined by the exchange value of the services of the corresponding goods, and not by their "market exchange value". As a result, the terms of pure trade do not have prerequisites for the formation of the market exchange value of "capital goods", on the one hand, and the interest rate, on the other (Nekipelov, 2021b, p. 44).

The transformation of production into the model's endogenous factor leads to important changes: the costs of producing durable goods become the basis for their "market exchange value", and the presence of two exchange values for such goods (current and trans-temporal) becomes the basis for the market interest rate. Due to the latter circumstance, it becomes possible to represent the

return on the means of labor used in production by an individual producer in the form of a part compensating for their "market exchange value" and a part corresponding to interest income[13].

The model of exchange economy under consideration allows us to enrich our ideas about the state (states) of general equilibrium. Now that production is an internal condition of the model, we get the opportunity to introduce the limited resources factor into the analysis and show that the formation of ownership of such resources is a necessary prerequisite for the normal functioning of the market mechanism. As a result, the concepts of absolute and differential rent are naturally included in the conceptual framework and the specifics of the mechanism of formation of the "market exchange value" of land become clear. There is also an opportunity to adapt the sources of uncertainty of economic life to the conditions of the model under consideration, to show the expansion (in comparison with the Robinson Crusoe model) of the tools available to economic agents to reduce the level of risks.

The article emphasizes that it is very important for the pure economic theory to make the spatial dimension of the economy and its influence on the parameters of general equilibrium a full-fledged subject of analysis. We show serious problems that stand in the way of solving this problem, and express considerations regarding a possible approach to the formulation of the initial model that makes it possible to take into account the influence of space on the general parameters of economic activity.

Perhaps the main result of our research consists in a holistic view of almost all key categories (albeit in embryonic forms) reflecting the action of the market mechanism. There arises a reasonable question: do we really believe that such a primitive economic system based on individual labor and lacking the most important tool of the market economy – money – can provide a deep social division of labor, multilaterally balanced in-kind exchange of goods, and developed rental and credit relations? There can be only one answer: of course not! But, from the point of view of the pure economic theory, it does not matter. After all, the results of the study indicate no more than those potentials that can (and therefore should!) be detected already in a simple exchange economy. The main reason that does not allow these opportunities to be realized in any mature form is also clear – enormous transaction costs that accompany in-kind exchange. And hence the obvious conclusion: the next stage of the study is designed to demonstrate whether these transaction costs can be drastically reduced and, if they can, what will be the implications of the corresponding changes for the economic system as a whole? It is easy to guess that the next step of our research should consider a monetary economy based on individual labor.

References

Blaug M. (1994). *Ekonomicheskaya mysl' v retrospective* [Economic Theory in Retrospect]. Moscow: Delo LTD.

Coase R. (1937). The nature of the firm. *Economica*, 4(16), 386–405

Isard W. (1956). *Location and Space-Economy. A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade and Urban Structure*. Cambridge, Massachusetts: The M.I.T. Press.

Katzner D.W. (2006). *An Introduction to the Economic Theory of Market Behavior. Microeconomics from a Walrasian Perspective*. Chaltenham, UK. Northampton, MA, USA: Edward Elgar.

[13] This conclusion is not as trivial as it may seem at first glance. Among theoretical economists, and by no means only those supporting Marxism, it was a very common idea that in a primitive economy, similar to the one we called a simple exchange economy, the exchange value of goods is determined solely by labor costs. A. Marshall writes: "In this case the cost problem is very simple. Things are exchanged for each other in proportion to the labor spent on their production" (Marshall, 1993, p. 211).

Marshall A. (1993). *Printsipy ekonomicheskoi nauki. T. II.* [Principles of Economics. Volume II]. Moscow: Progress, Univers.

Marx K. (1961). Das Kapital. In: Marx K., Engels F. *Soch. 2-e izd.* [Collected Works. Second edition]. Volume 23. Moscow: Gosudarstvennoe izdatel'stvo politicheskoi literatury.

Nekipelov A. (2019a). The crisis in economics – nature and ways to overcome it. *Vestnik Rossiiskoi akademii nauk,* 89(1), 24–37 (in Russian).

Nekipelov A. (2019b). Robinson Crusoe model as the starting point for pure economic theory. *Ekonomika i matematicheskie metody=Economics and Mathematical Methods,* 55(3), 5–20 (in Russian).

Nekipelov A. (2021a). On the theory of credit and interest rate. *Ekonomika i matematicheskie metody=Economics and Mathematical Methods,* 57(2), 5–20 (in Russian).

Nekipelov A. (2021b). From a Robinson Crusoe economy to a pure exchange economy. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 14(6), 33–48 (in Russian).

Ricardo D. (1817). *On the Principles of Political Economy and Taxation*. London: John Murray.

Thünen von J.H. (1895). *Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie*. Berlin: Hempel and Parey.

Torrens R. (1808). *The Economists Refuted and Other Early Economic Writings (1984 ed.)*. New York: Kelley.

Walras L. (1874). *Éléments d'économie politique pure ou théorie de la richesse sociale*. L. Corbaz & cie.

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Imbalances in the Spatial Development of Russia and Its Economic Regions: Choosing an Accurate and Adequate Assessment Method and Levelling-Off Ways

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Abstract. One of the factors determining the structure of the expenditure part of Russia's federal budget is represented by considerable imbalances in the spatial development of the country. The impact of this factor consists in the annual need to allocate funds to non-self-sufficient regions in the form of subsidies, which can be directed, for example, to the development of business in prosperous entities. The aim of the research is to carry out an accurate and adequate quantitative assessment of the degree of such an imbalance over a long retrospective period of time. Practical significance of the assessment is due to the fact that it will allow us to see which decisions of the authorities aggravated the problem under consideration, and therefore to develop recommendations for levelling off these imbalances. When choosing a method to achieve the goal, we decided to use the Herfindahl – Hirschman index that contains

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a modification proposed by Professor S.G. Svetunkov, which eliminates its disadvantage consisting in the dependence of the final value on the number of units included in the set under consideration. The use of this indicator has become the main element of the scientific novelty of the study. Having assessed the degree of heterogeneity of the Russian economic space on the basis of information retrieved from the official website of the Federal State Statistics Service, we use regression analysis to derive an equation describing its impact on the structure of the expenditure part of the federal budget. According to the viewpoint that we share, the key tool consists in smoothing out the imbalances within the economic regions that form the country. Their assessment is carried out in a similar way and is also an element of the scientific novelty of the study. Guided by the results obtained, we identify regions where the elimination of vulnerabilities can reduce the heterogeneity of the economic space of the respective economic regions and Russia as a whole. The indicator tested in the study can be used in the future, for example, to assess the degree of uneven distribution of various resources (material, financial, etc.) on the territory of Russia.

Key words: economic space, assessment of the degree of heterogeneity, Svetunkov index, subsidies, federal budget, economic district.

Introduction

The term "dynamics of the economic development process in the country" is one of the key ones in economics and denotes, in the most general interpretation, the process of improving the state of social production and, consequently, people's welfare. The successful course of such a process depends on the presence and impact of many factors, one of which is the phenomenon of heterogeneity of the economic space. Its essence lies in the fact that each administrative-territorial unit of a country has its own economy, which can be developed better or worse than the national economy. This phenomenon is inherent in all countries: developed, as well as developing ones. For example, Italy, a G7 member, is a developed country whose southern provinces, in particular those forming the Mezzogiorno macroregion, are noticeably inferior in economic indicators to other regions and do not have a high standard of living (Bigoni et al., 2016; Lagravinese, 2015). The United States also is a developed country which has a region with a telling name the "Rust Belt" (Hassink, Kiese, 2021) that is included by the UN in the group of least developed regions. Another example is the Democratic Republic of the Congo, in which, simultaneously with territories characterized exclusively negatively, there are regions (in particular Haut-Katanga) with a relatively developed transport system, industry and research. Besides, there are countries that, due to their area and location on the planet, can be compared to tiny clouds lost in the blue sky, for example, Mauritius, whose tourist-attractive territories (for example, Rivière Noire) noticeably dominate over territories that do not have such a feature (Dirksmeier, 2017).

The German economist I. von Thünen was the first to show interest in this phenomenon. In his work *The Isolated State in Relation to Agriculture and Political Economy* he explained its root cause. It lies in the fact that even in a country with the simplest state structure, i.e. having only one city located in its geographical center, with uniform natural and climatic conditions and with an economy represented by only one industry – agriculture, several types of economic activities are carried out (animal husbandry and crop production, represented by forestry, grain and other types of economy), the effectiveness of which is determined by two factors: land rent and transportation costs (Thünen, 1842). Later, the

Swedish economist G. Myrdal expressed a slightly different version. In his opinion, the heterogeneity of the country's economic space is generated by the uneven distribution of economic activity across its territory (Myrdal, 1957). Combining these views and applying them to a country with a diversified economy existing in the modern world, we can say that its administrative-territorial units that attract labor due to the high efficiency of many types of economic activities on their territory will be more developed.

As for the influence of this phenomenon on the dynamics of economic development in the country, it depends entirely on the degree of its manifestation, according to the view adopted by the academia. Thus, in 2006, I.I. Kuznetsova expressed the opinion that the weak heterogeneity of the economic space contributes to the acceleration of this process (Kuznetsova, 2006). Thirteen years later, candidates of sciences (Economics) M.A. Dugarzhapova, E.A. Zhalsaraeva and E.Ts. Chimitdorzhieva cited this opinion (Dugarzhapova et al., 2019). Also I.I. Kuznetsova and S.G. Pyankova[1] pointed out significant manifestation of the phenomenon under consideration in Russia, which is incompatible with the effective development of the national economy (Kuznetsova, 2006). The essence of this incompatibility was explained by A.G. Granberg, who noted that the allocation of subsidies from the federal budget to many lagging regions due to their lack of self-sufficiency, infringes on the interests of the population and business of prosperous subjects (Granberg, 2011).

In May 2017, Presidential Decree 208 officially recognized the heterogeneity of Russia's economic space as a threat to national economic security. The decree entrusted the authorities with the task of reducing its scale. One of the manifestations of considerable efforts undertaken in this direction was the development and approval of the Spatial Development Strategy of the Russian Federation for the period up to 2025, where for each region of Russia there is a list of economic activities, the development of which can strengthen the region's position in the country's national economy. However, this task seems to be very problematic. The greatest concern is the lack of an opportunity to reliably determine the effectiveness of the actions taken by the authorities and establish which of the previous decisions aggravated this circumstance. This state of affairs is due to the fact that to date economists have not been able to accurately and correctly assess the degree of heterogeneity of Russia's economic space and its enlarged administrative-territorial units, for example, major economic regions, including the dynamics of this heterogeneity over the past decades. The purpose of our study is to carry out such an assessment, which will serve as a basis for developing recommendations for smoothing out heterogeneity.

Materials and methods

Referring to the current research, it is easy to notice that one of the common mistakes when trying to give such an assessment is to implement it using the polar value gap coefficient, which implies the "utilization" of 83 regions of the country. It is noteworthy that such a mistake is made both by young researchers, for example A.K. Gubanova, who speaks about the excessively high degree of heterogeneity of the Russian economic space only on the basis that "GRP of the Altai Republic is 310 times less than GRP of Moscow" (Gubanova, 2019), and by experienced scientists, in particular employees of the World Bank, M. Bussolo, M.E. Davalos, V. Peragine, R. Sundaram, who expressed the opinion that Russia is among the world leaders in terms of the scale of regional

[1] Pyankova S.G. (2015). *Teoriya i metodologiya sistemnogo sotsial'no-ekonomicheskogo razvitiya monoprofil'nykh territorii na osnove institutsional'nogo obnovleniya: avtoref. dis. ... d-ra ekon. nauk: 08.00.0*5 [Theory and methodology of systems socio-economic development of single-industry territories based on institutional renewal: Doctor of Sciences (Economics) dissertation abstract]. In-t ekonomiki UrO RAN. Yekaterinburg.

development imbalances, since "the standard of living in the Sakhalin Oblast is similar to that of Singapore, and in the Republic of Ingushetia it is imperceptibly different from that of Honduras"[2], the correctness of this statement was fully supported by Candidate of Sciences (Economics) V.S. Fedolyak (Fedolyak, 2019). Among the economists who have chosen a more competent approach, first of all I would like to mention E.A. Kolomak. She assessed the degree of heterogeneity of the Russian economic space using the Theil index calculated by the formula:

$$T = \sum_{i=1}^{n} \left(\frac{Y_i}{Y} \ln \frac{Y_i}{Y/n} \right), \quad (1)$$

where:

Y_i – GRP volume of any region;

Y – total GRP volume of Russian regions;

n – number of regions in Russia.

The formula (1) implies consideration of all Russian regions, but E.A. Kolomak took into account only 77 of them. In addition, her work has two other very serious drawbacks. First, it presents the results of calculating the Theil index only for individual time points (1995, 2000, 2005 and 2009) included in the time interval covered by the author (1995–2009). Second, the study was conducted in 2013, and therefore there is no information about the extent of heterogeneity of the economic space Russia for the nearest retrospective (Kolomak, 2013). One of the more relevant is the study conducted by G.Yu. Gagarina and R.O. Bolotov. It should rightfully be recognized as one of the best in this field, because in addition to estimating the degree of heterogeneity of the economic space of Russia as a whole, the authors assess the degree of heterogeneity of the economic space of the federal districts (Gagarina, Bolotov, 2021). However, we have to admit that their research is not ideal either, because the use of the Theil index in this case is not entirely correct due to the dependence of the maximum value of the individual index for each federal district on the number of regions covered. Moreover, this negative feature of the indicator obliges the researchers to assess the degree of heterogeneity of Russia's economic space either for the period beginning in 2014 or for the period ending in 2013, due to the increase in the number of regions in the country in 2014. Failure to comply with such a restriction reduces the accuracy of conclusions about the dynamics of the magnitude of imbalances in the regional development of the Russian economy.

Some researchers, for example, R.F. Turovsky and K.Yu. Dzhavatova, attempted to estimate the degree of heterogeneity of Russia's economic space using the coefficient of variation (Turovsky, Dzhavatova, 2019), calculated as follows:

$$V = \left(\frac{\sigma}{\mu} \right) \times 100, \quad (2)$$

where:

σ – standard deviation;

μ – average GRP volume by regions of Russia.

As follows from the equation (2), the maximum value of the coefficient of variation, unlike the maximum value of the Theil index, does not depend on the number of Russia's regions; however, the final value of the coefficient is quite closely dependent on the average volume of their GRP; this fact also reduces the accuracy and correctness of the obtained assessment of the degree of heterogeneity of Russia's economic space.

Our research is designed to eliminate all of the above gaps in this area of economic science. We will conduct the research in four main stages. At the first stage, it is necessary to assess the degree of heterogeneity of the Russian economic space for the period from 2000 to 2019[3] using a special

[2] Bussolo M., Davalos M.E., Peragine V., Sundaram R. *Toward a New Social Contract: Taking On Distributional Tensions in Europe and Central Asia*. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/30393/9781464813535.pdf

[3] There are no data for 2020 in the sources.

coefficient, the formula for its calculation was developed by Professor S.G. Svetunkov (hereinafter referred to as the Svetunkov index) in 2003[4]:

$$I = \frac{(n\sum_{i=1}^{n} d_i^2)-1}{n-1}, \quad (3)$$

where:

n – number of units forming the set under consideration;

d_i – share of the i-th unit in the indicator of the set under consideration.

According to the equation (3), the coefficient used in the course of our study is a modified version of a well-known indicator called the Herfindahl-Hirschman index. This modification eliminates a significant disadvantage of the specified index, which consists in its high sensitivity to the number of units included in the studied population, which makes it difficult to interpret its values. Thus, the advantages due to which the Svetunkov index can be used accurately to assess the degree of heterogeneity of the economic space of Russia and its economic regions, in addition to a very simple calculation, are as follows:

– it takes into account all territorial entities that are part of Russia or that form a particular economic region;

– it helps to find the final value in a strictly defined numerical range from 0 to 1 and interpret it fairly simply (the closer to 1, the higher the degree of heterogeneity of the economic space);

– independence of the final value from the average GRP volume in the territorial entities that are part of Russia or that form an economic region;

– it helps to take into account GRP of territorial entities that are part of Russia or that form an economic region, not in absolute terms, but in fractions of a unit, which is more correct, since with an increase in GRP of one entity, the size of the share of all other regions in the volume of GRP changes at the aggregated level.

Despite the fact that the Svetunkov index was developed to assess the degree of monopolization of the market, its use in order to assess the extent of heterogeneity of the economic space of Russia is also appropriate, because this space resembles a market that unites 85 firms, among which there are both strong and weak players. The economic space of many economic regions of the country can be characterized similarly.

The information base for assessing the degree of heterogeneity of the Russian economic space is the data presented on the official website of the Federal State Statistics Service5. At the second stage, it is advisable to carry out a regression analysis of the dependence of the Svetunkov index on the indicator, which should be called the level of subsidized orientation of the federal budget:

$$LSF = \left(\frac{s}{Y}\right) \times 100, \quad (4)$$

where:

s – the amount of allocated subsidies to equalize the budgetary provision of RF constituent entities and municipalities;

Y – the total amount of federal budget expenditures.

The results of the analysis will serve as a clear proof of the importance of the authorities solving the task of smoothing the heterogeneity of Russia's economic space.

At the third stage of the study, the Svetunkov index will be used to assess the degree of heterogeneity of the economic space of all economic districts of Russia, which are understood as large economic regions, with the exception of the Kaliningrad economic region. It consists of only one subject – the Kaliningrad Oblast, which

[4] Svetunkov S.G. (2003). *Metody marketingovykh issledovanii: ucheb. posob.* [Marketing Research Methods: Textbook]. Saint Petersburg: DNK.

[5] National Accounts. Official website of the Federal State Statistics Service. Available at: https://rosstat.gov.ru/accounts (accessed: January 24, 2022).

makes it meaningless to apply such a procedure to it and impossible to apply the formula (3) to it. At the fourth stage, recommendations will be developed, which will probably help to smooth out the heterogeneity of the economic space of multi-subject Russian economic districts and the country as a whole, and therefore, fulfill the task set for the authorities by Presidential Decree 208, dated May 13, 2017.

Results and discussion

To assess the degree of heterogeneity of the Russian economic space using the formula (3), it is necessary, first of all, to determine what contribution each region makes to the total GRP. The sample results of these calculations are presented in *Table 1*.

A detailed calculation of the Svetunkov index is given in *Table 2*.

In order for the Svetunkov index to be reliably recognized as the most accurate and correct, its values (see Tab. 2) should be compared with the values of all indicators used to assess the degree of heterogeneity of Russia's economic space *(Tab. 3)*, including a correlation analysis of the relationship between them.

The results of the correlation analysis of the relationship between the indicators presented in Table 3 are reflected in *Table 4*.

The data in Tables 3 and 4 indicate that the dynamics of the Svetunkov index are almost completely synchronous with the dynamics of the Theil index and the coefficient of variation; and the dynamics of the polar value gap coefficient are markedly different from the dynamics of all three of these indicators. But if the polar value gap

Table 1. Share of some regions* in the total GRP of Russia in 2000–2019

Year	Region												
	1	2	3	4	5	6	7	8	9	10	11	12	13
2000	0.2014	0.0702	0.0373	0.0327	0.0324	0.0307	0.0271	0.0252	0.0244	0.0238	0.0216	0.0210	0.0204
2001	0.1911	0.0694	0.0334	0.0351	0.0298	0.0328	0.0279	0.0233	0.0251	0.0250	0.0233	0.0199	0.0257
2002	0.2022	0.0632	0.0264	0.0385	0.0287	0.0358	0.0269	0.0215	0.0236	0.0249	0.0204	0.0197	0.0300
2003	0.2037	0.0668	0.0254	0.0381	0.0284	0.0384	0.0265	0.0226	0.0239	0.0231	0.0195	0.0205	0.0264
2004	0.2043	0.0685	0.0262	0.0388	0.0280	0.0383	0.0261	0.0223	0.0234	0.0225	0.0191	0.0209	0.0255
2005	0.2293	0.0776	0.0244	0.0370	0.0268	0.0393	0.0264	0.0212	0.0223	0.0207	0.0181	0.0194	0.0245
2006	0.2339	0.0709	0.0260	0.0367	0.0269	0.0415	0.0291	0.0225	0.0217	0.0215	0.0171	0.0199	0.0243
2007	0.2395	0.0618	0.0263	0.0400	0.0271	0.0463	0.0294	0.0211	0.0209	0.0232	0.0171	0.0206	0.0213
2008	0.2433	0.0571	0.0218	0.0422	0.0273	0.0485	0.0272	0.0219	0.0206	0.0237	0.0179	0.0196	0.0212
2009	0.2227	0.0556	0.0234	0.0461	0.0277	0.0475	0.0258	0.0202	0.0182	0.0269	0.0169	0.0174	0.0203
2010	0.2222	0.0523	0.0280	0.0451	0.0266	0.0486	0.0278	0.0201	0.0185	0.0273	0.0165	0.0173	0.0208
2011	0.2192	0.0538	0.0258	0.0461	0.0288	0.0480	0.0284	0.0207	0.0184	0.0274	0.0185	0.0171	0.0213
2012	0.2137	0.0542	0.0237	0.0457	0.0288	0.0472	0.0297	0.0230	0.0188	0.0292	0.0172	0.0169	0.0239
2013	0.2184	0.0504	0.0232	0.0460	0.0287	0.0471	0.0290	0.0215	0.0194	0.0307	0.0163	0.0163	0.0254
2014	0.2159	0.0483	0.0238	0.0450	0.0281	0.0463	0.0280	0.0213	0.0194	0.0302	0.0165	0.0168	0.0276
2015	0.2056	0.0480	0.0254	0.0515	0.0284	0.0484	0.0277	0.0200	0.0192	0.0294	0.0162	0.0184	0.0273
2016	0.2040	0.0422	0.0246	0.0553	0.0278	0.0568	0.0285	0.0192	0.0184	0.0305	0.0155	0.0180	0.0274
2017	0.2074	0.0446	0.0248	0.0537	0.0284	0.0538	0.0283	0.0187	0.0182	0.0304	0.0156	0.0178	0.0308
2018	0.2082	0.0500	0.0263	0.0530	0.0291	0.0515	0.0269	0.0193	0.0180	0.0277	0.0158	0.0169	0.0338
2019	0.2075	0.0481	0.0284	0.0540	0.0295	0.0541	0.0267	0.0191	0.0178	0.0271	0.0158	0.0163	0.0327

* Due to the limited scope of this article, 13 subjects are represented, the total GRP of which is more than 55% of the all-Russian GRP.
1 – Moscow; 2 – Khanty-Mansi Autonomous Okrug – Yugra; 3 – Krasnoyarsk Krai; 4 – Saint Petersburg; 5 – Republic of Tatarstan; 6 – Moscow Oblast 7 – Sverdlovsk Oblast; 8 – Republic of Bashkortostan; 9 – Samara Oblast; 10 – Krasnodar Territory; 11 – Perm Krai; 12 – Chelyabinsk Oblast; 13 – Yamalo-Nenets Autonomous Okrug.
Compiled according to Federal State Statistics Service data.

Table 2. Assessment of the degree of heterogeneity of Russia's economic space for 2000–2019

Year	n	$\sum_{i=1}^{n} d_i^2$	$n\sum_{i=1}^{n} d_i^2$	$\left(n\sum_{i=1}^{n} d_i^2\right) - 1$	n – 1	I_{RF}
2000	83	0.0578	4.7976	3.7976	82	0.0463
2001		0.0539	4.4751	3.4751		0.0424
2002		0.0573	4.7539	3.7539		0.0458
2003		0.0582	4.8276	3.8276		0.0467
2004		0.0587	4.8725	3.8725		0.0472
2005		0.0700	5.8107	4.8107		0.0587
2006		0.0714	5.9279	4.9279		0.0601
2007		0.0734	6.0894	5.0894		0.0621
2008		0.0748	6.2064	5.2064		0.0635
2009		0.0654	5.4314	4.4314		0.0540
2010		0.0652	5.4156	4.4156		0.0538
2011		0.0642	5.3285	4.3285		0.0528
2012		0.0620	5.1453	4.1453		0.0506
2013		0.0636	5.2823	4.2823		0.0522
2014	85	0.0623	5.2927	4.2927	84	0.0511
2015		0.0588	4.9941	3.9941		0.0475
2016		0.0587	4.9885	3.9885		0.0475
2017		0.0599	5.0955	4.0955		0.0488
2018		0.0605	5.1445	4.1445		0.0493
2019		0.0603	5.1293	4.1293		0.0492

Source: own calculation.

Table 3. Svetunkov index and other indicators used to assess the degree of heterogeneity of the Russian economic space

Year	Svetunkov index	Polar value gap coefficient	Theil index	Coefficient of variation
2000	0.0463	442.63	0.7554	194.87
2001	0.0424	380.15	0.7224	186.42
2002	0.0458	493.42	0.7385	193.75
2003	0.0467	460.04	0.7478	195.64
2004	0.0472	459.43	0.7617	196.79
2005	0.0587	557.35	0.8554	219.33
2006	0.0601	582.30	0.8616	221.99
2007	0.0621	443.21	0.8699	225.60
2008	0.0635	441.08	0.8740	228.17
2009	0.0540	376.03	0.7952	210.51
2010	0.0538	420.28	0.7993	210.13
2011	0.0528	377.12	0.7973	208.05
2012	0.0506	350.37	0.7812	203.60
2013	0.0522	354.66	0.7890	206.94
2014	0.0511	423.88	0.7905	207.19
2015	0.0475	320.66	0.7712	199.85
2016	0.0475	318.78	0.7720	199.71
2017	0.0488	341.59	0.7854	202.37
2018	0.0493	347.29	0.7982	203.58
2019	0.0492	347.76	0.7949	203.21

Source: own calculation.

Table 4. Indicators used to assess the degree of heterogeneity of the Russian economic space: correlation matrix

	Svetunkov index	Polar value gap coefficient	Theil index	Coefficient of variation
Svetunkov index	1	0.4337	0.9700***	0.9939***
Polar value gap coefficient		1	0.3852	0.3793
Theil index			1	0.9824***
Coefficient of variation				1

Note: *** – significance at 1% level (the absence of asterisks means that this correlation coefficient is not statistically significant).
Source: own calculation.

coefficient has a serious disadvantage, then the disadvantages of the Theil index and the coefficient of variation are not such. In addition, as can be seen from Table 4, the Svetunkov index is more closely related to the coefficient of variation, the disadvantage of which is less significant than the disadvantage of the Theil index.

All of the above indicates that the assessment of the degree of heterogeneity of the Russian economic space, presented in Table 2, is as accurate as possible and extremely correct. It allows us, first, to see that the economic recovery in the 2000s was experienced not by the whole country, but only by its individual subjects, as evidenced by the dynamically growing value of the Svetunkov index during 2000–2008; second, it helps to establish which actions of the authorities aggravated the problem under consideration. Thus, a sharp surge in the index in 2005 may be a consequence of the completion of the policy of centralization of budget revenues at the federal level (Kulikov, Kulikov, 2017), and its growth in 2017–2018 is probably associated with an increase in the share of corporate income tax and the share of excise taxes on petroleum products credited to the federal budget (Yushkov et al., 2017).

In addition, Table 2 serves as a source of information necessary for conducting a regression analysis regarding the dependence of the level of subsidized orientation of the federal budget on the degree of heterogeneity of Russia's economic space. Its results will show that addressing the problem of leveling the spatial development of the country is very important for the authorities. *Table 5* presents a complete information base upon which an analysis will be carried out, namely, the values of the first of the parameters just listed, calculated by the formula (4) are provided and the values of the Svetunkov index are duplicated.

Table 5. Svetunkov index and the level of orientation of the federal budget toward subsidies

Year	$I_{РФ}$	LSF, %	Year	I_{RF}	LSF, %
2000	0.0463	9.83	2011	0.0528	3.63
2001	0.0424	17.40	2012	0.0506	3.08
2002	0.0458	14.34	2013	0.0522	3.14
2003	0.0467	14.74	2014	0.0511	2.97
2004	0.0472	13.14	2015	0.0475	3.12
2005	0.0587	10.20	2016	0.0475	3.13
2006	0.0601	9.67	2017	0.0488	3.74
2007	0.0621	9.90	2018	0.0493	3.86
2008	0.0635	5.16	2019	0.0492	3.71
2009	0.0540	5.99	2020	-	3.15
2010	0.0538	5.17			

Source: own calculation.

The data in Table 5 indicate that there is a relationship between the Svetunkov index for the i-th year and the level of subsidized orientation of the federal budget for the i + 1 year; this relationship emerged in 2007–2008. In other words, an increase in the Svetunkov index based on the results of a given year by x units leads to an increase in the LSF index by y percentage points in the following year. The regression analysis, which must be carried out taking into account the fact that the level of subsidized orientation of the federal budget cannot take negative values and will be zero if Russia's economic space is absolutely homogenous, will confirm or refute the existence of such a relationship *(Fig. 1)*.

Figure 1 shows that the relationship between the two parameters under consideration really exists. The only case when the actual level of subsidized orientation of the federal budget, recorded at the end of 2010, deviated significantly from what was expected, can be explained by the desire of the authorities to support the regions affected by the crisis. The equation describing this dependence is as follows:

$$y = 1435.6843x^2 - 3.0206x, \quad (5)$$

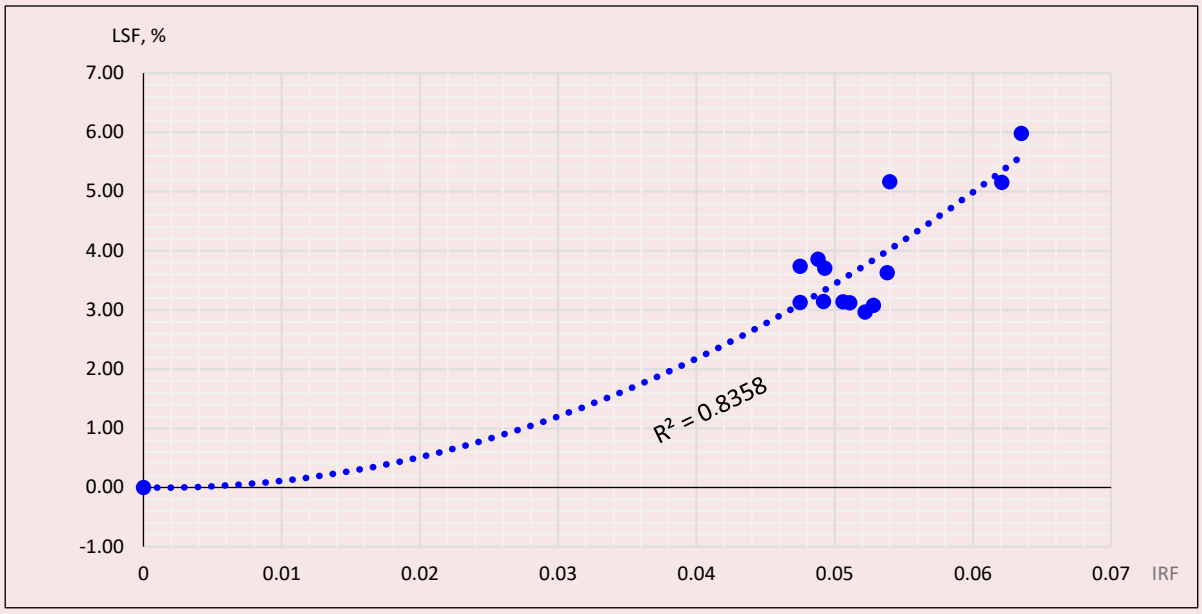
where:

y – level of subsidized orientation of the federal budget in the i-th year, %;

x – value of the Svetunkov index in the i – 1 year.

The equation (5) shows that with the value of the Svetunkov index equal to 0.0424 points, the possibility of achieving which is shown in Tables 2, 3 and 5, the level of subsidized orientation of the federal budget for the year following the year of the statement of such a fact will be equal, with a probability of 90%, from 2.12 to 2.78%. That is, even under an unfavorable scenario, the volume of subsidies for equalizing the budgetary provision of RF constituent entities and municipalities will, in this case, have a noticeably smaller share in the total expenditure of the federal budget,

Figure 1. Results of the regression analysis of the dependence of the level of subsidized orientation of the federal budget on the Svetunkov index



Source: own compilation.

which explains that for the Russian authorities it is important to fulfill the task of reducing the degree of heterogeneity of the country's economic space.

When choosing the tools for solving this problem, one important point must be taken into account: Russian regions form, in addition to the country as a whole, various enlarged administrative-territorial units, for example, economic districts. The main principle of the formation of such units is the similar economic specialization of their constituent entities, which creates favorable conditions for the homogeneity of their economic space. Table 1 contains 13 regions that form seven multi-subject economic districts of Russia. In the majority of these regions, the condition of economic space is far from homogeneous. Smoothing out the disproportions in the spatial development of Russia's economic regions by taking measures aimed at supporting the relatively weak entities is a key tool for fulfilling the task of reducing the degree of heterogeneity of the country's spatial development; the task was set by the May presidential decree signed a year before Vladimir Putin's fourth inauguration. To determine the right directions for the implementation of such a tool, it is necessary to calculate the Svetunkov index for 2000–2019 for all 11 multi-subject economic districts of Russia *(Tab. 6)*.

Table 6. The degree of heterogeneity of the economic space of multi-subject economic districts of Russia in 2000–2019*

Year	I_{CED}	I_{CChED}	I_{ESED}	I_{FEED}	I_{NED}	I_{NCED}	I_{NWED}	I_{VED}	I_{UED}	I_{VVED}	I_{WSED}
2000	0.4686	0.0175	0.3293	0.0572	0.0367	0.1763	0.3280	0.1080	0.0376	0.1975	0.1714
2001	0.4366	0.0131	0.3165	0.0509	0.0373	0.1703	0.3345	0.0998	0.0392	0.2290	0.1485
2002	0.4457	0.0181	0.2704	0.0504	0.0321	0.1686	0.3633	0.0950	0.0390	0.2138	0.1228
2003	0.4446	0.0197	0.2712	0.0475	0.0328	0.1574	0.3548	0.0971	0.0403	0.2148	0.1301
2004	0.4604	0.0227	0.2885	0.0482	0.0354	0.1583	0.3555	0.1028	0.0413	0.1964	0.1159
2005	0.5052	0.0213	0.2854	0.0498	0.0342	0.1544	0.3550	0.1041	0.0412	0.2193	0.1409
2006	0.5061	0.0215	0.2924	0.0459	0.0288	0.1537	0.3506	0.1059	0.0442	0.2118	0.1323
2007	0.5010	0.0215	0.2988	0.0497	0.0221	0.1602	0.3961	0.1037	0.0450	0.2068	0.1195
2008	0.4962	0.0259	0.2780	0.0500	0.0302	0.1582	0.4026	0.0983	0.0419	0.2070	0.1099
2009	0.4643	0.0235	0.2665	0.0507	0.0219	0.1557	0.3880	0.0942	0.0382	0.1976	0.1050
2010	0.4621	0.0314	0.3015	0.0567	0.0234	0.1623	0.3938	0.0941	0.0435	0.2049	0.0963
2011	0.4620	0.0398	0.2922	0.0576	0.0251	0.1640	0.4053	0.1028	0.0444	0.2093	0.1002
2012	0.4523	0.0425	0.2663	0.0570	0.0293	0.1675	0.3939	0.1000	0.0479	0.2001	0.1014
2013	0.4571	0.0385	0.2618	0.0588	0.0244	0.1665	0.4128	0.0949	0.0452	0.2080	0.0912
2014	0.4576	0.0353	0.2611	0.0628	0.0215	0.1533	0.4113	0.0925	0.0445	0.2002	0.0885
2015	0.4390	0.0353	0.2770	0.0597	0.0200	0.1485	0.4377	0.0951	0.0438	0.1997	0.0890
2016	0.4160	0.0338	0.2638	0.0568	0.0172	0.1429	0.4614	0.0919	0.0474	0.2098	0.0807
2017	0.4274	0.0361	0.2631	0.0573	0.0173	0.1457	0.4624	0.0948	0.0481	0.2180	0.0854
2018	0.4395	0.0338	0.2730	0.0653	0.0168	0.1403	0.4649	0.0993	0.0446	0.2231	0.0991
2019	0.4320	0.0363	0.2856	0.0595	0.0161	0.1352	0.4658	0.1002	0.0440	0.2276	0.1002

* The results of the correlation analysis of the relationship between the values of the Svetunkov index and the polar value gap coefficient, the Theil index and the coefficient of variation for all multi-subject economic districts presented in the Table are similar to the results of the correlation analysis conducted with respect to the values of these indicators for Russia (see Tab. 4), which confirms the maximum accuracy and correctness of the Svetunkov index.

Economic districts: CED – Central, CChED – Central Chernozem, ESED – East Siberian, FEED – Far Eastern, NED – Northern, NCED – North Caucasus, NWED – Northwestern, VED – Volga, UED – Ural, VVED – Volga-Vyatka, WSED – West Siberian.

Source: own calculation.

The calculation of the indicators presented in Table 6 for any economic district was based on the shares contributed by each of its constituent region to its gross district product, which should be understood as the total GRP of the entities forming the economic district. The table clearly reflects the picture that developed in 2000–2019 in all multi-subject economic districts of the country. Only two of them (Central Chernozem and Northern) are characterized by a degree of heterogeneity of the economic space, noticeably inferior to the all-Russian indicator. Since the Svetunkov index calculated in relation to them has no upward trend, they are not of interest in the context of this study. The remaining nine economic districts need to be considered in detail.

The economic space of the Central Economic District is one of the most heterogeneous. This is due to the presence of the Moscow agglomeration in its composition, which attracts labor resources from all over the country, and therefore is a given property of this area. But at the same time, smoothing out the imbalances in its spatial development is a key way to reduce the degree of heterogeneity of the economic space of Russia *(Tab. 7)*.

According to Table 7, the Central Economic District is the only economic district where the dynamics of the Svetunkov index in 2000–2019 had a direct and strong impact on the dynamics of the Svetunkov index of the country as a whole. This state of affairs indicates the need for the authorities to pay increased attention to this area as part of the solution of their task. Considering the contribution of all the regions forming it to the volume of its gross district product during the studied time period, it is easy to notice that the Ivanovo, Kostroma and Oryol oblasts require increased support, since the share of each of which in gross district product of this economic district in the near retrospect was less than 1%, while showing a downward trend.

The value and dynamics of the Svetunkov index in the North Caucasus Economic Disrtict are also of interest. In 2000–2019, its index showed a decline, and in the coming years, with a high degree of probability, this trend may continue *(Fig. 2)*.

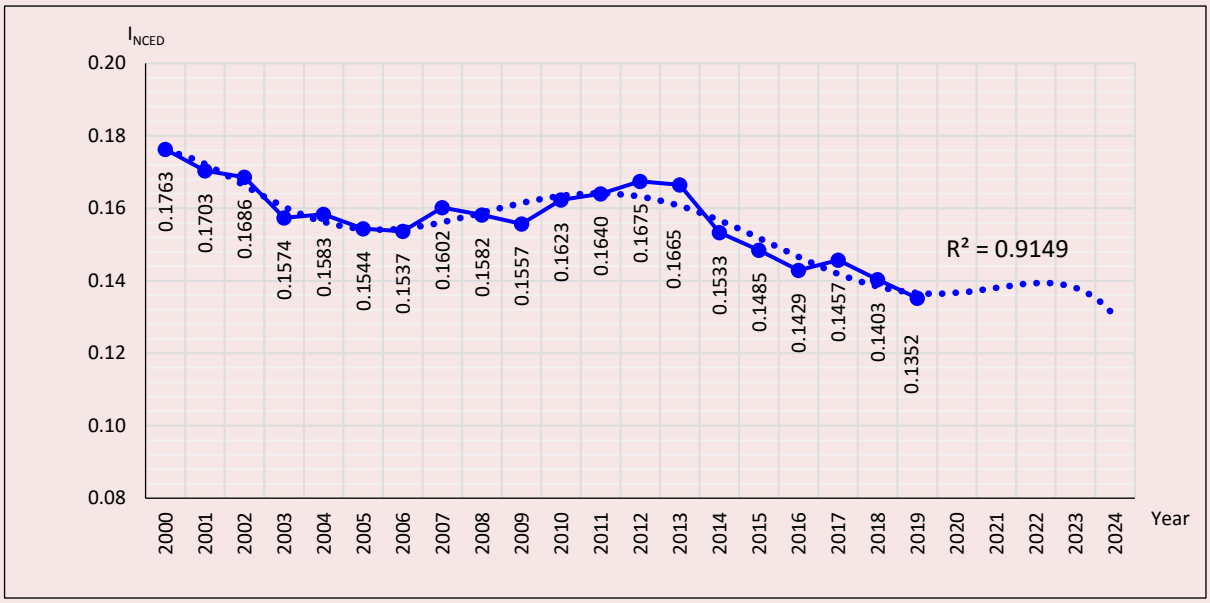
According to the forecast presented in Figure 2, the value of the Svetunkov index for the North Caucasus Economic District will no longer exceed 0.14 points, and in 2024 it will update the "historical minimum" reached in 2019. However, the authorities have an opportunity to accelerate this trend. The process of its implementation implies a tough fight against the shadow economy in a number of regions that are part of the economic district, in particular in the subjects forming the federal

Table 7. Degree of heterogeneity of the economic space of Russia and its economic districts: results of correlation analysis of the relationship

Economic district	Correlation coefficient between I_{RF} and I_{ED}	Economic district	Correlation coefficient between I_{RF} and I_{ED}
Central	0.8388***	Northwestern	-0.0117
Central Chernozem	0.0082	Volga	0.2561
East Siberian	-0.0210	Ural	0.1686
Far Eastern	-0.3108	Volga-Vyatka	-0.1521
Northern	-0.0889	West Siberian	-0.0352
North Caucasus	-0.0598		

Notes: a) the I_{ED} indicator means the Svetunkov index for the corresponding economic district; b) *** – significance at 1% level; c) the absence of asterisks means that this correlation coefficient is not statistically significant.
Compiled with the use of data from Table 2 and Table 6.

Figure 2. The degree of heterogeneity of the economic space of the North Caucasus Economic District



Source: own compilation.

district of the same name, in each of which, with the exception of Stavropol Krai, the level of the shadow economy in 2015 exceeded 50% of GDP (Balog, 2017), and the situation has not improved so far. The negative side of this state of affairs is that the consolidated budgets of these regions do not receive the tax revenues in the fullest amount (Berkovich, Shurygin, 2017; Alimuradov et al., 2021), and therefore, they are limited in the implementation of such an instrument to stimulate economic growth as an increase in budget expenditures.

A universal way to reduce the degree of heterogeneity of economic space in both Siberian economic districts is the implementation of an investment project for the construction of a railway that will connect the East Siberian Republic of Tyva with the West Siberian Republic of Altai. It will satisfy the need of these subjects for new jobs, the acute shortage of which often encourages residents to commit various illegal acts, and will eliminate one of the key problems of the Republic of Tyva associated with its lack of railway communication with other regions of Russia, which does not allow it to effectively use the rich mineral resource potential represented by fresh water deposits, mineral groundwater, solid minerals (gold, polymetallic ores, asbestos, etc.).

The huge unevenness of the economic space of the Northwestern Economic District is due to the fact that it includes the following regions: a) Saint Petersburg, whose share of GRP in the volume of gross district product in 2000–2006 exceeded 65%, in 2007–2015 it overcame the threshold of 70%, and in 2016–2019 it was slightly more than 75%; b) the Leningrad Oblast, characterized by relatively moderate economic development; c) the Novgorod and Pskov oblasts, which are depressed regions of Russia. Due attention on the part of the authorities to the last two oblasts will probably reduce the value of the Svetunkov index for this economic district, and therefore for the country as a whole. In the

Far Eastern Economic district, such attention is required, first of all, by the Jewish Autonomous Oblast and Chukotka Autonomous Okrug, in the Volga Economic District – the Republic of Kalmykia, the Penza and Ulyanovsk oblasts, in the Volga-Vyatka Economic District – the Republic of Mari El and the Republic of Mordovia, in the Ural Economic District – the Kurgan Oblast and the Udmurt Republic.

The degree of heterogeneity of Russia's economic space (see Tab. 2) and many of its multi-subject economic districts (see Tab. 6) increased due to the policy of concentrating budget revenues at the federal level; thus, one of the key measures to support all of the above entities may be the transfer of certain taxes to their budgets. We are talking about VAT and part of the corporate income tax currently credited to the federal budget. The introduction of appropriate amendments to the Tax and Budget codes will allow 14 entities to increase budget expenditures; this will help to increase their GRP. The effectiveness of such support is easily proved by the example of constituent entities of the Central and Ural economic districts *(Tab. 8, 9)*.

The results of calculation of the potential GRP volumes of these entities in 2019, i.e. the volumes that these regions would probably have reached by the end of 2019 if they were provided with support during the specified year, are shown in Table 9.

Table 8. Dependence of the GRP volume of some regions in need of support on the volume of expenditure of their budgets

Region	Equation describing the dependence	R^2
Ivanovo Oblast	$y = 10^{-10}x^2 + 0.0008x + 20548.4065$	0.9403
Kostroma Oblast	$y = 3\times10^{-11}x^2 + 0.0053x + 5740.4499$	0.9615
Oryol Oblast	$y = 2\times10^{-10}x^2 + 0{,}0009x + 34783.7296$	0.9746
Kurgan Oblast	$y = 0.0051x + 5814.5667$	0.9808
Udmurt Republic	$y = 7\times10^{-11} + 0.0027x + 53026.1594$	0.9774
Source: own calculation based on information on the volume of expenditures of regional budgets and the volume of their GRP for 2000–2019.		

Table 9. Budget expenditures and GRP volume of some regions of Russia in 2019: actual and potential values

Indicator	Ivanovo Oblast	Kostroma Oblast	Oryol Oblast	Kurgan Oblast	Udmurt Republic
Actual amount of budget expenditures, thousand rubles	41945693.8	33440857.5	35207250.8	47832043.2	82948883.0
Actual volume of GRP, million rubles	254968.9	203821.4	265672.7	233468.6	721345.1
Paid to the federal budget, thousand rubles:					
- VAT	7507743	9853240	5765626	8930007	45108435
- corporate income tax	553731	2915129	586820	390475	3108472
Potential budget expenditures, thousand rubles (p. 2 + p. 5 + p. 6)	50007167.8	46209226.5	41559696.8	57152525.2	131165790.0
Potential volume of GRP, million rubles	357485.5 (312622.9; 402348.1)*	324410.1 (283817.1; 365003.1)	355540.2 (325375.4; 385704.9)	294785.3 (279442.2; 310128.3)	1600020.8 (1498197.7; 1701843.9)
* 95% confidence intervals are given in parentheses. Source: own calculation.					

They allow us to determine what the degree of heterogeneity of the economic space of the Central and Ural economic districts would be in 2019 if the recommended measure were to take effect during this year. So, according to a realistic forecast, the value of the Svetunkov index for them would be 0.4213 and 0.03 points, respectively, which is 0.0107 and 0.014 points lower than the actual value, and with a favorable combination of circumstances, i.e. if all the regions considered in Table 9 reached the GRP volume equal to the upper limit of the confidence interval, the value would drop to 0.4175 and 0.0293 points respectively. This proves the effectiveness of the proposed recommendation. As for the losses of the federal budget that will occur as a result of the authorities following such a recommendation, the way to compensate them is the possibility of increasing the external state debt, advocated by Academician A.G. Aganbegyan. He emphasizes that "Russia can borrow 30–40 billion US dollars annually from China, Saudi Arabia and some other countries" (Aganbegyan, 2019).

Conclusion

In the course of the study, we considered methods used by the academia to assess the degree of heterogeneity of Russia's economic space, including their shortcomings. We propose to carry out such an assessment, taking into account the shortcomings, using the Svetunkov index, a modified version of the Herfindahl – Hirschman index, named after Professor S.G. Svetunkov who developed this modification. Using the Svetunkov index to assess the degree of heterogeneity of the economic space of Russia and all its multi-subject economic districts (economic regions consisting of more than one subject), and having carried out a correlation analysis of the relationship between the values of this index and such popular indicators as the polar value gap coefficient, the Theil index and the coefficient of variation, we have established that the Theil index and the coefficient of variation are closely related to the Svetunkov index. Since their shortcomings are not serious, and the Svetunkov index is devoid of these shortcomings, it was the Svetunkov index that was recognized as the most accurate and correct one.

In practice, the Svetunkov index will allow us to reliably determine which actions of the authorities can have a significant impact, both positive and negative, on the degree of heterogeneity of the economic space of Russia and its economic districts. The results of the study show that this heterogeneity was reinforced by the policy of concentrating budget revenues at the federal level. Therefore, our recommendations to reduce heterogeneity are related to the transfer of VAT and the part of the corporate income tax credited to the federal budget to the budgets of some entities, namely those that make a small contribution to the volume of the gross district product of the corresponding economic district. The effectiveness of such recommendations is proved by the example of constituent entities of the Central and Ural economic districts.

References

Aganbegyan A.G. (2019). On urgent measures to resume socio-economic growth. *Problemy prognozirovaniya=Studies on Russian Economic Development,* 1(172), 3–15 (in Russian).

Alimuradov M.K., Midov A.Z., Odintsov S.V. (2021). Strategic analysis of highly subsidized regions' budget efficiency. *Ekonomicheskoe vozrozhdenie Rossii=Economic Revival of Russia,* 2(68), 113–129. DOI: 10.37930/1990-9780-2021-2-68-113-129 (in Russian).

Balog M.M. (2017). Assessing the shadow economy in the regions of Russia. *Vestnik Pskovskogo gosudarstvennogo universiteta. Seriya: Ekonomika. Pravo. Upravlenie,* 6, 49–56 (in Russian).

Berkovich M.I., Shurygin A.A. (2021). Shadow economy in Russia: Economic and statistical assessment of its scale and the ways of its reduction in the country and regions. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 14(5), 70–84. DOI: 10.15838/esc.2021.5.77.4 (In Russian).

Bigoni M., Bortolotti S., Casari M., Gambetta D., Pancotto E. (2016). Amoral familism, social capital, or trust? The behavioural foundations of the Italian North-South divide. *The Economic Journal*, 126(594), 1318–1341. DOI: 10.1111/ecoj.12292

Dirksmeier P. (2017). Regional development in a postcolonial island state in the Global South: An empirical analysis of the Republic of Mauritius using census and survey data. *Journal of Economic Geography*, 61(3–4), 119–134. Available at: https://doi.org/10.1515/zfw-2017-0012

Dugarzhapova M.A., Zhalsaraeva E.A., Chimitdorzhieva E.Ts. (2019). Analyzing uneven indicators of the dynamics of economic development of Russian regions using statistical methods. *Gorizonty ekonomiki,* 5(51), 71–78 (in Russian).

Fedolyak V.S. (2019). Interregional disproportions of socio-economic development as seen through the prism of basic theories of regional economy. *Izvestiya Saratovskogo universiteta. Novaya seriya. Seriya: Ekonomika. Upravlenie. Pravo=Izvestiya of Saratov University. New Series. Series Economics. Management. Law*, 19(1), 16–20. DOI: 10.18500/1994-2540-2019-19-1-16-20 (in Russian).

Gagarina G.Yu., Bolotov R.O. (2021). Valuation of inequality in the Russian Federation and its decomposition using the Theil index. *Federalizm=Federalism,* 26(4)(104), 20–34. DOI: 10.21686/2073-1051-2021-4-20-34 (in Russian).

Granberg A.G. (2011). Disintegration of Russia: Is it possible?. *Region: Ekonomika i Sotsiologiya=Region: Economics and Sociology* 2, 9–18 (in Russian).

Gubanova A.K. (2019). Problems of economic inequality of Russia's regions. *Vestnik nauki,* 4(8)(17), 9–14 (in Russian).

Hassink R., Kiese M. (2021). Solving the restructuring problems of (former) old industrial regions with smart specialization? Conceptual thoughts and evidence from the Ruhr. *Review of Regional Research*, 41(3), 131–155. DOI: 10.1007/s10037-021-00157-8

Kolomak E.A. (2013). Uneven Spatial development in Russia: Explanations of new economic geography. *Voprosy ekonomiki,* 2, 132–150. DOI: 10.32609/0042-8736-2013-2-132-150 (in Russian).

Kulikov N.I., Kulikov A.N. (2017). The difference of socio-economic development of the Russian regions: Evaluation and conditions for alignment. *Regional'naya ekonomika: teoriya i praktika=Regional Economics: Theory and Practice,* 15(12), 2190–2209. DOI: 10.24891/re.15.12.2190 (in Russian).

Kuznetsova I.I. (2006). The problem of territorial differentiation in the regional economy and the possibilities of its research at the urban level. *Trudy Instituta sistemnogo analiza Rossiiskoi akademii nauk*, 22, 261–268 (in Russian).

Lagravinese R. (2015). Economic crisis and rising gaps North-South: Evidence from the Italian regions. *Cambridge Journal of Regions, Economy and Society*, 8(2), 331–342. DOI: 10.1093/cjres/rsv006

Myrdal G. (1957). *Economic Theory and Under-developed Regions*. London: Gerald Duckworth & Co Ltd.

Thünen I. von (1842). *Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie*. Rostock.

Turovskii R.F., Dzhavatova K.Yu. (2019). Regional disparity in Russia: Can centralization become a remedy? *Politicheskaya nauka=Political Science,* 2, 48–73. DOI: 10.31249/poln/2019.02.03 (in Russian).

Yushkov A.O., Oding N.Yu., Savul'kin L.I. (2017). The trajectories of donor regions in Russia. *Voprosy ekonomiki,* 9, 63–82. DOI: 10.32609/0042-8736-2017-9-63-82 (in Russian).

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Sales Markets for the Goods of the Regions of the Northwest of Russia: Quantitative Assessment

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Abstract. Promoting the spatial factor in the development of the national economy requires the implementation of state policy on the transformation of interregional value chains. This task is specific due to the vast spaces and the high degree of polarization of the country's economic sphere. The purpose of the study is to conduct a quantitative assessment of the sales markets of regions within the Northwest of Russia, taking into account the industry and territorial specifics of their production. The analysis reveals that, in general, in the Northwest of Russia, national and foreign markets prevail over local and macroregional, and interterritorial interaction remains largely fragmented. However, the presence of specialization industries in the regions, combined with relatively stable external demand, can contribute to the development of interregional value chains. It is noted that in Russia, the tasks of optimal zoning and development of value chains are of crucial importance, and it is reflected in the program documents. It is shown that the macroregion uses the potential of internal cooperation only to a small extent, being to a greater extent an array of multidirectionally oriented market zones with Saint Petersburg as its core and a number of value chains, often export-oriented. It is concluded that the nature of supplies to foreign markets is determined not only by the export specialization of the territory, but also by the diversification of the economic system. The findings of our research can be used to develop strategic documents for spatial development, programs for the development of economic sectors and industrial clusters. In the future, we will continue the work on searching for new growth points and the most promising areas of

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structural changes for the transition of regions and the country as a whole to sustainable socio-economic development.

Key words: macroregion, Northwest of Russia, value chains, interregional trade, economic integration.

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Introduction

The agenda related to the transformation of intra-country value chains (VCs) is becoming more relevant due to the increasing regionalization of global trade. A tangible impetus to the activation of this direction was the disruption of value chains at the beginning of the coronavirus pandemic, when the shutdown of production and the closure of the borders of major countries led to the collapse of the usual economic ties and aggravated the relations between traditional partners. Thus, due to a tenfold increase in the cost of sea freight transport services in 2020–2021, competitive advantage was gained by suppliers offering products in geographical proximity to the buyer[1].

The decline in the stability of trade relations has forced governments to overestimate the acceptable level of openness of their own economies. As V.A. Mau points out, the governments of major economies "clearly have a reduced willingness to pay for market efficiency with economic (and, consequently, political) security" (Mau, 2021).

The catalyst for the aggravation was the growing political rivalry between the United States and China, which quickly turned from trade negotiations to conflicts on the "economic front". At the same time, the steps taken by the largest players in the world markets do not make the situation more stable. So, in 2020, a series of mutual conflicts between the United States and China resulted in the introduction of a number of mutual duties. One of the consequences of the tension on world markets was the official statement on the reorientation of the Chinese economy to the domestic market (Zhu, 2020). A new model of China's economic development will focus on increasing consumption in the domestic market while simultaneously focusing on attracting foreign investment and stabilizing international trade. The main idea behind the development of the 14th five-year socio-economic development plan is the concept of "double circulation": internal and external. At the same time, internal circulation is declared as the main one and implies the development of national supply and demand production chains. In the long term this strategy is aimed at eliminating the dependence of the Chinese economy on foreign markets and technologies[2].

For the Russian economy, the development of production chains in the regions through the use of their cooperative potential is also a vital task. When relying on the export of raw materials and semi-finished products and the import of final products, an important point is the loss of potential income from products that could have been produced on the Russian territory. As a result, the domestic market is developing more slowly; while in the latest market research conducted by Rosstat, business representatives note that the main (after the "uncertainty of the economic situation" sharply increased at the end of 2021) limiting factor in the growth of production activity is the very lack

[1] Khabibullin D.Z. The port crisis provoked economic redistribution in the world. Available at: https://www.ng.ru/kartblansh/2022-02-10/3_8369_kb.html (accessed: February 21, 2022).

[2] Meeting of the Politburo of the CPC Central Committee on May 14, 2020. Available at: http://cpc.people.com.cn/n1/2020/0515/c64094-31709627.html?mc_cid=28966ada58&mc_eid=902fe70bde (accessed: February 20, 2022).

of more powerful domestic demand as a strategic resource that would give domestic entrepreneurs confidence[3].

At the same time, the authorities are also interested in this topic, as evidenced by the coverage of the importance of production chains for the development of the domestic market in the Consolidated Strategy for the Development of the manufacturing industry of the Russian Federation[4] ("In the field of consumer goods, we should focus on ensuring effective demand, both domestic and external"). We should also note that the fact that the Strategy consolidates the access to adjacent stages of production chains as a general principle of industrial development implies an increase in the potential of intra-country cooperation.

One of the drivers of the policy of mobilizing the spatial factor of national economic development in the Spatial Development Strategy of the Russian Federation[5] is the division of the country's economic space into macroregions (Minakir et al., 2020). The need to allocate macroregions increases when the potential of individual subjects is very small to solve certain tasks and it is necessary to consider their potential together and in a broader context (Kotov, 2021).

Within the framework of macroregions, it is planned to strengthen interregional cooperation and coordination of socio-economic development of RF constituent entities, the development of transport, energy, information and telecommunications infrastructure that will strengthen economic connectivity of territories, the completion of value chains, including through the implementation of large interregional investment projects. This, in turn, will require the development of strategies for socio-economic development of macroregions and plans for their implementation synchronized in time and space.

The national economic space in the Strategy is divided into 12 macroregions. The grid is based on federal districts, four of which in terms of territorial composition exactly coincide with the corresponding macroregions, and each of the other four is divided into two macroregions *(Tab. 1)*.

Table 1. Composition of macroregions of the Russian Federation

Federal district	Macroregion
Central	Central
	Central Chernozem
Northwestern	Northwestern
	Northern
Volga	Volga-Kama
	Volga-Ural
Southern	Southern
North Caucasian	North Caucasian
Ural	Ural-Siberian
Siberian	South Siberian
	Angara-Yenisey
Far Eastern	Far Eastern
Source: Spatial Development Strategy of the Russian Federation for the period up to 2025.	

[3] Business activity of organizations in Russia in January 2022. Available at: https://rosstat.gov.ru/storage/mediabank/17_09-02-2022.html (accessed: February 20, 2022).

[4] Consolidated strategy for the development of the manufacturing industry of the Russian Federation until 2024 and for the period up to 2035. Available at: http://static.government.ru/media/files/Qw77Aau6IOSEIuQqYnvR4tGMCy6rv6Qm.pdf (accessed: February 21, 2022).

[5] Spatial Development Strategy of the Russian Federation for the period up to 2025. Available at: http://static.government.ru/media/files/UVAlqUtT08o60RktoOXl22JjAe7irNxc.pdf (accessed: February 21, 2022).

In our work, we rely on the fact that in the RF Spatial Development Strategy, one of the main directions of the country's spatial development is stated to strengthen interregional cooperation and coordination of socio-economic development of subjects within macroregions. The purpose of the study is a quantitative assessment of the sales markets of regions of the Northwest of Russia, taking into account the industry and territorial specifics of production. At this stage, based on the materials of the regions of the Northwest of Russia, we provide the characteristics of interregional interactions within the macroregion.

There are two macroregions on the territory of the Northwest of Russia – the Northwestern macroregion, including the Republic of Karelia, Kaliningrad, Vologda, Leningrad, Murmansk, Novgorod, Pskov oblasts, the city of Saint Petersburg, and the Northern macroregion, including the Komi Republic, Arkhangelsk Oblast, Nenets Autonomous Okrug. Due to the historical interconnectedness of the Northern and Northwestern macroregions, we consider them jointly as the Northwest of Russia.

Literature review

The reproductive approach to management proves that economic development requires not only the economic resources available to a particular territory, but also resources imported from other territories, as well as the presence of external demand for manufactured products (Schniper, Novoselov, 1993). This determines the dependence of each territory on interregional economic integration and makes the economic cooperation of the regions an essential factor in their development.

The second half of the 20th century was marked by a sharp increase in world trade and increased competition between countries and regions. As a result, theories of competitive advantages of individual territories began to appear. In particular, M. Porter identified patterns in the competition of territories: the more developed the competition in the domestic market, the more likely the success of the country (region) in international markets (and vice versa, the weakening of competition in the national market may lead to the loss of competitive advantages) (Savel'ev, 2010).

Exploring the trade interaction of territories, P. Krugman noted that international trade increasingly resembles interregional trade, because factors of production and competencies in strategic decision-making are gradually moving to the regional level. The driving force of trade in competition and similarity of factors of production is the gain received by countries in the differentiation of product supply and economies of scale; the competitiveness of countries and regions with a shortage of factors of production is determined by the advantage of using special forms of organization and concentration of production (Krugman, Obstfield, 2005; Porter, 2016; Fujita et al., 1999; Krugman, Wells, 2006).

The last thesis was developed in the theories and concepts of cluster development. They investigated the structures and forms of organization of economic activity in space (vertically and horizontally integrated organizations, clusters, networks), factors promoting the competitiveness of economic agents, ways of their interaction (Krugman, Venables, 1995). Representatives of these scientific theories and concepts are primarily M. Porter, M. Enright, J. Humphrey, E. Schmitz, M. Storper, etc.

The contribution of theories and concepts of cluster development to the development of interregional cooperation is that the cluster form of production organization contributes to:

– increasing labor productivity and stimulating the innovation process by creating favorable conditions for this (Savel'ev, 2010);

– using the advantages of proximity (concentration) more effectively, to create favorable conditions for the manifestation of economies of scale and reducing operational costs (Pilipenko, 2005).

After the publication of G. Gereffi (Gereffi, 1994), the amount of scientific research on VCs has grown significantly and gained the greatest popularity in the 2010s. The impetus for the development of the direction was provided largely by the global economic crisis of 2008–2009, which demonstrated the importance of interconnections in the global economy. At the same time, traditional theories and tools were not enough to solve the economic problems that arose (many of them became more acute again in the early 2020s; among them: slowing global economic growth, increasing inequality, aggravating employment problems, decline in international trade). The result of the research was an intensive study of global VCs, conducted by a wide range of researchers (Gibbon, 2001; Gereffi et al., 2005; Yeung, 2009; Gereffi, Fernandez-Stark, 2011; Kaplinsky, 2013).

In the most systematic form, the modern theory of VCs is presented in the works of G. Jereffi and R. Kaplinsky, who emphasize the controlled and dynamic nature of VCs. In addition, they published two of the most influential theoretical works on this topic, which consolidated the conceptual framework concerning global VCs, later adopted by a number of major international organizations, such as the World Bank, the UN Conference on Trade and Development, the World Trade Organization, the Organization for Economic Cooperation and Development and others.

In a particular VC, it is customary to distinguish forward links that reflect the export of raw materials and services, which are then imported back in the form of finished products, and backward links in VCs that reflect the production and export of final goods and services, based on the import of raw materials and services (advanced manufacturers, assembling the final product)[6].

[6] Cogut B. (1985). *Designing Global Strategies: Comparative and Competitive Value-Added Chains.* Available at: http://sloanreview.mit.edu/article/designing-global-strategies-comparative-and-competitive-valueadded-chains/ (accessed: February 2021).

The works (Belousova, 2012; Kashbraziev, 2014; Sopilko, 2015) study various aspects of influence of VCs on economic development, the work (Ovchinnikova et al., 2016) – on economic security, the work (Okten et al., 1998) – on the spatial organization of territories, and the works (Arndt, 2008; De, 2014; Safronova, 2016) – on regional integration processes. Some scientists argue that VCs contain a new market approach to climate management (Zhang, Wang, 2015; Xu et al., 2017).

One of the leading research areas considers participation in VCs as a tool for the development of production. In this case, some works assess the relationship between cooperation of firms and their growth (Arita et al., 2006; Han, Wang, 2015), prospects and limitations of applying the principles of joint economy at enterprises in the conditions of digitalization (Pleshchenko, 2019), the possibility of modernization of production by embedding in existing VCs (Eriksson, 2011; Joudeh, 2018). Much attention of researchers is focused on the issues of improving the efficiency of production in the context of the development of industrial cooperation (Skopina, Skopin, 2007; Beviá, Corchón, 2009; Liu et al., 2019; Li et al., 2020). In (Walker, 1994) it is revealed that the main problem in the development of VCs is the lack of a system to support the processes of cooperation in regions, which should include the creation and functioning of an advisory council on industrial cooperation under the regional government, the development of a regional subcontracting center operating on the basis of chambers of commerce and industry, the implementation of regional program activities for the development of comprehensive cooperation.

In Russia, after the decentralization of the management of interregional economic relations in the 1990s and the establishment of the power vertical in the public administration system in the early 2010s, the process of spatial development entered the zone of strategic bifurcation and the search for new mechanisms (Rostanets, Topilin,

2019). In the scientific literature, attention has been paid to areas on the role of markets at various levels in the development of the regional economy (Shniper, Novoselov, 1993; Naumenko, 2006; Chaikovskii, 2008; Savel'ev, 2010; Lukin, 2013; Lukin, 2019; Lukin et al., 2020). Researchers come to the conclusion that in some cases the division into macroregions is formal, while real interregional economic associations may have different geographical outlines (Lösch, 1959; Minakir, 2015). At the same time, according to the Spatial Development Strategy, one of the key principles of the allocation of macroregions is their neighborly position[7].

A.R. Sayapova also dealt with issues of the quality of participation of Russian territories in global VCs. In particular, she noted a high proportion of the direct dependence of the volume of value added created in the country on foreign final demand, which implies that the economy of Russian territories is oriented toward the export of semi-finished products (Sayapova, 2018). In the work of E.V. Lukin, it is indicated that one of the most stable industries in the Northwest of Russia is metallurgical production (Lukin, 2021). All the main production stages of ferrous metallurgy are localized within the macroregion, which is largely due the fact that in the Soviet era, a single technological complex was created with its own raw materials and fuel and energy base, which was managed within a centralized planned system.

Methodology and data

In the course of the study, a quantitative assessment of the sales markets of the regions of the Northwest of Russia was carried out. The methodological basis was the work of P.A. Minakir (Minakir et al., 2020), which presents the results of the analysis of the effectiveness of the allocation of macroregions for the development of mesoregional economic ties on the example of the Far Eastern Federal District).

The key source of information was the data on interregional import and export of goods in value terms, published by Rosstat and generalized by the National Research University "Higher School of Economics"[8]. In this work, four types of sales markets were identified during the distribution of product supplies: 1) the local market, implying supplies for consumption within the region; 2) the macroregional market, covering supplies to the territory of the remaining Northwestern regions; 3) the national market, including the rest of the country's economic space; 4) foreign markets. The quantitative distribution of product supplies from the regions of the Northwest of Russia between different types of markets is presented in *Table 2*.

At the same time, the analysis of intra-country markets is difficult due to the incompleteness of domestic economic statistics on interregional trade. In particular, since 2017, Russian statistics have stopped publishing data in value terms, as a result of which it was necessary to evaluate the structure of markets based on the data for 2016[9]. The most significant problem was to determine the value of the indicator reflecting sales volumes in each of the abovementioned markets. An important source of data is statistics on interregional trade, but the materials presented in it do not fully reflect the supply of products, since they include information on sales in a limited range of industries[10]. A significant part of the goods and services produced in RF constituent entities entering the interregional and foreign trade turnover are not reflected in statistics, although they are taken into account

[7] Spatial Development Strategy of the Russian Federation for the period up to 2025. Available at: http://static.government.ru/media/files/UVAlqUtT08o60RktoOXl22JjAe7irNxc.pdf (accessed: February 21, 2022).

[8] Unified Archive of Economic and Sociological Data. Available at: http://sophist.hse.ru/rosstat.shtml (accessed: June 4, 2022).

[9] For the remaining indicators, data for 2016 were also used, unless it is indicated otherwise.

[10] Products of food, light, timber processing, petrochemical, chemical, metallurgical industry, mechanical engineering, production of non-metallic mineral products.

Table 2. Quantitative assessment of the sales markets of the regions of the Northwest of Russia according to the statistics of interregional supplies, billion rubles

Region	Local markets	Macroregional market	National market	Foreign markets
Northwest of Russia	**522**	**371**	**1445**	**803**
Republic of Karelia	33	5	9	23
Komi Republic	45	49	42	35
Arkhangelsk Oblast	17	15	39	42
including Nenets Autonomous Okrug	1	1	0	1
Arkhangelsk Oblast except Nenets Autonomous Okrug	16	14	39	42
Vologda Oblast	57	38	176	178
Kaliningrad Oblast	45	11	192	36
Leningrad Oblast	69	176	242	366
Murmansk Oblast	21	2	5	31
Novgorod Oblast	17	14	29	42
Pskov Oblast	7	14	12	1
Saint Petersburg	211	48	699	47

Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

in export statistics. Therefore, when forming a database for analyzing the structure of markets, the distribution of the remaining part of the output was carried out based on the reporting of major enterprises.

In particular, the statistics do not reflect the products by type of activity "mining" (except coal), among which the production of crude oil is a branch of specialization and actually makes up the bulk of interregional and export supplies for the Komi Republic and Nenets Autonomous Okrug. It is also important to take into account interregional supplies of iron ore mined in the Republic of Karelia and the Murmansk Oblast. In addition, there are no data on the distribution of products of the electric power industry, agriculture, and the service sector, which can significantly distort the overall picture of the distribution of the product created in the territories.

In order to clarify the structure of supplies for these types of activity, the following corrective steps were applied: for enterprises associated with the extraction of coal (Komi Republic) and metal ore (Republic of Karelia, Murmansk Oblast) in the regions of Northwest Russia, the main direction of supplies is the macroregional market, since the relevant enterprises are part of PAO Severstal (Vologda Oblast). Fuel and energy balances of the regions were used to assess the structure of crude oil supplies and products of the sector "production and distribution of electricity, gas and water". In the study of non-ferrous metals sales markets, an important source was the reporting of PJSC MMC Norilsk Nickel and OJSC Timan Bauxite. With regard to other types of activity, such as construction, services and agriculture, it is conventionally assumed that their sales are completely concentrated on local markets[11]. The supply flows of the products of the military-industrial complex were not taken into account.

During the distribution of products unaccounted for in the statistics, an estimated matrix of deliveries of products not included in the statistics of interregional trade was obtained *(Tab. 3)*.

Thus, by summing up the data in Tables 2 and 3, estimated volumes of supplies of products from the regions of the Northwest of Russia to various types of markets were obtained *(Tab. 4)*.

[11] It is not possible to track the sale of services outside the region; and agriculture in the Northwest of Russia is mainly represented by the production of fodder crops and is aimed at meeting the needs of local animal husbandry.

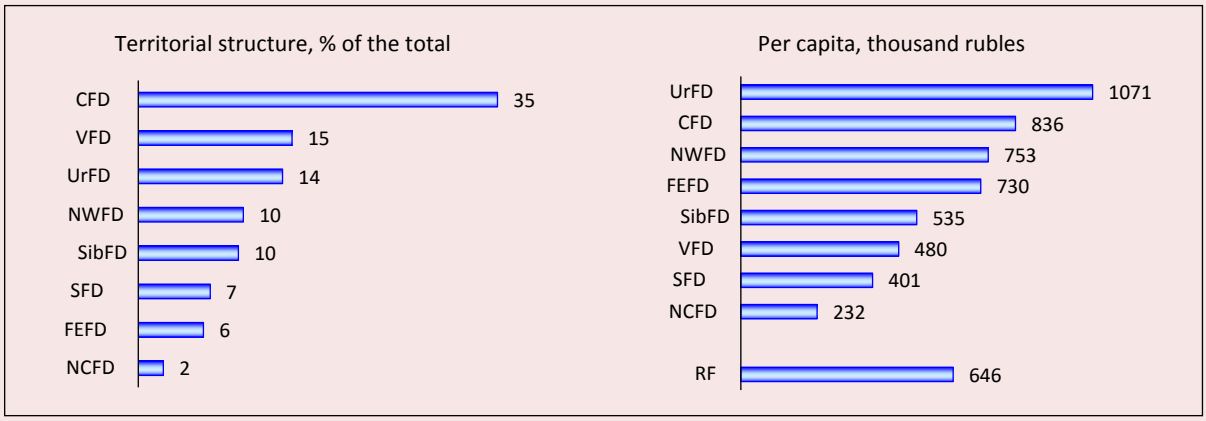
Table 3. Estimation of the distribution of supplies of products not included in the statistics of interregional trade, billion rubles

Region	Local markets	Macroregional market	National market	Foreign markets
Northwest of Russia	**3834**	**227**	**425**	**102**
Republic of Karelia	33	5	0	0
Komi Republic	408	28	141	9
Arkhangelsk Oblast	128	13	78	8
including Nenets Autonomous Okrug	59	0	42	7
Arkhangelsk Oblast except Nenets Autonomous Okrug	69	13	36	1
Vologda Oblast	68	0	2	0
Kaliningrad Oblast	102	0	17	0
Leningrad Oblast	289	64	65	0
Murmansk Oblast	133	115	6	53
Novgorod Oblast	39	2	0	0
Pskov Oblast	33	1	2	0
Saint Petersburg	2600	0	114	32
Source: own elaboration.				

Table 4. Estimation of sales of products of the regions of the Northwest of Russia by various types of markets, billion rubles

Region	Output	Local market	Macroregional market	National market	Foreign markets
Northwest of Russia	**9084**	**4656**	**661**	**2755**	**1011**
Republic of Karelia	145	84	13	13	35
Komi Republic	747	451	74	181	42
Arkhangelsk Oblast	322	142	25	111	44
including Nenets Autonomous Okrug	111	60	1	42	8
Arkhangelsk Oblast except Nenets Autonomous Okrug	211	82	24	69	36
Vologda Oblast	600	135	45	209	210
Kaliningrad Oblast	491	162	14	267	48
Leningrad Oblast	1182	351	221	282	328
Murmansk Oblast	417	173	119	15	111
Novgorod Oblast	183	62	22	40	59
Pskov Oblast	95	45	25	24	1
Saint Petersburg	4903	3052	103	1613	134
Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml					

Figure 1. GRP production in the context of federal districts of Russia in 2019



Note: CFD – Central Federal District, VFD – Volga Federal District, UFD – Ural Federal District, NWFD – Northwestern Federal District, SibFD – Siberian Federal District, SFD – Southern Federal District, FEFD – Far Eastern Federal District, NCFD – North Caucasian Federal District.

Source: compiled according to Rosstat data.

Results

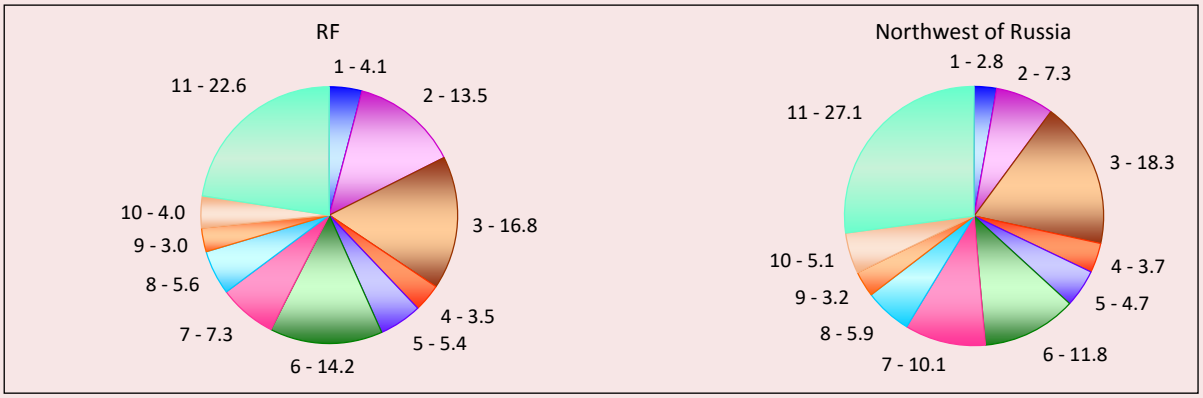
The Northwest accounts for 9.9% of the area of Russia and 9.5% of its population. The macroregion has a fairly high level of economic development, it produces about 10% of the total gross regional product (GRP) of the country *(Fig. 1)*. The volume of GRP per capita is 753 thousand rubles, which is 17% higher than the average Russian level.

Proximity to the European Union and international transport corridors, and the presence of Arctic territories have led to a smaller share of agriculture in the structure of the economy of the macroregion and a greater share of manufacturing, as well as transportation and storage *(Fig. 2)*.

The functional and sectoral structure of the economy of the Northwest determined its spatial configuration. Almost half of GRP of the macroregion is created in Saint Petersburg, another 12% – in the Leningrad Oblast *(Fig. 3)*. The high rates of the Arkhangelsk Oblast that follows the two regions are due to the location of machine-building and mining capacities in it. The least (2%) of GRP is produced in the agrarian-oriented Pskov Oblast. In terms of GRP production per capita, the Northwest of Russia exceeds the national average. At the same time, the leaders in the average per capita GRP volume are the regions with the most developed industry: Saint Petersburg, the Komi Republic and the Murmansk Oblast.

The Northwest of Russia is an industrially developed macroregion. It occupies leading positions in the country in the construction of sea and river vessels, the production of automobiles, as well as in the pulp and paper and woodworking industries. Almost half of the total industrial production of the macroregion is produced in Saint Petersburg and the Leningrad Oblast *(Fig. 4)*. At the same time, the total contribution of the territories (republics of Karelia and Komi, Murmansk and Vologda oblasts), which have the metallurgical production chain, which is the most important in the connecting role of the regions of the Northwest of Russia, is 22%. The Murmansk Oblast is the leader in the production of industrial

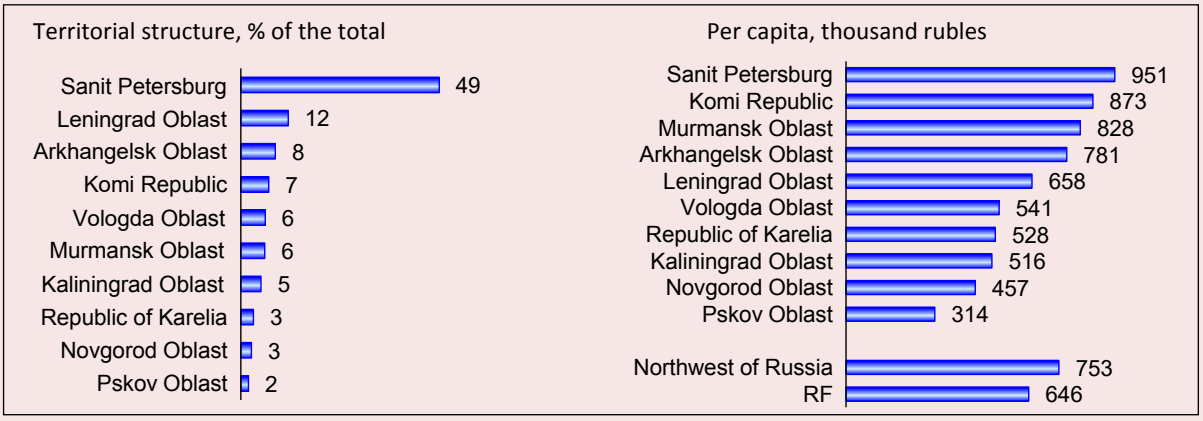
Figure 2. GRP production structure in Russia and the Northwest of Russia in 2019, % of the total



Note: 1 – Agriculture, forestry, hunting, fishing and fish farming; 2 – Mining; 3 – Manufacturing; 4 – Production and distribution of electricity, gas and water; 5 – Construction; 6 – Wholesale and retail trade; 7 – Transportation and storage; 8 – Public administration and military security; social security; 9 – Education; 10 – Health care; 11 – Other services.

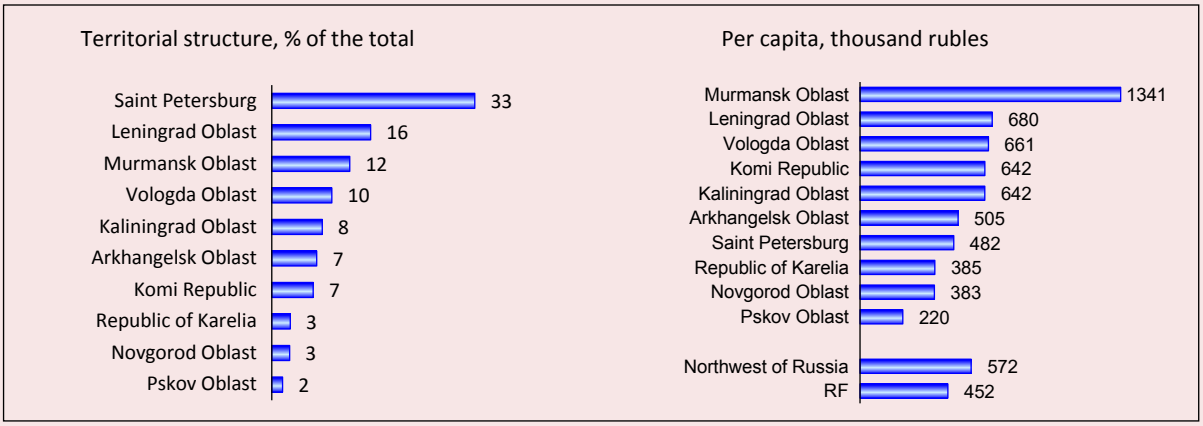
Source: compiled according to Rosstat data.

Figure 3. GRP production by regions of the Northwest of Russia in 2019



Source: compiled according to Rosstat data.

Figure 4. Specific indicators of industrial production in the Northwest of Russia in 2020



Source: compiled according to Rosstat data.

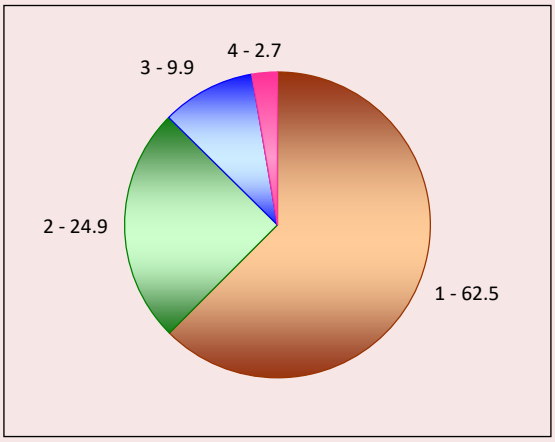
products per capita, the level of which is almost three times higher than the national average (such a high indicator is primarily associated with highly developed non-ferrous metallurgy). It is curious that, despite its proximity to Saint Petersburg, the volume of per capita industrial production (642–680 thousand rubles) in the Leningrad Oblast is similar to the Vologda and Kaliningrad roblasts, as well as the Komi Republic.

The structure of industrial production in the Northwest of Russia is dominated by the manufacturing industry, the share of value added produced is 62% *(Fig. 5)*. Mining accounts for another 25%.

The current production structure in the regions of the Northwest of Russia largely determines the nature of the supply of the macroregion's products to markets at various levels. Its geographical proximity to the Central Federal District and the borders of Europe is also important.

As a result of the distribution of data on the missing part of the output by the main types of markets in which products created in the regions of the Northwest of Russia are sold, an estimated structure of markets as of 2016 was obtained *(Tab. 5)*.

Figure 5. Branch structure of industry in the Northwest of Russia in 2020, % of the total



Note: 1 – Processing industries; 2 – Mining; 3 – Provision of electric energy, gas and steam, air conditioning; 4 – Water supply; sanitation, organization of waste collection and disposal, activities to eliminate pollution.

Source: compiled according to Rosstat data.

Let us consider the role of each of the abovementioned types of markets (local, macroregional, national, foreign) in ensuring the functioning and maintenance of market equilibrium in the Northwest of Russia as a whole and in its constituent entities.

Table 5. Structure of markets for the sale of products by regions of the Northwest of Russia, % of the total

Region	Local market	Macroregional market	National market	Foreign markets
Northwest of Russia	**51.3**	**7.3**	**30.3**	**11.1**
Republic of Karelia	58.0	8.9	9.2	23.9
Komi Republic	60.3	9.8	24.2	5.6
Arkhangelsk Oblast	44.0	7.9	34.5	13.6
including Nenets Autonomous Okrug	53.8	0.9	38.2	7.0
Arkhangelsk Oblast except Nenets Autonomous Okrug	38.8	11.5	32.5	17.1
Vologda Oblast	22.5	7.5	34.9	35.1
Kaliningrad Oblast	32.9	2.9	54.4	9.7
Leningrad Oblast	29.7	18.7	23.8	27.8
Murmansk Oblast	41.4	28.6	3.5	26.6
Novgorod Oblast	34.1	11.8	21.9	32.3
Pskov Oblast	47.3	26.4	25.2	1.1
Saint Petersburg	62.3	2.1	32.9	2.7

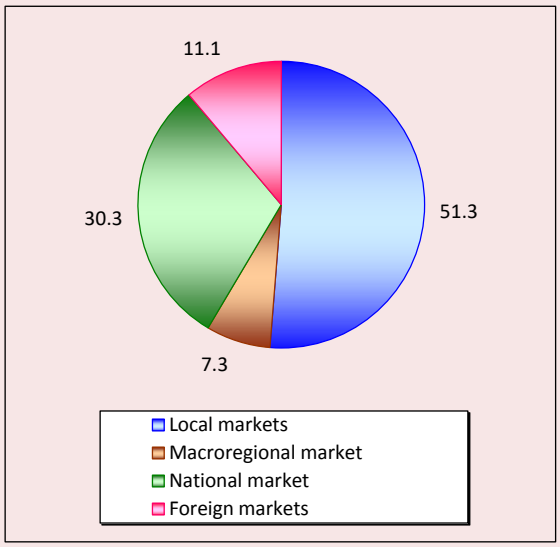
Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

Local markets

Local markets are the most important ones in the functioning of the regional economy. In general, in the Northwest of Russia, more than half of output is consumed within the framework of producing entities, while the macroregional market is only 7.3%, which indicates a weak connectivity of territories within the macroregion *(Fig. 6)*. At the same time, a significant excess of the share of local markets over the macroregional market largely indicates that the regions of the Northwest of Russia use possible synergetic effects only to a small extent.

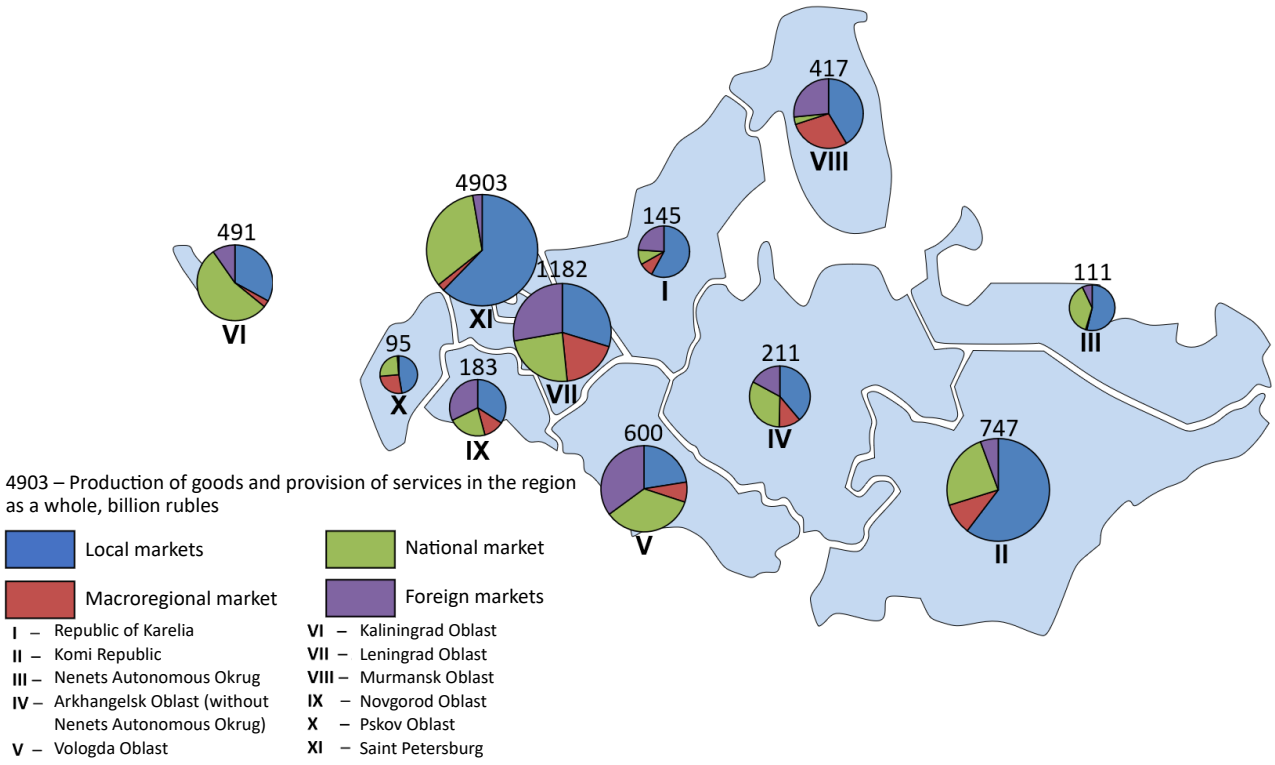
On the other hand, this indicates a high level of territorial specialization of these regions. The most notable exception from the general series is the Leningrad Oblast, whose economy is aimed at the demand of Saint Petersburg (the share of the local market in it is 29.7%, *Fig. 7*), and mainly the export-oriented Vologda Oblast (with the smallest share of the local market in the macroregion – 22.5%).

Figure 6. The structure of markets for the sale of products of the regions of the Northwest of Russia, %



Source: compiled according to the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

Figure 7. The scale of output and the structure of sales by type of markets in the regions of the Northwest of Russia



Source: compiled according to the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

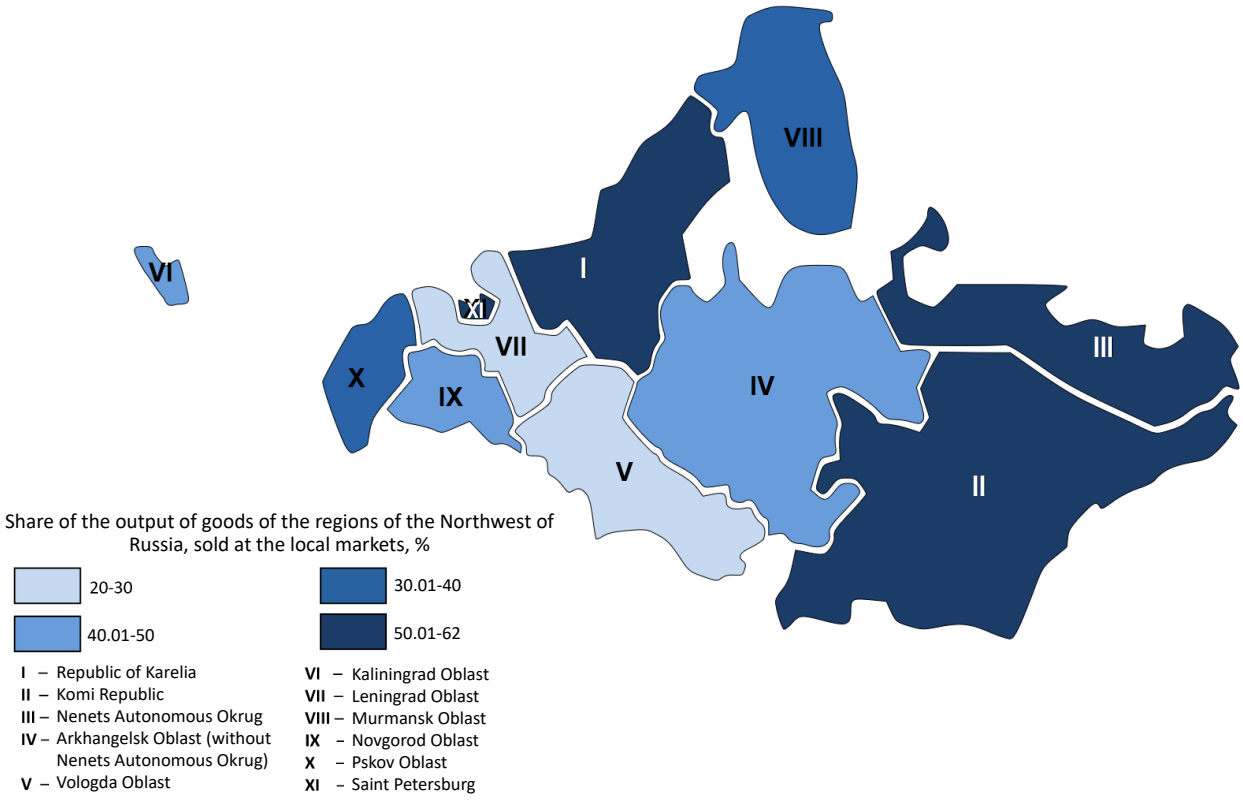
We should note that, in addition to export orientation, another important factor determining the high share of foreign markets in the total output of the region is the development of its economic system (Savel'ev, 2010). An example is the Leningrad Oblast *(Fig. 8)*, whose production is most diversified in comparison with other regions of the Northwest of Russia.

National market

A significant part of the products and services produced in the economy of the Northwest of Russia is directed to the markets that are foreign relative to it. Thus, 30.3% of the total output of the macroregion is supplied to the national market (see Fig. 6). One of the prerequisites for this phenomenon is the stability of the historically conditioned specialization of the economy of the Northwest of Russia, formed as a complex of VCs of the unified national economic complex of the USSR. At the same time, the importance of the national market for the subjects of the macroregion is heterogeneous, since it is determined by the specifics of their specialization. The main volume of exports of products and services from the macroregion to the markets of RF constituent entities of other macroregions (78.7%) falls on Saint Petersburg, as well as on the Leningrad and Kaliningrad Oblasts (58.6, 10.2 and 9.7% respectively; *Fig. 9*).

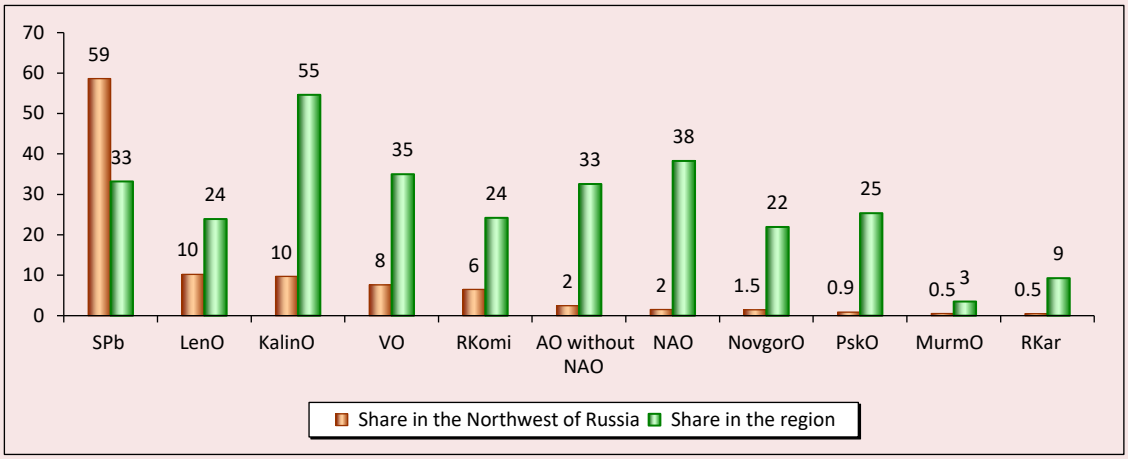
At the same time, half of the Northwestern regions account for only 7.3% of the total volume of supplies of the macroregion's products to the national market. Due to the low economic potential, the Novgorod and Pskov oblasts collectively carry out only 2.4% of the total volume of supplies from the Northwest of Russia

Figure 8. Distribution of regions by the share of local markets



Source: compiled according to the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

Figure 9. The share of the national market in the total sales of products of the regions of the Northwest of Russia, % of the total



Source: Compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

to the national market, although this direction occupies 22 and 25% respectively in the structure of their implementation. One of the reasons that the Murmansk Oblast appears to be the least active participant in trade on the national market in the macroregion is a combination of the nature of its involvement in production processes (interaction within the macroregion and export activities) and remote geographical location. From the point of view of the importance of the national market for the economy of the region, the Kaliningrad Oblast stands out among other territories of the Northwest of Russia by the fact that in the structure of its implementation, the national market accounts for more than half. The Vologda Oblast, which is next in importance, has a volume of supplies to the national market that exceeded sales on the local market (for the rest of the regions, the local market is the largest).

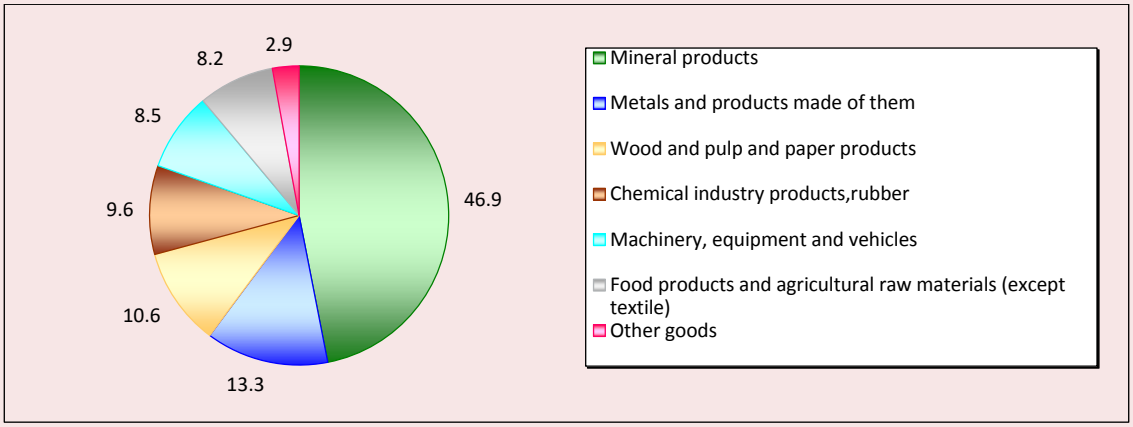
Foreign markets

The foreign direction of product sales is one of the most significant for the regions of the Northwest. At the same time, despite the fuel and energy specialization, the industry structure of supplies is quite diversified: the key export goods are mineral products, almost entirely represented by hydrocarbons (46.9%; *Fig. 10*), the next most important are metal and products made from it (13.3%), wood and pulp and paper products (10.6%), chemical industry products (9.6%), as well as machinery, equipment and vehicles (8.5%).

Almost a third of the macroregion's total exports come from the Leningrad Oblast, whose key commodities are hydrocarbons (58% of total exports) and chemical industry products (36%). Another 21% of the total exports of the Northwest of Russia comes from the Vologda Oblast *(Fig. 11)*, specializing in the production of rolled metal and chemical fertilizers (49 and 36% respectively).

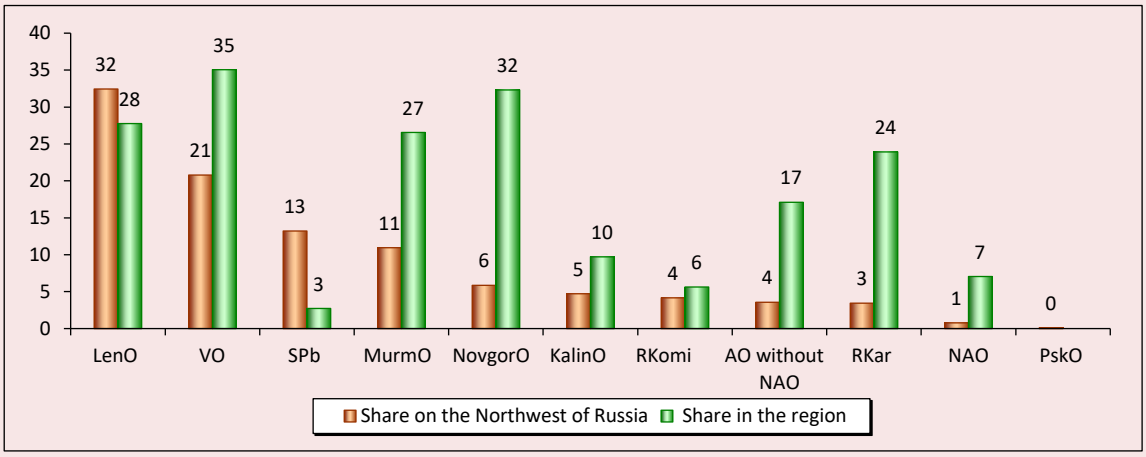
The export flow from the Northwest of Russia is largely formed by Saint Petersburg (also specializing in hydrocarbons and mechanical engineering, 63 and 14%, respectively) and the Murmansk Oblast (acting as a supplier of metal and mineral goods, 59 and 22%, respectively). Their share totals another 24%. Export plays the most important role for the Vologda Oblast, for which the share in the sale of products produced in the Northwest in foreign markets is 35%. The Novgorod Oblast and the

Figure 10. The share of commodity groups in the total exports of the Northwest of Russia, %



Source: compiled on the basis of statistics of the Northwest Customs Administration.

Figure 11. The share of foreign market markets in the total sales of products of the regions of the Northwest of Russia, %



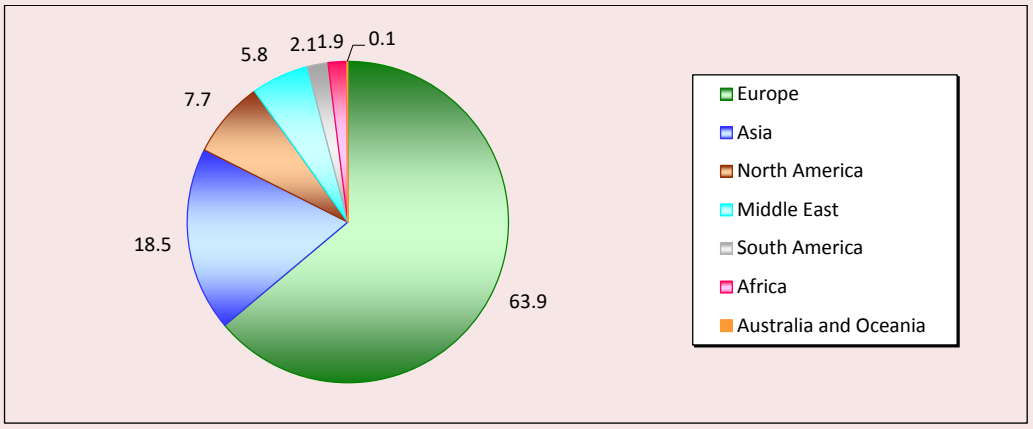
Source: compiled on the basis of statistics of the Northwest Customs Administration and materials of the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

Republic of Karelia are clearly export-oriented (the share of foreign markets in the structure of their supplies is 32 and 24% respectively). It is noteworthy that for the exclave Kaliningrad Oblast, foreign markets have only limited significance. An interesting point is the extremely low share of exports (3%) in the sales channels of the border Pskov Oblast (1.1%) and in those of Saint Petersburg, which produces almost a third of the products of the Northwest of Russia.

The largest volume of supplies from the Northwest of Russia falls on European markets (63.9%), another 18.5% goes to Asian markets *(Fig. 12)*.

The Kaliningrad Oblast has a slightly different supply structure, with 17% of its exports going to African countries. The Murmansk Oblast is almost entirely aimed at European markets, and in the export structure of the Novgorod Oblast, Asia occupies 35%, Europe 30%, and North and South America 15% each.

Figure 12. Geographical structure of foreign markets for the sale of products and services of the Northwestern regions, %

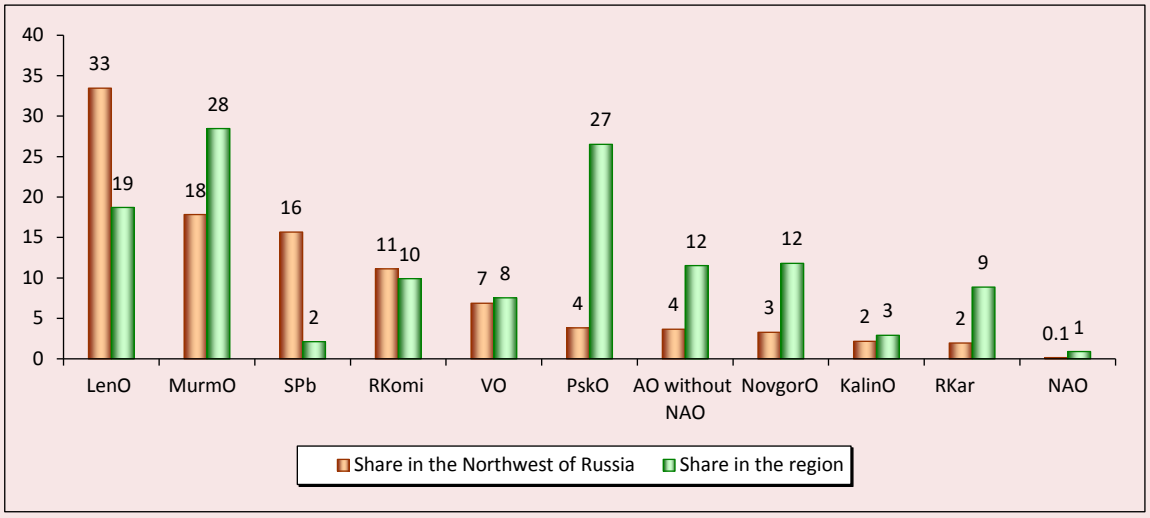


Source: compiled on the basis of statistics of the Northwestern Customs Administration. Available at: http://sophist.hse.ru/rosstat.shtml

Macroregional market

Mutual supplies between the regions of the Northwest of Russia account for only 7.3% of the output produced within the macroregion *(Tab. 2)*. The Leningrad Oblast generates the bulk of supplies to the macroregional market (33.4%). Another 44.6% are formed by three regions: the Murmansk Oblast, Saint Petersburg and the Komi Republic (17.8, 15.7 and 11.1% respectively; *Fig. 13*). Other regions account for another 18%.

Figure 13. The share in the output of goods and services sold on the macroregional market in the context of regions of the Northwest of Russia



Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml

In general, for most of the constituent entities of the Northwest of Russia, the macroregional market is an insignificant driver of development, since it provides a small part of the sale of products created within their borders. Among the regions for which the macroregional market is significant, it is possible to note the border Pskov Oblast. The Murmansk Oblast appears to be the most market-oriented in the Northwest of Russia, and the Komi Republic, which supplies raw materials for key industries of the Vologda Oblast, also stands out against the general background. It is worth noting the Kaliningrad Oblast and Nenets Autonomous Okrug, which almost do not interact with the macroregional market, preferring the country's domestic market.

Economic interactions of the Northwestern regions

The mutual supplies of the regions of the Northwest of Russia are presented in *Table 6* and in *Figure 14*. The pole of the macroregional market is the trade turnover between Saint Petersburg, the Komi Republic, the Leningrad and Vologda oblasts. These territories account for 84.3% of the value volume of mutual trade of the regions of the Northwest of Russia.

The key role in the macroregion belongs to the trade of Saint Petersburg and the Leningrad Oblast, the turnover between which accounts for 60.2% of the total turnover within the subregion and 7.1% of the output of the regions of the Northwest of Russia (see Fig. 13). The main part of bilateral trade consists of deliveries to Saint Petersburg.

A significant share of exports is represented by supplies of iron ore (Komi Republic and the Murmansk Oblast) and coal (Komi Republic). Most of them are sent to the Vologda Oblast, where then, as part of the production process of PAO Severstal, rolled metal is produced; its largest buyer in the macroregion is Saint Petersburg.

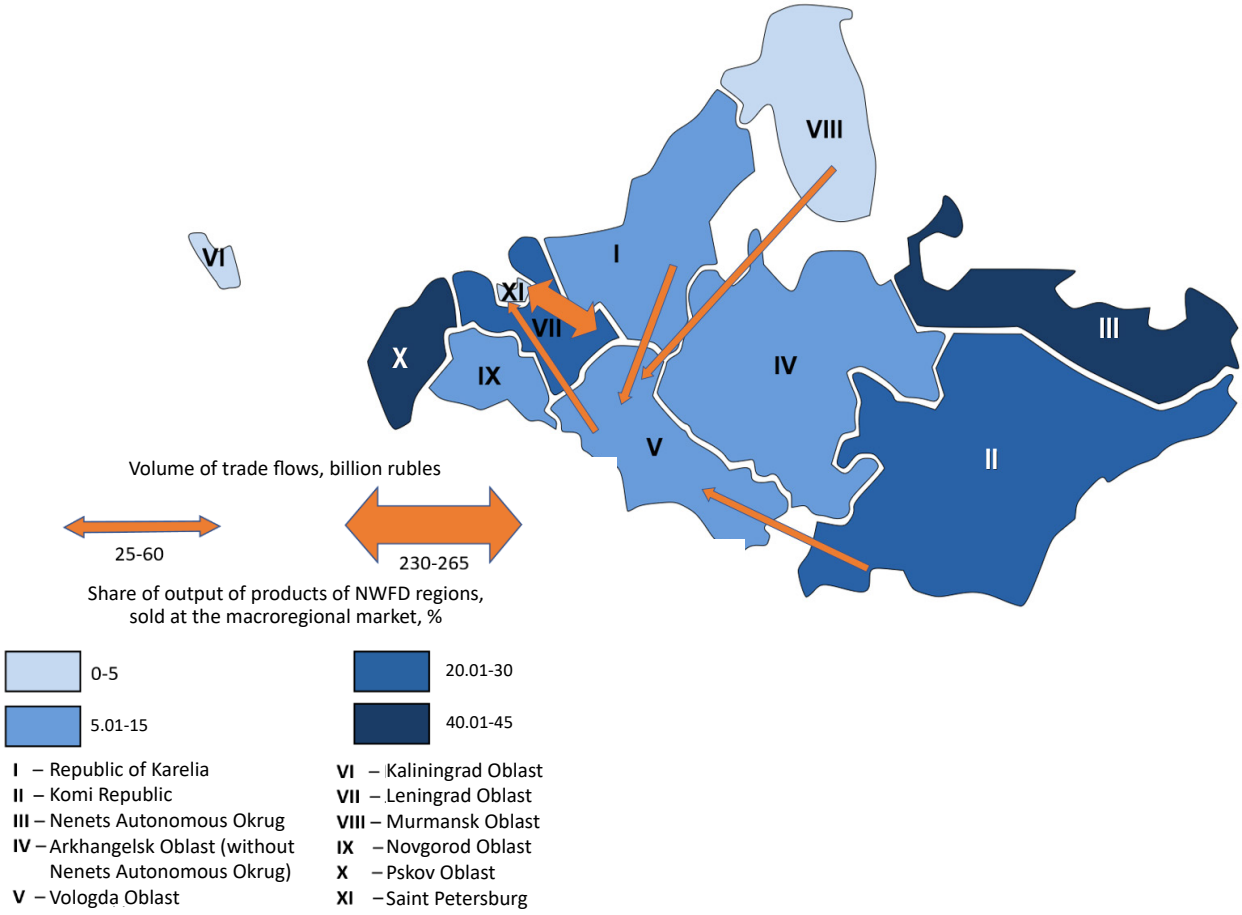
The analysis of the mutual trade of the regions of the Northwest of Russia confirms the assumption of the heterogeneity of its economic system, its differentiation in terms of the participation of constituent entities of the macroregion in interregional trade. At the same time, the existing economic ties of small economically wealthy and some highly specialized regions need to be supplemented within the framework of the integrated development of the Russian space (Mikheeva, 2018).

Table 6. Matrix of trade flows in the macroregional market of the Northwest of Russia, billion rubles

Region	RKar	RKomi	NAO	AO without NAO	VO	KalinO	LenO	MurmO	NovgO	PskO	SPb	Northwest of Russia
RKar		1.9	–	0.3	1.4	0.0	2.4	6.4	0.2	0.1	3.0	15.6
RKomi	0.3		0.4	0.5	0.5	0.0	0.4	0.0	0.0	0.0	2.8	5.0
NAO	–	0.0		0.0	0.0	0.0	0.0	–	0.0	0.0	0.0	0.1
AO without NAO	0.4	5.0	–		2.5	0.0	0.8	0.2	0.3	0.0	7.6	16.8
VO	56.3	47.6	–	0.4		0.1	1.9	49.6	0.7	0.0	4.4	160.9
KalinO	0.0	0.3	–	0.1	0.2		4.7	0.7	0.7	0.4	2.8	9.9
LenO	5.6	6.5	–	6.7	8.1	0.6		0.1	5.1	0.9	20.8	54.4
MurmO	1.0	2.0	0.9	1.3	0.5	0.5	5.6		0.9	0.1	2.1	14.6
NovgO	0.2	0.6	–	0.6	0.4	0.2	12.7	0.4		0.8	3.2	19.2
PskO	0.1	0.5	–	0.0	0.1	0.0	9.9	0.0	1.7		1.4	13.7
SPb	2.0	11.3	–	4.2	24.6	9.4	193.6	0.6	6.0	11.9		263.6
Northwest of Russia	65.9	75.7	1.3	14.1	38.3	10.9	232.0	57.9	15.6	14.1	48.0	573.8

Note: lines denote import of the corresponding RF constituent entity; columns – export of the corresponding RF constituent entity.
Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml; regional fuel and energy balances and reports of major companies.

Figure 14. Distribution of the regions of the Northwest of Russia by the role of the macroregional market



Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: http://sophist.hse.ru/rosstat.shtml; regional fuel and energy balances and reports of major companies.

Conclusion

Summarizing the analysis of the role of various markets for the functioning of the economies of the regions of the Northwest of Russia, on the one hand, and the role of regional economies in the functioning of the macroregional market, on the other hand, we can point out the following.

1) The most important for the functioning of regional economies are local and national markets, the supply and sale of products and services on the national market has a significant impact on the maximum number of regions. The high level of territorial specialization of the regions of the Northwest of Russia in the production of intermediate products complements the development potential of intra-country VCs.

2) The macroregional market occupies the smallest share in the total volume of supplies, which indicates the weak connectivity of the regions within its borders. The Northwest of Russia uses the potential of internal cooperation only to a small extent, being to a greater extent an array of multidirectionally oriented market zones; their pole is Saint Petersburg and also a number of short VCs that are often export-oriented.

3) The potential of integration of the regions of the Northwest of Russia is strengthened by largely coinciding export channels. The largest share of exported products is absorbed by European and Asian markets. At the same time, supplies to foreign markets should not be exceptional, since the income received from the sale of primary raw

materials and semi-finished products (key goods of both the Northwest and Russia as a whole) through distribution mechanisms first become the income of business and the population (government orders, salaries, pensions, transfer payments, etc.), after which they are exchanged for foreign products, becoming the income of foreign capital. An integral tool for solving this problem, in our opinion, is the development of macroregional VCs as a form of production links that has an advantage proceeding from the reduction in transport costs.

4) The more significant role of external sales markets relative to the region is partly determined not only by its specialization in export supplies, but also by the diversification of its economic system, an example of which is the Leningrad Oblast, whose production is most diversified compared to other regions of the Northwest of Russia.

Thus, the analysis has revealed that, in general, in the Northwest of Russia, local and national markets prevail over foreign and macroregional ones, and interterritorial interaction remains fragmented.

At the same time, the federal state policy on the development of VCs within macroregions remains largely nominal. As an example, we note that, according to the established action plan for the implementation of investment projects implemented as part of the integrated investment project "Yeniseyskaya Sibir"[12], by December 2019, the strategy for the socio-economic development of the Angara-Yenisey macroregion was to be approved, but at the beginning of 2022 it still remains at the stage of development.

The novelty of the research, which determines its contribution to the development of science, lies in the identification of modern patterns in the functioning of Russian VCs based on a quantitative assessment of the sales markets of the regions of the Russian Northwest. The materials of the article can be useful for decision makers in justifying economic policy at the regional level. In future works, it is planned to develop research on designing methodological tools for managing the transformation of intra-country VCs and calculating the socio-economic effects of their development. It is important to take into account the sectoral specialization of the regions in the existing national VCs, as well as the development of public policy directions for their extension based on foresight research of production and distribution chains of industrialized countries.

References

Arita T., Fujita M., Kameyama Y. (2006). Effects of regional cooperation among small and medium-sized firms on their growth in Japanese industrial clusters. *Review of Urban & Regional Development Studies*, 18, 209–228. DOI: 10.1111/j.1467-940X.2006.00122.x (accessed: February 2021).

Arndt S.W. (2008). Production networks and the open macroeconomy. *The Singapore Economic Review*, 53(03), 509–521. DOI: 10.1142/S0217590808003075 (accessed: February 2021).

Belousova A.V. (2012). The inter-regional cooperation: The impact on the regional economy (Khabarovsk Krai). *Prostranstvennaya ekonomika=Spatial Economics,* 4, 127–137. DOI: 10.14530/se.2012.4.127-137 (in Russian).

Beviá C., Corchón L.C. (2009). Cooperative production and efficiency. *Mathematical Social Sciences*, 57(2), 143–154. DOI: 10.1016/j.mathsocsci.2008.09.006 (accessed: February 2021).

Chaikovskii N.G. (2008). Interregional trade as a factor of economic development of the region. *Vestnik Orenburgskogo gosudarstvennogo universiteta=Vestnik of Orenburg State University,* 2(81), 47–53 (in Russian).

De P. (2014). Strengthening regional trade and production networks through transport connectivity in South and South-West Asia. *South and South-West Asia Development Papers*, 14(1), 35.

[12] RF Government Resolution 571-r, dated March 29, 2019.

E.V. Lukin, T.S. Anosova, A.E. Mel'nikov, M.A. Sidorov. (2020). Experience in agent-based modeling of interregional value chains. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 13(6), 101–116. DOI: 10.15838/esc.2020.6.72.6 (in Russian).

Eriksson S. (2011). Globalisation and changes of aircraft manufacturing production/supply-chains – the case of China. *International Journal of Logistics Economics and Globalisation*, 3(1), 70–83.

Fujita M., Krugman P., Venables A.J. (1999). The spatial economy: Cities, regions and international trade. *The MIT Press*, 367.

Gereffi G. (1994). The organization of buyer-driven global commodity chains: How US retailers shape overseas production networks. In: Gereffi G., Korzeniewicz M. (Eds.). *Commodity Chains and Global Capitalism*. Westport, CT: Praeger.

Gereffi G., Fernandez-Stark K. (2011). Global value chain analysis: A primer. *Center of Globalization, Governance & Competitiveness*. Duke University, 40.

Gereffi G., Humphrey J., Sturgeon T. (2005). The governance of global value chains. *Review of International Political Economy*, 12(1), 78–104.

Gibbon P. (2001). Upgrading primary production: A global commodity chain approach. *World Development*, 29(2), 345–363.

Han W., Wang J. (2015). The impact of cooperation mechanism on the chaotic behaviours in nonlinear supply chains. *European Journal of Industrial Engineering*, 9(5), 595–612. DOI: 10.1504/EJIE.2015.071773 (accessed: February 2021).

Joudeh S. (2018). Global value chain participation and prospects for local upgrading in the Egyptian-Chinese economic and trade cooperation zone. *Economic Research Forum*, 1278, 25.

Kaplinsky R. (2013). *Global Value Chains: Where They Came From, Where They Are Going and Why This Is Important. IKD Working Paper No. 68.* Milton Keynes, UK: The Open University.

Kashbraziev R.V. (2014). The impact of international cooperation on the national economy. *Finansy: teoriya i praktika=Finance: Theory and Practice,* 2, 79–92 (in Russian).

Kotov A.V. (2021). The territory requires coherent work: The role of interregional interactions in economic recovery (to the 100th anniversary of I.G. Aleksandrov's work 'Economic Regionalization of Russia'). *Prostranstvennaya ekonomika=Spatial Economics,* 17(1), 18–34. DOI: 10.14530/se.2021.1.018-034 (in Russian).

Krugman P., Obstfield M. (2005). *Mezhdunarodnaya ekonomika* [International Economics: Theory and Policy]. Saint Petersburg: Piter.

Krugman P., Venables A. (1995). Globalization and the inequality of nations. *Quarterly Journal of Economics*, 110, 857–880.

Krugman P., Wells R. (2006). *Economics*. Worth Publishers.

Li J., Ku Y., Yu Y., Liu C., Zhou Y. (2020). Optimizing production of new energy vehicles with across-chain cooperation under China's dual credit policy. *Energy*, 194. DOI: 10.1016/j.energy.2019.116832 (accessed: February 2021).

Liu Z., Yang D., Wen T. (2019). Agricultural production mode transformation and production efficiency: A labor division and cooperation lens. *China Agricultural Economic Review*, 11(1), 160–179. DOI: 10.1108/CAER-07-2017-0129 (accessed: February 2021).

Lösch A. (1959). *Geograficheskoe razmeshchenie khozyaistva* [The Economics of Location]. Moscow: Inostrannaya literatura.

Lukin E.V. (2013). Interregional interactions in the system of economic development of regions: Theoretical and practical approaches. *Voprosy territorial'nogo razvitiya=Territorial Development Issues,* 5(5). Available at: http://vtr.vscc.ac.ru/article/1333 (accessed: January 2022; in Russian).

Lukin E.V. (2019). Sectoral and territorial specifics of value-added chains in Russia: The input-output approach. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast*, 12(6), 129–149. DOI: 10.15838/esc.2019.6.66.7 (in Russian).

Lukin E.V. (2021). The ferrous metallurgy of the North-West of Russia: Trends and development problems. *EKO=ECO,* 10, 110–131 (in Russian).

Mau V.A. (2021). Coronavirus pandemic and trends of economic policy. *Voprosy ekonomiki,* 3, 5–30. DOI: 10.32609/0042-8736-2021-3-5-30 (in Russian).

Mikheeva N.N. (2018). Long-term forecasts of regional development: Analysis of results and problems of development. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 5(170), 24–38 (in Russian).

Minakir P.A. (2015). Spatial interdisciplinary synthesis: Experience of policy studies. *Regional Research of Russia*, 5(4), 299–309.

Minakir P.A., Isaev A.G., Dem'yanenko A.N., Prokapalo O.M. (2020). Economic macroregions: An integration phenomenon or a political geographic rationale? Far Eastern Russia case. *Prostranstvennaya ekonomika=Spatial Economics,* 16(1), 66–99. DOI: 10.14530/se.2020.1.066-099 (in Russian).

Naumenko E.N. (2006). On interregional commodity exchange and competitiveness of Altai Krai. *Polzunovskii vestnik,* 4-1, 296–302 (in Russian).

Okten A., Sengezer B., Camlibel N., Evren Y. (1998). Spatial implications of the organization of production in the automotive industry in Turkey. *38th Congress of the European Regional Science Association*: 28 August – 1 September. Vienna. Available at: http://www-sre.wu.ac.at/ersa/ersaconfs/ersa98/papers/430.pdf (accessed: February 2021).

Ovchinnikova T.I., Bulgakova I.N., Markov A.V. (2016). The role of outsourcing in the mechanism of economic security activities of cluster formations. *Vestnik VGUIT=Proceedings of the Voronezh State University of Engineering Technologies,* 4, 274–279. DOI: 10.20914/2310-1202-2016-4-274-279 (in Russian).

Pilipenko V.I. (2005). *Konkurentosposobnost' stran i regionov v mirovom khozyaistve. Teoriya, opyt malykh stran Zapadnoi i Severnoi Evropy* [Competitiveness of Countries and Regions in the World Economy. Theory, Experience of Small Countries of Western and Northern Europe]. Moscow: Oikumena.

Pleshchenko V. (2019). Prospects and limits of shared economics principles application at steel industry plants in the context of digitalization. *Chernaya metallurgiya. Byulleten' nauchno-tekhnicheskoi i ekonomicheskoi informatsii=Ferrous Metallurgy. Bulletin of Scientific, Technical and Economic Information,* 75(6), 741–747 (in Russian).

Porter M. (2016). *Mezhdunarodnaya konkurentsiya. Konkurentnye preimushchestva stran* [The Competitive Advantage of Nations]. Moscow: Al'pina.

Rostanets V.G., Topilin A.V. (2019). Ways of formation of economic mechanisms and organizational structures of managing the development of macroregions. *Vestnik Rossiiskogo novogo universiteta. Seriya: chelovek i obshchestvo=Vestnik of Russian New University. Series: Human and Society,* 3, 3–14 (in Russian).

Safronova I.A. (2016). The value chains of high-technology products as factor of formation of the regional comprehensive economic partnership. *Vestnik MGIMO-Universiteta=MGIMO Review of International Relations,* 51(6), 125–135 (in Russian).

Savel'ev Yu.V. (2010). Theoretical foundations of modern interregional competition. *Zhurnal ekonomicheskoi teorii,* 2, 86–98 (in Russian).

Sayapova A.R. (2018). Quantitative parameters of global value chains in macrostructural forecasting. *Problemy prognozirovaniya=Studies on Russian Economic Development,* 6, 31–61 (in Russian).

Shniper R.I., Novoselov A.S. (1993). *Regional'nye problemy rynkovedeniya* [Regional Problems of Market Studies]. Novosibirsk: Nauka.

Skopina I.V., Skopin A.O. (2007). Integrated development of regional industrial cooperation and cluster projects. *Regional'naya ekonomika i upravlenie=Regional Economics and Management: Electronic Scientific Journal,* 1(9). Available at: https://eee-region.ru/article/901 (in Russian).

Sopilko N.Yu. (2015). The contradictions in the development of international industrial relations. *Kontury global'nykh transformatsii: politika, ekonomika, pravo=Outlines of Global Transformations: Politics, Economics, Law,* 8(5), 58–67 (in Russian).

Walker G. (1994). Asset choice and supplier performance in two organizations – US and Japanese. *Organization Science*, 5(4), 583–593. DOI: 10.1287/orsc.5.4.583 (accessed: February 2021).

Xu X., He P., Xu H., Zhang Q. (2017). Supply chain coordination with green technology under cap-and-trade regulation. *International Journal of Production Economics*, 183(B), 433–442. DOI: 10.1016/j.ijpe.2016.08.029 (accessed: February 2021).

Yeung H.W. (2009). Regional development and the competitive dynamics of global production networks: An East Asian perspective. *Regional Studies*, 43(3), 32–51.

Zhang W., Wang M. (2015). Green supply chain management: A new market approach for climate governance. *Chinese Journal of Urban and Environmental Studies*, 03(04). DOI: 10.1142/S2345748115500335 (accessed: February 2021).

Zhu V. (2020). *China's Dual Circulation Economy*. Available at: https:// www.institutmontaigne.org/ressources/pdfs/publications/china-trends-7-EN.pdf (accessed: February 2021).

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A System for Classification of Technologies in the Field of Artificial Intelligence for Personnel Forecasting

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Abstract. The development of the Russian economy, including through large-scale introduction of digital technology and artificial intelligence technology, requires appropriate resources. Qualified personnel is one of them. The need for trained specialists poses important questions to state institutions – whom to train and in what quantity; this, in turn, demands a detailed elaboration on the issue of staffing requirement. The article presents the results of development of a classification system of artificial intelligence technology for solving personnel forecasting problems. Theoretical significance of the research findings consists in the creation of a classification system that structures existing knowledge about technologies in the field of artificial intelligence and has the potential to gain new knowledge. The novelty of the approach to the classification of artificial intelligence technologies consists in using a three-component structure of technologies "methods – tools – application areas" and adjusting the classification to suit the tasks of forecasting the demand of the economy for personnel with competencies in the field of artificial intelligence. The classification is based on the results of analysis of scientific publications on AI (journals of the first quartile Q1 and conferences of the A/A* level). "The Systematic Literature Review" method was used for their research. All thematic publications indexed in Scopus were also analyzed. Practical significance of the results is revealed in relation to the tasks of personnel forecasting in the field of artificial intelligence. The developed classification makes it possible to structure the personnel need at different levels of refinement of artificial intelligence technologies. Another direction in the development of the proposed classification is to compare competencies (knowledge, skills and practical experience) in popular groups of professions with components of artificial intelligence technologies (methods, tools, applications) to design educational programs in the relevant field. The proposed classification has the potential for development: one of the ways is an expert assessment of priority areas for the development of artificial intelligence. The article presents an overview of the results of application of the classification.

Key words: digital economy, staffing requirement, forecasting, artificial intelligence, technologies, classification, frontiers.

Introduction

The last few years have given a start to the accelerated introduction of artificial intelligence (AI) technologies in all areas of the Russian economy. The most important strategic documents[1] declaring the goals, main directions and tasks[2], as well as the mechanisms of implementation of the RF state policy in the field of artificial intelligence[3] development were adopted. Large-scale projects are being implemented to train personnel with AI competences: the federal project "Personnel for the digital economy"[4], the creation of NTI Competence Centers[5], and an alliance of the largest Russian companies founded to develop artificial intelligence[6]. In 2021, six AI research centers were created on the basis of the Higher School of Economics, Skoltech, Innopolis University, Ivannikov Institute for System Programming of the

[1] "On the development of artificial intelligence in the Russian Federation": RF Presidential Decree 490, dated October 10, 2019. Available at: https://www.garant.ru/products/ipo/prime/doc/72738946/ (accessed: March 1, 2022).

[2] List of instructions on the results of the conference on artificial intelligence Pr-2242, dated December 31, 2020. Available at: http://www.kremlin.ru/acts/assignments/orders/64859 (accessed: March 1, 2022).

[3] The passport of the federal project "Artificial intelligence" of the national program "Digital economy of the Russian Federation". Available at: https://ac.gov.ru/uploads/_Projects/AI_otbor/Passport.pdf (accessed: March 1, 2022).

[4] Personnel for digital economy. Available at: https://digitalskills.center/ (accessed March 1, 2022).

[5] NTI Competence Centers. *National Technology Initiative*. Available at: https://nti2035.ru/technology/competence (accessed: March 1, 2022).

[6] Forbes.ru. Available at: https://www.forbes.ru/newsroom/tehnologii/387055-v-rossii-sozdali-alyans-po-razvitiyu-iskusstvennogo-intellekta (accessed: March 1, 2022).

RAS, ITMO University, and MIPT[7]. In May 2022, the National Ethics Commission in the field of AI[8] was established.

To manage the process of accelerated technological development of the Russian Federation in the field of AI, in accordance with the Presidential Decree "On the development of artificial intelligence in the Russian Federation"[9], state institutions require current and projected indicators of staffing needs in the medium and long term, including knowledge of the current number of personnel employed in the economy and having competencies in the field of AI, as well as the required amount of specialists. Calculation of such indicators defines a practical problem, the solution of which is necessary for Russia's transition to the digital economy.

At the same time, there is an open scientific problem, namely the lack of a clear structure of AI technologies, which would regulate the relationship of technology with professions in the economy and training programs/specialties. When detailing forecast indicators, it is necessary to have a structural model of technologies in the field of AI to highlight frontiers (promising sub-technologies), as well as methods and tools for the formation of competencies in the training of specialists. Existing systems of classification of AI technologies, including international ones, are insufficient to distinguish development frontiers based on the assessment of the potential for this development.

The identified problem is accompanied by other contradictions. Thus, when developing federal state educational standards (FSES) for the new educational specialties of AI from the All-Russian Classifier of Specialties (OKSO) – 2022 it is necessary to specify the relevant technology areas, and for the basic professional educational program of higher education (BPEP) – the relationship of graduate competencies with the technology areas. When developing professional standards for artificial intelligence professions, it is necessary to specify the technology areas for which these professional standards are created.

The posed practical problem of calculating the indicators of staffing requirements in the field of AI necessitates the solution of a scientific problem to develop a new system of classification of AI technologies. The aim of the scientific research presented in this article is to form a science-based approach to the development of a classification system of AI technologies, providing a solution to the problems of personnel forecasting in the transition to the digital economy. The object of the study is the field of artificial intelligence, the subject of the study is the structural components of artificial intelligence technologies. To achieve the goal, it is necessary to solve the following tasks.

1. Analysis of existing approaches to the classification of AI technologies in order to identify problem areas that do not allow using existing classification systems for the task of forecasting personnel needs.

2. Development of a general structural model of AI technologies, providing elimination of problem areas on the basis of differentiation of AI technologies by the composition of promising methods, tools and areas of application included in each of them.

3. Construction of a private system of AI technology classification based on a structural model with the calculation of quantitative indicators assessing the current potential of development frontiers (the most promising sub-technologies) based on the data on international publication activity in the field of AI for 2016–2021.

[7] Research centers demonstrated pilot AI solutions. Ministry of Economic Development of the Russian Federation. Available at: https://economy.gov.ru/material/news/issledovatelskie_centry_prodemonstrirovali_pilotnye_ii_resheniya.html (accessed: March 1, 2022).

[8] A commission on ethics in the field of artificial intelligence has been created in Russia. *Nezavisimaya Gazeta*. Available at: https://www.ng.ru/news/740197.html (accessed: March 1, 2022).

[9] "On the development of artificial intelligence in the Russian Federation": RF Presidential Decree 490, dated October 10, 2019. Available at: https://www.garant.ru/products/ipo/prime/doc/72738946/ (accessed: March 1, 2022).

4. Application of AI technology classification system for solving the problems of personnel forecasting and determining the frontiers of the Russian Federation's development in the field of AI in the future through to 2025.

The theoretical significance of the study results lies in the creation of a classification system that structures existing knowledge about technologies in the field of AI and has the potential to generate new knowledge.

The practical significance of the results is disclosed in relation to the tasks of personnel forecasting in the field of AI.

The information base of the study includes federal documents of strategic planning in the field of artificial intelligence, international bibliographic databases WoS and Scopus, scientific publications. We give particular names and references as they are mentioned in the text of the article.

Analysis of existing approaches to the classification of technologies in the field of artificial intelligence

There are many scientific works in the field of artificial intelligence, and their number is increasing every year. However, the majority of both Russian and foreign studies are related directly to artificial intelligence technologies, their development, implementation and improvement. There are works on specific areas of AI, for example, we can note a number of works by Russian researchers in the field of AI – computer vision (Khokhlova et al., 2019; Bokovoy et al., 2020), biometric recognition (Vartanov et al., 2020), predictive analytics (Buevich et al., 2021), etc.

Another block is formed by works revealing the concept of "artificial intelligence" and its ethical components (Razin, 2019; Lyubimov, 2020). A number of studies address the relationship between human cognitive functions and artificial intelligence technologies (Gust, Kühnberger, 2006; Lu, Li, 2019; Jin, 2020).

The field of artificial intelligence is also considered through the prism of economic research. O.A. Romanova and A.O. Ponomareva raise the topic of digital transformation and artificial intelligence (Romanova, Ponomareva, 2020), V.N. Leksina presents the role of artificial intelligence in the economy in a series of articles (Leksin, 2020). There are also works on human resources for digital transformation (Kolin, 2019; Kuznetsov et al., 2020).

There are analytical papers that address a broader range of problems in this area. A series of analytical reports published by Stanford University, the AI Index Report (2017–2022), is authoritative in the international community[10]. The reports contain an analysis of research and development, the state of the labor market and the education system in the field of AI, as well as strategies for the development of AI in individual countries. In Russia, similar reports are published by the Center for National Technological Initiative at MIPT, the Almanac "Artificial Intelligence"[11]. Large-scale research of the AI field is conducted by international consulting companies IDC[12] and Gartner[13]. A number of countries produce white papers on AI technology, one of which was published in Russia[14].

However, not much is being done to classify AI technologies, including the problem of human resources in the implementation of plans for the development of the AI field.

Among the existing developments we can point out the scheme of AI technologies used at the National Technology Initiative Center at MIPT –

[10] The AI index report. Available at: https://aiindex.stanford.edu/report/ (accessed: March 22, 2022).

[11] Almanac "Artificial Intelligence". Available at: https://aireport.ru/ (accessed: March 22, 2022).

[12] Research by International Data Corporation, an international consulting company, "Worldwide artificial intelligence spending guide". Available at: https://www.idc.com/tracker/showproductinfo.jsp?containerId=IDC_P33198 (accessed: March 22, 2022).

[13] A study by the international consulting company Gartner "Hype Cycle for Artificial Intelligence", 2021. Available at: https://www.gartner.com/doc/reprints?id=1-27ILFEVT&ct=210923&st=sb#cppdip.747735 (accessed: March 22, 2022).

[14] White Paper: Development of selected high-tech areas. (2020). Available at: https://www.economy.gov.ru/material/file/ba6a7585c4b23c85931aaee99682ad30/belaya_kniga_2022.pdf (accessed: March 16, 2022).

in the Almanac "Artificial Intelligence"[15]. A basic model of AI Alliance professions and competencies has been developed[16]. The AI maps were developed by the company IP Laboratory[17] and the publication of technology and business RB.RU[18]. At the same time, the proposed approaches to classification allow forming only a general picture of the state of AI technologies, not directly applicable to the tasks of personnel forecasting.

As part of the classification of AI technologies presented by the authors of the almanac *Artificial Intelligence*[19], a chain of AI technologies of the following type is built: "cognitive function – topical applied development areas". In the classification there is no possibility of building a connection of technologies with professions in the economy and with specialists' training programs.

The closest for the tasks of personnel forecasting is the basic model of professions and competencies of the AI Alliance. It identifies six professional roles and the required level of mastery of each of the 36 key competencies. This model describes the required competencies for the professions: it illustrates what university graduates must be able to do in the development and application of AI technologies. At the same time, the model is not sufficient for planning the volume of training and forecasting the staffing needs of the economy, because it presents technologies in terms of tools. There is no reference to other constituent elements of any technology – methods and areas of application.

The AI Alliance's basic model of professions and competencies also identifies six major groups of professions needed to develop AI technologies. However, it is necessary to train not only AI product developers, but also those who use individual AI technologies or tools in their professional activities.

The classification of AI technologies used in the "Map of Artificial Intelligence of Russia", as the authors themselves point out, consists of two parallel classifiers – function (vision, speech, etc.) and application (finance, industry, etc.)[20], and has not yet been merged into a single system. A qualitative description of the state of technology is presented, but the capabilities of the model are insufficient to obtain quantitative indicators of technology development.

The national strategy for the development of artificial intelligence for the period through to 2030[21] defines AI technologies as "technologies based on the use of artificial intelligence, including computer vision, natural language processing, speech recognition and synthesis, intelligent decision support, and advanced artificial intelligence methods". Undoubtedly, the development of any technology depends significantly on the promising methods that make up that technology. At the same time, forecasting the workforce requires an understanding of the promising and potential development of technology-related tools and applications.

Summarizing, we can conclude that the presented classification systems of artificial intelligence technologies are sufficiently advanced and solve individual industry problems, but they are not suitable for the task of personnel forecasting. For example, classifications do not have ways to

[15] Artificial Intelligence. The current state in Russia and the world. Russia's strategy (2019): Almanac. *National Technological Initiative Center at MIPT for Artificial Intelligence*, 1, Moscow. Available at: https://aireport.ru/review (accessed: March 3, 2022).

[16] Basic model of professions and competencies. *AI Alliance*. Available at: https://a-ai.ru/education/#methodology-proffession-model (accessed: March 3, 2022).

[17] "Airussia" Artificial Intelligence Map of Russia. Available at: http://airussia.online/ (accessed: March 3, 2022).

[18] Artificial Intelligence Edition Map. *RB.RU*. Available at: https://rb.ru/ai/ (accessed: March 3, 2022).

[19] *Artificial Intelligence. The current state in Russia and the world. Russia's strategy (2019): Almanac*. Available at: https://aireport.ru/review (accessed: March 3, 2022).

[20] Available at: http://airussia.online/#opis (accessed: March 22, 2022).

[21] The national strategy for the development of artificial intelligence for the period through to 2030 "On the development of artificial intelligence in the Russian Federation", approved by Presidential Decree 490, dated October 10, 2019. Available at: https://www.garant.ru/products/ipo/prime/doc/72738946/ (accessed: March 1, 2022).

quantify the essential features of technology, which would allow us attributing professions or types of economic activity to a particular technology.

Structural model of artificial intelligence technologies

In order to develop the classification system required in the tasks of predicting personnel in the field of AI, we propose a structural model based on the following properties.

1. Hierarchy of AI technologies from the general (cognitive function) to the particular (specialized technologies), similar to the "cognitive function – topical applied development areas" chain from the almanac *Artificial Intelligence*.

2. The qualitative composition of each technology is determined by its constituent methods, tools, and applications.

3. The quantitative assessment of the essential features of each technology corresponds to the potential of technology development and is determined by the prospects of the methods, tools and areas of application used.

Hierarchy of artificial intelligence technologies

Nowadays, the term "artificial intelligence" has many definitions. Thus, the "AI development roadmap" defines artificial intelligence as "*a set of technological solutions that imitate human cognitive functions (including self-learning and search for solutions without a predetermined algorithm) and allow the performance of tasks to achieve results at least comparable with the results of human intellectual activity. A set of technological solutions includes information and communication infrastructure, software, including machine learning methods, processes and services for data processing and decision making*"[22]. Hussein Abbas, editor of IEEE Transactions on Pattern Analysis and Machine Intelligence, defines AI as *"social and cognitive phenomena that allow a machine to integrate into society to perform competitive tasks that require cognitive processes and communicate with other actors in society by exchanging messages with high information content and shorter representations"* (Abbass, 2021).

It follows that AI technology allows delegating tasks that were previously performed by humans to a machine. A distinctive feature of such tasks is the presence of cognitive functions, and individual technologies of artificial intelligence in the presented definitions are determined by information and communication technologies (ICT). Thus, each AI technology has the following characteristics:

1) ensuring the realization of human cognitive functions;

2) implementation of these functions is based on the use of ICTs.

Consequently, at the top level of the hierarchy there should be a classification according to the attributes associated with cognitive functions. At the next levels the classification according to the ICT-oriented way of implementation is performed. Let us distinguish three levels in the hierarchy of AI technologies.

1. First level: substitutable cognitive function.
2. Second level: AI technology areas.
3. Third level: private technologies (sub-technologies) of AI.

There are three types of human cognitive function realization (Baksanskii, 2005):

1) recognition as perception of information;

2) comprehension as processing and analyzing information, remembering and storing, sharing information;

3) action as the construction and implementation of a program of action.

They represent a nested structure, where each successive view includes the functions of the previous one.

When applied to the field of AI, the presented types of implementation of cognitive functions

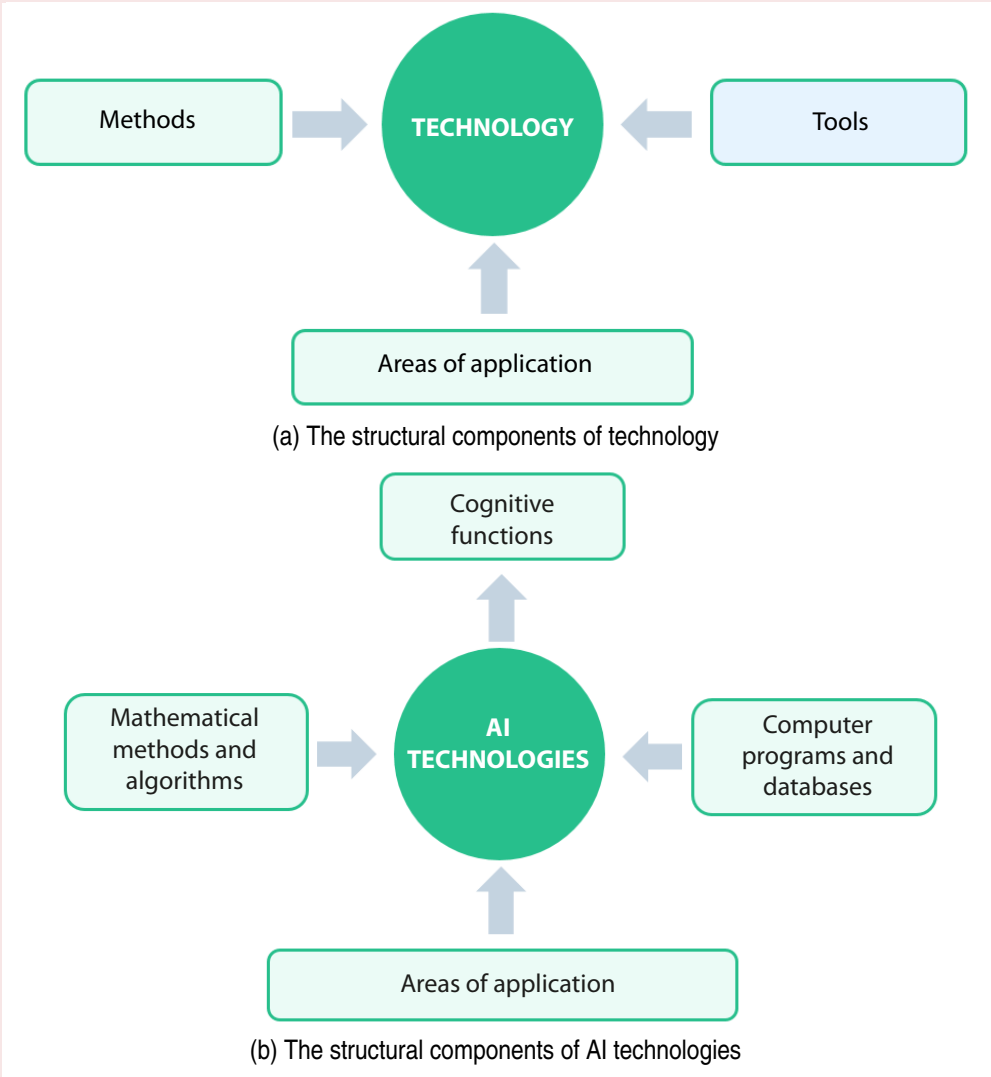
[22] A roadmap for the development of "end-to-end" digital technology "Neurotechnology and Artificial Intelligence". Ministry of Digital Development, Communications and Mass Media of the Russian Federation. Approved October 10, 2019. Available at: https://digital.gov.ru/ru/documents/6658 (accessed: March 1, 2022).

determine the extent to which AI delegates (replaces) those functions that were previously performed by humans. Determines what functions (competencies) can be freed from a person through the use of individual AI technologies. In general, competence is the ability of a specialist to solve a class of professional tasks (knowledge, experience, skills). Consequently, competencies are included in both methods, tools, and applications (Migurenko, 2016; Kalinovskaya, 2021), as defined in the second and third levels of the proposed AI technology hierarchy.

Qualitative structure of artificial intelligence technologies

In general, technology contains three components (Ushakov, 2017): methods (scientific knowledge that provides a solution to the problem); tools (means for applying the method to solve the problem); applications (source of practical tasks). The overall component structure of the technology is shown in *Fig. 1(a)*. For AI technology, these three components that determine the composition of its methods, tools and applications will be as follows: methods – these are mathematical methods

Figure 1. Structure of technology components and AI technology components



Source: own compilation.

and algorithms; tools – computer programs and databases / knowledge bases; areas of application of AI – sectors of the economy. The component structure of artificial intelligence technologies is shown in *Fig. 1(b)*.

The AI technology areas (the second level of the hierarchy) provide sets of methods and algorithms, tools and applications for the field of AI. For each type of implementation of cognitive functions, sets of AI technologies (names, including synonymous ones) falling into this type were expertly determined. For the component "Mathematical methods and algorithms" allocated 10 items; for the component "Computer programs and databases" – 18 items; for "Areas of application" – 21 items. They are presented in the form of directories, which have a two-level structure of keywords.

1. The name of the object from the set (in Russian and English), including equivalent names.

2. Key words for each object in the set (in Russian and English) detailing the elements of specialization of the corresponding object.

As a result, we developed four reference titles: a) AI technology areas; b) mathematical methods and algorithms; c) computer programs and databases / knowledge bases; d) AI application areas. The handbooks are auxiliary internal materials, they are designed to quantify the essential features of AI sub-technologies (the third level of the hierarchy); they were formed based on expert analysis of fundamental documents in the field of AI, as well as scientific publications in leading journals.

Assessment of AI technology attributes based on scientific publications

For personnel forecasting tasks, the main attribute of AI technology is its development potential, so it is required to assess the promising areas of AI technology based on the promisingness of the AI sub-technologies included in the field. The promising nature of a sub-technology is determined by the promising nature of the methods, tools, and applications used. It is necessary to identify which specific methods, tools and applications define the sub-technology.

For this purpose, the method of Systematic Literature Review (Snyder, 2019), based on the analysis of scientific publications on the topic of AI, in our case in the journals indexed in the international databases (IDB) Scopus and Web of Science, as well as in the publications indexed in Russian Science Citation Index (RSCI). Within the framework of this method, a list of journals containing only leading publications (journals of the first quartile Q1 and conferences of the A/A* level) in the field of AI was used to identify priority areas of development (frontiers) of artificial intelligence. The list of such publications was approved by the Ministry of Economic Development of Russia as part of the AI Centers competition in 2021[23].

The methodology for analyzing publication activity is as follows. AI experts selected for each year in the period 2016–2021 all articles in Q1 journals and the first 100 articles from conference proceedings in the field of AI A/A*. Performing text analysis in the title, abstract, and keywords of the publication, experts generated a list of private AI technologies (AI sub-technologies), the first level of the technology guide. Then a list of keywords of the second level of the technology guide was formed. Similarly, sets of used methods and tools were formed, as well as keywords for method and tool guides. The first level (names) in the guide to the fields of application is created on the basis of the Russian Classifier of Economic Activities[24]. Thus, the directories are lists of keywords for each of the technology area components.

[23] Documentation for the selection of recipients of support for research centers in the field of artificial intelligence, including "strong" artificial intelligence, trusted artificial intelligence systems, and ethical applications of artificial intelligence. Available at: https://ac.gov.ru/uploads/_Projects/AI_otbor/DocumentsWord.docx (accessed: February 1, 2022).

[24] OKVED 2. Russian Classifier of Economic Activities OK 029-2014. Available at: https://classinform.ru/okved2.html (accessed: February 1, 2022).

To obtain quantitative characteristics of the degree of use of various components (methods, tools, applications) and their individual subcomponents, we applied the following algorithm based on queries to the Scopus / WoS IDB:

1) to find K_c the number of publications in which any words from the set of keywords of specific components are used.;

2) to find the K_{sc} number of publications that use the keywords of specific subcomponents;

3) to find the proportion of subcomponent publications in the component publications K_p:

$$K_p = K_{sc} / K_c .$$

This algorithm is of a general nature and does not require expert analysis. A specific variant of the algorithm implementation will be presented in the article below on the basis of the Scopus IBD for the period 2016–2022.

Artificial intelligence technology classification system

Using the methodology of expert analysis of scientific publications, we conducted a sample study of leading publications (first quartile Q1 journals and A/A* level conferences) in the field of AI for 2016–2021 (2426 publications). Based on the expert analysis of names and keywords, we formed 96 private technologies (sub-technologies) of AI, which constitute the third (lower) level of classification. For each sub-technology, we evaluated its frequency of occurrence (number of publications) using Scopus IBD queries (69571 publications). At the same time, experts have also done work on the formulation of names of sub-technologies, taking into account other sources, in particular the Development Strategy of AI[25].

[25] The national strategy for the development of artificial intelligence for the period through to 2030 "On the development of artificial intelligence in the Russian Federation", approved by Presidential Decree 490, dated October 10, 2019. Available at: https://www.garant.ru/products/ipo/prime/doc/72738946/ (accessed: March 1, 2022).

Next, the experts grouped AI sub-technologies to form the second level of classification – consolidation into AI technology areas. Each such area represents a certain main direction of AI development. The perspective score of a technology area is calculated as the sum of the scores included in the sub-technology area. This grouping of sub-technologies by experts is based on Russian and foreign industry sources and documents. As a result, fifteen names of AI technology areas have been formed with preservation of the established terminology.

To form the first level of classification, we structured these fifteen areas according to three basic cognitive functions. Four technology areas are assigned to recognition (perception), six areas are assigned to comprehension, and five areas are assigned to action.

Table 1 shows the presence of fifteen AI technology areas in the fundamental Russian documents in the field of AI. It is worth noting that the presented technology areas do not cover the entire sphere of AI. They identify promising areas of development, where perspective is assessed on the basis of mentions in leading scientific publications in the field of AI.

As we have already noted, the quantitative indicator characterizing the importance of the technology area (perspective from the point of view of development) is the number of publications on the subject of AI technologies in Q1 journals and proceedings of A/A* conferences in the field of AI for 2016–2022. In general, we have studied 2,426 publications (expert analysis) and 69,571 publications (automatic occurrence analysis). Based on their analysis, 96 private AI technologies (sub-technologies) were formed and 15 areas of AI technology. To illustrate the relationship between three levels of "cognitive function – technology area – sub-technology", *Table 2* shows an example of the AI technology area "Machine translation, natural language dialogue".

Table 1. Intersection of artificial intelligence technology areas with key AI documents and sources

Artificial intelligence technology areas	RF Presidential Decree 490, dated October 10, 2019 "On the development of artificial intelligence in the Russian Federation", the National Strategy for the Development of Artificial Intelligence for the period through to 2030	Order of the Ministry of Economic Development of RF, dated July 14, 2021 "Documentation of the selection of support recipients for research centers in the field of artificial intelligence including in the field of "strong" artificial intelligence, systems of trusted artificial intelligence and ethical aspects of the use of artificial intelligence"	Order of the Ministry of Economic Development of RF 392, dated June 29, 2021 "On approval of criteria for determining whether projects belong to projects in the field of artificial intelligence"	Roadmap for the development of "end-to-end" digital technology "Robotics and sensor components"	Roadmap for the development of "end-to-end" digital technology "Neurotechnologies and artificial intelligence"	Analytical collection "Almanac artificial Intelligence, no. 1. AI market Overview Russia and the World" (MIPT)	Analytical collection "Almanac artificial intelligence no. 8. Index 2020" (MIPT)	Report of the research and consulting company Gartenr "Hype Cycle for Artificial Intelligence" (July 2021)
Computer vision	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Biometric recognition		Yes				Yes		
Intelligent sensor technology (information from sensors)		Yes		Yes		Yes	Yes	
Speech analysis and synthesis	Yes	Yes	Yes		Yes	Yes	Yes	
Information search						Yes		Yes
Machine translation, natural language dialogue	Yes	Yes	Yes		Yes	Yes		Yes
Expert and recommendation systems	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Knowledge ontologies: representation, interpretation, learning	Yes		Yes		Yes	Yes		Yes
Predicative analytics		Yes				Yes		
Data mining		Yes	Yes			Yes		Yes
Process automation	Yes		Yes				Yes	Yes
Software agents						Yes		Yes
Industrial robots		Yes				Yes		
Drones and autonomous robots, swarm intelligence		Yes		Yes		Yes	Yes	Yes
Responsible artificial intelligence (ethics and philosophy, legal norms, security)		Yes						Yes
Source: own compilation.								

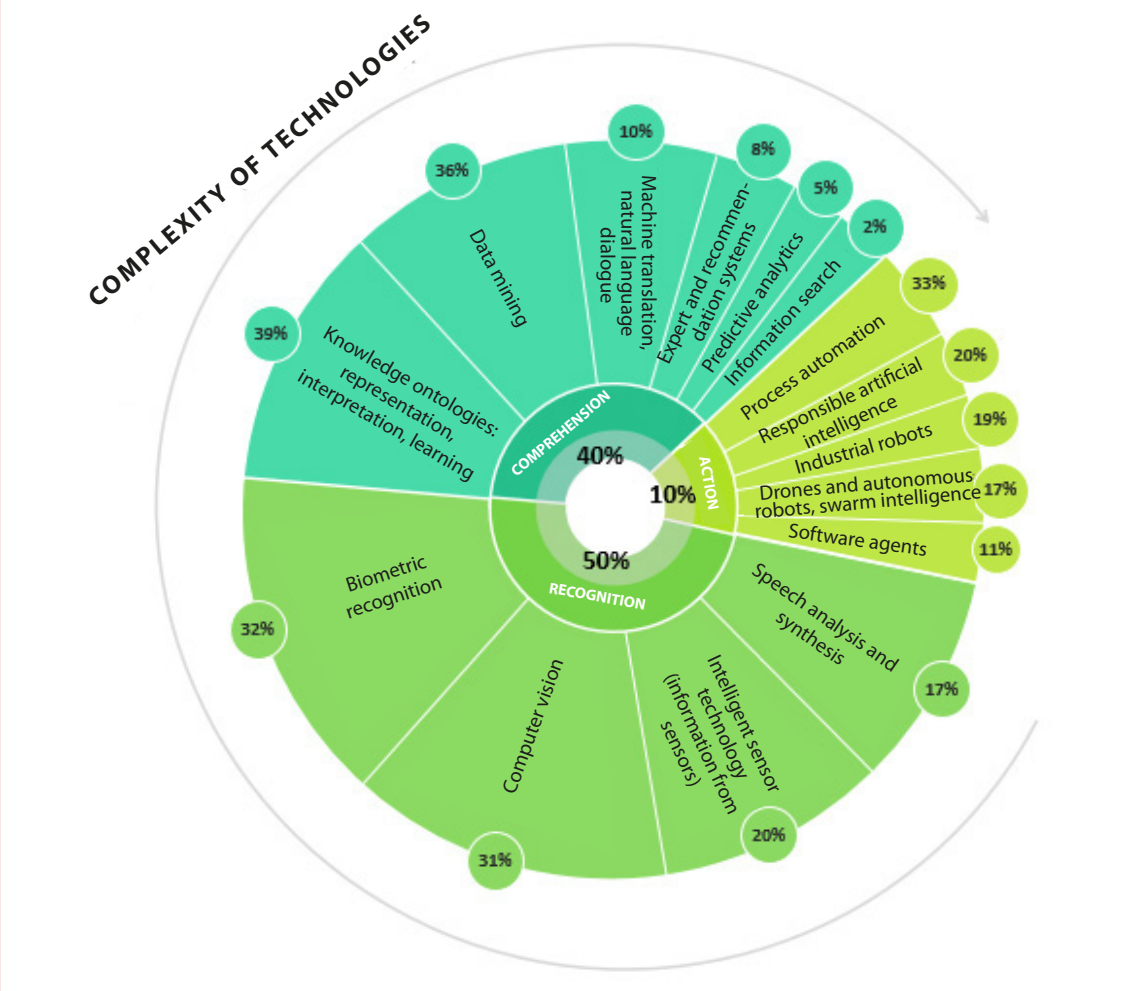
Table 2. Scheme "cognitive function – technology area – sub-technology"

Cognitive function: comprehension (processing and analysis of information; memorization and storage; information exchange)	
AI technology area	Sub-technologies (private technologies)
Machine translation, natural language dialogue	1. Multilingual automatic machine translation system 2. Machine representation of texts (neuro symbolic model, thematic modeling, language-neutral models, multilingual models) 3. Dialog systems with personalized natural language response generation 4. Program code generation 5. Generating images by text 6. Annotation (abstracting, summarizing) of texts 7. Text mining for text classification (attribution, spam recognition, sentiment analysis, authorship, style compliance, error checking, etc.) 8. Subject-oriented virtual assistants implementing conversational AI 9. Paraphrasing the text 10. Text (synthesis) augmentation for solving machine learning problems
Source: results of the conducted research.	

Figure 2 shows the distribution of the share of publications on cognitive functions and AI technology areas. We have found that the proportion of the identified publications on each of the cognitive functions differs significantly decreasing as the complexity of the implementation of the cognitive function increases.

About half of the publications studied account for the basic cognitive function "Recognition" which is responsible for the information perception. This function includes biometric recognition, computer vision, speech analysis, and synthesis technologies. The next level of increasing complexity is "Comprehension" which includes processing, analysis, storage and exchange of the received information. At the technological level, this includes the fields of technology, knowledge ontology, machine learning, predictive analytics, etc. The share of publications on this function is 40%. The maximum complexity level is "Action"; this function is based on "Recognition" and "Comprehension" of information. The technology areas that relate to this function account for only 10% of the identified publications.

Figure 2. Distribution of the number of publications on cognitive functions and AI technology areas



Share of publications is calculated in relation to the total number of publications, for sub-technologies – in relation to the number of publications on cognitive function.

Source: own compilations.

We should note that the most "advanced" (from the point of view of product creation) AI technology areas according to the model of the "Hype cycle of artificial intelligence technologies for 2021"[26] are computer vision and semantic search corresponding to the cognitive function "Recognition". In other words, AI technology areas that are more studied by the criterion of "number of publications" and relate to the basic cognitive function of "Recognition" also turn out to be technologically more mature[27].

Each of the identified fifteen areas of AI technology is characterized by a unique set of methods (mathematical methods and algorithms), tools (computer programs and databases / knowledge bases) and applications (economic sectors). To identify this set, we have carried out an automatic occurrence analysis for the entire array of publications in the Scopus database for 2016–2021. The queries used the names of the required components and key words in accordance with the developed reference books. We have analyzed 2.6 million publications. The transition from samples of publications in leading scientific publications Q1/A* to a complete sample from the Scopus database is due to the need to have statistically significant indicators when detailing the components of AI technologies.

It is known that the entire array of publications in the Scopus database is characterized by the presence of a large number of publications that are not essential for development in the field of AI. To assess the correctness of using the entire Scopus database array in comparison with publications in leading publications Q1 and A*, we have carried out a comparative analysis of publication activity in the AI technology areas with samples of publications from both databases – complete and only Q1 and A* – for Russia, China and the USA.

Based on the collected data (using information on all AI technology areas), we have calculated Pearson correlation coefficients *corr* between the total number of publications in the Scopus database and the total number of publications in leading publications Q1 and A*:

$$corr = \frac{\sum_{i=0}^{n}(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=0}^{n}(x_i-\bar{x})^2}\sqrt{\sum_{i=0}^{n}(y_i-\bar{y})^2}},$$

where x_i – number of publications on i-th (i = 1, 2, ..., n) from n AI technology areas in the Scopus database, y_i – number of publications on i-th (i = 1, 2, ..., n) form n AI technology areas in leading publications Q1 and A*, $\bar{x}, \bar{y}$ – corresponding averages. For Russia, the value of such a correlation coefficient is 0.89, for the USA it is 0.86, for China – 0.96, which allows concluding that there are similarities between the two sources of publications and use samples from the entire array of publications of the Scopus database along with samples from publications in leading scientific publications Q1/A*.

For each AI technology area, a set of publications has been formed in which a given area is affected. In the generated set of publications, a key word search was performed, each of which characterizes one of the components of AI technology: "Mathematical methods and algorithms" (methods), "Computer programs and databases / knowledge bases" (tools), "Economic sectors" (application areas).

Figure 3 shows an example of the identified composition of such AI technology area as "Biometric recognition" in terms of its constituent methods, tools, applications and AI sub-technologies *(presented example details Fig. 1 (b))*. We should note that the component is included in the composition provided that it is highly common

[26] Hype Cycle for Artificial Intelligence (2021), July. *Gartner*. Available at: https://www.gartner.com/doc/reprints?id=1-27ILFEVT&ct=210923&st=sb#cppdip.747735 (accessed: March 16, 2022).

[27] *White Book: Development of Certain High-Tech Areas* (2020). Available at: https://www.economy.gov.ru/material/file/ba6a7585c4b23c85931aaee99682ad30/belaya_kniga_2022.pdf (accessed: March 16, 2022).

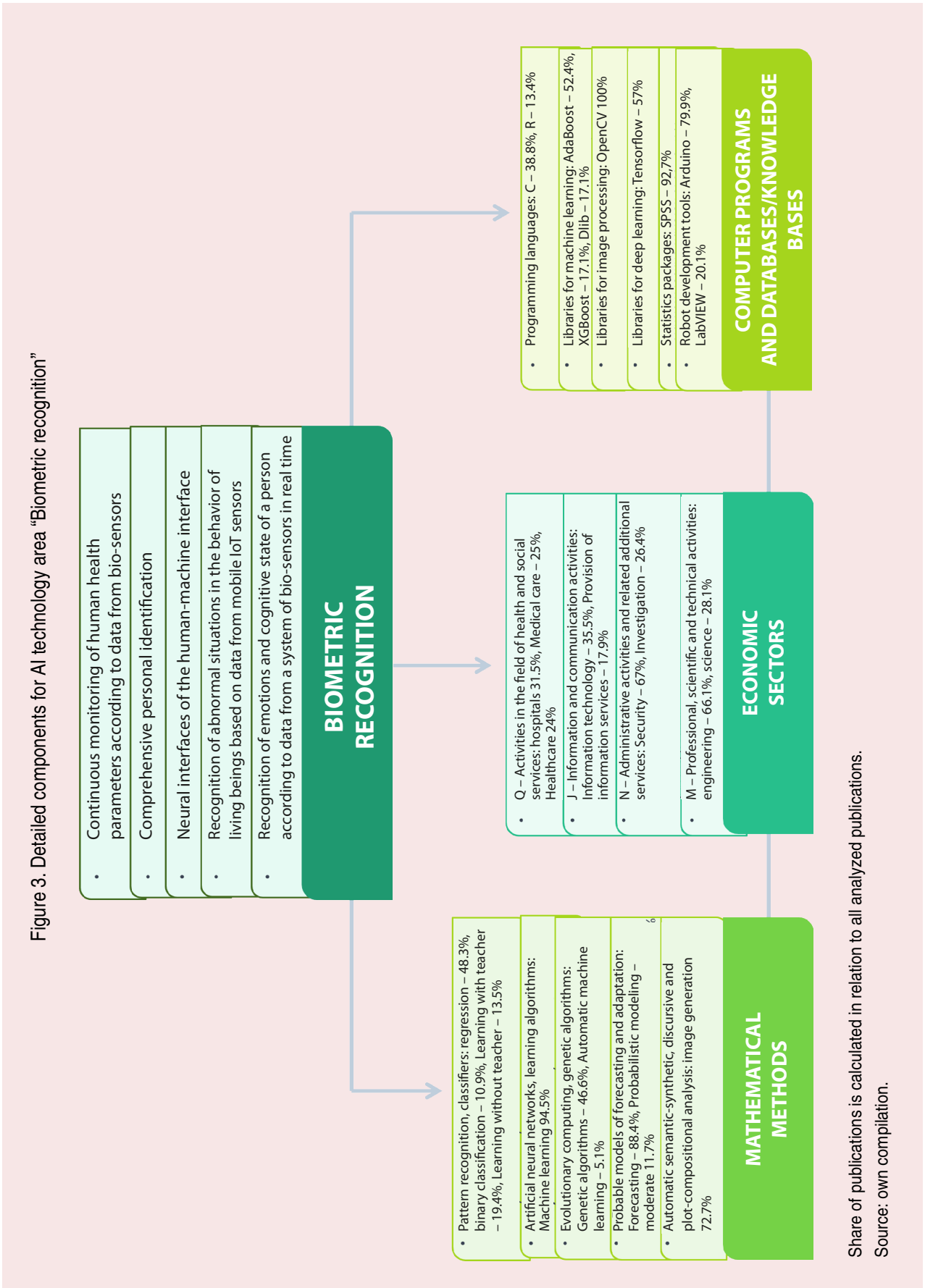


Figure 3. Detailed components for AI technology area "Biometric recognition"

Share of publications is calculated in relation to all analyzed publications.
Source: own compilation.

in scientific publications. Thus, the proposed classification system not only determines the unique qualitative composition of AI technology, but also provides a way to quantify the essential features of the technology coming from its complex composition. Such an opportunity is necessary to solve the problems of personnel forecasting.

For this AI technology area, we have analyzed 50,650 publications. In the central part of Figure 3, a list of sub-technologies is indicated including human sensory, emotion analysis, personality identification, analysis of human and animal behavior, neurointerfaces of human-machine interface.

The left part of Figure 3 "Mathematical methods and algorithms" gives the key methods for the technology "Biometric recognition"; we have indicated the share of publications for each of them in which they have been mentioned. In particular, among these methods, the most important are probabilistic forecasting and adaptation models; automatic semantic-syntactic, discursive and plot-compositional analysis; pattern recognition; classifiers.

The right part of Figure 3 shows the key tools – "Computer programs and databases / knowledge bases" for the AI technology area "Biometric recognition", as well as the share of publications where they were mentioned. In particular, among the tools in the technology area "Biometric recognition", the most common are software tools "OpenCV" (image processing), "AdaBoost", "XGBoost", "Dlib" (machine learning); programming languages C and R, robot development tools "Arduino". However, it is worth noting the absence of Python in this list; its individual libraries are more often mentioned (for example, "OpenCV").

The central part of Figure 3 lists the types of economic activities in which the AI technology area "Biometric recognition" is used. This technology is actively mentioned in publications in conjunction with such types of economic activities as "Administrative activities and related additional services" (security, investigations), "Professional, scientific and technical activities", "Activities in the field of health and social services".

Separately, we should note that the sets of components for each of the technology areas are unique, thereby characterizing this area. *Table 3* shows an example of the names of components with the maximum contribution for three technology areas; the share of publications in which one or another component occurs is indicated.

In general, the proposed new classification system of AI technologies systematizes promising AI technologies on three levels (cognitive functions – technology areas – sub-technology). The prospects are determined by the scientific interest degree in the technology and its components. The system details each structural level by three components: methods, tools, and applications. The details are based on quantitative estimates of the prospects determined

Table 3. Example of unique components for AI technologies

AI technology area	Mathematical methods and algorithms	Computer programs and database	Application areas – types of economic activity
Computer vision	Automatic semantic-syntactic, discursive and plot-compositional analysis – 60.6%	Programming languages – C – 33.4%	Section M – Professional, scientific and technical activities – Engineering – 77.8%
Industrial robots	Fuzzy knowledge, reasoning in conditions of uncertainty – 86.2%	Programming languages – MATLAB – 28.1%	Section C – Manufacturing – Production –Machinery – 27.2%
Data mining	Artificial neural networks, learning algorithms – 97.6%	Programming languages – Python – 38,2%	Section J – Information and communication activities – Information technology – 34.1%

Source: results of the conducted research.

by the number of scientific publications. The classification system allows automatic regular updating, based on accounting for outgoing scientific publications. Updating the qualitative structure of the classification system (names of technologies and their components) requires expert participation.

Using classification system for personnel forecasting purposes

Further, we will present details of methods, tools, application areas in the field of AI and options for applying the classification system to the tasks of personnel forecasting.

Component content: detailing methods, tools, application areas

The set of component contents – "Mathematical methods and algorithms" (methods), "Computer programs and databases" (tools), "Economic sectors" (application areas) – is unique for each of the AI technology areas. At the same time, individual components (elements) of each of the three components may occur in different technologies. A software package was developed in the Python programming language which, using selenium tools and generated sets of key words, allowed automating the sending of requests to the Scopus database and processing responses in order to obtain the number of publications in the Scopus database corresponding simultaneously to a certain method or tool, or application area and a certain AI technology.

To identify the priority of the component elements, we have carried out an additive convolution for each of the three components of AI technology areas. For example, for AI technology component "Mathematical methods and algorithms", we have calculated the number of publications containing key words corresponding to this component during convolution.

Tables 4, 5, and 6 present the results obtained. Table 4 shows a fragment of the original matrix with the key elements of the "AI Methods" component, where key words are given for each method, the number of the fields of AI in which the method is used, as well as the total number of mentions of the element in the analyzed publications, which reflects

Table 4. AI Methods: mathematical methods and algorithms

Name of the elements of the component "Mathematical methods and algorithms"	Key words for detail	Number of AI areas in which the method is applied	Number of mentions in publications	Share of mentions, %
Artificial neural networks, learning algorithms	Machine learning	15	434,586	35.24
Probabilistic forecasting and adaptation models	Forecasting	13	219,336	17.79
Pattern recognition, classifiers	Regressions	14	137,058	11.11
Graph representation of knowledge, data markup	Ontologies	7	75,260	6.10
Pattern recognition, classifiers	Learning with teacher	12	67,738	5.49
Fuzzy knowledge, reasoning in conditions of uncertainty	Autonomous systems	10	43,450	3.52
Pattern recognition, classifiers	Learning without teacher	9	37,949	3.08
Artificial neural networks, learning algorithms	Reinforcement learning	4	36,419	2.95
Evolutionary calculations, genetic algorithms	Genetic algorithms	15	36,281	2.94
Automatic semantic-syntactic, discursive and plot-compositional analysis	Image generation	4	35,663	2.89
Source: results of the conducted research.				

Table 5. AI Tools (computer programs and databases / knowledge bases)

Name of the elements of the component "Computer programs and databases / knowledge bases"	Key words	Number of AI areas with the usage of tools	Number of mentions in publications	Share of mentions, %
Programming languages	C	15	95,679	49.82
Programming languages	R	15	53,813	28.02
Libraries for machine learning	XGBoost	15	5,911	3.08
Libraries for machine learning	AdaBoost	13	5,865	3.05
Robot development tools	Arduino	10	4,985	2.60
Libraries for deep learning	Tensorflow	8	4,142	2.16
Programming languages	MATLAB	4	4,119	2.14
Statistics packages	SPSS	7	3,935	2.05
Libraries for natural language processing	Word2Vec	6	3,015	1.57
Libraries for machine learning	Weka	8	2,390	1.24
Source: results of the conducted research.				

Table 6. AI application areas (economic sectors by the type of economic activity)

Name of the elements of the component "Application areas"	Key words	Number of AI areas with the usage of tools	Number of mentions in publications	Share of mentions, %
M - Professional, scientific and technical activities	Technical	14	286,781	25.37
P – Education	Education of schoolchildren and students	2	187,404	16.58
M - Professional, scientific and technical activities	Scientific	13	120,406	10.65
J – Information and communication activities	Information technology	15	116,449	10.30
Q – Healthcare and social services activities	Healthcare	7	70,588	6.25
J – Information and communication activities	Provision of information services	14	57,120	5.05
Q – Healthcare and social services activities	Medical care	7	36,954	3.27
F – Building	Reconstruction	2	36,184	3.20
N – Administrative activities and related additional services	Ensuring security	3	29206	2.58
R – Activities in the field of culture, sports, leisure and entertainment	Libraries	4	12,779	1.13
H – Transportation and storage	Transportation	2	7,745	0.69
Source: results of the conducted research.				

its "weight" in relation to other elements. The key word "Machine learning" means that of the many other key words for the element "Artificial neural networks, learning algorithms", the proportion of mentions of the phrase "Machine learning" in publications is the highest.

The analysis of convolution indicators shows that the most common (often encountered) are mathematical methods such as artificial neural networks, learning algorithms, pattern recognition, classifiers, probabilistic forecasting and adaptation models.

Table 5 presents a fragment of the results of a similar convolution procedure for the component "Computer programs and databases / knowledge bases".

The most common elements of the "Computer Programs and databases/knowledge bases" component are programming languages (C, R, MATLAB, Python, Java) and libraries for machine learning (XGBoost, AdaBoost, Weka, LightGBM, Dlib).

Table 6 presents a fragment of the results of the convolution for the component "AI application areas (by type of economic activity)".

The most common elements of the "AI application areas" component were the types of economic activities "Information and communication activities" and "Education". Separately, it is worth noting the relatively low popularity of the use of AI technologies in the real economy.

Classification system applied to the tasks of personnel forecasting

The proposed classification system of artificial intelligence technologies can be used to detail the indicators of personnel forecasting in the filed of AI. The detailing of the annual additional staffing requirement (AAR) of the economy is usually carried out by types of economic activity, professions and educational specialties.

In relation to the filed of artificial intelligence, this triad can be supplemented with details on AI technology areas. According to the author's estimate, the AAR in the field of AI for 2022 is 25.7 thousand people[28]. To detail the AAR on AI technologies, we can use the proportion of publications within each of the three classification levels (cognitive function – technology area – sub-technology). For example, if we take into account the share distribution of publications, shown in Figure 2 for the field of computer vision technologies, then the AAR value will be 7.9 thousand people.

Another important indicator of the detail of the personnel forecast is the training in the context of educational specialties of graduates with competencies in the field of artificial intelligence. These competencies are formed as a result of the implementation of educational programs (Gurtov et al., 2013). For example, master's programs should have at least seven disciplines that provide professional competencies in the field of AI. Examples of such competencies are for the "Mathematical methods and algorithms" component – the "Artificial neural networks, learning algorithms" element; for the component "Computer programs and databases / knowledge bases" is the element "Programming languages C, R".

Let us note the similarity of the meaningful interpretation of the concepts of "competence" and "technology". Considering competencies as a set of knowledge, skills, practical experience, and technologies as a set of methods, tools, and application areas, we can draw an analogy where knowledge is mathematical methods and algorithms, skills are computer programs and databases / knowledge bases, practical experience is application areas (types of economic activity). Thus, the content of the technology areas serves as the basis for the formation of professional competencies.

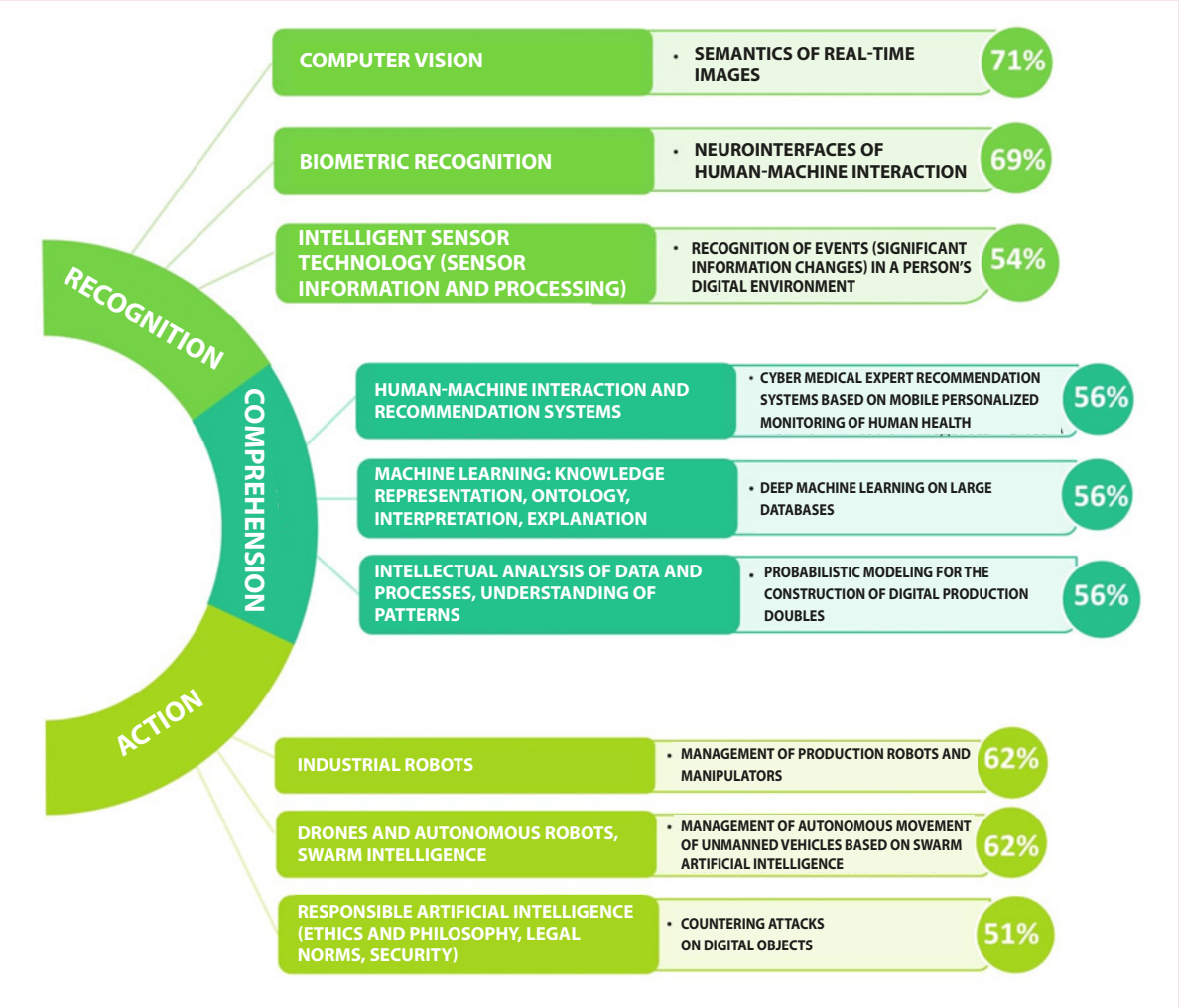
Continuing the analogy of the connection between technologies and competencies, technology areas need to be detailed to the level of sub-technologies, and professional competencies – to highly specialize professional competencies (Gurtov et al., 2015; Sigova et al., 2013).

Also, the proposed classification has the potential for the development. One of the ways is to identify priority development areas (frontiers) of artificial intelligence. AI frontiers are the most significant highly specialized areas of artificial intelligence technology development (sub-technologies) belonging to the first decile (the first 10% in the ranked distribution series) in terms of significance[29]. As we have already noted

[28] Artificial intelligence. Personnel of the highest scientific qualification: Internet portal. Available at: http://science-expert.ru/ai (accessed: March 30, 2022).

[29] Top 20 frontiers of world science. Available at: https://issek.hse.ru/news/562631350.html (accessed: May 30, 2022).

Figure 4. Frontiers of artificial intelligence technologies (fragment)



Percentage of responses is calculated from the total number of experts who answered the question.
Source: own compilation.

in the section "Methodology", for quantitative assessment when identifying priority development areas (frontiers) AI can be used by leading publications indexed in the international databases Scopus and Web of Science (journals of the first quartile Q1 and conferences of the A/A* level). The analysis of publication activity together with a survey of experts among employers, developers of educational programs in the field of AI will help to form these frontiers. During the expert evaluation of 95 sub-technologies formed, experts among employers, developers of educational programs and products in the field of AI identified those which, in their opinion, belong to the frontiers of sub-technologies[30].

Figure 4 shows examples of frontiers with the maximum number of expert assessments (three frontiers for each cognitive function), the

[30] Artificial intelligence. Personnel of the highest scientific qualification: Internet portal. Available at: http://science-expert.ru/ai (accessed: March 30, 2022).

percentage of experts who chose one or another frontier is indicated (106 experts participated in total).

Separately, we should note that the topics of the frontiers correspond to promising areas of artificial intelligence which were designated in the RSF-2021 contests[31].

Conclusion

Analysis of classifications of AI technologies used in the Center of the National Technology Initiative based on MIPT, the AI Alliance group, the companies "IP Laboratory" and "RB.RU", showed that these approaches allow forming only a general picture of the structure of AI technologies. Based on the general conceptual model of technologies (methods, tools, fields of application), we have developed a structural model of AI technologies, based on their differentiation by the composition and significance of mathematical methods and algorithms, computer programs and databases, application areas. Quantitative indicators for this differentiation were obtained by analyzing publication activity in publications refereed in the Scopus database. We have been formed a unique set of components for each of the fifteen AI technology areas, an example of which is shown in Figure 3 for the technology area "Biometric Recognition".

The proposed methodology has made it possible to structure technologies by levels: cognitive functions – technology areas – AI sub-technologies. The technological maturity of AI technology areas in the context of cognitive functions differs significantly decreasing as the complexity of cognitive function increases.

The constructed three-level classification system of AI technologies allows moving from technology areas to AI sub-technologies which are highly specialized areas of AI development within each of the technology areas with the preservation of its components. The theoretical component of the classification makes it possible to gain new knowledge including identifying priority development areas (frontiers) of artificial intelligence.

The proposed classification system of AI technologies is practically applicable in the field of personnel forecasting when detailing the indicators of annual additional personnel needs by types of economic activity, professions and educational specialties.

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References

Abbass H. (2021). Editorial: What is artificial intelligence? *IEEE Transactions on Artificial Intelligence*, 2(2), 94–95. DOI: 10.1109/tai.2021.3096243 (in Russian).

Baksanskii O.E. (2005). *Kognitivnye nauki. Ot poznaniya k deistviyu* [Cognitive Sciences. From Cognition to Action]. Moscow: URSS.

Bokovoy A., Muravuev K., Yakovlev K. (2020). *Map-Merging Algorithms for Visual SLAM: Feasibility Study and Empirical Evaluation*. DOI: 10.1007/978-3-030-59535-7_4

[31] List of supported projects based on the results of the 2022 competition for grants of the Russian Academy of Sciences "Conducting basic scientific research and exploratory scientific research by small individual scientific groups". Available at: https://rscf.ru/upload/iblock/b97/u4u9s0w4fh0c1ovy6n0w40ne0niyre7e.pdf (accessed: March 30, 2022).

Buevich A., Sergeev A., Shichkin A., Baglaeva E. (2021). A two-step combined algorithm based on NARX neural network and the subsequent prediction of the residues improves prediction accuracy of the greenhouse gases concentrations. *Neural Computing and Applications,* 33. DOI: 10.1007/s00521-020-04995-4

Gurtov V., Pitukhina M., Sigova S. (2015). Hi-tech skills anticipation for sustainable development in Russia. *International Journal of Management, Knowledge and Learning,* 3(2), 3–17.

Gurtov V.A., Ershova N.Yu., Sigova S.V. (2013). In-demand competencies for solving "tasks of the future" in priority areas of science, technology and technology: Embedding in OOP. In: *Mat-ly Mezhdunar. nauch.-metod. Konf. "Vysokie intellektual'nye tekhnologii i innovatsii v natsional'nykh issledovatel'skikh universitetakh": plenarnye doklady (28 fevralya – 01 marta 2013 g.)* [Proceedings of the International Scientific and Methodological Conference "High Intellectual Technologies and Innovations in National Research Universities": Plenary Reports (February 28 – March 1, 2013)]. Saint Petersburg: Izdatel'stvo Politekhnicheskogo universiteta (in Russian).

Gust H., Kühnberger K.-U. (2006). *The Relevance of Artificial Intelligence for Human Cognition*.

Jin C. (2020). Relevance between artificial intelligence and cognitive science. In: *Proceedings of the 2020 International Symposium on Artificial Intelligence in Medical Sciences (ISAIMS 2020)*. DOI: 10.1145/3429889.3429917

Kalinovskaya I.N. (2021). Creation of programs for the development of human resources of the organization using artificial intelligence technology. In: Koroleva A.A. et al. (Eds.). *Tendentsii ekonomicheskogo razvitiya v XXI veke: Mat-ly III Mezhdunar. nauch. konf., Minsk, 1 marta 2021 g* [Trends of Economic Development in the 21st Century: Materials of the 3rd International Scientific Conference, March 1, 2021]. Minsk: Belorusskii gosudarstvennyi universitet (in Russian).

Khokhlova M., Migniot C., Morozov A., Sushkova O., Dipanda A. (2019). Normal and pathological gait classification LSTM model. *Artificial Intelligence in Medicine*, 94, 54–66. DOI: 10.1016/j.artmed.2018.12.007

Kolin K.K. (2019). A new stage in the development of artificial intelligence: National strategies, trends and forecasts. *Strategicheskie prioritety=Strategic Priorities*, 2(22), 4–12 (in Russian).

Kuznetsov N.V., Lizyaeva V.V., Prokhorova T.A., Lesnykh Yu.G. (2020). Training personnel for the implementation of the national program "digital economy of the Russian Federation". *Sovremennye problemy nauki i obrazovaniya=Modern Problems of Science and Education*, 1. Available at: https://science-education.ru/ru/article/view?id=29520. DOI: 10.17513/spno.29520 (accessed: March 24, 2022; in Russian).

Leksin V.N. (2020). Artificial intelligence in economy and policy nowadays. Article 1. Artificial intelligence as new economic and political reality. *Rossiiskii ekonomicheskii zhurnal=Russian Economic Journal*, 4, 3–30. DOI: 10.33983/0130-9757-2020-6-3-32 (in Russian).

Lu H., Li Y. (2019). Editorial: Cognitive science and artificial intelligence for human cognition and communication. *Mobile Networks and Applications,* 25, 995–996. DOI: 10.1007/s11036-019-01265-z

Lyubimov A.P. (2020). Main approaches to the definition of "artificial intelligect". *Nauchno-tekhnicheskaya informatsiya. Seriya 2: Informatsionnye protsessy i sistemy=Scientific and Technical Information. Series 2: Information Processes and Systems*, 9, 1–6. DOI: 10.36535/0548-0027-2020-09-1 (in Russian).

Migurenko R.A. (2010). Human competencies and artificial intelligence. *Izvestiya Tomskogo politekhnicheskogo universiteta=Bulletin of the Tomsk Polytechnic University. Geo Assets Engineering*, 6(317), 85–89 (in Russian).

Razin A.V. (2019). Ethics of artificial intelligence. *Filosofiya i obshchestvo=Philosophy and Society*, 1(90), 57–73 (in Russian).

Romanova O.A., Ponomareva A.O. (2020). Industrial policy: New realities, formation and implementation issues. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 13(2), 25–40. DOI: 10.15838/esc.2020.2.68.2 (in Russian).

Sigova S.V., Serebryakov A.G., Luksha P.O. (2013). Creating the list of competences in demand: First Russian experience. *Nepreryvnoe obrazovanie: XXI vek=Lifelong Education: The 21st century*, 1. Available at: http://lll21.petrsu.ru/journal/atricle.php?id=1946 (in Russian).

Snyder H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research,* 104, 333–339. DOI: 10.1016/j.jbusres.2019.07.039

Ushakov E.V. (2017). *Filosofiya tekhniki i tekhnologii* [Philosophy of Engineering and Technology]. Moscow: Yurait.

Vartanov A.V., Ivanov V., Vartanova I. (2020). Facial expressions and subjective assessments of emotions. *Cognitive Systems Research,* 59, 319–328. DOI: 10.1016/j.cogsys.2019.10.005

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Ethnodemographic Structure of Immigration to Russia: Possibilities of Statistical Analysis

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Abstract. Migration processes, unlike natural population movement, are more diverse, can be caused by different reasons and have different directions and deadlines. In this regard, the boundaries between the types of migration (and migrants) are often unclear, which complicates not only their classification, but also the choice of suitable sources for obtaining information about them. Ethnodemographic changes are taking place in modern Russia; this makes it necessary to monitor them more closely and expand approaches to their accounting. The purpose of the study is to develop proposals for the registration of immigrants based on the analysis of approaches developed in Russian and foreign practice aimed at studying and assessing the ethnodemographic characteristics of migrants. As a result of the study, we show that the most complete information about immigrants in Russia is provided by population census data, but the dynamic nature of migration flows requires additional measures related to their accounting. Current migration accounting is carried out using various forms, but the information most often remains at the level of authorized organizations and is not publicly available for analysis in the context of Russia's regions and in the context of the countries whose citizens have arrived in Russia. Sample surveys allow us to study in more detail certain aspects of migration processes or certain categories of migrants, but their results may not always be comparable in time. We suggest the possibility of including additional data on the place of birth of the respondent's father and mother in the population census sheets. For Russia, as well as for other countries, citizenship is an unstable feature, since migrants can become citizens of the country of residence. Requesting data on the place of birth of the respondent's father and mother does not contradict constitutional law and helps to obtain a more clear idea concerning the ethnic and cultural roots of the individual.

Key words: registration of immigrants, ethnodemographic changes, population census, registration forms, national identity, ethnic group, citizenship, foreign citizens.

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Introduction

Migration is a complex social phenomenon that has a significant variety of processes. Due to the emergence of new forms of ethno-cultural differences, it is necessary to obtain relevant information for effective management within the framework of interethnic interaction (Bublikov, Ermak, 2021). Foreign studies on taking ethnicity into account are revealed in the research on political and social aspects, while evaluating the effectiveness of population policy implementation (Birnir et al., 2015; Zhou, 2019).

Changes in ethno-demographic features can be considered as a result of implementation of the state national and demographic policy, as well as a source of changes occurring in the social, economic and political spheres (Rodrigues-Silveira, 2014). While studying population ethnic features, including interethnic relations, researchers encountered problems that can be divided into subjective and objective or endogenous and exogenous (Barwiński, 2015). Endogenous restrictions are associated with individual beliefs of the researcher and their nationality, while exogenous barriers are largely explained by limited access to reliable statistical data that allow us to assess the nature and dynamics of ethno-demographic processes.

At the beginning of the 21st century, more than 60% of national censuses included some form of ethnic registration (Morning, 2008). W. O'Hare in the work *Differential Undercounts in the US Census: Who Is Missed?* notes that ethnicity and race are included in the list of five demographic characteristics that contribute to underreporting. At the same time, he concludes that many studies confirm the fact of underestimation of these categories of the population, but there is still no single point of view about its causes (O'Hare, 2019).

The presence of a significant underestimation of recent immigrants and non-permanent residents in the census is noted on the example of Canada. The probability of undercounts of recent immigrants may be more than 17%, non-permanent residents – more than 40%, with an average of about 8%. Underestimation of these categories correlated with knowledge of the official language of the country of arrival, age and marital status (Bérard-Chagnon et al., 2019).

According to R. Alba, racial origin and ethnicity differ from demographic characteristics such as gender and age due to the need for individual choice, and are also related to the social circumstances of an individual's life and the origin of the family, are characterized by shifting boundaries, which is largely due to the formation of interethnic unions (Alba, 2018). This, in turn, will have an impact on forecasting ethno-demographic processes in society, taking them into account when choosing management approaches.

Due to the fact that labor immigrants play a significant role in the Russian economy, the issues of taking into account their ethno-demographic characteristics are relevant. In Russia, the sources of information include population censuses and sample surveys, forms of administrative accounting, as well as data collected at the borders of states (during passport control, processing of migration cards). However, there is still no universal source of information. Despite the existing opinion that the results of the population census do not always objectively reflect the ethno-geographic processes in the region due to the increased informational impact that causes interethnic tension and the escalation of negative stereotypes (Gabdrafikov, 2021), in Russia, the results of the population census provide a more complete description of the demographic structure of the resident population and migrants, including the ethnic component.

The aim of our study is to develop proposals for the registration of immigrants in Russia based on the analysis of the approaches developed in Russian and foreign practice to the study and assessment of the ethno-demographic characteristics of migrants, including citizenship, ethnic and cultural origin.

In contrast to the previous studies (Mishchuk, 2013; Chudinovskikh, 2015; Vorob'eva et al., 2016; Ryazantsev, Pis'mennaya, 2019; Ryvkina, Osmanova, 2021), our work analyzes approaches to assessing ethno-demographic characteristics of the population on the example of Russia and a number of foreign countries; this fact determines the novelty of our research. In accordance with the approach of the possible mobility of ethnic self-identification, on the one hand, and the instability of citizenship, which may change due to the adoption of the citizenship of the country of residence by a migrant, on the other hand, a set of variables to clarify the socio-cultural characteristics of foreign citizens may include several indicators. Taking into account the experience of foreign countries, we propose to include questions about the place of birth of the respondent's father and mother in the census forms, which will help to get a more accurate idea of the ethnic and cultural roots of foreign citizens and citizens of Russia. In addition, the authors propose to add the "Nationality" entry to the departure sheet and to the migration registration card; this will make it possible to obtain operational information about the ethno-demographic structure of immigrants in the periods between population censuses.

Research methods and methodology

Over the past decades, significant ethno-demographic changes have taken place in Russia as a result of migration processes, as well as the so-called national revival, implying the growth of self-consciousness of representatives of small and large peoples (Gabdrakhmanova, Sagdieva, 2019), which necessitated the introduction of clarifications in the approach to the study and accounting of the ethnic structure of the population and international migration flows. Obviously, at present it is necessary to pay equal attention to permanent and labor migration.

We consider immigration flows in the Russian Federation as an object of research. The subject is the ethno-demographic structure of immigration in the context of accounting methods and available sources of statistics.

The research methodology includes generalizing and comparing existing approaches to the analysis of the nationality structure of migrants in Russian and foreign practice, and also includes comparative analysis of available statistical and departmental data. The paper analyzes the content of forms of registration of migrants, highlights issues that allow assessing the ethnicity or nationality of migrants. As a result, we propose a comparative table of existing approaches to the registration of immigrants, indicating the presence of separate entries concerning nationality or ethnicity.

Using the materials of the Ministry of Internal Affairs of the Russian Federation, we compiled two maps reflecting the territorial distribution of immigrants by regions of Russia, including immigrants who have signed an employment contract and those registered at their place of residence.

The study is based on official sources that allow analyzing the ethnic component of migration flows: data from Rosstat forms and reports, sample observations of migrant labor, the Department of the Ministry of Internal Affairs of the Russian Federation, as well as sociological surveys regarding the issues of ethnicity and interethnic interaction in Russia and its regions. A brief overview of foreign experience related to taking into account the ethno-demographic characteristics of migrants is based on official sources of population censuses of foreign countries. A cartographic method was used to analyze the territorial distribution of migrants.

The first part of the paper discusses the Russian experience of registering the ethno-demographic structure of immigration flows, including the features of current migration accounting, data from the All-Russian Population Census, sample surveys of migrants, and the results of sociological studies revealing the importance of accounting for the ethno-demographic component in the structure of immigration flows for the host society. The second section examines the distribution of foreign citizens across the territory of constituent entities of the Russian Federation, which allows us to assess the existing territorial features of the placement of immigrants. The third section is devoted to the analysis and the possibility of applying in Russian practice the experience of foreign countries receiving immigrants from countries with similar socio-cultural characteristics. As part of the discussion, we propose possible ways to optimize existing approaches to the system of accounting for the ethno-demographic characteristics of immigrants.

Russian experience of estimating the ethno-demographic structure of immigration

The existing system for collecting information on migration in Russia is represented by current (administrative) and census accounting (conducting the All-Russian Population Census (ARPC) once in ten years). A micro-census may take place between the periods of the ARPC, the content of the census forms of micro-censuses coincides with the questions of the main population census. Besides,

an additional source of information is the selective statistical observations on the use of migrant labor, which were conducted in Russia in 2014 and 2019. Let us dwell in more detail on the designated forms of registration of migrants.

Current migration accounting

An important advantage of current (administrative) accounting is the ability to assess the ongoing short-term changes at a certain point in time or their dynamics. Currently, every foreign citizen entering the territory of the Russian Federation must necessarily fill out a migration card, which is issued at the border. The card only indicates the citizenship of the immigrant (the place of birth, as in some documents, is not requested). The manual records should then be transferred to the central database. This form of statistical observation, despite a long practice (in Russia, migration cards for foreigners entering the country were introduced in 2004), has no statistical reflection due to the unorganized procedure for compiling and summarizing information contained in immigration cards (Vorob'eva et al., 2016).

The information within the framework of the current registration of migrants, including international migrants, is collected by the territorial bodies of the Administration of the Ministry of Internal Affairs of the Russian Federation (UMVD RF)[1]. They provide information to the territorial bodies of the Federal State Statistics Service (Rosstat). Summary results are presented in the bulletin *Population Size and Migration in the Russian Federation* and other federal and regional statistical collections.

Since 2008, Rosstat has stopped processing data and publishing information about the national composition of migrants. After this step, Russian statistics completely lost the source of information about the national composition of migration flows (Ryazantsev, Mishchuk, 2020). In order to carry out work or educational activities in Russia, as well as to make other applications, foreign citizens fill out documents containing questions about their citizenship, place of birth and/or nationality[2].

All-Russian Population Census (ARPC) and migration

The program of the 2002 All-Russian Population Census, unlike the previous population censuses, included Questionnaire Form "B": "Census form for persons temporarily residing in Russia and permanently residing abroad", which was intended for interviewing persons temporarily residing in Russia at the time of the population count, but permanently residing abroad. In previous population censuses, persons temporarily staying in the country were counted on general census forms with a note on temporary residence. However, due to the frequent refusals of foreign citizens to answer certain questions of the program, a shortened list of

[1] On approval of the forms of federal statistical observation with instructions for filling them out for the organization of federal statistical observation of population migration: Rosstat Order 545, dated September 15, 2020.

[2] On approval of the application forms submitted in connection with the registration of a patent, its reissue, the issuance of its duplicate or amendments to the information contained in the patent: Order of the Ministry of Internal Affairs of Russia 635, dated August 14, 2017; On approval of the application form of a foreign citizen (stateless person) to engage them as a highly qualified specialist and the procedure for filling it out, as well as the forms and procedures for notifying the Ministry of Internal Affairs of the Russian Federation or its territorial authority on the implementation of labor activity by foreign citizens (stateless persons) on the territory of the Russian Federation (Appendix 13): Order of the Ministry of Internal Affairs of Russia 363, dated June 4, 2019; Appendix 1 to the Administrative regulations of the Ministry of Internal Affairs of the Russian Federation on the provision of state services for granting the status of an internally displaced person and extending its validity; On approval of the application form for participation in the state program to assist the voluntary resettlement of compatriots living abroad to the Russian Federation: Resolution of the Government of the Russian Federation 196-r, dated February 16, 2013 (as amended on July 27, 2017); Appendix 1 to the Administrative regulations of the Ministry of Internal Affairs of the Russian Federation on the provision of state services for the issuance of a residence permit to foreign citizens and stateless persons, replacement of a residence permit to foreign citizens and stateless persons in the Russian Federation, approved by Order of the Ministry of Internal Affairs of Russia 417, dated June 11, 2020.

Table 1. List of questions for persons temporarily staying in Russia

	ARPC-2002		ARPC-2010, 2020*
1.	Sex	1.	Sex
2.	Year of birth	2.	Year of birth
3.	Country of birth	3.	Country of permanent residence
4.	Country of permanent residence	4.	The purpose of coming to Russia
5.	Citizenship	5.	Duration of stay in Russia
6.	Nationality (optional)	6.	Country of residence
7.	The purpose of coming to Russia	7.	Citizenship (only one citizenship)
* Questions 5–7 are intended for persons who have indicated the purpose of coming to work or study. Own compilation according to: ARPC data for 2002, 2010, 2020.			

questions was designed[3]. In subsequent population censuses, this form of questionnaire was retained.

During the 2002 ARPC, first of all, foreign citizens permanently residing in the Russian Federation (i.e. persons with citizenship of a foreign state) and stateless persons at their place of residence were accounted for in a general manner. Second, persons (regardless of their citizenship) who arrived in the Russian Federation to work under contracts of Russian and foreign organizations (except for foreign citizens working in representative offices of foreign states and international organizations) or study for a period of one year or more were counted as permanent residents of Russia at the place of their usual residence in the Russian Federation (regardless of when they arrived). The third category is persons (regardless of their citizenship) who have arrived from foreign countries (including CIS countries) in the Russian Federation for permanent residence or in search of asylum (regardless of whether they have received a residence permit or not)[4].

The entry "nationality" could be filled in by self-determination of a citizen according to Article 26 of the Constitution of the Russian Federation, which states: "Everyone shall have the right to determine and indicate their nationality. No one may be forced to determine and indicate their nationality"[5].

During the 2010 All-Russian Population Census the entire population permanently (usually) residing in the Russian Federation, as well as persons temporarily (up to one year) located on the territory of the Russian Federation, whose place of permanent residence was abroad, were subject to accounting[6]. Three forms of census forms were used[7]. In contrast to the resident population of the Russian Federation, migrants were to answer questions about the country of birth and the country of permanent residence. There was no entry regarding nationality in this census form. The list of questions of the ARPC forms 2002, 2010, 2020 is presented in *Table 1.*

The results of the population census can be considered as a demographic cross-section for a certain period of time; however, we agree with V.A. Tishkov's opinion that the accounting of foreign migrants during the census is conducted very approximately (Tishkov, 2011). In addition,

[3] *Metodologicheskie voprosy Vserossiiskoi perepisi naseleniya 2002 goda* [Methodological Issues of the All-Russian Population Census of 2002]. Moscow, 2005. 129 p.

[4] *Rukovodstvo dlya perepischika o poryadke provedeniya Vserossiiskoi perepisi naseleniya 2002 goda i zapolneniya perepisnykh dokumentov* [A Guide for a Census Taker on the Procedure for Conducting the All-Russian Population Census of 2002 and Filling Out Census Documents]. 66 p.

[5] Article 26. The Constitution of the Russian Federation (adopted by popular vote on December 12, 1993 with amendments approved during the all-Russian vote on July 1, 2020).

[6] The main methodological and organizational provisions of the 2010 All-Russian Population Census. Available at: https://rosstat.gov.ru/bgd/free/meta_2010/Main.htm/ (accessed: November 22, 2021).

[7] On approval of the forms of census sheets of the 2010 All-Russian Population Census: RF Government Resolution 1990-r, dated December 16, 2009.

the analysis of foreign migrants summarizes data on labor migrants, citizens living in Russia, but having foreign citizenship.

The advantage of the population census over administrative sources of information, the collection of which is based on a particular administrative procedure, is a wide range of coverage of migrant workers, regardless of the legality of their situation. However, despite the obvious advantages (coverage of the entire population and the variety of information collected), the census has a major drawback – the inter-census intervals, which, as a rule, make up a decade (Ryazantsev, Mishchuk, 2020).

Changes in migration legislation, major economic or political changes, which get a quick and sensitive response from migration flows, occur much more often, so the data collected during the census can quickly become outdated. Despite the completeness and accuracy of the data provided by population censuses, they do not allow us to observe constant changes in the migration situation. Specialized sample surveys, which are a more flexible tool for collecting such data than population censuses, partly help to supplement the missing information and correct these shortcomings (Vorob'eva et al., 2014).

Selective observation of migrant labor

An additional survey of foreign labor migrants is carried out as part of a sample statistical observation of the use of migrant labor. Monitoring has been carried out since 2014, once every five years. Currently, the observation materials of 2014 and 2019 are available. Based on the methodological and organizational provisions developed for the observation in 2019, the following terms were used in the study: international migrants, international migrant workers, foreign workers, foreign labor migrants. Let us focus on the meanings of these terms, since they do not fully coincide with the common approach to the notion of "international migrant".

In this observation, according to the Guidelines concerning statistics of international labour migration approved at the 20th International Conference of Labor Statisticians in October 2018, "international migrants include all those residents of a given country who have ever changed their country of usual residence"[8]. International migrant workers are also persons aged 15 years and older, permanently residing in Russia, but born abroad.

Our research also considers the category of foreign workers or foreign labor migrants, these are non-residents temporarily located on the territory of Russia, citizens of other states who were employed by households or entrepreneurs and performed paid work in the Russian Federation[9].

Information on the citizenship of foreign labor migrants in the context of the regions of the Russian Federation for 2019 is contained in the tables on the number of foreign citizens employed in households (Table 2.13 in the results of the Sample observation of migrant labor[10]). At the same time, it is impossible to compare the data of 2014 and 2019 in full, since in 2014 information on the citizenship of foreign labor migrants was provided only for the Russian Federation as a whole. In the context of regions, the citizenship of foreign labor migrants is indicated if they are employed by households, but there is no data on the citizenship of foreign labor migrants attracted by entrepreneurs in the context of RF regions.

A comparative analysis of data on the number of foreign labor migrants attracted to work in the Russian Federation from 2014 to 2019 allows us to draw the following conclusions:

[8] The main methodological and organizational provisions of the selective observation of migrant labor in 2019. P. 11. Available at: https://rosstat.gov.ru/free_doc/new_site/imigr18/index.html/ (accessed: December 21, 2021).

[9] Ibidem, p. 13.

[10] The main methodological and organizational provisions of the selective observation of migrant labor in 2019. P. 11. Available at: https://rosstat.gov.ru/free_doc/new_site/imigr18/index.html/ (accessed: December 21, 2021).

– the number of migrants attracted by entrepreneurs and households has decreased, while the share of labor migrants attracted by households is 81%;

– in the context of countries, most of the migrants attracted to work in households in 2014 and 2019 came from Uzbekistan; the number of migrants arriving from all countries decreased, with the exception of Kyrgyzstan and Turkey;

– in 2014, most of the migrants attracted by entrepreneurs came from Ukraine, in 2019 – from Uzbekistan; while the overall reduction in the number of migrants from Belarus has increased in all countries.

The analysis of the distribution of foreign labor migrants employed by entrepreneurs in federal districts of the Russian Federation in 2019 shows that more than 43% of all attracted labor migrants are employed in the Central Federal District. The Central Federal District is the leader in attracting migrants from different countries, while there is also a high proportion of migrants from Kyrgyzstan and China employed in the Far Eastern Federal District. The Nortwestern Federal District ranks second in attracting migrants from Belarus, the Republic of Moldova and Tajikistan.

Sociological research

Sociological research aimed at studying the relations of different ethnic groups in the regions and the relation of the host community toward migrants, allow us to expand the statistical information obtained as a result of current accounting and population censuses.

The materials are collected within the framework of monitoring surveys, public opinion polls conducted by research organizations: the analytical center "Levada-Center"[11], the Public Opinion Foundation (FOM)[12], the Russian Public Opinion Research Center[13] (VCIOM). In November 2011, the Public Opinion Foundation conducted a survey on the attitude toward the return of the entry "nationality" in the passports of Russians; 26% of respondents reacted positively to this proposal, 48% were indifferent[14].

In the spring of 2016, the Federal Agency for Ethnic Affairs switched to a new system for implementing social monitoring of ethno-confessional relations. Studies are conducted at the level of constituent entities and municipalities, in addition, ethnic groups (nationality) and confessional groups are studied as an object.

In December 2018, VCIOM presented data from a public opinion poll on the impact of immigration on Russia. According to the results of the poll we can conclude that Russians are more supportive of the idea of attracting Russian and Russian-speaking immigrants from the Republic of Belarus, Ukraine, Kazakhstan and Germany. The greatest "antipathy" is caused by the probability of entry of citizens of Tajikistan, Uzbekistan, Ukraine, the U.S. and China[15].

In September 2019, Levada-Center* presented the results of monitoring the xenophobic sentiments of the Russian population, reflecting the increased attention of the population to ethnic and migrant issues. However, the authors of the monitoring note that such dynamics may be due to external (political) reasons[16].

[11] Autonomous non-profit organization Yuri Levada Analytical Center "ANO Levada-Center"*. Available at: https://www.levada.ru/nopisanie/o-tsentre/ (accessed: December 24, 2021).

* Included in the register of foreign agents.

[12] Public Opinion Foundation (FOM). Available at: https://fom-gk.ru/ (accessed: December 25, 2021).

[13] Russian Public Opinion Research Center (VCIOM). Available at: https://www.wciom.ru/ (accessed: December 25, 2021).

[14] Available at: https://fom.ru/Bezopasnost-i-pravo/10262#page=22/ (accessed: November 15, 2021).

[15] Immigration to Russia: Good or bad? Available at: https://wciom.ru/analytical-reviews/analiticheskii-obzor/immigracziya-v-rossiyu-blago-ili-vred/ (accessed: October 28, 2021).

[16] Monitoring of xenophobic sentiments, 2019. Available at: https://www.levada.ru/2019/09/18/monitoring-ksenofobskih-nastroenij-2/ (accessed: October 28, 2021).

* Included in the register of foreign agents..

In the scientific community, among the works of specialists dealing with issues of interethnic interaction at the federal and regional levels, we note the works of L.M. Drobizheva (Drobizheva, 2019) and V.I. Mukomel (Mukomel, 2018). Scientists from RAS Institute of Ethnology and Anthropology have made a great contribution to the study of theoretical and practical directions of interethnic relations[17]. The issues of ethnic and religious diversity in Russia, ethnic politics and the history of interethnic relations are revealed in the works of RAS Academician V.A. Tishkov (Tishkov, Stepanov, 2017).

Regional studies are conducted using different methods and in different time periods, which makes their results incomparable within the country (Khaykin, Berezhkova, 2016). In addition, in most of them, the goals and objectives depend on the specifics of socio-economic development and the ethnic processes taking place in them, which also does not allow conducing comparisons between regions. Regional studies address issues of interethnic relations in Crimea (Kulbachevskaya, 2019), the Republic of Tatarstan (Kozlov et al., 2016; Gabdrakhmanova, Sagdieva, 2019), the Republic of Buryatia (Petrova et al., 2019), the Republic of Sakha (Yakutia) (Davydova et al., 2015; Maklashova, 2019). The issues of integration of migrants in Moscow are considered by E.A. Varshaver, A.L. Rocheva (Varshaver, Rocheva, 2015), V.M. Peshkova (Peshkova, 2015). The works of O.I. Vendina (Vendina, 2016; Vendina, Pain, 2018) are devoted to the ethno-cultural diversity in Russian cities and specifics of managing cultural diversity in multi-ethnic cities.

Comparative analysis of approaches to taking into account ethno-demographic characteristics of migrants in the Russian Federation

The analysis of approaches to taking into account the ethno-demographic characteristics of migration flows allows us to note that when collecting data by filling out various forms (migration sheets, petitions, applications), applicants can indicate their nationality and religion.

According to Rosstat's expert assessments, the entry "nationality" was filled out very poorly in the mid-2000s, mostly due to the fact that passport office employees did not pay due attention to the quality of filling out migration registration sheets. Currently, individual departments with access to the relevant forms of documents can estimate the proportion of answers to these questions. According to the results of the ARPC-2010, 96% of the census population indicated their nationality, in 2018 – 82.2%. It should be taken into account that the overwhelming majority of the population participating in the census are permanent residents of the Russian Federation, and the proportion of migrants is low. In 2010, 7.8% of the surveyed population within the ARPC-2010 indicated foreign countries as their place of birth.

Russian population censuses have the following issue: foreign citizens are recorded in the census by their nationality, and Russian citizens by ethnicity, but all these data are summarized by the term "nationality"[18]. That is, at the stage of publishing data on the ethno-demographic characteristics of migrants for evaluation by the scientific community, the information is narrowed down to the entry "citizenship". Other information collected is not analyzed. *Table 2* presents an analysis of the

[17] Tishkov V.A. (Ed). (2019). *Migratsiya i mezhnatsional'nye otnosheniya: resurs gosudarstvenno-obshchestvennogo partnerstva v Rossii* [Migration and Interethnic Relations: A Resource of Public-Public Partnership in Russia]. Moscow.

[18] Stepanov V.V., Tishkov V.A. (Eds.). (2007). *Etnokul'turnyi oblik Rossii: perepis' 2002 goda* [Ethnocultural Image of Russia: the 2002 Census]. Moscow: Nauka.

Table 2. The presence of ethno-demographic characteristics of migrants in different forms of accounting

	Citizenship	Nationality	Religion	Native language	Country of birth	Country of permanent residence
ARPC-2002 (sheet B)	+	+	-	-	+	+
ARPC-2010, 2020 (sheet B)	+	-	-	-	+	+
Current accounting	+	+	+	+	+	+
Sample surveys*	+	…	…	…	+	…
Opinion polls**	+	+	…	…	…	…

* In sample surveys, depending on the goals and objectives, the given characteristics of migrants may change. The most common questions are about migrants' citizenship and country of birth.
** In sociological research, the inclusion of a particular characteristic depends on the purpose of the study. Most ethnic studies include questions about the citizenship or nationality of respondents.
Source: Ryazantsev S.V., Mishchuk S.N. (2020). Approaches to taking into account the citizenship and ethnicity of migrants in Russia. *Nauchnoe obozrenie. Seriya 1: Ekonomika i pravo,* 5, 18–31.

presence or absence of certain ethno-demographic characteristics of migrants in the Russian Federation in the application forms.

Territorial distribution of foreign citizens by nationality and citizenship: results of the ARPC and current accounting in Russia

The change in the current consideration of approaches, forms of taking into account migration in the context of nationalities does not contribute to a comparative time analysis of the ongoing processes. In most sources, information is provided by the countries of which migrants are citizens. Additional difficulties arise when analyzing international labor migration in the context of countries. Rosstat's open sources provide data on the number of foreign citizens who had a valid work permit or a patent for employment; these data are presented in the context of regions of Russia, but do not allow analyzing the distribution by countries from which migrants arrived. According to the Federal Migration Service of Russia, in 1995, in the structure of the foreign labor force (FLF) by country of origin, the first place was occupied by citizens of Ukraine (34% of the number of FLF attracted to Russia). The second and third places are occupied by citizens of Turkey (13%) and China (9%). In 1998, the structure of FLF exporters did not change, Ukraine, Turkey and China remained the leaders.

The information and reference bulletin no. 5, prepared by the Consolidated Analytical Department of the Federal Migration Service of Russia, presents the national composition of international migrants in the Russian Federation for 1997. The results of the analysis of migration growth (loss) by the national composition of migrants reflect the excess of the number of arrivals over the number of departures, which formed the migration growth of the population in 1997. According to the abovementioned bulletin, the peoples and ethnic groups of the Russian Federation accounted for 73% of the migration increase, of which 90.5% were Russians. A significant migration increase was noted in the group of Tatars. A significant excess of the number of migrants who left over the number of arrivals was noted among Jews.

Migration growth was recorded among all indigenous nationalities of the CIS and Baltic countries, with the maximum increase in the number of Ukrainians. They accounted for 39% of the number of peoples and ethnic groups who arrived in the Russian Federation, living mainly outside the Russian Federation. The second place in terms of both the volume of migration growth (23.6%) and the number of arrivals (13.2%) was occupied by Armenians.

In contrast to the positive balance of migration with the CIS and Baltic countries, in 1997 there was a migration decline in the population with other countries, largely formed by the outflow of Germans, whose share amounted to 75% of the total number of the population that left Russia.

In the collections and newsletters issued after 1998, migrants are represented by the countries from which they came, without specifying their nationality. The analysis of the distribution of labor migrants is based on data from several sources: Monitoring of legal (legal) external labor migration issued in 2006–2008 by the Federal Migration Service of Russia, Rosstat collection *Labor and Employment in Russia*, which has been published since 1995 with a frequency of once every two years[19], the collection *Regions of Russia. Socio-Economic Indicators*[20].

A detailed analysis with the inclusion of tabular statistics on legal international migration was presented in the collections issued by the Department of External Labor Migration of the Federal Migration Service of Russia in 2004–2007. There are currently no analogues of such materials.

The collection *Labor and Employment in Russia* includes tables on international labor migration. The total number of foreign citizens who carried out labor activity in Russia is presented in it until 2010; since 2011, data on foreign labor migrants are recorded separately according to the number of citizens who have received patents, have valid patents and have valid work permits.

Changes in legislation and the signing of intergovernmental agreements affect the forms of accounting for labor migration in Russia, including accounting for their citizenship. For example, as a result of the signing of the Treaty on the Eurasian Economic Union (Astana, May 29, 2014), citizens of the EAEU member states engaged in labor activity in Russia are not statistically counted among the foreign citizens who have received permits to work in Russia. Citizens of these countries are counted based on the number of notifications received from employers about the conclusion of an employment contract or a civil contract with foreign citizens and stateless persons.

From 1994 to 2018, the number of foreign citizens with work permits in Russia has been constantly increasing. Despite the lack of data on the number of citizens of the EAEU member states in the number of foreign labor migrants, the share of citizens from the CIS countries by the end of 2020 amounted to about 96% of the total number of foreign citizens engaged in labor activity in Russia[21]. Since 2007 and up to the present, the number of citizens of Uzbekistan and Tajikistan engaged in labor activity in Russia has been increasing. The share of citizens of these countries in 1994 was 1.1 and 0.4% of the total number of foreign labor migrants, in 2018 – 57.6 and 25.3% respectively. At the end of 2020, due to restrictions in connection with COVID-19, the number of Tajik migrants decreased by 25% compared to the level of 2018, Uzbek – by 33%, Chinese – by 70%[22].

Let us take a closer look at the territorial distribution of citizens of Uzbekistan and Tajikistan in the context of Russia's regions in 2020 based on the data provided by the Ministry of Internal Affairs of Russia.

[19] Labor and employment in Russia. Available at: https://rosstat.gov.ru/folder/210/document/13210/ (accessed: January 16, 2022).

[20] The collection *Regions of Russia. Socio-Economic Indicators* presents the number of permits issued and patents in force (and issued in a separate table) in the context of regions of Russia, but without specifying the countries from which foreign labor migrants came. These tables only allow us to estimate the distribution by region of the share of labor migrants from the CIS countries and other countries, while since 2015 migrants from the EAEU member states have not been taken into account. For Russia as a whole, there are open data.

[21] *Labor and Employment in Russia. 2021: Statistics Collection*. Moscow: Rosstat, 2021. Available at: https://rosstat.gov.ru/storage/mediabank/Trud_2021.pdf (accessed: November 22, 2021).

[22] Ibidem, p. 107.

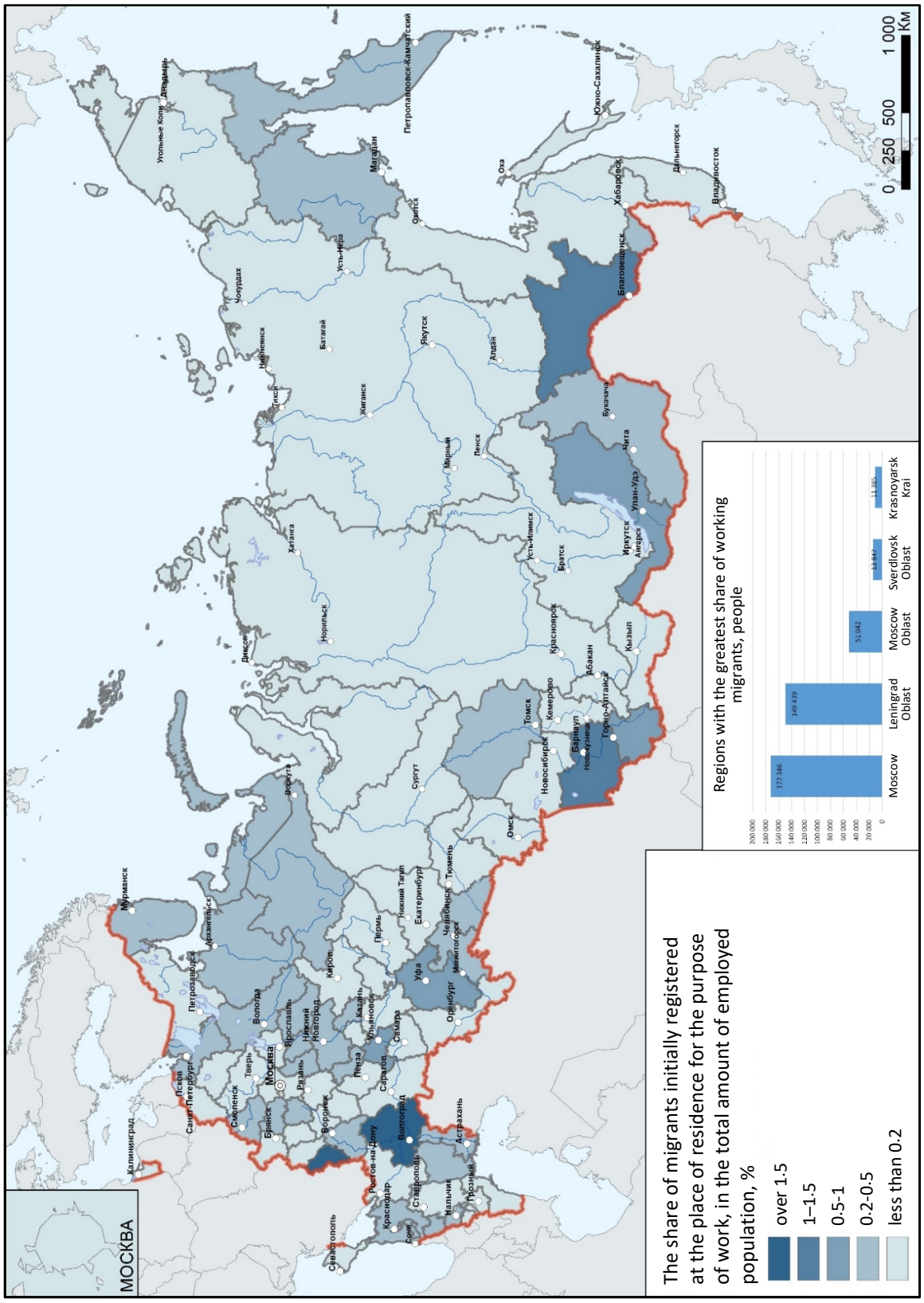

Figure 1. Distribution of labor migrants from Tajikistan by regions of Russia in 2020, %

Source: own compilation on the basis of data from the Ministry of Internal Affairs of the Russian Federation.

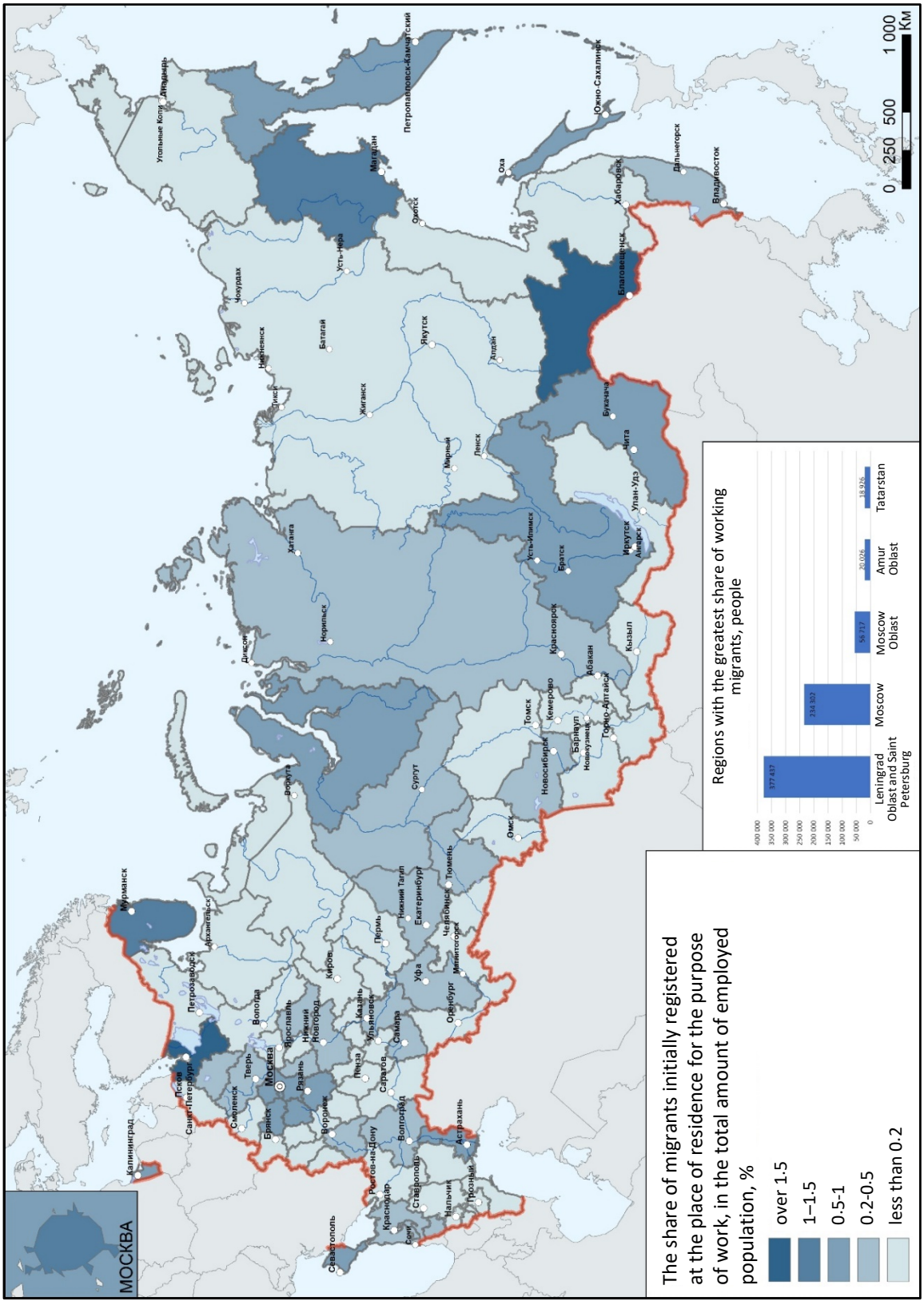

Figure 2. Distribution of labor migrants from Uzbekistan by regions of Russia in 2020, %

Source: own compilation on the basis of data from the Ministry of Internal Affairs of the Russian Federation.

The largest number of migrant workers from Uzbekistan and Tajikistan were registered in the Leningrad Oblast, Saint Petersburg and Moscow. The territorial distribution of migrants from the above-mentioned countries, initially registered at the place of residence, in the total number of employed population, is different and is characterized by the presence of high values in the western and eastern regions of Russia. The presented cartographic material *(Fig. 1, 2)* makes it possible to visualize the features of territorial distribution of these categories of migrants across Russian regions.

According to the results of the All-Russian Population Census in 2002 and 2010 Rosstat presents tables on the number of migrants temporarily staying in Russia and permanently residing in other countries[23]. A comparative analysis of the data of ARPC-2002 and ARPC-2010 revealed a twofold increase in the number of citizens of other countries who were on the territory of Russia at the time of the census. At the same time, the share of foreign citizens who indicated work as the purpose of arrival averaged about 65% in 2002 and 2010. We should note a high proportion of respondents who did not indicate the country of permanent residence. In 2002, the share of this category of migrants was 9.5%, in 2010 – 41.6% (1.1% lower than the number of migrants arriving from CIS countries in 2010). If we consider the distribution of migrants who did not indicate the country of permanent residence by the purpose of their arrival, then the share of labor migrants in 2002 was 59% of the number who indicated the reason for arrival. In 2010, the share of labor migrants who did not indicate the country of permanent residence was 82% of the number of migrants who indicated the purpose of arrival.

The predominant share of migrants came from CIS countries. The share of the total number of migrants arriving from CIS countries in 2002 was 63.9%, in 2010 – 42.7%. The share of labor migrants from CIS countries was below the average for this group of countries: in 2002 – 69.8%, 2010 – 76.8% of the total number of migrants from CIS countries.

In the structure of migrants in 2002, there was the maximum share of labor migrants (who indicated work as the purpose of arrival) in the total number of migrants who arrived in Russia from Kyrgyzstan (81.6%), Tajikistan (87.5%) and Turkey (91.9%). In 2010, in relative terms, the leading place was occupied by Vietnamese citizens, 90.5% of whom indicated the purpose of their arrival as "work". In addition, high values were noted for citizens of Tajikistan, Turkey, and Uzbekistan.

Let us pay attention to the fact that regardless of the form of accounting used, statistics reflect an increase in the number of migrants arriving from Uzbekistan, Tajikistan, and Kyrgyzstan. Of course, data mismatch is likely in absolute values, but the trends have a common direction.

We emphasize that in order to plan socio-economic development, the formation of migration and national policy of the state, it is necessary to have access to more accurate information. In compliance with the constitutional rights of citizens of the Russian Federation and international rules for taking into account the nationality and ethnicity of the population, it is possible to adopt the experience of foreign countries in taking into account these characteristics (for example, the place of birth of parents). Let us take a closer look at the experience of foreign countries in taking into account the ethnicity and nationality of migrants.

Taking into account the ethno-demographic structure of immigration in foreign countries

In many countries, questions about ethnicity are included in the list of census questions. There are still significant differences in the terminology used and approaches to taking into account the ethnic diversity of the population.

[23] All-Russian Population Census. Available at: https://rosstat.gov.ru/vpn_popul/ (accessed: October 23, 2021).

In our study, we selected states that have historically accepted immigrants from countries with similar socio-cultural characteristics, primarily the widespread use of a single language. Immigration flows to Russia during the post-Soviet period mostly come from countries whose population speaks Russian. Thus, foreign experience in the field of taking into account the ethno-demographic characteristics of immigrants may be interesting and relevant for Russia.

In countries with a long experience of attracting migrants, for example, Australia, Canada, etc., consideration of ethnic identity, ethnic roots and nationality is included in the surveys of the population within the framework of population censuses. Currently, the list of cultural and ethnic groups is being expanded in the census forms, and the questions about nationality are being clarified. Ethnicity is determined by respondents through self-identification. In addition, the ethnic roots of the population are investigated in more detail. For example, in Australia, questions were added to the 2016 census lists to clarify the country of birth of the mother, the country of birth of the father, the country of birth of the respondent. Previously, either Australia or other countries without specifying their name were indicated as the country of birth.

In the UK, information about the respondents' country of birth is also considered more important and objective than citizenship. Ethnicity and nationality are also included in the list of questions in the population census[24]. The previous UK census took place in 2011[25]. In the spring of 2021, the next population census was held, in which questions about nationality, ethnic group, religion, main language, knowledge of English (ability to speak English), knowledge of the Welsh language were used to collect data[26].

In Canada in 2002 a study of ethnic diversity was carried out, where questions about the cultural, linguistic, ethnic, religious, etc. identity of respondents were widely presented. Within the group of questions on socio-cultural information, data on the place of birth of the mother and father were entered. When specifying citizenship, people are asked to clarify how it was obtained (by birth, by naturalization with an indication of the date, specify another country). In addition, taking into account the increasing need to expand information about migrants, a longitudinal survey of immigrants has been conducted in Canada since 1997[27]. This study lasts four years after arrival in the country, since during this time immigrants establish economic, social and cultural ties with Canadian society.

The population census in Canada is conducted every five years. The latest population census was held in March 2021. As a result of a preliminary population survey conducted in 2019 to test the number and new formulations of questions, changes were made in the following five sections: family and demographic concepts and daily activities; immigration, ethno-cultural diversity and languages in Canada; indigenous peoples, education, labor, commuting and veterans; income and expenses; housing.

The section "Immigration, ethno-cultural diversity and languages in Canada" addressed issues

[24] List of migration data in the UK in the 2011 Census. Available at: https://www.nomisweb.co.uk/census/2011/uk_migration/ (accessed: December 19, 2021).

[25] The UK population censuses were held on March 27, 2011. They were conducted by the Northern Ireland Statistics and Research Agency (NISRA), the National Archives of Scotland (NRS) and the Office for National Statistics (ONS) for both England and Wales. The UK includes countries such as England, Wales, Scotland and Northern Ireland. The ONS is responsible for the dissemination of UK census statistics. Available at: https://www.ons.gov.uk/census/2011census/2011ukcensuses/ (accessed: December 19, 2021).

[26] Development of questions of national identity, ethnic group, language and religion for the 2021 census. Available at: https://www.ons.gov.uk/census/censustransformationprogramme/questiondevelopment/nationalidentityethnicgrouplanguageandreligionquestiondevelopmentforcensus2021/ (accessed: 20.01.2022).

[27] Available at: https://www12.statcan.gc.ca/census-recensement/2011/ref/92-135/surveys-enquetes/longitudinalsurvey-enquetelongitudinale-eng.cfm/ (accessed: December 13, 2021).

of immigration and citizenship, the place of birth of a person and their parents, ethnic or cultural origin, population groups, religion, language, rights to education in a minority language.

In order to reflect the growing ethnic diversity of the Canadian population in the 2021 census, examples of ethnic groups were removed from the questionnaire to exclude their influence on the answers. Instead, in order to help respondents understand the question, a description of the types of origin is provided, as well as a link to an extensive list of examples of ethnic and cultural origin, which, according to the developers, encourages Canadians to identify themselves without offering specific answers, and allows them to better reflect the growing diversity of the Canadian population[28].

A brief overview of the approaches existing in foreign countries to the development of questions about citizenship, ethnicity and nationality showed the importance of this aspect in the statistical assessment of the population of the state. The increased intensity of international migration flows only emphasizes the need to take into account these characteristics of the resident population and immigrants. In foreign practice, questions about ethnicity (based on self-identification), the country of birth of the mother and father, the country of birth of the respondent are used.

Discussion

The sources of information about migrants include population censuses and sample surveys, various forms of administrative accounting, as well as data collected at the borders of states (during passport control, processing of migration cards). Due to the complexities of accounting, there is no universal source of information about migration. Each source is necessary in obtaining generalized and complete information about migrants[29]. If the results of administrative accounting can be used as an element of routine and even daily management, then the results of the population census can be considered as a source of planning for the future and a means of analyzing the past[30].

Returning to the issue of taking into account the ethno-demographic structure of migrants, we agree with O.S. Chudinovskikh's opinion that Russia is characterized by an accelerated process of naturalization of migrants, which can take no more than three years. After naturalization and acquisition of citizenship of the Russian Federation, many migrants become "invisible" and "blend" with the local population. This situation complicates the assessment of the experience of integration of migrants in the host community, the territorial features of their placement and the structure of economic activity, the unemployment rate (Chudinovskikh, 2015).

The absence of information on the distribution of the resident population and migrants, in the context of their ethnic identity, limits managerial functions in the field of regulation of ethnic and migration processes. In order to plan socio-economic development, the formation of migration and national policy of the state, it is necessary to be able to access more detailed information by including clarifying questions in various forms of registration within ARPCs, sample surveys of migrants, as well as in administrative forms of registration. Flexible ethnic policy can be based on full-fledged information about the management object for the application of effective practices and

[28] Updated content for the 2021 Census of Population: Immigration, ethno-cultural diversity and languages in Canada. Release date: July 17, 2020. Available at: https://www12.statcan.gc.ca/census-recensement/2021/ref/98-20-0001/982000012020002-eng.cfm/ (accessed: November 30, 2021).

[29] Generalization of world experience in measuring labor migration based on sample population surveys (2015). Available at: https://www.econ.msu.ru/sys/raw.php?o=39716&p=attachment/ (accessed: December 2, 2021).

[30] Stepanov V.V., Tishkov V.A. (Eds.). (2007). *Etnokul'turnyi oblik Rossii: perepis' 2002 goda* [Ethnocultural Image of Russia: the 2002 Census]. Moscow: Nauka.

management mechanisms, promptly responding to possible and real violations of human rights and groups (Drobizheva, 2019).

In our opinion, in order to expand information that allows taking into account and analyzing the issues of the ethnic situation in Russia and its regions, it is possible to optimize existing approaches to the migrant accounting system as follows:

1. While maintaining the existing list of questions in the census lists of the All-Russian population censuses about socio-demographic characteristics, including the question of nationality, preliminary explanatory work should be carried out on the importance of providing this information to both the permanent population and migrants. It is possible to prepare special memos revealing the need to take into account the national factor when making managerial decisions in the field of migration, analyzing and developing recommendations on the directions of adaptation and integration of migrants in Russian society.

2. According to the approach on the possible variations of ethnic self-identification, a set of variables to clarify the socio-cultural characteristics of foreign citizens may include several indicators. Taking into account the experience of foreign countries, we consider it necessary to include questions about the place of birth of the respondent's father and mother in the census forms, which will allow us to get a more accurate idea of his ethnic and cultural roots[31]. Nationality on the basis of self-determination is included in the list of issues within the framework of the ARPC; however, we consider it appropriate to include this entry in the departure sheet and in the migration registration card, since current (administrative) accounting does not allow taking into account the changes occurring in the national composition of the country and its individual regions. At the same time, the availability of up-to-date information about the ethnic situation in the country is a necessary condition for the implementation of ethnic policy.

3. Another variant of questions aimed at deepening information about the migration past of respondents is related to clarifying whether the respondent is a citizen of Russia by birth or as a result of naturalization, as well as about the place of birth and the year of moving to Russia for permanent residence (Chudinovskikh, 2015).

The proposed variants of the questions are aimed at forming a systems approach to obtaining comprehensive information about the ethnodemographic structure and migrants, which will help to get closer to obtaining more accurate knowledge about the ethnic situation in the country and regions.

Conclusion

The most complete information about migrants in Russia is provided by population census data, but it is obvious that the dynamic nature of migration flows requires appropriate accounting measures. In Russian practice, current migration accounting is carried out using various forms, but the information they contain most often remains at the level of authorized organizations, and subsequently is not publicly available for analysis in the context of Russia's regions and in the context of the countries whose citizens have arrived in Russia. Sample surveys allow us to study in more detail certain aspects of migration processes or certain categories of migrants, but their results may not always be comparable in time.

Regarding the accounting of the indicators under consideration, we note that ethnicity is not considered in the framework of the current accounting of migrants. In all forms to be filled in, the citizenship (allegiance) of a foreign citizen is indicated, often – the place of birth, if desired – nationality and religion in one form. Nationality on the basis of self-determination can be indicated by citizens during a population census. Currently, it is

[31] Perhaps this item can be included in the lists for surveys of the resident population.

mandatory to indicate citizenship in the statistical forms of migration registration, as well as in other forms used by executive authorities that collect and systematize migration data. Information about the nationality and religion of foreign citizens is provided on request in a number of applications. At the same time, this information is not presented in current statistical forms, which makes it almost impossible to analyze the ethnic composition of labor migrants in Russia.

Taking into account all the difficulties of collecting information about the ethnicity of migrants, we think it is necessary to consider the possibility of including additional data on the place of birth of the respondent's father and mother in the census sheets. Requesting this information will not contradict constitutional law, but it will help to get a more accurate idea of a person's ethnic and cultural roots. Often, information about the country of birth is more important and objective than citizenship. In Russia, as well as in other countries, citizenship is an unstable sign, because migrants can take citizenship of the country of residence.

References

Alba R. (2018). What majority-minority society? A Critical analysis of the census bureau's projections of America's demographic future. *Socius,* 4. DOI: 10.1177/2378023118796932. Available at: https://journals.sagepub.com/doi/10.1177/2378023118796932?icid=int.sj-abstract.similar-articles.2

Barwiński M. (2015). The ethnic structure of Poland in geographical research. *Geographia Polonica*, 88, 41–63. DOI: 10.7163/GPol.0005

Bérard-Chagnon J., Hallman S., Caron G. (2019). Recent immigrants and non-permanent residents missed in the 2011 Census. *Statistics Canada=Statistique Canada*. DOI:10.13140/RG.2.2.22420.5568

Birnir J., Wilkenfeld J., Fearon J. et al. (2015). Socially relevant ethnic groups, ethnic structure, and AMAR. *Journal of Peace Research*, 2, 110–115. DOI: 10.1177/0022343314536915

Bublikov V.V., Ermak G.G. (2021). Multiethnicity: From theoretical concepts to practice. *Vestnik antropologii=Herald of Anthropology,* 3, 7–16. DOI: 10.33876/2311-0546/2021-3/7-16 (in Russian).

Chudinovskikh O.S. (2015). Data collection on labor migration during population cluster sampling. *Voprosy statistiki,* 9, 12–22 (in Russian).

Davydova V.Ya., Egorova A.I., Savinova K.P., Shchukina K.E. (2015). Study of social distance towards migrant workers of different ethnic groups. *Kazanskaya nauka=Kazan Science*, 11, 330–332 (in Russian).

Drobizheva L.M. (2019). The policy of integrating a multi-ethnic Russian society into doctrinal documents, political discourse and mass consciousness. *Obshchestvennye nauki i sovremennost'=Social Sciences and Contemporary World,* 4, 134–146. DOI: 10.31857/S086904990005821-5

Gabdrafikov I.M. (2021). Population censuses in the Tatar-Bashkir border region: Politicization of ethnostatistics. *Vestnik antropologii=Herald of Anthropology,* 3, 17–23. DOI: 10.33876/2311-0546/2021-3/17-23 (in Russian).

Gabdrakhmanova G.F., Sagdieva E.A. (2019). The socio-cultural conditions for the adaptation of "new" ethnic groups in the Republic of Tatarstan. *Vestnik Instituta sotsiologii=Bulletin of the Institute of Sociology,* 10(1), 62–81. DOI: 10.19181/vis.2019.28.1.556 (in Russian).

Khaikin S.R., Berezhkova S.B. (2016). Sociological monitoring of inter-ethnic and inter-confessional relations of the Federal Agency for Ethnic Affairs. *Monitoring obshchestvennogo mneniya: Ekonomicheskie i sotsial'nye peremeny=Monitoring of Public Opinion: Economic and Social Changes*, 5, 96–109. DOI: 10.14515/monitoring.2016.5.07 (in Russian).

Kozlov V.E., Frolova E.V., Vyatchina M.V. (2016). *Diaspory i soobshchestva migrantov v Respublike Tatarstan: etnosotsiologicheskie ocherki* [Diasporas and Migrant Communities in the Republic of Tatarstan: Ethno-Sociological Essays]. Part III. Kazan: Glagol'.

Kul'bachevskaya O.V. (2019). Ethno-social situation and interethnic relations in Crimea. *Vestnik antropologii=Herald of Anthropology,* 4(48), 106–118. DOI: 10.33876/2311-0546/2019-48-4/106-118 (in Russian).

Maklashova E.G. (2019). Ethnic structure's transformation of the population of Yakutia (territorial view). *Oikumena. Regionovedcheskie issledovaniya=Ojkumena. Regional Researches,* 4(51), 98–105. DOI: 10.24866/1998-6785/2019-4/98-105 (in Russian).

Mishchuk S.N. (2013). Migration and ethnic composition of the population in the Far East of Russia at the end of the 20th – beginning of the 21st century. *Izvestiya Irkutskogo gosudarstvennogo universiteta. Seriya: Politologiya. Religiovedenie=The Bulletin of Irkutsk State University. Series "Political Science and Religion Studies",* 2-2, 210–221 (in Russian).

Morning A. (2008). Ethnic classification in global perspective: A cross-national survey of the 2000 census round. *Population Research and Policy Review*, 27, 239–272. DOI: 10.1007/s11113-007-9062-5

Mukomel' V.I. (2018). Regional specificity of integration of internal ethnic migrants. *Federalizm=Federalism,* 2, 141–160 (in Russian).

O'Hare W.P. (2019). *Differential Undercounts in the US Census: Who Is missed?* Springer Nature.

Peshkova V.M. (2015). Central Asian ethnic cafes in Moscow: Migrant infrastructure in urban space. In: *Etnicheskie rynki v Rossii: prostranstvo torga i mesto vstrechi* [Ethnic Markets in Russia: The Bargaining Space and the Meeting Place]. Irkutsk: Izd-vo IGU.

Petrova E.V., Zhalsanova V.G., Bil'trikova A.V. (2019). Migrants in Buryatia: The host community assessments. *Sotsial'naya kompetentnost'=Social Competence*, 4(3), 292–298 (in Russian).

Rodrigues-Silveira R. (2014). *The Politics of Demography: Censuses as Resources for Political Analysis*. DOI: 10.13140/RG.2.2.30912.94729

Ryazantsev S.V., Mishchuk S.N. (2020). Approaches to taking into account the citizenship and ethnicity of migrants in Russia. *Nauchnoe obozrenie. Seriya 1: Ekonomika i pravo=Scientific Review. Series 1: Economics and Law,* 5, 18–31. DOI: 10.26653/2076-4650-2020-5-02 (in Russian).

Ryazantsev S.V., Pis'mennaya E.E. (2019). International labor migration to Russia. *Mezhdunarodnye protsessy,* 17(4)(59), 65–83. DOI: 10.17994/IT.2019.17.4.59.5 (in Russian).

Ryvkina O.L., Osmanova E.U. (2021). Population census: Foreign experience and modern trends. *Ekonomika stroitel'stva i prirodopol'zovaniya,* 1(78), 83–94. DOI: 10.37279/2519-4453-2021-1-83-94 (in Russian).

Tishkov V.A. (2011). About the All-Russian Population Census of 2010: Explanations for retrogrades and nationalists and warnings for officials and politicians. In: Stepanov V.V. (Ed.). *Etnologicheskii monitoring perepisi naseleniya* [Ethnological Monitoring of the Population Census]. Moscow: IEA RAN (in Russian).

Tishkov V.A., Stepanov V.V. (2017). nterethnic relations and ethno-cultural education in Russia. *Vestnik Rossiiskoi akademii nauk*, 87(10), 879–890. DOI: 10.7868/S0869587317100024 (in Russian).

Varshaver E.A., Rocheva A.L. (2015). Peering into "ethnic" community: Integration in performance differences "patriotic-related" and "national" wheels (on the example migrants from Kyrgyzstan in Moscow). *Sotsial'naya politika i sotsiologiya=Social Policy and Sociology,* 4, 24–37. DOI: 10.17922/2071-3665-2015-14-3-1-24-37 (in Russian).

Vendina O.I. (2016). Urban responses to the challenge of ethnic and cultural diversity (Perm, Ufa, Rostov-on-Don). *Gosudarstvennaya sluzhba=Public Administration,* 6(104), 74–80. DOI: 10.22394/2070-8378-2016-18-6-74-80 (in Russian).

Vendina O.I., Pain E.A. (2018). *Mnogoetnichnyi gorod. Problemy i perspektivy upravleniya kul'turnym raznoobraziem v krupneishikh gorodakh* [A Multi-Ethnic City. Problems and Prospects of Cultural Diversity Management in the Largest Cities]. Moscow: Sektor.

Vorob'eva O.D., Topilin A.V., Grebenyuk A.A., Lebedeva T.V. (2014). *Metodologicheskie podkhody k organizatsii vyborochnykh statisticheskikh obsledovanii trudovoi migratsii* [Methodological Approaches to the Organization of Sample Statistical Surveys of Labor Migration]. Available at: https://mgimo.ru/upload/iblock/79d/trudovaya-migraciya.pdf (accessed: November 18, 2020).

Vorob'eva O.D., Topilin A.V., Grebenyuk A.A., Lebedeva T.V. (2016). The analysis of migration processes in Russia according to the census. *Ekonomika regiona=Economy of Region,* 12(1), 175–188. DOI: 10.17059/2016-1-13 (in Russian).

Zhou Y. (2019) Question of ethnic group formulation in the Chinese census. *China Popul. Dev. Stud.*, 3, 67–83. Available at: https://doi.org/10.1007/s42379-019-00034-5

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Digital Civic Participation in the Context of Modern Research

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Abstract. The emergence and development of digital civic participation is an inevitable consequence of Internet penetration into various spheres of life. Despite the novelty of the phenomenon itself, the practices of online activism have become engrained in public life; and they have a significant impact on certain events, and sometimes even act as the main trigger of subsequent changes, which is especially typical of the political system. At the same time, there are many concerns related to the spread of digital civics, so that it is very difficult to talk about the long-term implications of such transformations. In this regard, the purpose of our research is to summarize the experience of studying digital civic participation and highlight the features of its manifestation in a modern world. The research methodology is based on the principles of making a systematic scientific review. During the analysis, we identify essential foundations and distinctive features of online activism compared to the traditional offline format, which are reflected in the forms of manifestation, methods of attracting and composition of the participants themselves, as well as the conditions necessary for collective action. The scope of digital civic participation is largely

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ensured by the ease of entry into public affairs, and the variability of activities and types of networking. Despite the prevalence of the thesis about the purely external visibility of online activism and its destructive consequences, specific empirical studies do not confirm this conclusion. Nevertheless, the threats of the spread of ICT are quite real and go far beyond the virtual space. In conclusion, we formulate several polemic provisions on possible ways to overcome the contradictions in this area. Our research contributes to the development of scientific ideas about the specifics of digital civic participation and the disclosure of the potential of its application from the standpoint of modern challenges and threats.

Key words: digital civic participation, online activism, digital activism, social media, slacktivism, civic participation, digitalization.

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Introduction

Trends of modern development allow speaking with confidence about the full-fledged entry of the world community into the digital era. Over the previous 20 years, the share of Internet users has increased from just a few percent to more than half of the inhabitants of the world[1]. In the context of the COVID-19 coronavirus pandemic, when the demand for digital services showed record growth, the indicator values reached 66%, and in some regions of the world – 90% and higher[2]. It is obvious that in the near future the use of the global network will become ubiquitous. It has already penetrated into almost all spheres of human activity transforming traditional practices of public participation in society. In this regard, the Internet acts not only as a means of carrying out actions that are familiar to us, but also as a space that fixes fundamentally new patterns of behavior. This is especially evident in the field of civic activism, where online activity comes to the place of pickets, strikes and demonstrations: from writing and reposting messages on social media to developing special applications aimed at identifying and solving social problems. At the same time, the openness and, for the most part, anonymity of the Internet space not only contributes to expanding opportunities for participation in public initiatives, but also becomes a platform for conducting destructive activities (spreading disinformation, Internet harassment, hacker attacks, etc.).

As a result, the perception of digital civic participation, despite the regularity of its occurrence, is difficult to call unambiguous. The academic environment often talks about the positive aspects of this phenomenon, which is often only emerging in the digital space, but is already being implemented offline (Basheva, 2020, p. 45). At the same time, the researchers emphasize that digital civic participation does not replace traditional practices, but rather contributes to unlocking their potential and increasing the diversity of forms of social activity, especially for younger generations[3] (Pettingill, 2008). However, there are also opposing views on this matter. For instance, the use of digital

[1] Individuals using the Internet (% of population). *World Bank Open Data*. Available at: https://data.worldbank.org/indicator/IT.NET.USER.ZS (accessed: October 15, 2021).

[2] Internet usage statistics. *Internet World Stats*. Available at: https://www.internetworldstats.com/stats.htm (accessed: October 15, 2021).

[3] Smith A. Civic Engagement in the Digital Age. *Pew Research Center*. Available at: https://www.pewresearch.org/internet/2013/04/25/civic-engagement-in-the-digital-age/ (accessed: October 15, 2021).

media often turns into slacktivism (clicktivism), that is, imitation of an activity when actions on the network satisfy only their own needs due to the illusory ideas of participation in solving a particular problem (signing online petitions, joining online communities, etc.) (Lane et al., 2018). However, specific empirical studies, as a rule, do not confirm this hypothesis (Lee, Hsieh, 2013; Howard et al., 2016; Boulianne, Theocharis, 2020), although in some works attention is focused on the fact that in the case of anonymous support of initiatives, the probability of real participation in them is noticeably reduced (Yessenbekova, 2020).

Digital civic participation is a very sensitive topic for the authorities. On the one hand, in developed countries there are objective prerequisites for ensuring the principles of deliberative democracy, implying the involvement of civil society institutions in the implementation of public policy (Ermolaeva et al., 2020, p. 388), since the youth participation level in traditional practices (in particular, voting and joining political parties) is steadily decreasing (Xenos et al. al., 2014). Hence there is the government's interest in creating favorable conditions for digital activism. Along with this, there are many reasons for concern about its spread. One of them is the lack of transparency on the Internet (Mandarano et al., 2010, p. 132), which allows, for example, hiding the authorship of extremist publications available to a wide audience and not being responsible for it. The situation is similar in the case of virtual aggression which is quite difficult to deal with (Makarova et al., 2016, pp. 298–299). Another important problem is the spread of fake news which has received a second wind in the digital age as a tool for manipulating mass consciousness. Uncontrolled dissemination of information on the global network can have serious consequences for the state and society. Examples include the US presidential election in 2016, during which every fourth news item on the Twitter social network was false or extremely biased (Bovet, Makse, 2019), as well as the COVID-19 pandemic, which generated a huge amount of misinformation (Barua et al., 2020). In this regard, serious measures are being taken in many countries aimed at regulating and controlling civil activity on the Internet.

Despite all the opportunities and threats, the phenomenon of digital civic participation manifests itself at various levels of networking. As a rule, the formation of horizontal ties occurs when initiative people declare their position and unite with each other to achieve certain goals. In this case, a wide variety of Internet platforms can be used, created both for simple communication and information exchange, and directly encouraging citizens to creative activities (for example, crowdfunding platforms). At the vertical level of interaction, there is mainly a dialogue between society and authorities, where the basis is the electronic government, which has been developed in almost all countries of the world[4]. This concept represents the organization of public administration based on the use of information and communication technologies (ICT), which, in particular, expand the possibilities of feedback and the provision of electronic services.

Taking into account the inconsistency and widespread use of online activism, it is important to emphasize that there are many gaps in this area that prevent the disclosure of its potential. The information, presented in the scientific literature, is largely fragmented as a result of which it is very difficult to talk about the formation of a holistic understanding of the essence and prospects for the development of this phenomenon from the point

[4] UN E-government survey 2020. Digital government in the decade of action to achieve sustainable development. *UN Department of Economic and Social Affairs*. Available at: https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20-%20Russian.pdf (accessed: October 10, 2021).

of view of the possibilities of interaction between the state and society. In this regard, the article aims to summarize the experience of studying digital civic participation and highlight the features of its manifestation in the modern world. We also pay special attention to the comparison of practices implemented in the virtual and real world as this discourse is of fundamental importance for determining the contours of the future civil society.

Materials and methods

In order to more clearly define the design of the study, we will reveal the essence of the concept of "digital civic participation" and related categories. However, we will make a reservation right away that in the framework of this study we use the terms "digital civic participation", "online activism", "online participation", "digital activism", as well as a number of broader formulations (for example, the online format of civic participation) as synonyms. Despite some differences in interpretations, it allowed reducing the number of unnecessarily cumbersome speech constructions and repetitions that make it difficult to perceive the material being presented.

In numerous works, when defining digital civic participation, the starting point is the statement that *this is a form of civic participation, during the implementation of which ICT tools are involved* (Vegh, 2003; Yang, Kang, 2014; Gerbaudo, 2017). If we follow this logic, then first of all it is necessary to correlate the concepts of "civic participation" and "digital civic participation" as general and private. To do this, let us turn to the definition of the first term, limiting its subject field and highlighting the essential features (Milbrath, 1965, p. 5).

The analysis of the scientific literature helps to set the following conceptual framework for civic participation:

- participation includes voluntary collective actions (Demakova et al., 2014, p. 148);
- the purpose of the actions is to influence/pressure the authorities (Ermolaeva et al., 2020; Teocharis, 2015), cooperation with other citizens and civil society structures (Nikovskaya, 2017) or awareness raising (Lonkila et al., 2021);
- actions are implemented in the course of communicative interaction with other citizens and social institutions (Lonkila et al., 2021);
- as a result of actions, it is assumed to solve a social problem (Ermolaeva et al., 2020), satisfaction of public interests (Skalaban, 2011a).

Based on the above provisions, by *civic participation we will understand various types of voluntary interaction of citizens or their associations in order to influence the authorities, cooperation or awareness-raising aimed at solving social problems and satisfying public interests*. Since the conceptual apparatus in this area has not yet been formed, it is hardly possible to draw a clear boundary between adjacent categories. For instance, the scientific literature says that social participation is more based on horizontal connections that are established within the framework of everyday life, while civic participation focuses on the interaction of people with various structures and democratic institutions and may include political participation (Skalaban, 2011b, pp. 136–137). We share this point of view, but it is not the only one and each author ultimately means something of their own by the designated terms. All this imposes certain limitations on our research, since during the analysis of scientific literature, the conceptual apparatus often remains outside the narrative, as a result of which it can be very difficult to form a holistic view of the approach used.

Further, a logical question arises: is the transition to digital civic participation really limited to the use of ICT? From the point of view of identifying essential features, this is indeed the case, which is confirmed by the above-mentioned literature, while the virtual space makes serious adjustments to people's behavior.

One of these features is connective actions, which imply the lack of clear top-down coordination by movement leaders (Bennett, Segerberg, 2015). The relative ease of entry into online activism makes it optional to have a formal organization and leadership, as well as the formation of a civic identity and collective ideology (Bennett, 2012). It is not by chance that the concept of "personalized collective action" is even introduced into scientific discourse (Micheletti, 2003). At the same time, we should note that among network users there is a division into opinion leaders (communicators in the linear communication model of H. Lasswell) and recipients of information. For example, only 6% of Twitter users were classified as "active political tweeters" while the rest of the participants of protest groups were limited to reading, "likes", sometimes commenting and reposts (Akhremenko et al., 2020).

In itself, digital civic participation is inextricably linked with traditional collective actions and often acts as a booster, strengthening or expanding them primarily through the establishment of communication chains and the dissemination of information in social media and messengers. In this case, the main effects are achieved in the real world which *requires additional efforts outside the virtual space* (voting in elections, participation in rallies, etc.). However, online activism can be very self-sufficient and carried out only on the Internet. The individual's target attitudes come to the fore here, which may be limited, for example, to informing the population about socially significant problems. At the same time, there are many opportunities to fully realize the potential of digital civic participation. We are mainly talking about Internet platforms (digital participatory platforms) which can be used to raise funds for charity, support various civic initiatives, and create digital solutions and even electronic voting on issues relevant to the state and society. The range of possible destinations is growing every day, although it depends on the characteristics of a particular country. In the most generalized form, such actions are divided into wareness/advocacy, organization/mobilization and action/reaction (Vegh, 2003, p. 72).

An important feature of our research is the construction of the logic of presentation *from the point of view of the activists' actions*, i.e. the consideration of purely one-sided connections, since even in this case the topic remains quite broad, although our goal is only to outline the general contours of the development of digital civic participation. According to the accepted approach, when solving socially significant problems, an individual can apply both to the authorities and to other social institutions. Based on this, we assume that digital civic participation is characterized by the following main types of interaction: *citizen-to-government* (C2G), *citizen-to-society* (C2S), *citizen-to-business* (C2B) (Smoleva, 2021).

In the course of the analysis, we have used methodological principles for constructing a systematic scientific review including setting goals and developing research design, selecting literature, summarizing and presenting results (Tranfield et al., 2003, p. 214). The information base of the work is the articles published in Russian and foreign databases, monographs, reports of international organizations and other sources posted on the Internet. We have carried out literature search in the databases Web of Science, Scopus, Google Scholar, RSCI by the keywords "digital civic participation", "online activism", "digital activism", "slacktivism" in Russian and English. Despite the lack of emphasis on specific areas of life, many works were *devoted to activity in the political field which affected the nature of the presentation of the material and the examples we have given*. However, this does not contradict the essential foundations of digital civic participation which we outlined earlier.

Research results

The results of the analysis of scientific literature in the field of digital civic participation indicate a tendency to narrow the subject of research. Online

activism is often understood as activities related to social media: posting original content and links to user materials, discussing socially significant issues and encouraging other people to take active action (Theocharis et al., 2021). The actual list of digital civic participation practices is noticeably broader and includes *filing and signing petitions, charity, creating online communities, electronic voting*, etc.

A broader approach to digital civic participation can be characterized as "a new concept of citizenship based on alternative ways of participation" (Akhremenko et al., 2020). At the same time, acts of participation in the virtual space can often be more than just online versions of autonomous civil actions (Teocharis, 2015). At the same time, there are statements that only the translation of online activity into the real world contributes to the realization of social movements of their purposes (Menteş, 2019). It is the transition from one format to another that is of particular interest. In particular, the potential of protest movements can accumulate on the Internet and subsequently spill out "outside" (the "Occupy Wall Street", "Arab Spring", etc.) (Akhremenko et al., 2020). Therefore, both formats of citizen participation are closely linked. Scientists cite data according to which the probability of accessing an online format of any type of civic activity increases if a person is already involved in it in the traditional way (Theocharis et al., 2021). Conversely, online participation in political discussions has a positive effect on off-network activity, such as electoral behavior (Boulianne, 2009).

As we have mentioned earlier, digital civic participation has its own characteristics depending on the interaction type. In the research environment, much attention is paid to online activism which has a direct impact on the activities of authorities (C2G): participation in elections and referendums, the work of application services, etc. The key mechanism here is e-government, which contains various tools for dialogue with the population: from state information resources to portals of state and municipal services. As a concrete example, we can name the Internet resource "Russian Public Initiative"[5], where Russian citizens can vote for existing initiatives or put forward their ones. An important role is also given to informal communication channels, where the "palm of victory" belongs to social media, mainly used for interaction within society, both between individuals and when they address various associations (C2S). At the same time, in the second case, citizens have the opportunity to resort to more formalized types of interaction: participation in the preparation of informational materials, distance learning, online volunteering, management of digital projects and network communities, etc. In the work, we consider online volunteering as an element of crowdsourcing, when several people work together to solve a socially significant task on a voluntary basis. Within the framework of joint activities, the following subtypes are also distinguished: crowdfunding (fundraising or resources), crowdfunding (expertise), crowdrekruiting (search for volunteers), crowdcriaction (collective development of an idea).

Since civic participation is most often interpreted from the perspective of politics and assistance to the state in overcoming social problems, some skepticism may cause the identification of the type of interaction "citizens-to-business" (C2B). However, we believe that collective actions of people in relation to any organization, be it complaints or reviews of its activities, have a significant impact not only on the development of the principles of corporate social responsibility, but also on the functioning of entire sectors of the economy. As an example, we can cite the MeToo movement

[5] On the project. *ROI*. Available at: https://www.roi.ru/page/about/ (accessed: March 10, 2022).

which turned into serious consequences for the film industry[6], computer game developers[7], etc. As a result, many companies were forced to revise their policies on female employment and the formation of favorable working conditions in general.

In the process of organizing and forming social movements, the digital environment contributes to the implementation of the most important tasks of informing, coordinating and mobilizing people (Boyd, 2008). However, it is hardly possible to talk about the existence of a consolidated position regarding the impact of the Internet on civic participation. On the one hand, many focus on the entertainment nature of the activities of users of the global network, which distracts them from civic actions (Wu, Weaver, 1997) and reduces social capital (Etzioni, Etzioni, 1999; Putnam, 2000). On the other hand, virtual space provides people who are already involved in online activism with additional opportunities for self-realization (Norris, 2001), and also helps to attract new participants by expanding the information horizon and providing an easy entry point into public affairs (for example, the transition from signing a petition to participating in a rally) (Weber et al. al., 2003; Edgerly et al., 2018).

Just as in the case of the Internet in general, the scientific literature has formed polar approaches to assessing the role of social media in civic activism: *positive* (allow people to be more informed, find like-minded people and participate in society) and *negative* (focus on interpersonal communication in the online space, distracting from real affairs and contributing to activism) (Kristofferson et al., 2014; Smith et al., 2019). It seems that it may be premature to occupy one of the designated parties due not only to the lack of a sufficient number of specific empirical studies in this area, but also to the specifics of the process of digitalization of civic participation and its regulation in different countries. Nevertheless, there are already works according to which the overwhelming majority of respondents believe that social media are effective in terms of raising public awareness of political or social problems (80%), creating sustainable social movements (77%), and influencing management decisions (63%)[8]. At the same time, platforms such as Facebook and Twitter are perceived as popular tools for organizing protests (Wolfsfeld et al., 2013) and platforms for political discussions (Howard et al., 2011), as well as alternative sources of information under the control of the authorities of traditional media (Khondker, 2011).

Popularity of social media in this context is largely due to their mass character, which allows more clearly monitoring certain processes. For instance, according to reports by the Pew Research Center, in 2018, 53% of Americans participated in political activities associated with actions on social media (an increase of 14% compared to 2013). About a quarter of adult users of social media in the United States in 2020 changed their views on the problem because of the information posted there (for example, about the MeToo and BlackLivesMatter movements). This implies the crucial role of social media in the formation of people's political self-awareness and their political self-presentation (Lane et al., 2019).

[6] #MeToo and Hollywood: What's changed in the industry a year on? *The Guardian*. Available at: https://www.theguardian.com/world/2018/oct/08/metoo-one-year-on-hollywood-reaction (accessed: October 10, 2021).

[7] #MeToo topples activision blizzard exec after huge staff revolt—$10 billion in market value lost. *Forbes*. Available at: https://www.forbes.com/sites/jonathanponciano/2021/08/03/metoo-topples-activision-blizzard-exec-after-huge-staff-revolt-10-billion-in-market-value-lost/?sh=28e3d02fb480 (accessed: October 10, 2021).

[8] Auxier B., Mcclain C. Americans think social media can help build movements, but can also be a distraction. *Pew Research Center*. Available at: https://www.pewresearch.org/fact-tank/2020/09/09/americans-think-social-media-can-help-build-movements-but-can-also-be-a-distraction/ (accessed: October 10, 2021).

Speaking about the Internet space, it is important to understand that digital inequality leaves a serious imprint on certain segments of society involved in online activism. With equal access to information about participation opportunities, the representativeness of various groups is significantly shifted toward people with knowledge and resources (Rottinghaus, Escher, 2020). Young people with a low level of trust in the political system and a high level of political interest often come to the fore (Theocharis et al., 2021). The participation of older people is usually complicated by a lack of digital competencies and problems when interacting with web resources (Seddighi, Salmani, 2018). In this regard, the socio-demographic portraits of followers of offline and online formats of civic participation differ. The situation is similar with the motivation that encourages people to be active on the Internet. For example, online volunteers, along with altruism, social recognition, and self-development, have a great need for flexibility and freedom (primarily in terms of time and place of work) (Silva et al., 2018).

As in the case of traditional practices, country and regional differences in digital civic participation largely depend on economic, institutional and socio-cultural characteristics. Using the case of Facebook, it was shown that protest mobilization primarily occurs in the following countries: technologically advanced, with an increase in public discontent or lack of other opportunities for coordinating actions against the authorities (Fergusson, Molina, 2021). At the same time, studies show that relatively disparate networks with a predominance of long-distance connections among activists will rather contribute to the dissemination of information about the protest, and networks with denser clusters and strong connections will contribute to protest behavior (with an increase in the risks of forming a closed community, beyond which the protest does not go (Jost et al., 2018)). In this regard, great importance is given to the type of settlement. So, in rural areas, the activity of citizens depends mainly not on the presence of opinion leaders on the Internet or the network nature of the dissemination of information, but on the behavior of the immediate environment. Although there are exceptions here, when, for example, it comes to political elections at the state level (Eubank, 2021). In turn, in urban districts characterized by higher social capital and people's participation in online communities, efforts to coordinate collective actions are noticeably reduced (Enikolopov et al., 2020).

A feature of digital civic participation is the low threshold for entry. This is confirmed by the consequences of the COVID-19 pandemic. For example, three weeks after the announcement of the introduction of restrictive measures and blocking the activities of official social institutions, 247 Facebook support groups with hundreds of thousands of participants were formed in Denmark, and in Germany every fourth volunteer providing assistance during the pandemic had not previously participated in civic initiatives (Hjalmar et al., 2021).

Ultimately, the involvement of people in digital civic participation is influenced by the characteristics of *Internet connectivity* (as a rule, users with broadband access are more active) and *websites* (their popularity and engagement, biased presentation of information), as well as *user experience*. The results of studying the electoral behavior of the adult population in the United States showed that the popularity and obvious bias of network resources affect not only the attitude to the information received, but also the subsequent activity (Al-Hasan, Khalil, 2021). At the same time, it is very difficult to assess the real effect of using the global network to involve people in civic participation which is largely due to the need to take into account such a factor as

the presence of interest that determines the general mood toward online activism (Boulianne, 2009). Based on this, personalized invitations are an effective mobilization tool that increases the level of participation four to seven times (Rottinghaus, Escher, 2020).

The disadvantages and negative manifestations of ICT in the context of digital civic participation include an overabundance of information, the possibility of controlling the information field by the authorities, and the substitution of the real environment/virtual actions. The year of the US presidential election was accompanied by political attacks on social media, which forced more than half of adult users (55%) to report information "fatigue"[9]. In addition, the majority of Americans (72%) do not find common ground during online discussions about politics. Researchers also pay attention to the use of social media by autocratic governments to control democratic movements (Gunitsky, 2015). In connection with the above, it is alarming that about 70% of social media users in the United States never publish information (or very rarely) and do not talk about political and social problems as of their unwillingness to be attacked because of their views[10].

As a result, can digital civic participation be considered an effective way to overcome social challenges? In our opinion, the very formulation of the question contains an answer that can be either positive or negative depending on the position of the state and society on this matter. On the one hand, online activism has firmly entered public life, transforming the reality around us, which is facilitated by the development of technologies (for example, the use of blockchain for electronic voting). As a result, the range of possible activities is constantly expanding. Given the low entry threshold, more and more people can unleash their civic potential at least at a basic level (message reposts, petition signing, online volunteering, etc.), since individual actions on the network require certain competencies. On the other hand, there are many examples when the authorities are trying to strictly regulate digital civic participation, delineating very narrow boundaries of what is allowed (mainly within the framework of formal mechanisms of interaction). Even in countries committed to the principles of deliberative democracy, ideas about combating excessive Internet freedom are often heard, a special place is given to deanonymization of users, blocking unwanted content and countering hacker attacks.

In the conditions of rapid digitalization of all spheres of life, it seems obvious that further increasing the importance of virtual space will lead to the merging of online and offline worlds. This will overcome a number of difficulties associated with distrust of digital civic participation, although it will generate new challenges that have been mentioned more than once in fiction. In this regard, the situation in many respects seems to be a stalemate, and the only rational way to resolve contradictions is close monitoring of the development of online activism by the state and society, the search for mutual compromises.

[9] Anderson M., Auxier B. 55% of U.S. social media users say they are 'worn out' by political posts and discussions. *Pew Research Center*. Available at: https://www.pewresearch.org/fact-tank/2020/08/19/55-of-u-s-social-media-users-say-they-are-worn-out-by-political-posts-and-discussions/ (accessed: October 10, 2021).

[10] Auxier B., Mcclain C. Americans think social media can help build movements, but can also be a distraction. *Pew Research Center*. Available at: https://www.pewresearch.org/fact-tank/2020/09/09/americans-think-social-media-can-help-build-movements-but-can-also-be-a-distraction/ (accessed: October 10, 2021).

References

Akhremenko A.S., Stukal D.K., Petrov A.P. (2020). Network vs message in protest diffusion on social media: Theoretical and data analysis perspectives. *Polis. Politicheskie issledovaniya=Polis. Political Studies*, 2, 73–91. DOI: 10.17976/jpps/2020.02.06 (in Russian).

Al-Hasan A., Khalil O., Yim D. (2021). Digital information diversity and political engagement: The impact of website characteristics on browsing behavior and voting participation. *Information Polity*, 26(1), 21–37. DOI: 10.3233/IP-190183

Barua Z., Barua S., Aktar S., Kabir N., Li M. (2020). Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation. *Progress in Disaster Science*, 2020, 8. Available at: https://www.sciencedirect.com/science/article/pii/S2590061720300569. DOI: 10.1016/j.pdisas.2020.100119 (accessed: October 10, 2021).

Basheva O.A. (2020). Digital activism as a new method of civil mobilization. *Nauchnyi rezul'tat. Sotsiologiya i upravlenie=Research Result. Sociology and Management*, 6(1), 41–57. DOI: 10.18413/2408-9338-2020-6-1-0-4 (in Russian).

Bennett L.W. (2012). The personalization of politics: Political identity, social media, and changing patterns of participation. *The Annals of the American Academy of Political and Social Science*, 644, 20–39. DOI: 10.1177/0002716212451428

Bennett L.W., Segerberg A. (2015). The logic of connective action. Digital media and the personalization of contentious politics. *Information, Communication & Society*, 15(5), 739–768.

Boulianne S. (2009). Does Internet use affect engagement? A meta-analysis of research. *Political Communication*, 26(2), 193–211. DOI: 10.1080/10584600902854363

Boulianne S., Theocharis Y. (2020). Young people, digital media, and engagement: A meta-analysis of research. *Social Science Computer Review*, 38(2), 111–127. DOI: 10.1177/0894439318814190

Bovet A., Makse H.A. (2019). Influence of fake news in Twitter during the 2016 US presidential election. *Nature Communications*, 10. Available at: https://www.nature.com/articles/s41467-018-07761-2. DOI: 10.1038/s41467-018-07761-2(accessed: October 10, 2021).

Boyd D. (2008). Facebook's privacy trainwreck: Exposure, invasion, and social convergence. *Convergence: The International Journal of Research into New Media Technologies*, 14, 13–20.

Demakova K., Makovetskaya S., Skryakova E. (2014). Non-political activism in Russia. *Pro et Contra*, 3–4, 148–163 (in Russian).

Edgerly S., Vraga E.K., Bode L., Thorson K., Thorson E. (2018). New media, new relationship to participation? A closer look at youth news repertoires and political participation. *Journalism & Mass Communication Quarterly*, 95, 192–212. DOI: 10.1177/1077699017706928

Enikolopov R., Makarin A., Petrova M., Polishchuk L. (2020). Social image, networks, and protest participation. *SSRN Electronic Journal*. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2940171

Ermolaeva P.O., Ermolaeva Yu.V., Basheva O.A. (2020). Digital environmental activism as the new from of environmental participation. *Sotsiologicheskoe obozrenie=Russian Sociological Review*, 19(3), 376–408. DOI: 10.17323/1728-192x-2020-3-376-408(388) (in Russian).

Etzioni A., Etzioni O. (1999). Face-to-face and computer-mediated communities, a comparative analysis. *The Information Society*, 15(4), 241–248. DOI: 10.1080/019722499128402

Eubank N., Grossman G., Platas M.R., Rodden J. (2021) Viral voting: Social networks and political participation. *Quarterly Journal of Political Science*, 16(3), 265–284. DOI:10.1561/100.00019092

Fergusson L., Molina C. (2021). *Facebook Causes Protests*. Lacea Working Paper Series No. 0041.l. 112 p.

Gerbaudo P. (2017). From cyper-autonomism to cyber-populism: an ideological history of digital activism. *TripleC: Communication, Capitalism & Critique*, 15(2), 477–489. DOI: 10.31269/triplec.v15i2.773

Gunitsky S. (2015). Corrupting the cyber-commons: Social media as a tool of autocratic stability. *Perspect. Polit.*, 13(1), 42–54.

Hjalmar B.C., Jonas T., Benedikte B. (2021). On solidarity and volunteering during the COVID-19 crisis in Denmark: The impact of social networks and social media groups on the distribution of support. *European Societies*, 23(1), 122–140. DOI: 10.1080/14616696.2020.1818270

Howard P.N., Duffy A., Freelon D., Hussain M., Mari W., Mazaid M. (2011). *What Was the Role of Social Media During the Arab Spring ?* PITPI Work. Pap. 30 p.

Howard P.N., Savage S., Flores Saviaga C., Toxtli C., Monroy-Hern ndez A. (2016). Social media, civic engagement, and the slacktivism hypothesis: Lessons from Mexico's "El Bronco". *Journal of International Affairs*, 70(1), 55–74.

Jost J.T., Barber P., Bonneau R., Langer M., Metzger M., Nagler J., Sterling J., Tucker J.A. (2018). How social media facilitates political protest: Information, motivation, and social networks. *Political Psychology*, 39, 85–118. DOI: 10.1111/pops.12478

Khondker H.H. (2011). Role of the new media in the Arab Spring. *Globalizations*, 8(5), 675–679. DOI: 10.1080/14747731.2011.621287

Kristofferson K., White K., Peloza J. (2014). The nature of slacktivism: How the social observability of an initial act of token support affects subsequent prosocial action. *Journal of Consumer Research*, 40(6), 1149–1166. DOI: 10.1086/674137

Lane D.S., Dal Cin S. (2018). Sharing beyond slacktivism: The effect of socially observable prosocial media sharing on subsequent offline helping behavior. *Information, Communication* & Society, 21(11), 1523–1540. DOI: 10.1080/1369118X.2017.1340496

Lane D.S., Lee S.S., Liang F., Kim D.H., Shen L., Weeks B.E., Kwak N. (2019). Social media expression and the political self. *Journal of Communication*, 69(1), 49–72. DOI: 10.1093/joc/jqy064

Lee Y.-H., Hsieh G. (2013). Does slacktivism hurt activism? The effects of moral balancing and consistency in online activism. In: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13). Association for Computing Machinery, New York. DOI: 10.1145/2470654.2470770

Lonkila M., Shpakovskaya L., Torchinsky P. (2021). Digital activism in Russia: The Evolution and forms of online participation in an authoritarian state. In: Gritsenko D., Wijermars M., Kopotev M. (Eds.). *The Palgrave Handbook of Digital Russia Studies*. Cham: Palgrave Macmillan. DOI: 10.1007/978-3-030-42855-6_8

Makarova E.A., Makarova E.L., Makhrina E.A. (2016). Psychological features of cyberbullying as a form of internet crime. *Rossiiskii psikhologicheskii zhurnal=Russian Psychological Journal*, 13(3), 293–311. DOI: 10.21702/rpj.2016.3.17(298-299) (in Russian).

Mandarano L., Meenar M., Steins C. (2010). Building social capital in the digital age of civic engagement. *Journal of Planning Literature*, 25(2), 123–135. DOI: 10.1177/0885412210394102 (132)

Menteş S.A. (2019). Online environmental activism: The case of I neada floodplain forest. *SAGE Open*, 9, 1–10. DOI:10.1177/2158244019877877

Micheletti M. (2003). *Political Virtue and Shopping: Individuals, Consumerism and Collective Action*. New York: Palgrave-Macmillan.

Milbrath L. (1965). *Political Participation: How and Why Do People Get Involved in Politics*. Chicago, IL: Rand McNally.

Nikovskaya L.I. (2017). Civic activism and public policy in Russia: Status and challenges. In: *Gosudarstvo i grazhdane v elektronnoi srede. Vyp. I (Trudy XX Mezhdunarodnoi ob''edinennoi nauchnoi konferentsii Internet i sovremennoe obshchestvo, IMS-2017, Sankt-Peterburg, 21–23 iyunya 2017 g. Sbornik nauchnykh statei)* [State and Citizens in

the Electronic Environment. Issue 1 (Proceedings of the 20th International Joint Scientific Conference Internet and Modern Society, IMS-2017, Saint Petersburg, June 21–23, 2017: Collection of Scientific Articles)]. Saint Petersburg: Universitet ITMO (in Russian).

Norris P. (2001). *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. New York: Cambridge University Press. 303 p.

Pettingill L. (2008). Engagement 2.0? How the new digital media can invigorate civic engagement. *Gnovis Journal*, 8(3), 155–161.

Putnam R. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.

Rottinghaus B., Escher T. (2020). Mechanisms for inclusion and exclusion through digital political participation: Evidence from a comparative study of online consultations in three German cities. *Z Politikwiss*, 30, 261–298. DOI: 10.1007/s41358-020-00222-7

Seddighi H., Salmani I. (2018) Online volunteering, a way to reduce health inequalities: A review study. *Journal of Community Health Research*, 7(4), 256–264.

Silva F., Proença T., Ferreira M.R. (2018). Volunteers' perspective on online volunteering – a qualitative approach. *International Review on Public and Nonprofit Marketing*, 15, 531–552. Available at: https://doi.org/10.1007/s12208-018-0212-8

Skalaban I.A. (2011a). Public participation: Theoretical and methodological problems of interpretation. *Sovremennye issledovaniya sotsial'nykh problem=Modern Studies of Social Studies*, 6(2), 216–220 (in Russian).

Skalaban I.A. (2011b). Social, public and civic participation: On the problem of understanding concepts. *Vestnik Tomskogo gosudarstvennogo universiteta. Seriya "Filosofiya. Sotsiologiya. Politologiya"=Bulletin of Tomsk State University. Series "Philosophy. Sociology. Political Science"*, 1(13), 131–139 (in Russian).

Smith B.G., Krishna A., Al-Sinan R. (2019). Beyond slacktivism: Examining the entanglement between social media engagement, empowerment, and participation in activism. *International Journal of Strategic Communication*, 13(3), 182–196. DOI: 10.1080/1553118X.2019.1621870

Smoleva E.O. (2021). Internet practices of citizens' participation in creating comfortable urban area (case study of the Northwestern federal district). *Problemy razvitiya territorii=Problems of Territory's Development,* 25(2), 90–107. DOI: 10.15838/ptd.2021.2.112.6 (in Russian).

Teocharis Y. (2015). The conceptualization of digitally networked participation. *Social Media Society*, 2(1), 5. DOI:10.1177/2056305115610140

Theocharis Y., de Moor J., van Deth J.W. (2021). Digitally networked participation and lifestyle politics as new modes of political participation. *Policy & Internet*, 13(1), 30–53. DOI: 10.1002/poi3.231

Tranfield D., Denyer D., Smart P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 4, 207–222.

Vegh S. (2003). Classifying forms of online activism: The case of cyberprotests against the World Bank. In: McCaughey M., Ayers M. (Eds.). *Cyberactivism: Online Activism in Theory and Practice*. New York: Routledge.

Weber L., Loumakis A., Bergman J. (2003). Who participates and why? An analysis of citizens on the Internet and the mass public. *Social Science Computer Review*, 21, 26–42.

Wolfsfeld G., Segev E., Sheafer T. (2013). Social media and the Arab Spring: Politics comes first. *Int. J. Press.*, 18(2), 115–137.

Wu W., Weaver D. (1997). On-line democracy or on-line demagoguery? Public opinion "polls" on the Internet. *Harvard International Journal of Press/Politics*, 2(4), 71–86.

Xenos M., Vromen A., Loader B.D. (2014). The great equalizer? Patterns of social media use and youth political engagement in three advanced democracies. *Information, Communication & Society*, 17(2), 151–167. DOI: 10.1080/1369118X.2013.871318

Yang K.C., Kang Y. (2017). Social media, political mobilization, and citizen engagement: A case study of the March 18, 2014, Sunflower Student Movement. In: Adria M., Mao Y. (Eds.). *Handbook of Research on Citizen Engagement and Public Participation in the Era of New Media*. IGI Global. Available at: http://doi:10.4018/978-1-5225-1081-9.ch020

Yessenbekova U.M. (2020). Social media and slacktivism in young people's life. *Media Watch*, 11(3), 515–525.

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Methodology for Assessing the Effectiveness of Citizen Electronic Participation in Socio-Political Processes

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Abstract. The development and active introduction of information and communication technologies contributes to the emergence of new forms of citizen electronic participation in socio-political processes and the expansion of the circle of persons involved in these processes. In this regard, it becomes urgent to develop a method for evaluating the effectiveness of the use of existing information and communication technologies to enhance citizen socio-political participation. Currently, the scientific literature and management practice do not possess a single integrated approach to carry out such an assessment. The issue requires further study and elaboration, since the existing methods assume a one-sided assessment, in most cases focused on quantitative indicators. The article presents a four-aspect approach to the development of a comprehensive indicator of the effectiveness of citizens of socio-political activity through information and communication technologies. The proposed methodology is based on the fact that the

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effectiveness of information and communication technologies in increasing socio-political participation is determined by the ability of citizens, involved with their help in socio-political processes to participate in the policy pursued by the authorities, influence it and even determine it. The effectiveness of such socio-political participation depends on four aspects (technical, economic, social and political), each of which is determined by a set of indicators. All these aspects affect the perception of information and communication technologies, used by citizens for the manifestation of socio-political activity, as well as assessing the level of their accessibility, satisfaction with them and trust in them. The methodology was tested as part of a study of the socio-political participation of the Tyumen Oblast citizens using modern technologies. The study will be interesting for government and business representatives involved in the development, implementation, improvement of existing information and communication technologies for the purpose of citizens' socio-political participation.

Key words: socio-political activity, citizen socio-political participation, citizen electronic participation, role of information and communication technologies in the citizen socio-political participation.

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In recent decades, the issues of electronic participation in socio-political processes remain rather relevant. This is due to the development of information and communication technologies (hereinafter referred to as ICTs) which allow both expanding the participation forms and increasing the number of participating citizens, as well as the fact that socio-political participation is considered by the authorities as a way to reduce general dissatisfaction with the policy and increase confidence in the authorities. At the same time, issues related to assessing the effectiveness of modern digital participation forms require additional research, and existing assessment methods remain the subject of discussion by specialists. According to a number of scientists, the assessment of electronic participation requires further research, since existing methods assume a one-sided assessment, in most cases focused on quantitative indicators of the number of participants and their perception of existing technologies. A number of works focus on the factors limiting the use of modern technologies by individual social groups.

The effectiveness of using modern digital services in socio-political processes is determined not only by their convenience, accessibility, but also by the ability to influence political processes. Sh. Arnstein notes that citizens do not always count on true participation, which makes it possible to influence the policy pursued by the authorities (Arnstein, 1969, p. 217). Most of them are limited to the lowest levels of participation corresponding to the level of "informing" remaining passive participants in socio-political processes. Moreover, passive participation may be associated with various factors (social, economic, technical, cultural, and legal) that should be taken into account when assessing the effectiveness of using ICT for socio-political participation.

The article aims to develop a methodology for assessing the effectiveness of their use for citizen socio-political participation of including principles and a set of quantitative and qualitative methods, based on the analysis and synthesis of the most popular information and communication technologies. These principles and methods allow evaluating the effectiveness of ICTs from the

standpoint of the possibility of their use by citizens for socio-political participation and influence on existing policies.

The theoretical basis of the research are the following works: Sh. Arnstein (Arnstein, 1969), J. van Deth et al. (van Deth, 2014; Hooghe et al., 2014; Vráblíková, van Deth, 2017), E. Theocharis (Theocharis, van Deth, 2018; Theocharis et al., 2021), J. Gabber (Gabber, 2019), E. Macintosh and A. Whyte (Macintosh, Whyte, 2006), A.V. Anttiroiko (Anttiroiko, 2003; Anttiroiko, 2004), L. Pratchett et al. (Pratchett et al., 2011), M. Henderson (Henderson, Hogarth, 2011), H. Kubicek and G. Aicholzer (Kubicek, Aichholzer, 2016), D. Kipenis and D. Askonis (Kipenis, Askounis, 2016), R. Lindner (Lindner, Aichholser, 2020), D. Friess (Friess et al., 2021) et al.

We use a broad interpretation of socio-political participation considering it as any citizen activity influencing politics which includes both traditional participation forms (voting, party membership, election campaigning) and non-traditional ones designed to influence political actors (protests and political activism, in particular on the Internet, etc.), as well as activities aimed at solving specific community problems (civic activism and volunteering), participation forms that stem from individual motives (political expression of one's own views) (van Deth, 2014).

The study assesses the existing digital services and platforms in the Tyumen Oblast that citizens can use to demonstrate their socio-political activity.

Brief overview of methodologies for assessing citizen electronic participation

Foreign literature presents a fairly wide range of studies concerning the citizen socio-political participation including methodologies for assessing the effectiveness of modern information technologies for electronic participation, whereas in the Russian scientific discourse there are only separate studies of citizen electronic participation at the federal and regional levels (Demushina, 2017; Belyi, 2019; Vasilenko, 2020; Mukhametov, 2020), and we can also find works devoted to the assessment of trust, perception of ICTs used for socio-political participation (Vidyasova, Tensina, 2020).

H. Kubicek and G. Aichholser point out that in the early 2000s, many methodologies appeared describing various approaches to assessing citizen electronic participation in socio-political processes. International or intergovernmental organizations developed them. According to the authors, in most cases, the developed methodologies concerned e-government and were aimed at assessing the implemented e-government and e-participation technologies, but not at expanding citizen political participation from the position of influencing political decision-making (Kubicek, Aichholser, 2016).

Currently, international practice presents several well-established methodologies of assessing citizen electronic participation in socio-political processes. Since the concept of "e-participation" is closely related to the concept of "e-government", one of the first methodologies to assess the implementation level of digital technologies for socio-political participation is the UN methodology "E-Government Development Index" (EGDI). Within its framework, the possibilities of the country's government to implement online participation initiatives are assessed to a greater extent. In particular, this index allows assessing the volume and quality of online services, the state and development of IT-infrastructure, as well as the level of human capital development in the country. Its advantage is the coverage of most world countries, and therefore the ability to conduct cross-country comparisons.

In addition to it, the index of citizen electronic participation is calculated. It supposes a quantitative and qualitative assessment of existing digital services for socio-political participation on the basis of sociological surveys. The survey is aimed at

assessing e-participation in accordance with citizen involvement level in socio-political processes (based on the authorities' official websites data). The study evaluates the provision of electronic information, electronic consultations, as well as the possibility of electronic decision-making in six different areas (health, education, employment, social protection, environment and justice).

Another index for assessing citizen electronic participation is the Measurement and Evaluation Tool for Citizen Engagement and e-Participation (METEP). It is calculated by the United Nations Department of Economic and Social Affairs (UNDESA). The methodology is aimed at assessing the success of the ICT introduction for citizen political participation in three blocks: political, social and technical. It makes it possible to assess the government's implemented initiatives in the field of e-participation at the local, regional and national levels, based on the opinions of various categories of participants in socio-political processes.

The Global Open Data Index (GODI), calculated by the Open Knowledge Foundation, can also be considered an index that allows partially assessing citizen electronic participation level. Its feature is the emphasis on the level of informing citizens about certain data published by the government. During the calculation of the index, attention is paid to information accessibility for citizens, the efforts required to find information, the convenience of its use and processing, the need for additional registration to receive it, as well as to who is collecting and accumulating information.

The index of local online services, which is calculated by the UN for individual municipalities, deserves attention. This index takes into account 4 aspects: technology; provision of content; provision of services; citizen participation and involvement in governance processes at the local level. The technological aspect is related to the accessibility and attractiveness of websites, portals and platforms, as well as the quality and functionality of digital services. The provision of content determines the accessibility degree of information and resources on the Internet, the provision of services implies a focus on the provision of public services to the population, and the last aspect is the citizen active involvement in the management processes at the local level.

It is worth noting that in the mid-2000s, the European Union implemented several research projects aimed at assessing electronic forms of citizen participation in socio-political processes. Among such projects, we should particularly note the DEMO-NET[1] project, aimed at studying the effectiveness of electronic forms of citizen participation to maintain democracy, as well as the initiative of the Special Council of Europe activities in the field of e-democracy[2] to create standards for electronic participation (CAHDE – Ad hoc Committee on e-democracy, 2006–2008). The implementation of these projects allowed the EU authorities, together with scientists, to assess a large number of existing e-participation practices and tools and to assert that "e-participation assessment is in its infancy and there is a need to develop a coherent assessment system covering various methods" (Macintosh, Whyte, 2006, p. 4).

E. Macintosh and A. Whyte have pointed out the need to revise the assessment methods used, and noted that in order to obtain a relevant assessment of the effectiveness of using ICT for involvement in socio-political processes, a combination of field research (surveys, interviews, focus groups) and analysis of statistical data on users and ICT infrastructure is required. And the very assessment of citizen electronic participation should be carried out taking into account three aspects: political, social and technological.

[1] The democracy network. Available at: https://cordis.europa.eu/project/id/027219

[2] Council of Europe activities in the field of e-democracy. Available at: https://www.coe.int/t/dgap/goodgovernance/Activities/CAHDE/Default_en.asp

According to E. Macintosh, the political aspect of e-participation assessment involves getting answers to the questions: "Was e-interaction an effective contribution to the decision-making process?", "To what extent did interaction affect the policy pursued by the authorities?", "How is consensus achieved in the system?" etc. (Macintosh, Whyte, 2006, p. 4). The social aspect of the assessment makes it possible to determine whether the results obtained by citizens are related to electronic participation, how effective it turned out to be, whether it allowed achieving the intended goals, making a real contribution to solving the problem, what circumstances helped or prevented the solution of problems.

The technological aspect of the assessment makes it possible to understand to what extent the ICT design promotes participation, whether it takes into account the skills and experience of target participants, whether the system contributes to increasing public satisfaction with the use of modern digital systems and participation platforms; whether modern digital platforms allow achieving the intended results (Macintosh, Whyte, 2006).

The three-aspect assessment of electronic participation is regarded by the scientific community today as a reference. At the same time, a number of authors have made attempts to supplement and expand the vision of E. Macintosh in assessing the effectiveness of the use of digital technologies in citizen socio-political participation.

H. Kubicek and G. Aichholser write that most e-participation studies focus on technical aspects ignoring procedural and institutional ones. It does not take into account the fact that the same tools can be used in completely different contexts in different countries, different legal regimes, formalized rules of participation, cultural traditions (Kubicek, Aichholser, 2016). According to H. Kubicek and G. Aichholser, "the effectiveness of online tools is not determined by their technical functionality and usability, but to a much greater extent by the context in which they are used", as well as the existing institutional and social environment. In addition, the authors emphasize the need to apply different approaches to the assessment of passive and active forms of participation (Kubicek, Aichholser, 2016; Karakaya Polat, Pratchett, 2014; Macintosh, Whyte, 2006).

A.V. Anttiroiko has proposed a system for assessing the implementation of ICT in the e-government system based on four "I" involving the analysis of the following:

To what extent do existing institutions and establishments use ICTs, how does the introduction of modern ICTs affect the actual decision-making processes (*Institutions*);

How optimally is the potential of modern technologies used to integrate the main elements of the electronic democratic process including agenda setting, planning, preparation and decision-making, implementation, assessment and control (*Integration*);

Does the existing e-democracy practice in the country allow citizens to influence decision-making (*Influence*);

To what extent the technology potential is used in the dissemination of information, facilitating interaction in the political conduct of transactions, in increasing transparency, efficiency, flexibility, economic efficiency and inclusiveness of the democratic system (*Interaction*) (Anttiroiko, 2003; Anttiroiko, 2004).

According to A.V. Anttiroiko, e-democracy should develop in such a way as to give people a real opportunity to influence the policy being pursued. The author believes that at present "a hybrid democracy model is being formed in which the new technologies used are developing together with public and government structures" (Anttiroiko, 2003, p. 127). The introduction of digital technologies and their combination with traditional participation forms contribute to increasing transparency, facilitating information and communication processes, and democratizing society.

M. Henderson et al. also point out that the existing system for evaluating the effectiveness of the use of electronic services for citizen socio-political participation should be based on the principles of efficiency, fairness, quality, efficiency, relevance, sustainability of the process (Henderson, Hogarth, 2011).

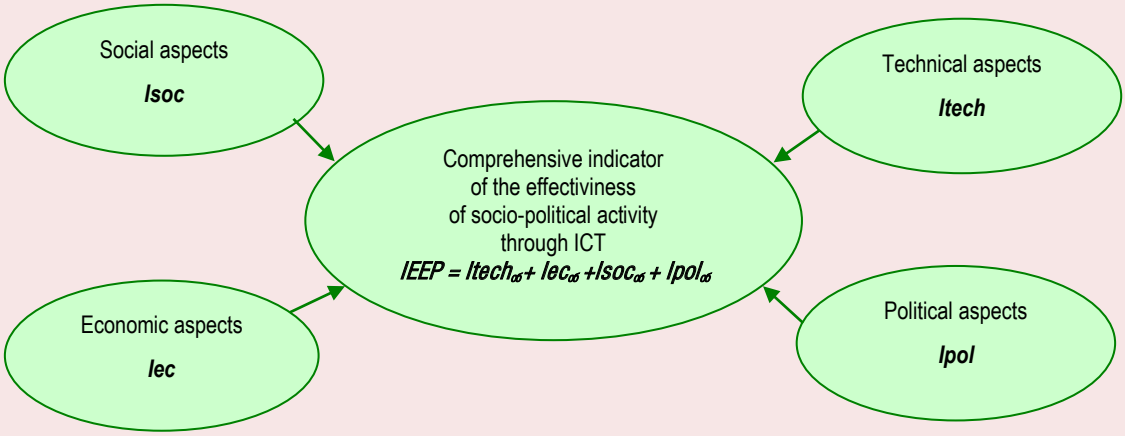
Summarizing the existing research, we can argue that the effectiveness of the use of digital services in citizen socio-political participation should be assessed in accordance with the ability not only to participate in the policy, but also to influence it. Thus, the method for assessing the effectiveness should include quantitative and qualitative indicators reflecting citizens' ability to use existing technologies for socio-political participation, as well as indicators of the ability to influence existing policies.

Methodology for assessing the effectiveness of the use of electronic services in citizen socio-political participation

The assessment of the effectiveness of the ICT use in citizen socio-political participation should take into account technological, social, economic and political aspects of the introduction of digital services and platforms for socio-political participation (*Fig. 1*).

The technical aspect reflects the development level of the IT-infrastructure, the quality of mobile communications, convenience and accessibility of modern e-participation services for citizens. When assessing the technical aspect, the development degree of the ICT infrastructure in the settlement area should be taken into account. In addition, this aspect should reflect the convenience of the existing services for users, ease of use, and clarity of functionality. In fact, the design of existing services and their functionality will affect the accessibility level of these services and citizens' satisfaction with them. The availability of digital services for socio-political participation will also be determined by socio-economic factors characterizing the level of income, education, information competence of citizens, their information culture within the established communities. When assessing the technical aspect, efficiency included such indicators as the availability of access points to free Wi-Fi and high-speed Internet connection, fixed and mobile communications for citizens and organizations, as well as the convenience of existing services for users (functionality, ease of use, the need for additional registration, obtaining passwords from the ESIA; flexibility; the ability to correct errors).

Figure 1. Components of comprehensive assessment of citizen socio-political participation through ICT



Source: own compilation.

The economic aspect of using modern technologies reflects the cost of funds needed to access them, as well as time savings. When assessing the economic aspect, we have considered the accessibility of communication services for population (the cost of communication services for consumers in relation to the subsistence minimum), as well as the attractiveness of using ICT for citizens through saving time during the use of electronic participation forms compared with the traditional form. Thus, economic and technical factors together influence the accessibility level of modern technologies for political participation.

The social aspect of e-participation reflects the level of citizens' trust in modern information technologies, the assessment of the safety of their use, the possible level of participation and interaction with the authorities. The assessment of the social aspect involves the analysis of such indicators as social acceptability (trust and security, relevance and legitimacy), usefulness and satisfaction with existing services and platforms, as well as the possibility of citizens' interaction with the authorities and responsiveness to their appeals.

The political aspect includes the level of participants' involvement, the ability to influence the policy. It reflects the level of decisions transparency, equality of all participants, and public control quality. The political aspect of socio-political participation presupposes the characterization of the type of interaction between citizens and authorities that has developed through ICT (informing; consulting; active participation), assessment of the scope of discussion and interaction between the authorities and citizens (social/economic/political, perceptions of subjects about democracy), the level of participants' involvement in socio-political processes. In addition, the transparency of the existing system of citizen electronic participation, the existing system quality, the quality of participants' management/ satisfaction in public control, political equality and integration with the traditional system of participation should be assessed.

Each aspect includes a number of indicators characterizing it which should be taken into account in a comprehensive assessment of the effectiveness of citizen socio-political participation through modern ICT (*Tab. 1*).

Table 1. Comprehensive methodology of citizen electronic participation in socio-political processes

Index	Indicator	Methods used to evaluate indicators
$Itech_{об}$	*TECHNOLOGICAL ASPECT*	
$Itech_1$	Availability of access points to free Wi-Fi High-speed Internet Availability of fixed communication Mobile communication Availability of Internet in organizations (including public access points)	Analysis of statistical data on the development level of IT-infrastructure in the region
$Itech_2$	Convenience of services for users (functionality, ease of use, need for additional registration, obtaining passwords from ESIA; flexibility; ability to correct errors)	User survey/analysis of platforms, services for the opportunity to make edits
$Iec_{об}$	*ECONOMIC ASPECT*	
Iec_1	Cost of communication services for consumers in relation to the subsistence minimum	Actual data analysis
Iec_2	Saving time when using electronic participation forms compared to the traditional form (attractiveness of use)	

End of Table 1

Index	Indicator	Methods used to evaluate indicators
$\boldsymbol{Isoc_{об}}$	*SOCIAL ASPECT*	
$Isoc_1$	Social acceptability (trust and security, relevance and legitimacy)	Sociological survey
$Isoc_2$	Usefulness (accessibility, satisfaction, attractiveness of use)	Sociological survey
$Isoc_3$	Ability of interaction, responsiveness	Sociological survey / analysis of interaction regulations / regulatory framework
$Isoc_4$	Content and quality (satisfaction of participants with responses)	Sociological survey
$\boldsymbol{Ipol_{об}}$	*POLITICAL ASPECT*	
$Ipol_1$	Type of interaction: informing; consulting; active participation	Sociological survey
$Ipol_2$	**Area of discussion and interaction** (social/economic/political, subjects› ideas about democracy)	Sociological survey
$Ipol_3$	**Participants'; involvement:** gender, age and territorial (city, village, regions) structure of participants	Sociological survey, actual data analysis on participants (using technologies)
$Ipol_4$	**Providing information:** about the rules of participation, knowledge, number of participants and level of involvement, building social capital, etc.	Analysis of changes in the list of services offered on platforms and websites based on the request of citizens' requirements / analysis of shortcomings in the work
$Ipol_5$	**Process quality:** improvement areas, gap analysis, harmonization of working methods	Expert survey, analysis of legislation in the field of electronic citizen participation, monitoring of websites, platforms
$Ipol_6$	**Transparency / Conflict and consensus:** transparency of interim and final decisions, publication of results, identification of "pros" and "cons", discussion of final results, moderation; publication of interim and final results, information on how decisions were agreed, public discussion of final results	Expert survey
$Ipol_7$	**Quality of management / Participants' satisfaction in public control:** satisfaction of participants; influence on the decision-making process, i.e. the level of administrative integration, accountability, documentation of results, policy results, influence at different stages of decision-making	Expert survey
$Ipol_8$	**Political equality / Pluralism:** number of relevant target groups in relation to the total number of participants, openness, i.e. identification of barriers to active citizenship **Integration with the traditional participation system:** compliance with the current legal framework, integration with offline participation.	Analysis of legislation
Source: own compilation.		

The table presents four groups of indicators that should be reflected in the comprehensive assessment of socio-political participation through ICT. The assessment method involves the calculation of four sub-indices:

$$IEEP = Itech_{об} + Isoc_{об} + Iec_{об} + Ipol_{об},$$

where IEEP – comprehensive index of the effectiveness of citizen electronic participation in socio-political processes;

$Itech_{об}$ – sub-index reflecting the technological aspect of socio-political participation;

Iесоб – sub-index reflecting the economic aspect;

$Isoc_{об}$ – sub-index reflecting the social aspect;

$Ipol_{об}$ – sub-index reflecting the political aspect.

The first two sub-indices largely determine the availability of the existing ICTs for socio–political participation, the latter two reflect the level of citizens' involvement in socio-political processes and their trust in the existing system in terms of the ability to influence the policy pursued in the country.

Research methods

We have carried out the development and testing a methodology for assessing the effectiveness of the ICT use for socio-political participation in several stages. At the first stage, we have studied works concerning the concept and essence of citizen socio-political participation, as well as how modern information technologies fit into socio-political participation. Then, at the second stage, we have studied the most cited works devoted to assessing the effectiveness of citizen electronic participation in socio-political processes. The analysis of theories suggests that the effectiveness of the use of modern technologies in socio-political processes lies in the ICT ability to give citizens the opportunity to influence the policy implemented by the authorities.

At this stage, based on the analysis of the works, we have identified the main aspects, each of which is presented in the form of an index. The sum of the indices is the complex index of citizen electronic participation in socio-political processes (*IEEP*). Further, to calculate each of the sub-indices of the complex indicator, we have determined a list of indicators requiring evaluation and the methods used for this, and also developed an assessment scale for each group of indicators. Since the social and political aspects are fundamental in assessing the effectiveness of the ICT use for socio-political participation, the two corresponding indices received a greater share and were assessed in the range from 0 to 40 points. We have estimated sub-indices reflecting technological and economic aspects of socio-political activity ($Itech_{об}$ *and* $Iec_{об}$) on a scale from 0 to 20 points each.

Thus, the maximum IEEP value in points is 100. The index value in the range from 0 to 20 points indicates a low level of efficiency; from 21 to 40 points – about average; from 41 to 60 points – about high; from 61 to 100 points – about very high.

At the third stage, we have developed a questionnaire survey method to assess the use of modern ICT by citizens for socio-political participation, as well as their involvement level in socio-political processes. The survey has also identified social, economic and technical barriers to active socio-political participation through ICT.

At the fourth stage, we have carried out the analysis of the level of IT-infrastructure development in the south of the Tyumen Oblast, as well as socio-economic factors of the region's development and factors limiting the ICT use by respondents. We have compared and adjusted the data obtained in accordance with the all-Russian indicators presented in the study "Infrastructure of Russia: Development Index 2020".

At the fifth stage of the study, during the questionnaire survey, we have measured the social acceptability and perception of modern technologies, their usefulness and usability for citizens; determined the type of interaction with the authorities, the area of issues discussed, satisfaction with existing technologies, the quality of the process, as well as the main problems arising during interaction with the authorities through ICT. During the survey, we asked the respondents to assess each of the indicators on a five-point scale, as well as to speak about the main factors limiting the use of modern ICTs for socio-political participation.

At the sixth stage, we have carried out an assessment of the sub-index reflecting the political aspect of the citizen socio-political participation ($Ipol_{об}$). Its calculation is based on the sociological survey data characterizing citizen participation level, as well as the analysis of actual data reflecting the involvement and transparency of the existing system of electronic participation of the country's population.

For a more accurate assessment of the accessibility and level of citizen involvement, we have analyzed statistical data of websites and platforms used for the manifestation of socio-political activity. The assessment of the democratic aspects of the effectiveness of electronic participation in socio-political processes is based on the respondents' survey about their perception of the opportunity to influence the adoption of socio-political decisions, as well as to be heard by the authorities.

Assessment results

We have obtained data for a comprehensive assessment of the effectiveness of the ICT use for socio-political participation on the basis of statistics reflecting the development level of the region's information and communication infrastructure, as well as the socio-economic development level of cities and villages in the south of the Tyumen Oblast, and during a sociological survey[3].

We have carried out the assessment of the development level of the Tyumen Oblast IT-infrastructure on the basis of available official statistics, as well as data from the Tyumen Oblast geoportal (information on the coverage of territories with mobile communications, the number of collective Internet access points, free Wi-Fi, etc.). *Table 2* presents the assessment results in points.

The Tyumen Oblast can be characterized as a region with a fairly high level of IT-infrastructure development. In the all-Russian rating of the development level of telecommunications infrastructure, the Tyumen Oblast ranks 14th[4], although there are certain problems associated with providing high-speed Internet for remote areas. For instance, the survey has revealed that about 6% of respondents are not satisfied with the communication quality in their localities.

In the research course, based on the analysis of the theory of citizen socio-political and electronic participation, we have selected a list of electronic services and platforms available for use by the Tyumen Oblast residents for the manifestation of socio-political activity. The sample for assessing accessibility, demand and perception included the most popular services and platforms for socio-political participation, most of which were created by the authorities (the portal "Gosuslugi", websites

[3] The survey was implemented in an online format using the SurveyMonkey service in June – August 2021. The research object is residents of all cities and municipal districts of the south of the Tyumen Oblast at the age of 18. The sample size is 1,200 people. The sample represents the population of the south of the region by gender, age and place of residence (Tyumen, other urban settlements of the south of the region, rural municipal districts). The sampling error does not exceed 3% for one attribute.

[4] According to the analytical report of InfraONE research "Infrastructure of Russia: Development index 2020". Available at: https://infraone.ru/sites/default/files/analitika/2020/index_razvitiia_infrastruktury_rossii_2020_infraone_research.pdf

Table 2. Complex methodology for assessing information and communication technologies in the manifestation of citizen socio-political activity

Index	Maximum value of indicator	Calculated value
$Itech_{об}$	**20**	**15.2**
$Itech_1$	10	7
$Itech_2$	10	8.2
$Iec_{об}$	**20**	**13**
Iec_1	10	7
Iec_2	10	6
$Isoc_{об}$	**20**	**12.36**
$Isoc_1$	5	2.1
Iso_{c2}	5	3.26
$Isoc_3$	5	3
$Isoc_4$	5	4
$Ipol_{об}$	**40**	**18.45**
$Ipol_1$	5	1.45
$Ipol_2$	5	2
$Ipol_3$ $Ipol_3^1$ $Ipol_3^2$	5 3 2	3 2 1
$Ipol_4$	5	2
$Ipol_5$	5	2
$Ipol_6$	5	3
$Ipol_7$	5	2
$Ipol_8$	5	3
IEEP	**100**	**59.01**

Source: own compilation.

of government agencies, blogs, pages on social networks of government representatives, parties, services for petitions). The assessment also took into account the availability of services, platforms for socio-political participation created by individuals, local communities and organizations for the purpose of citizen social or political participation (unofficial sites of cities, villages, pages of local communities in social networks used to manifest their social and political activity). At the first stage of the study, we have made an assessment of the demand for these services, awareness of them and their availability. Respondents evaluated the services on a five-point scale which allowed deducing the average values for each of the indicators of the first block of the methodology.

To assess the convenience and satisfaction with technical aspects, we have offered the respondents a list of available and most popular digital services which were initially assessed separately. Further, we have determined the average values of the indicator reflecting the convenience of the services. We have also assessed the overall satisfaction level with digital services and platforms. 82% of respondents have stated that they are satisfied with the existing services, but 14% have noted that they have difficulty working with them due to the fact that the services are complex and incomprehensible to

use. In most cases, citizens of the older group have experienced difficulties (60 years and older).

The maximum rating of this indicator can be 10 points, but considering that the satisfaction level with digital services is 82%, which means that every fifth citizen is not satisfied with the service work, and every seventh claims that the services are incomprehensible, an adjustment was made by minus 2 points.

We have assessed the *Iec* value comprehensively taking into account survey data on the respondents' socio-economic situation, as well as actual data reflecting the income level of the Tyumen Oblast residents. During the survey, the majority of respondents noted that the cost of communication services for them is not a factor limiting the ICT use for socio-political participation. The minimum possible tariff for cellular subscribers is 250–300 rubles depending on the operator which ranges from 0.45 to 0.54% of the average monthly income. According to the mobile accessibility index, the Tyumen Oblast ranked 17th in the second half of 2020, and 11th in Russia in the first half of 2021[5]. But at the same time, prices for home Internet have increased by 3–4% over the previous year; the average cost of unlimited Internet in Russia was 830 rubles per month. The total expenses of citizens to pay for communication services (mobile communications, home Internet, landline phone) amount to more than 1,500 rubles which is generally a significant amount for pensioners and low-income citizens. For example, the average salary in Ishim is 45,015 rubles, and the median is 28,105 rubles. Considering that the study involvs residents of small towns and villages of the Tyumen Oblast, where the average income level is significantly lower, we have made an adjustment of minus 3 points in terms of the cost of communication services in relation to average incomes.

In addition, the study reveals that 11% of respondents do not have technical means of communication; they do not have a computer or smartphone which does not allow using modern technologies to manifest their socio-political activity. Analysis of the research results proves that, in general, citizens with higher incomes demonstrate a higher level of socio-political activity.

The majority of respondents in the survey noted that the ICT use allows significantly saving time and money on interaction with the authorities and accelerating the decision-making process. In general, the research does not carry out a detailed quantitative analysis of time and money savings, but the survey data indicate that, since among the services used, those that allow solving the current pressing problems of citizens, filing complaints, appeals, informing the authorities are the most popular, then indicators characterizing electronic participation in within the framework of e-government. For such services, time savings are estimated to be up to 20 hours per year which in monetary terms for the Tyumen Oblast residents is about 6,900 rubles per year. But at the same time, 24% of respondents said that sometimes using the services is useless – in any case, they have to personally visit the authorities. This indicates that not all services help to effectively implement socio-political participation; in some cases, saving time for citizens is not obvious. This fact also allows adjusting the time saving indicator by minus 4 points, since in the case of receiving public services, sending complaints through digital services and applications, it is significant, but if we want to participate in the ongoing socio-economic processes at a higher level, citizens will not feel it, this activity will require time to comprehend the processes and the participation itself.

We have assessed the indicators characterizing the usefulness of individual services on the basis of survey data and varied significantly, the portal

[5] The most affordable mobile communication in Russia. Available at: https://www.content-review.com/articles/53245/

"Gosuslugi" received the highest utility rating among all services – 4.6 points out of 5 possible, but the average score for all types of digital services was equal to 3.26. The level of social acceptability of the existing ICTs for the manifestation of socio-political activity was low and it was rated at 2 points.

Low trust in digital services on the part of the Tyumen Oblast residents is associated with distrust of modern technologies, fear of losing privacy, and becoming the object of manipulation and fraud. At the same time, the satisfaction level with the existing services is quite high, more than 80% of respondents state that their needs for political participation are fully satisfied. However, some respondents have noted that the main problem remains the lack of feedback when interacting with the authorities, and in some cases the slow response rate to appeals.

Further, we have given an assessment of the indicators of the political bloc on the basis of survey data and analysis of the regulatory framework related to electronic government, citizen electronic participation. The most important indicator characterizing the effectiveness of the existing services for socio-political participation is the type of interaction between population and the authorities. We have found that the majority of citizens remain at the lowest level of interaction (informing – 70% of respondents, consulting – 25%, only 5% of respondents feel genuine participation). Therefore, the value of the indicator characterizing the types of participation turned out to be 1.45 points[6].

Regarding the scope of the issues, the survey shows that residents discuss the most pressing problems for the region, most often their appeals are related to social security, housing and communal services, healthcare, but most respondents note that they turn to digital services in order to solve some life problems. More than 70% of citizens have stated that their use of services is not political in nature.

We have assessed the participants' involvement within the framework of gender, age and territorial structure. In particular, men demonstrate greater involvement in political life, compared to women. Young people are characterized by the lowest participation level in socio-political processes than older respondents. The level of electronic socio-political participation of residents of the capital was the highest, and in the villages – the lowest. Both of these criteria were evaluated at 2 points.

We have assessed the latest 5 indicators based on the analysis of Russia's legislation, as well as expert assessments concerning the level of openness, transparency of the system of electronic socio-political participation, participants' satisfaction in public control, research conducted by the scientific community (the study "Openness of the state in Russia – 2021"[7], the Openness Index of the government of Russia's regions[8]).

Taking into account the data of the previous studies, we can conclude that the Tyumen Oblast indicators characterizing transparency, the quality of participants' satisfaction in public control, political equality can be estimated at 3 points each because according to the openness ratings, the region ranks 19th out of 82, and has the lowest ratings in terms of instruments of open government of executive bodies of Russia's entities and the use of social networks[9] which indicates the authorities' interaction with citizens of the "informing" type. As for public control, additional research is required to conduct a more accurate assessment of this parameter. In general, the analysis of the public chamber activities shows that public

[6] The share of participants of the first type × 1 + the share of participants of the second type × 2 + the share of participants of the third type × 5 = 0,7×1+0,25×2+0,05×5=1,45.

[7] Electronic region. Available at: http://eregion.ru/opengov

[8] Openness of the state in Russia-2021. Available at: https://ach.gov.ru/upload/pdf/Otkrytost-2021.pdf

[9] Electronic region. Available at: http://eregion.ru/opengov#methodology

control is carried out, but not all issues of concern to citizens fall under it, but only those with the greatest resonance. The Tyumen Regional Public Chamber has not yet considered issues related to digital services and technologies of socio-political participation.

We have assessed the integration of the existing system of socio-political participation with the traditional one at 3 points. The Tyumen Oblast population, unlike the residents of the capital, is limited in the possibilities of electronic participation, there is no access to electronic voting in elections in the region, citizens are less involved in the system of online petitions, crowdfunding, etc. As for political pluralism, 28 regional branches of various political parties out of 32 registered in Russia are represented in the Tyumen Oblast today[10]. However, the political composition of the Tyumen Regional Duma includes 4 parties: United Russia, LDPR, CPRF and Just Russia, the majority is represented by members of the United Russia party. This cannot indicate a high level of political pluralism in the region.

Summing up 4 sub-indices, we have obtained the complex index value of citizen electronic participation in socio–political processes – 59.01 *(IEEP = $Itech_{об}$ + $Iec_{об}$ + $Isoc_{об}$ + $Ipol_{об}$* = 15.2 + 13 + 12.36 + 18.45 = 59.01), which, in accordance with the proposed scale, indicates a high efficiency level in the ICT use for citizen socio-political participation. A fairly high indicator of the $Itech_{об}$ sub-index indicates a high development level of the region's IT-infrastructure and high satisfaction of respondents with it and the design of existing services. The sub-index reflecting the economic aspect of citizen socio-political activity ($Itech_{об}$) is equal to 13 points; therefore, the economic component is not a significant limiting factor for the majority of respondents when using modern ICT for the manifestation of socio-political activity.

The value of the $Isoc_{об}$ sub-index is equal to 12.33 points; it means that in general, reginal residents are satisfied with the existing services to demonstrate their socio-political activity, but the use of services is mainly non-political in nature. Most of the respondents, using services and platforms for socio-political participation, remain at its lowest level of "informing"; only a small part goes to the level of "consultations" and the level of real participation in socio-political processes which also partly explains the low value of the $Ipol_{об}$ sub-index (18.45 points).

Conclusion

The research results allow concluding that the development of modern digital services is important for citizen socio-political participation. The participation of population through the ICT should be effective, make it possible to act not only as a passive consumer of digital services, but also through these technologies to influence policy, to be heard by the authorities. Further improvement of platforms and services for socio-political participation is impossible without developing a methodology for assessing the effectiveness of their use. The availability of the methodology will allow developers and authorities to monitor the level of citizens' involvement in socio-political processes, their satisfaction level with existing services.

V. Lowndes and L. Pratchett wrote that people are ready for socio-political participation when "the infrastructure allows doing it, they have the resources necessary for argumentation, when they feel part of something whole, when they are asked about it, their opinion is asked. Finally, people participate when the participation system allows them to interact and influence socio-political processes, when the system is responsive to them

[10] Election Commission of the Tyumen Oblast. Available at: http://tyumen.izbirkom.ru/regionalnye-otdeleniya-pp-v-ra/informatsiya-o-tyumenskikh-regionalnykh-otdeleniyakh-politicheskikh-partiy/index.php

and their needs" (Lowndes et al., 2011, p. 553). This statement is characteristic of both traditional forms of participation and modern forms involving the ICT use.

Taking into account the most popular studies, conducted in the field of assessing the effectiveness of citizen socio-political participation through ICT, the proposed methodology is aimed at assessing four main components that determine the effectiveness of socio-political participation tools using modern technologies: technological, economic, social and political. Each of these components is of significant importance for assessing the final value of the indicator of the effectiveness of socio-political participation through modern ICT.

The effectiveness of the ICTs used in socio-political participation depends on the political system and democratic foundations, the country's legislation that determines the censorship level on the Internet, on the cultural and historical heritage that determines the citizenship model in the country and the development of formal and informal political institutions, as well as on the level of economic and technological development of the country/region.

The proposed methodology shows that a qualitative assessment of the effectiveness of the ICT use for socio-political participation is impossible without combination of quantitative and qualitative research methods of its various aspects. The assessment of the political aspect seems to be the most difficult which should be comprehensive, include an analysis of the legislative framework in various areas related to transparency and openness of the public administration system, security, the level of censorship and control in networks, as well as expert assessments of the potential of various services and platforms for citizens to demonstrate socio-political activity.

The obtained assessment results for the Tyumen Oblast are not final and require further research. This is largely due to the fact that today there is no single database that could become the basis for clarifying the assessments of existing services and platforms for socio-political participation in various regions. In addition, the primary research results indicate that the data should be supplemented with an expert survey of business representatives engaged in the development of platforms and services; political parties and public organizations; authorities actively implementing various kinds of ICT for social and political participation; citizens as users and participants of socio-political processes.

References

Aichholzer G., Kubicek H., Torres L. (Eds.). (2016). Evaluating e-participation. Frameworks, practice, evidence. *Public Administration and Information Technology*, 19. Available at: https://doi.org/10.1007/978-3-319-25403-6

Anttiroiko A.-V. (2003). Building strong e-democracy. *Communications of the ACM*, 46(9), 121–128. Available at: https://doi.org/10.1145/903893.903926

Anttiroiko A.-V. (2004). Introduction to democratic e-governance. In: *ETransformation in Governance: New Directions in Government and Politics*. Available at: https://doi.org/10.4018/9781591401308.CH002

Arnstein S.R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), 216–224. Available at: https://doi.org/10.1080/01944366908977225

Belyi V.A. (2019). On the prospects for the development of electronic participation of citizens in public administration. In: Gaman O.V., Smorgunov L.V., Timofeeva L.N. (Eds.). *Traektorii politicheskogo razvitiya Rossii: instituty, proekty, aktory: mat-ly Vserossiiskoi nauchnoi konferentsii RAPN, g. Moskva, MPGU, 6–7 dekabrya 2019 g.* [Trajectories of Russia's Political Development: Institutes, Projects, Actors: Materials of the All-Russian Scientific Conference RAPN, Moscow, MPSU, December 6–7, 2019]. Moscow: MPGU (in Russian).

Demushina O.N. (2017). E-participation of citizens: Regional level (the case of the Volgograd region). *Mir ekonomiki i upravleniya=World of Economic and Management*, 17(4), 190–200. DOI: 10.25205/2542-0429-2017-17-4-190-200 (in Russian).

Friess D., Escher T., Gerl K., Baurmann M. (2021). Political online participation and its effects: Theory, measurement, and results. *Policy & Internet*, 13(3), 345–348. Available at: https://doi.org/10.1002/POI3.270

Gaber J. (2019). Building "a ladder of citizen participation": Sherry Arnstein, citizen participation, and model cities. *Journal of the American Planning Association*, 85(3), 188–201. Available at: https://doi.org/10.1080/01944363.2019.1612267

Henderson M., Hogarth F. (2011). Evaluation framework for assessing e-democracy policy. In: *Encyclopedia of Digital Government*. Available at: https://doi.org/10.4018/978-1-59140-789-8.CH120

Hooghe M., Hosch-Dayican B., Van Deth J.W. (2014). Conceptualizing political participation. *Acta Politica*, 49(3), 337–348. Available at: https://doi.org/10.1057/AP.2014.7

Karakaya Polat R., Pratchett L. (2014). Citizenship in the age of the Internet: A comparative analysis of Britain and Turkey. *Citizenship Studies*, 18(1), 63–80. Available at: https://doi.org/10.1080/13621025.2013.780765

Kipenis L., Askounis D. (2016). Assessing e-participation via user's satisfaction measurement: The case of Ourspace platform. *Annals of Operations Research*, 247(2), 599–615. Available at: https://doi.org/10.1007/S10479-015-1911-8

Kubicek H., Aichholzer G. (2016). Closing the evaluation gap. *E-Participation Research and Practice. Public Administration and Information Technology*, 19, 11–45. Available at: https://doi.org/10.1007/978-3-319-25403-6_2

Lindner R., Aichholzer G. (2020). E-democracy: Conceptual foundations and recent trends. In: Hennen L., van Keulen I., Korthagen I. et al. (Eds.). *European E-Democracy in Practice. Studies in Digital Politics and Governance*. Available at: https://doi.org/10.1007/978-3-030-27184-8_2

Lowndes V., Pratchett L., Stoker G. (2006). Local political participation: The impact of rules-in-use. *Public Administration*, 84(3), 539–561. Available at: https://doi.org/10.1111/J.1467-9299.2006.00601.X

Macintosh A., Whyte A. (2006). Evaluating how e-participation changes local democracy. *eGOV06*. Available at: http://www.edemocracy.gov.uk/default.htm

Mukhametov D.R. (2020). Models of citizen engagement platforms for creating a new generation of smart cities in Russia. *Voprosy innovatsionnoi ekonomiki=Russian Journal of Innovation Economics*, 10(3), 1605–1622. DOI: 10.18334/vinec.10.3.110683 (in Russian).

Pratchett L., Wingfield M., Polat R.K. (2011). Local democracy online: An analysis of local government web sites in England and Wales. In: *E-Government Research*: *Policy and Management*. Available at: https://doi.org/10.4018/978-1-59904-947-2.CH267

Theocharis Y., de Moor J., van Deth J.W. (2021). Digitally networked participation and lifestyle politics as new modes of political participation. *Policy & Internet*, 13(1), 30–53. Available at: https://doi.org/10.1002/POI3.231

Theocharis Y., Van Deth J.W. (2018). The continuous expansion of citizen participation: A new taxonomy. *European Political Science Review*, 10(1), 139–163. Available at: https://doi.org/10.1017/S1755773916000230

Van Deth J.W. (2014). A Conceptual Map of Political Participation. *Acta Politica*, 49(3), 349–367. Available at: https://doi.org/10.1057/AP.2014.6/TABLES/1

Vasilenko I.A. (2020). Formation of "digital governance" concept in political science and prospects for its implementing in Russia. *Gosudarstvennoe upravlenie. Elektronnyi vestnik=Public Administration E-Journal*, 82, 218–244. DOI: 10.24411/2070-1381-2020-10099 (in Russian).

Vidiaasova L.A., Tensina I.D. (2020). A study of the trust of St. Petersburg residents in the use of information technology for interaction with authorities. *International Journal of Open Information Technologies*, 8(1), 42–46. DOI: 10.17586/2541-979X-2019-3-93-101 (in Russian).

Vráblíková K., van Deth J.W. (2017). Conducive contexts: The impact of collective and individual social capital on democratic citizenship. *Acta Politica*, 52(1), 23–42. Available at: https://doi.org/10.1057/AP.2015.25/FIGURES/1

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Models of Matrimonial and Reproductive Behavior of Russian Youth

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Abstract. Based on statistical indicators, the Federal State Statistics Service presented the demographic forecast of the Russian Federation until 2035. In all three forecast options (low, medium, high), natural population growth is negative, only its intensity changes. Population growth is presented only in a high forecast and is corrected by a decrease in the rate of natural decline and intensification of migration growth. It is possible to reverse the negative trends and implement the high version of the forecast if favorable conditions are created for the implementation of the marriage and reproductive behavior of young people as the main demographic resource. The aim of the study is the analytical modeling of the marriage and reproductive behavior of young people under the age of 35 based on the data of the author's sociological research. The article is based on the methods of estimating average values according to the distributions of respondents' answers, their ranking to determine the priority of factors. Statistical methods for measuring and analyzing social information are widely used: chi-square statistic for testing hypotheses, contingency tables (cross-tabulation), Pearson and Chuprov's mutual contingency coefficients, as well as the concordance coefficient (multiple rank correlation). The results made it possible to implement analytical modeling of the matrimonial and reproductive behavior of young people under the age of 35, depending on the self-assessment of their standard of living, in particular, to reliably determine the impact of the standard of living of young people on their decision to start married life and have a child, to identify young people's opinions about the significance of motives to postpone the birth of a child for different groups depending on the self-assessment of the standard of living.

Key words: youth, prosperous family, matrimonial behavior, reproductive attitudes, behavior patterns, standard of living, mutual contingency coefficients.

Acknowledgment

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Introduction

The demographic situation in Russia remains tense, the population is declining. Measures introduced by the government to support Russian families (maternity capital, housing allowances, concessionary mortgages for families with children) had a positive effect on the birth rate in Russia until 2016. In recent years there has been an increase in scientific research aimed at analyzing the matrimonial and reproductive behavior of contemporary Russian youth, as well as the values and goals underlying these types of behavior. The identification of social drivers and descriptions of social practices will contribute to the development of managerial decisions aimed at increasing the overall fertility rate and the growth of demographic indicators in general, the development of support measures in accordance with the needs of young people who are married, have children, and are planning or postponing marriage and having children.

It is not possible to significantly correct the marriage and reproductive behavior of young people, especially in the short term, because in this case we can only talk about changing values and forming new attitudes. What is meant is the creation of conditions conducive to the fuller realization of young people's reproductive plans. A number of empirical studies show that the gap between

desired and expected numbers of children persists (Beaujouan, Berghammer, 2019; Arkhangel'skii et al., 2021), hence it is the implementation of plans to have the desired number of children that is the most promising scenario. The tendency in Russian society to postpone childbearing until older ages (Kalachikova, Korolenko, 2018) undoubtedly hinders the matching of the desired number of children with their expected number. Postponing the birth of the first child in young families not only reduces the likelihood of having subsequent children, but may also be an obstacle to the realization of reproductive function in the future, since fertility declines with age in both women and men, with the trend being most pronounced in women (Leridon, 2004; Zemlyanova, Chumarina, 2018). In connection with this, the results of the study based on analytical modeling are of practical importance, helping to assess the impact of factors (marital status and assessment of one's standard of living) on the decision to postpone having a child.

Operationalization of the concept of "prosperous family" allows defining the main metrics necessary to solve the problem: to conduct analytical modeling of matrimonial and reproductive behavior of young people under the age of 35 on the basis of the author's sociological research data.

The rationale for the concept of "prosperity" is presented in the strategic documents regulating the implementation of state family policy in Russia: "Concept of state family policy of the Russian Federation for the period until 2025"[1] and "The concept of state policy for the young family"[2]. The latter approved the model of a prosperous young family – registered marriage, a two-parent family, children, economic independence, a favorable psychological climate, and the performance of basic functions. The model presented is an ideal type of family, and a comparison of the ideal type with real practices allows forming measures of social support, mechanisms that help to solve the basic problems of families, to form prosperity.

Extent of prior research

The methodological basis of the study is the concept of family prosperity, developed under the guidance of Professor T.K. Rostovskaya, doctor of sciences in sociology (Rostovskaya et al., 2021a; Rostovskaya et al., 2021b). The construction of this concept was carried out on the basis of classical and modern theories revealing the factors influencing the realization of the family's basic functions; systematizing the origins and resources of overcoming problems in the family; devoted to certain aspects of marriage and family relations, the search for values underlying matrimonial, marital and reproductive behavior; and with the help of empirical data collected by Russian and foreign scientists as a result of the evaluation of prosperity indicators. The concept of the prosperous family is developed on the basis of the analysis of empirical information collected by the author's team and is enriched by new data obtained as a result of theoretical discussion of the processes under study by modern sociologists, economists, and demographers. We take into account contemporary trends classified by A.G. Vishnevskii according to the first, second and third "demographic transitions": reduction of mortality, including infant mortality, transition to controlled births, secularization, breakdown of sexual, marital and reproductive behavior, etc. (Vishnevskii, 2014).

In general, modern strategies of matrimonial and reproductive behavior are promising to consider as the results of increased rationalization of actors' behavior. A.I. Antonov, V.M. Karpova, and S.V. Lyalikova, studying family needs (desired and actual income), draw conclusions based on interviewing both spouses and comparing the data obtained. The introduction of the "desired" income indicator

[1] "On approval of the concept of state family policy in the Russian Federation for the period through to 2025": Government Decree 1618-r, dated August 25, 2014. Available at: http://www.garant.ru/products/ipo/prime/doc/70627660/

[2] The concept of state policy for the young family. Available at: https://docs.cntd.ru/document/902060617

shows the levels of spouses' claims affecting the number of children in the family, not only examining the ratio of "desired" to "real" income for both spouses, but also comparing income to the well-being of others (the social norm). The study partially reveals such an indicator of well-being as "economic self-sufficiency". Negative trends are revealed: the share of large families with per capita income below the subsistence level is 2.5 times higher than that of single-child families (Antonov et al., 2021). Thus, the material well-being of families decreases with the birth of each subsequent child if the parents' career or financial strategies are not effective. In this regard, young people are oriented toward finding a balance between the number of children and material well-being, which leads to postponement of parenthood, refusal to have children. Having many children is realized if the parents' values place children higher than material goods (parents' low aspirations); if the parents' values place children high and there are the necessary material opportunities. Both strategies of forming a large family are not typical in contemporary Russian society.

O.N. Kalachikova, M.A. Gruzdeva study the trends of changes in matrimonial behavior in the Russian Federation; on the basis of statistical data for 1994–2017 they record an increase in the age of the first marriage, an increase in the proportion of unregistered marriages. In sample surveys of the population's reproductive plans conducted by Rosstat (2012 and 2017), they found that about a third of those who are not officially married do not consider it necessary to register their marital relationship when they have a child either (Kalachikova, Gruzdeva, 2018). State family and demographic policy is aimed at encouraging legal unions, since participation in housing programs for those living without marriage registration is impossible, except for single-parent families with sufficient income to approve mortgage loans. However, as A.V. Artamonova and E.S. Mitrofanova point out, state and church pressure has less and less influence due to changes in social norms, the legitimization of unregistered relationships, and the fact that the state and the church are not the only ones that have a significant influence on the situation (Artamonova, Mitrofanova, 2018).

A.V. Artamonova and E.S. Mitrofanova model the first marital unions and possible scenarios: no union; cohabitation as the first union; marriage as the first union. They found statistical correlations of increased odds of cohabitation and odds of marriage: place of residence (urban and rural areas), level of education (general or vocational and secondary), age, non-pregnancy. Living with parents, the well-being of the parental family, and postponing work careers reduce the chances of cohabiting relationships (Artamonova, Mitrofanova, 2018).

Family well-being not only affects the willingness to marry, but also contributes to the optimal performance of basic functions (reproduction, socialization, economic renewal, etc.). Responsible fatherhood contributes to a favorable psychological climate. O.N. Bezrukova explores the practices of responsible fatherhood (Bezrukova, 2012): emotional closeness with children, involvement in care, communication, care for the physical and personal development of the child. In Russia, the formation of responsible fatherhood moves slowly, while foreign studies show the effectiveness of supporting responsible fatherhood as part of family and demographic policy (Rehel, 2014; Duvander et al., 2020). Increased parental responsibility also leads to the rationalization of youth behavior, hence the postponement of marriage, the uncertainty that parents will handle raising a child, especially multiple children (Lebano, Jamieson, 2020).

Methodological rationale

In order to form patterns of matrimonial and reproductive behavior of Russian youth, we can identify a set of determinants that lead to changes

in matrimonial and reproductive behavior: increased education, increased employment of women, changes in the value matrix, etc. (Bagirova, Ilyshev, 2009; Wood, Neels, 2019; Isupova, 2020). In this study, we will focus on the following factors: financial status, age, and marital status, which influence behavioral patterns and are indicators of a prosperous family.

The models of matrimonial and reproductive behavior of contemporary Russian youth in the study are based on the data taken into account as a result of the All-Russian sociological survey "Demographic well-being of Russian regions"[3]. conducted on the territory of 10 regions of the Russian Federation (the city of Moscow, the Moscow Oblast, the Republic of Bashkortostan, the Republic of Tatarstan, Stavropol Krai, the Vologda, the Volgograd, the Ivanovo, the Nizhny Novgorod and the Sverdlovsk oblasts).

In accordance with the objectives of the study, unmarried persons aged 18–35 (borders are included) were selected from the total population of respondents. There were 1,541 such persons.

Formation of analytical models of matrimonial and reproductive behavior was carried out on the basis of identifying the dependence on standard of living factors and a number of other motives for starting a marital life (family values, personal factors): cross-tabulation, hypothesis testing using χ^2 criterion, evaluation of the closeness of relationship by Pearson and Chuprov's cross-correlation coefficients, multiple rank correlation coefficient – concordance coefficient as well as by constructed regression models.

The preliminary stage of the analysis determined the importance and influence on the likelihood of marriage of young people – respondents aged up to 35 years – the following five factors: the priority for the creation of a family is the desire to have a like-minded, kindred, loved one, not to feel lonely (first place); the second place is occupied by the desire to have a permanent sexual partner; the third and fourth places are shared by the desire to become a really mature, independent person and the desire to receive material benefits from more rational household management; and the fifth place is occupied by the desire to have a child in the near future *(Tab. 1)*.

The demographic values of creating a family, based on the birth of children in the family, as follows from Table 1, are not given due attention in the youth environment today, the priority are social and psychological factors (primarily in the context of the significant importance of the desire to have a like-minded, kindred, loved one, not to feel lonely).

Table 1. Significance of factors influencing the intention to start a future married life, the average score according to the answers of respondents who are not married and intend to get married under the age of 35

Motive for marriage	Average score (on a 5-point scale)	Rank
Desire to become a mature, independent person	3.4	3.5
Desire to have a child in the near future	2.7	5
Desire to have a permanent sexual partner	3.5	2
Desire to have the material advantages of a more rational household	3.4	3.5
Desire to have a like-minded, kindred, loved one by your side, not to feel lonely	4.7	1
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".		

[3] All-Russian sociological survey "Demographic well-being of Russia", conducted in late 2019 – early 2020 in the Central, Northwestern, Volga, Urals, North Caucasian, and Southern Federal Districts. N = 5616, representatives of different population groups aged 18 to 50 years. The supervisor is Professor T.K. Rostovskaya, Doctor of Sciences (Sociology).

This defines the importance of a more detailed/deep analysis of the determinants of matrimonial and reproductive behavior of young people (Brown et al., 2015). It is of interest to model the dependencies of the factors influencing the intention to marry and have a child in families, taking into account different assessments of their standard of living by respondents.

Results of the study in the context of analytical modeling of matrimonial and reproductive behavior of young people under the age of 35

The contingency characteristics of the responses of young people under the age of 35 in assessing the dependence of the respondent's current family standard of living and the respondent's intentions to marry *(Tab. 2)* are summarized as follows: intend to get married 54.38% of the respondents, and 3/5 of them characterize their standard of living as quite good (from 8 to 10 points on a 10-point scale); 25.63% of all respondents are not going to get married, 19.99% hesitate to answer. Among those who indicated that they did not intend to marry, as well as among those who were undecided about marriage, one in two gave a score of 5 to 7 to their family's standard of living at the present time.

Testing the hypothesis about the correlation between the respondent's intentions to marry and their family' current standard of living showed a connection: chi-square statistic χ^2 equals 143.439 (at 5% significance level $\chi^2_{\text{табл.}} = 28.869$). Consequently, the respondent's family standard of living is a determinant of marriage.

Data of *Table 3*, which characterizes the correlation of answers of young people under 35, who defined their life standard as quite good (from 8 to 10 points on a 10-point scale), according to the evaluation of dependence of marriage intentions and intention to have a child, show: among 63.94% of those who answered that they intended to get married, not all were interested in having a child in the nearest future, the postponement of childbirth is observed. At the same time, two respondents out of those who are going to get married are already expecting a child.

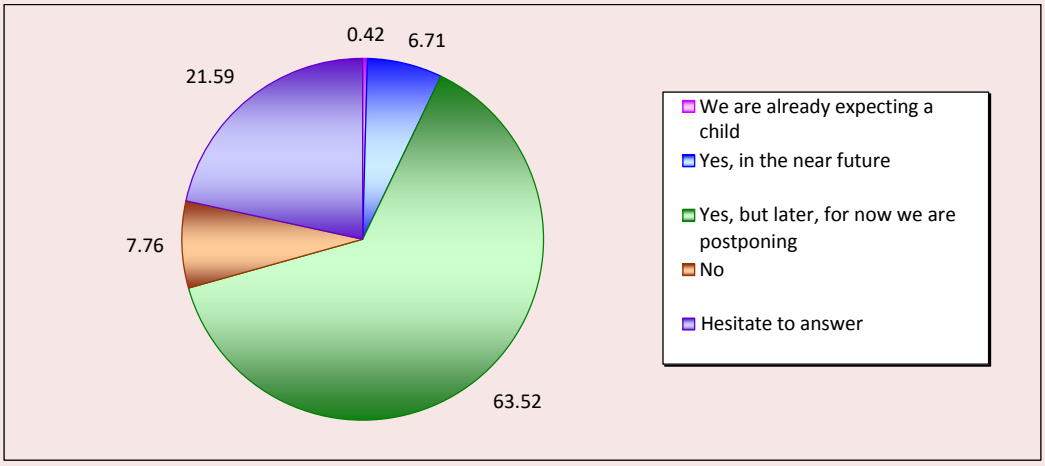
Table 2. Answers correlation of unmarried respondents under 35 years of age in their assessment of the dependence of their intention to start a future married life on their family's standard of living at present, %

Are you going to get married?	Your family's current standard of living in points *(on a 10-point scale, where 10 points is very good; 1 point is very bad)*										Total
	10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
Yes	6.99	10.77	14.95	9.05	4.94	5.07	1.71	0.48	0.00	0.41	54.38
No	2.40	4.32	4.04	4.66	5.62	2.81	0.41	0.96	0.27	0.14	25.63
Hesitate to respond	1.16	2.72	3.74	4.15	1.84	3.74	1.84	0.61	0.14	0.07	19.99
Total	10.55	17.80	22.73	17.86	12.39	11.62	3.96	2.05	0.41	0.62	100.00
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".											

Table 3. Answers correlation of respondents under the age of 35, who are not married and indicated their standard of living as quite good (8–10 points), in assessing the dependence of their intention to start a future married life and the birth of a child in their family, %

Are you going to get married?	Are you going to have a child?					Total
	We are already expecting a child	Yes, in the near future	Yes, but a little later, for now we are postponing	No	Hesitate to respond	
Yes	0.27	4.29	40.62	4.96	13.81	63.94
No	0.00	0.40	2.68	13.14	4.83	21.05
Hesitate to respond	0.00	0.27	5.76	2.68	6.30	15.01
Total	0.27	4.96	49.06	20.78	24.93	100.00
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".						

Figure 1. Structure of young people's answers to the question "Are you going to have a child?" among those who estimated their standard of living at 8–10 points and expressed their desire to start a married life, %



Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".

Among the respondents who characterized their standard of living as quite good (8–10 points) and indicated their intention to get married, 63.52% are going to have a child somewhat later (delaying for now) and only 6.71% expressed their desire to have a child in the near future *(Fig. 1)*.

Analyzing the correlation between the opinions of respondents under the age of 35, who described their standard of living as quite good (8–10 points) according to their intention to marry and desire to have a child, we note the connection between the factors in question: the chi-square statistic χ^2 is 260.268 (at 5% significance level $\chi^2_{\text{табл.}} = 15.507$). The connection between the intention to create a family and the desire to have children was confirmed by contingency criteria: Pearson mutual contingency coefficient is 0.519; Chuprov's mutual contingency coefficient is 0.351 (a moderate relationship between the analyzed attributes).

Thus, young people who rate their standard of living at 8–10 points out of a possible 10 have a pronounced desire both to get married and to have a child (albeit in the future, postponing the birth for a certain period of time).

The data of *Table 4*, showing the correlation of answers of respondents aged under 35, who indicated their standard of living as average and above average (5 to 7 points on a 10-point scale),

Table 4. Correlation of answers of respondents aged under 35, unmarried, who assessed their standard of living by 5–7 points, according to the dependence of their intention to start a future married life and the birth of a child in their family, %

Are you going to get married?	Are you going to have a child?					Total
	We are already expecting a child	Yes, in the near future	Yes, but a little later, for now we are postponing	No	Hesitate to respond	
Yes	0.82	3.59	23.37	3.92	13.73	45.42
No	0.98	1.14	3.92	16.18	8.99	31.21
Hesitate to respond	0.00	0.49	7.19	3.92	11.76	23.37
Total	1.80	5.23	34.48	24.02	34.48	100.00
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".						

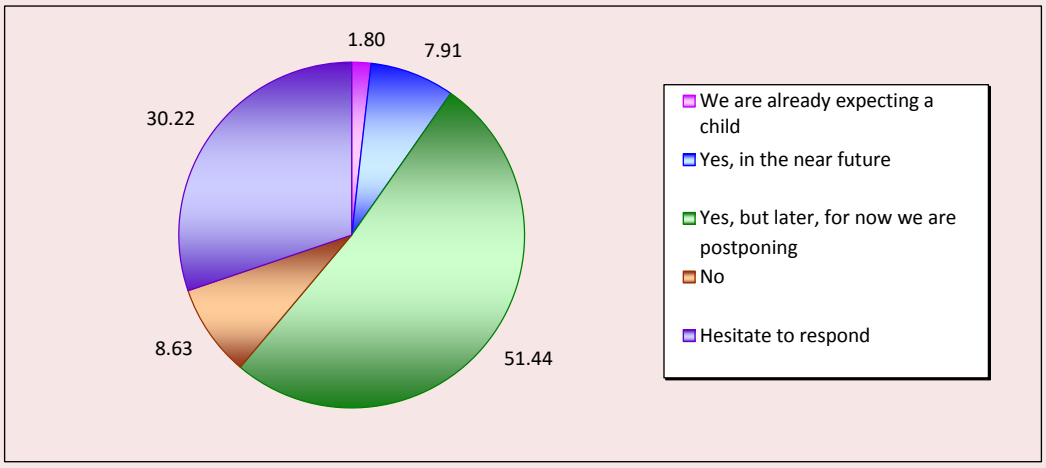
according to the evaluation of the connection between the intention to get married and having a child, show: among 45.42% of those who answered that they intended to get married, not all were interested in having a child in the near future, and the postponement of childbirth is observed. At the same time there is a large proportion of those who are going to get married and are already expecting a child (0.82%, or 5 respondents). Among young people who rate their standard of living at 5–7 out of a possible 10 points, there is an equality between those who are postponing having a child (34.48%) and those who hesitate to answer the question about the possibility of having a child (34.48%). And 24.02% of them do not plan to have a child.

Among those respondents who characterize their standard of living as 5–7 (on a 10-point scale) and indicated an intention to marry, 51.44% are going to have a child somewhat later (postpone it for now), which is 12.08 percentage points lower than among respondents who rate their standard of living more highly. However, the redistribution of percentages did increase the proportion who would like to get married and have a child in the near future among the respondents with a life standard of 5–7 points (on a 10-point scale), but not by much (by 1.21 p.p.). The proportion of those who intend to marry, but hesitate to answer the question about having a child, increased substantially *(Fig. 2)*.

Taking into consideration the correlation between the opinions of respondents under the age of 35, who assessed their standard of living as average and above average (5–7 points), regarding the intention to marry and desire to have a child, we note the connection between the factors in question: the chi-square statistic χ^2 is 167.995 (at 5% significance level $\chi^2_{\text{табл.}} = 15.507$). The relationship between intention to create a family and desire to have a child according to the Pearson (0.462) and Chuprov's (0.298) mutual correlation coefficients is defined as weak and is not a statistically confirmed relationship at a significance level of 0.05.

Consequently, young people who rate their standard of living at 5–7 out of a possible 10 points are characterized by uncertainty in making decisions both about starting a family life and about the possibility of having a child in the future.

Figure 2. Structure of young people's answers to the question "Are you going to have a child?" among those who assessed their standard of living in 5–7 points and expressed their desire to start a married life, %



Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".

Table 5. Answers correlation of respondents aged under 35, unmarried, who assessed their standard of living as 1–4 points, according to the dependence of their intention to start a future married life and the birth of a child in their family, %

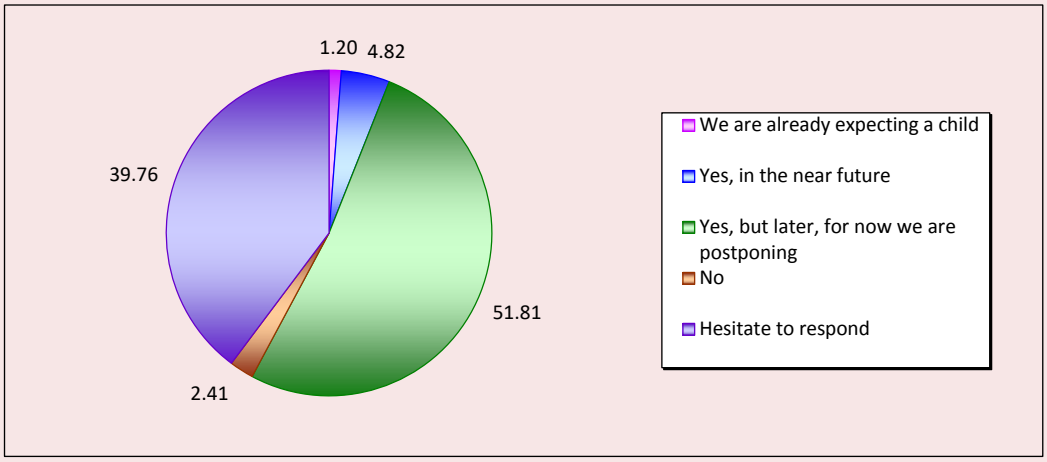
Are you going to get married?	Are you going to have a child?					Total
	We are already expecting a child	Yes, in the near future	Yes, but a little later, for now we are postponing	No	Hesitate to respond	
Yes	0.55	2.19	23.50	1.09	18.03	45.36
No	0.00	0.55	1.09	10.93	13.11	25.68
Hesitate to respond	0.00	0.55	3.83	4.92	19.67	28.96
Total	0.55	3.28	28.42	16.94	50.82	100.00
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".						

The data in *Table 5*, showing the correlation between the answers of respondents aged under 35 who assessed their standard of living as below average (from 1 to 4 points on a 10-point scale), in assessing the relationship between intention to marry and having a child, show that 45.36% of them intend to get married. At the same time, among these respondents there is a larger proportion of those who find it difficult to answer the question about the possibility of having a child (50.82%).

It is an interesting fact that among respondents who estimated their standard of living at 1–4 points (on a 10-point scale) and indicated that they intend to get married, the proportion of those who intend to have a child in the future but are still postponing is 51.81% *(Fig. 3)*, which almost coincides with the opinions of young people who estimate their standard of living at 5–7 points. Consequently, the deterrent to the decision to have a child in each of these two groups of respondents is their material well-being.

Taking into consideration the dependence of the opinions of respondents aged under 35, who indicated their standard of living as below average (1–4 points), on the intention to marry and desire to have a child, we note the existence

Figure 3. Structure of young people's answers to the question "Are you going to have a child?" among those who assessed their standard of living in 1–4 points and expressed their desire to start a married life, %



Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".

of a connection between the factors in question: the chi-square statistic χ^2 is 65.857 (at the 5% significance level $\chi^2_{\text{tabl.}} = 15.507$). The relationship between the intention to create a family and the desire to have a child according to the Pearson (0.515) and Chuprov's (0.357) mutual correlation coefficients is defined as moderate.

Thus, among young people who rate their standard of living at 1–4 out of a possible 10 points, there is uncertainty in the decision to start a family life. It is difficult for them to decide on the possibility of having a child in the future (and this uncertainty is more pronounced than for young people who estimate their standard of living at 5–7 points).

Analytical modeling of the relationship between the standard of living and matrimonial and reproductive behavior of young people under the age of 35 showed that with a decrease in the assessment of their standard of living, confidence in making the decision to start a married life and have a child decreases, the latter to a greater extent.

In accordance with the analytical modeling we built regression models of reproductive behavior for different groups of young people, depending on their assessment of the standard of living in the family at present, which allow us to confirm the findings *(Tab. 6)*.

The results of the simulation are presented in *Table 7*.

The modeling results suggest that it is possible to build an adequate model of reproductive behavior for young people who rate their family's standard of living at 5–7 and 8–10 points.

Table 6. Description of variables in the models

Variable	Question	Description	Statistics
y (resultant)	Are you going to have a child?	The variable takes values: 1 – we are already expecting a baby; 2 – yes, in the near future; 3 – yes, but later, for now we are postponing; 4 – no; 5 – hesitate to respond	Average values for groups of young people depending on their own assessment of their living standards: 0–4 points: $\overline{y_1} = 3.747$ 5–7 points: $\overline{y_2} = 3.575$ 8–10 points: $\overline{y_3} = 3.434$
x_1	What is your family's current standard of living?	The variable takes values in points (on a 10-point scale, where: 10 points – very good; 1 point – very bad)	Average values for groups of young people depending on their own assessment of their living standards: 0–4 points: $\overline{x_1} = 1.530$ 5–7 points: $\overline{x_2} = 6.209$ 8–10 points: $\overline{x_3} = 8.757$
x_2	Are you going to get married?	The variable takes values: 1 – yes 2 – no 3 – hesitate to respond	The statistics are based only on cases for which $x_2 = 1$
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".			

Table 7. Summary data on regression models

Your family's current standard of living	Constant	β	F (equation significance)	t (parameter significance β)	Regression model
0–4 points	3.807	-0.04	0.366 (insignificant)	-0.604 (insignificant)	-
5–7 points	4.516	-0.152	4.023 (significant)	-2.006 (significant)	$\hat{y} = 4.516 - 0.152x_1$
8–10 points	2.223	0.138	6.73 (significant)	2.594 (significant)	$\hat{y} = 2.223 - 0.138x_1$
Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".					

For young people who rated their standard of living as average or above average (5–7 points), the uncertainty about the possibility of having a child at marriage decreases as the standard of living increases. However, for respondents with a higher standard of living (8–10 points), with its increase there is a shift from the intention to have a child in the near future to "postponement", which in turn may indicate the difficulties of combining reproductive and labor functions.

In general, the analysis reveals the propensity of young people to postpone childbearing at marriage, which determines the importance of assessing the causes of such reproductive behavior.

An analysis of the factors influencing the decision to postpone childbirth revealed that, for the most part, the opinions of respondents under the age of 35 were similar and did not depend on self-assessment of living standards, but there was considerable disagreement on some of the most significant ones.

We note that young people, regardless of their assessment of their standard of living, currently put the need to find a better-paying job at the top of the list of reasons for postponing having a child. The factor is a priority determinant, but differs in the strength of influence on the decision to postpone having a child - the average score out of 5 possible increases with decreasing living standards *(Fig. 4)*:

- young people, who rate their standard of living at 8–10, rate the importance of the need to find a better-paying job at an average of 3.89 points;
- young people, who rate their standard of living at 5–7 points, rate the importance of the need to find a better-paying job at an average of 4.07 points;
- young people who rate their standard of living at 1–4 points rate the importance of the need to find a better-paying job at an average of 4.33 points.

Consequently, even those young people who rate their standard of living as good enough (8–10 points) still seek more income. At the same time, such reasons for postponing having a child, as lack of financial opportunities and own housing, are not leading in importance for this category of young people – the average score on the factors is 3.41 (5th place) and 3.30 (6th place), respectively. Among the factors influencing the decision to postpone having a child, the greatest importance is given to having completed education (2nd place, mean score 3.64) and being married (3rd place, mean score 3.45).

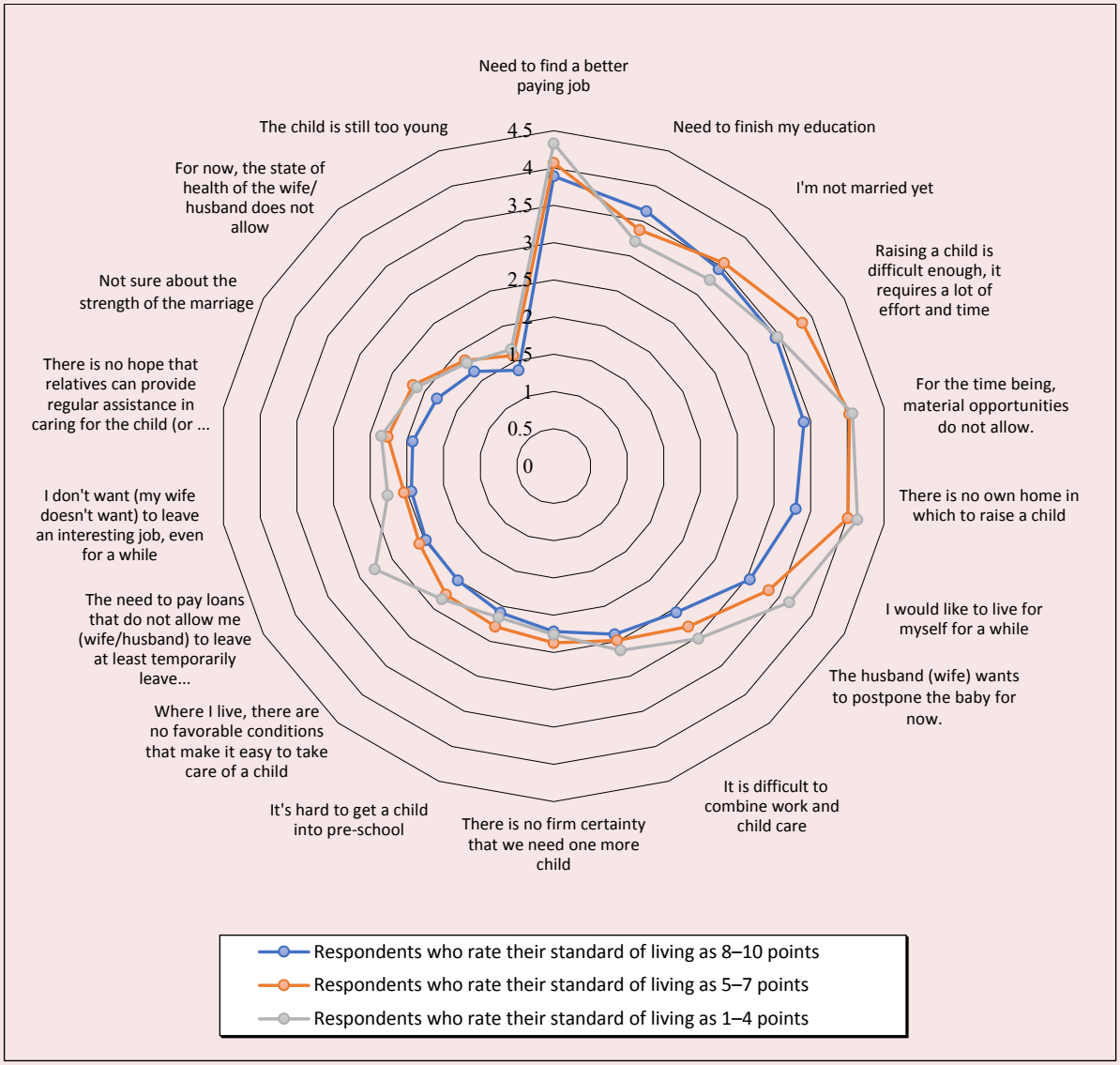
At the same time, for young people who rate their standard of living at 5–7 points and 1–4 points the second and third most important reasons are related to material well-being: the birth of a child is postponed, as they do not have enough money or own housing in which to raise a child. The average factor score is more than 4 out of a possible 5.

The need to complete education ranks 6th and 7th, but the importance of this factor decreases as the standard of living decreases: the average score is 3.37 – 6th place (a standard of living score of 5–7 points); the average score is 3.21 – 7th place (a standard of living score of 1–4 points).

It is worth noting that young people who rate their standard of living as quite good (8–10 points) and average or above average (5–7 points) are equally aware of social responsibility for a child, the factor "raising a child is quite difficult, requires a lot of effort and time" is in fourth place in their importance; while young people with a standard of living score of 1–4 are less socially responsible and rank the factor "I would like to live at least some time for myself" in fourth place, pushing the consciousness of the difficulty of raising a child to fifth place.

For young people with an assessment of their standard of living of 8–10 and 5–7 points, the importance of the factor "desire to live for yourself at least some time" ranks seventh.

Figure 4. Opinions of young people on the importance of motives for postponing childbearing for different groups, depending on their assessment of living standards, mean score



Source: compiled according to the data of All-Russian sociological survey "Demographic well-being of the Russian regions".

Starting from the 8th place there is a full correspondence in the distribution of the importance of the reasons contributing to the decision to postpone having a child (in descending order of importance): husband (wife) wants to wait with having a child; it is difficult to combine work and child care (the main housework is on me) / wife finds it difficult to combine work and child care (the main housework is on her), etc. (see fig. 4).

Overall, despite the differences among respondents under the age of 35 in their assessment of their standard of living, their opinions on the reasons for postponing childbirth are fairly consistent. Calculation of the multiple rank correlation showed a fairly close relationship: the coefficient of concordance (W) is 0.973 and is confirmed at the significance level of 0.05.

Conclusion

Currently, a young family is recognized as a married couple consisting of persons, each under the age of 36 years, that is, the upper limit is defined by the age of 35 years inclusive. This young age limit is set in accordance with the federal law "On youth policy in the Russian Federation", dated 2020, which expanded the category from 30 to 35 years old inclusive[4]. In this regard, the study was based on data characterizing the matrimonial and reproductive behavior of young people – respondents aged 18 to 35 years inclusive. It is this category that includes the reproductive ages where the greatest age-specific fertility is observed, which speaks to the practical relevance of the analysis performed.

Summarizing the results of the research methodology, we can formulate the following main conclusions. First, young people have a clear preference for having a child in marriage, which requires an understanding of the significance of matrimonial factors. At the same time, young people's likelihood of getting married depends on their assessment of the standard of living. Among young people who estimate their standard of living at 8–10 points out of 10 possible, the highest propensity to decide to get married was revealed. Young people who rate their standard of living at 5–7 and 1–4 are significantly less likely to make the decision to marry compared to the previous group. The second, analytical modeling of the relationship between living standards and the matrimonial and reproductive behavior of young people showed that with a decrease in the assessment of living standards, confidence in the decision to marry decreases only to a certain level, while confidence in the decision to have a child acquires a pronounced uncertainty. This indicates a significantly greater influence of the standard of living of young people on fertility than on marriage rates. The third, but most important conclusion of the analysis is that postponing the birth of a child when deciding to marry is becoming the scourge of Russia's demographic development. Young people, even those with the highest standard of living score of 8–10, when deciding to get married, prefer not to have a child soon, but to postpone the birth until later. In this regard, the results of regression modeling are undoubtedly significant in both scientific and practical aspects, as they allowed identifying the features of changes in reproductive attitudes for different social groups of young people. Thus, for the category of young people with a quite high self-assessment of living standards (8–10 points), we identified an increase in the likelihood of deciding to postpone having a child when living standards improve. It can be assumed that a high income is associated with a heavy workload and awareness of the lack of time and energy to raise a child (the reason is in the top five in importance among all the motives for postponing the birth of a child). Such hypotheses require further sociological research that also takes into account, for example, questions to characterize respondents by occupation and position.

The reproductive attitudes of young people, characterized by postponing childbearing after marriage, are a threat not only to the growth of

[4] "On youth policy in the Russian Federation": Federal Law 489-FZ, dated December 30, 2020. Available at: https://www.garant.ru/products/ipo/prime/doc/400056192/

fertility, but also to the current level of natural reproduction (the extreme assumption is the possible transition to a single-child family model and the spread / growth of the proportion of childless families), which is linked to the ability of the couple to conceive, decreasing fertility with age (Syrkasheva et al., 2016).

At present it is important for the state to pay due attention to young families and the problems of their functioning. It is necessary to change the priority demographic attitude of young people: the trend of postponing the birth of a child "for later" (confirmed in dynamics by Rosstat data on the increase in the average age of mothers when giving birth[5]), which has been established in recent decades, needs to be reversed.

The solution to this question is based on an understanding of the reasons why young people decide to postpone having a child. The priority determinant is the rationalization of young people's behavior and their orientation toward the formation of a prosperous family – a family based on registered marriage, with children and characterized by economic independence. However, the desire to achieve economic independence in the form of a high-paying job, regardless of one's estimate of living standards, is the main motive influencing the decision to postpone having a child.

In general, the opinions of young people with different assessments of their standard of living about the reasons for postponing childbirth are fairly consistent, as evidenced by the obtained value of the concordance coefficient, equal to 0.973. We should note that the assessment of the multiple rank correlation has elements of scientific novelty in relation to the problem of research.

One should take into account the importance of the various reasons for postponing childbearing, taking into account that some of the most important ones differ significantly among young people with different assessments of their standard of living. For example, young people with the highest assessment of living standards (8–10 points) among the priority factors influencing the decision to postpone having a child, recorded the need to complete education, while the importance of this factor is less pronounced among young people with an assessment of living standards of 5–7 points and 1–4 points. This conclusion also determines the practical relevance of the study. The demographic policy mechanisms being developed to stimulate the birth rate must be based both on a set of general measures and on a targeted approach, based on the development and implementation of narrowly targeted, selective measures to support young families, from material additional payments to expanding the potential for self-organization and self-actualization of family members, including opportunities to balance the triad: family, education and employment.

It is reasonable to consider all the results of the study when developing managerial decisions aimed at achieving strategic national goals in the field of demographic development, including fertility growth, as well as the development of the institution of a well-to-do young family.

[5] Demographic Yearbook of Russia. 2021: Statistics Collection. Rosstat. Available at: https://rosstat.gov.ru/storage/mediabank/dem21.pdf

References

Antonov A.I., Karpova V.M., Lyalikova S.V. (2021). The gap between desired and actual level of families well-being according to the results of sociological and demographic married couples survey. *Uroven' zhizni naseleniya regionov Rossii= Living Standards of the Population in the Regions of Russia,* 17(1), 121–131. DOI: 10.19181/lsprr.2021.17.1.9 (in Russian).

Artamonova A.V., Mitrofanova E.S. (2018). Matrimonial behavior of Russians in a European context. *Demograficheskoe obozrenie=Demographic Review,* 5(1), 106–137. DOI: 10.17323/demreview.v5i1.7711 (in Russian).

Arkhangel'skii V.N., Vasil'eva E.N., Vasil'eva A.E. (2021). Reproductive intentions of modern Russian youth and assessment of the possibilities of their realization. *Logos et Praxis,* 20(3), 93–111. DOI: 10.15688/lp.jvolsu.2021.3.10 (in Russian).

Bagirova A.P., Ilyshev A.M. (2009). Drivers of reproductive behavior of the population (analysis of inter-country and inter-regional differences). *Sotsiologicheskie issledovaniya=Sociological Studies,* 2(298), 37–45 (in Russian).

Bezrukova O.N. (2012). Practices of responsible fatherhood: "Father-school" and social capital. *Vestnik Sankt-Peterburgskogo universiteta=Vestnik of Saint-Petersburg State University,* 3, 266–275 (in Russian).

Vishnevskii A.G. (2014). The demographic revolution is changing the reproductive strategy of Homo sapiens. *Demograficheskoe obozrenie=Demographic Review,* 1(1), 6–33 (in Russian).

Zemlyanova E.V., Chumarina V.Zh. (2018). Births' postponement by women in Russia within modern socio-economic context. *Sotsial'nye aspekty zdorov'ya naseleniya=Social Aspects of Population Health,* 64(6). DOI: 10.21045/2071-5021-2018-64-6-9 (in Russian).

Isupova O.G. (2020). Population and family policy in different countries: conceptual approaches and practices. *Demograficheskoe obozrenie=Demographic Review,* 7(3), 51–83. DOI: 10.17323/demreview.v7i3.11636 (in Russian).

Kalachikova O.N., Gruzdeva M.A. (2018). Changes in reproductive behavior and marriage patterns of the Russian population (based on analysis of Rosstat sample studies). *Sotsial'noe prostranstvo=Social Area,* 2(14). DOI: 10.15838/sa.2018.2.14.1 (in Russian).

Kalachikova O.N., Korolenko A.V. (2018). Patterns of reproductive behavior of population (on the materials of Vologda oblast). *Narodonaselenie=Population,* 21(4), 109–121. DOI: 10.26653/1561-7785-2018-21-4-10 (in Russian).

Rostovskaya T.K., Zolotareva O.A., Knyaz'kova E.A. (2021). The image of a prosperous family through the eyes of residents of Russian regions: Sociological analysis. *Sotsial'noe prostranstvo=Social Area,* 7(4). DOI: 10.15838/sa.2021.4.31.2 (in Russian).

Rostovskaya T.K., Kuchmaeva O.V., Zolotareva O.A. (2021). Assessment of the social well-being of families in Russian regions: A sociological analysis. *Vestnik Rossiiskogo universiteta druzhby narodov. Seriya: Sotsiologiya=RUDN Journal of Sociology,* 21(4), 805–824. DOI: 10.22363/2313-2272-2021-21-4-805-824 (in Russian).

Syrkasheva A.G., Il'ina E.O., Dolgushina N.V. (2016). Infertility in women of advanced age: Etiology, management, application of preimplantation genetic screening. *Ginekologiya=Gynecology,* 18(3), 40–43. (in Russian).

Beaujouan E., Berghammer C. (2019). The gap between lifetime fertility intentions and completed fertility in Europe and the United States: A cohort approach. *Population Research and Policy Review,* 38, 507–535. Available at: https://doi.org/10.1007/s11113-019-09516-3

Brown S.L., Manning W.D., Stykes J.B. (2015). Family structure and child well-being: Integrating family complexity. *Journal of Marriage and Family,* 77(1). DOI: 10.1111/jomf.12145

Duvander A.-Z., Lappegard T., Johansson M. (2020). Impact of a reform towards shared parental leave on continued fertility in Norway and Sweden. *Population Research and Policy Review*, 39, 1205–1229. Available at: https://doi.org/10.1007/s11113-020-09574-y

Lebano A., Jamieson L. (2020). Childbearing in Italy and Spain: Postponement narratives. *Population and Development Review,* 46(1), 121–144. Available at: https://doi.org/10.1111/padr.12313

Leridon H. (2004). Can assisted reproduction technology compensate for the natural decline in fertility with age? A model assessment. *Human Reproduction,* 19(7). DOI: https://doi.org/10.1093/humrep/deh304

Rehel E.M. (2014). When dad stays home too: Paternity leave, gender, and parenting. *Gender & Society,* 28(1), 110–132. Available at: https://doi.org/10.1177/0891243213503900

Wood J., Neels K. (2019). Does mothers' parental leave uptake stimulate continued employment and family formation? Evidence for Belgium. *Social Sciences,* 8, 292. Available at: https://doi.org/10.3390/socsci8100292

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Telemedicine in Modern Conditions: The Attitude of Society and the Vector of Development

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Abstract. The intensive development of information technology and the external challenges, primarily the coronavirus pandemic, have caused a revision of attitudes toward telemedicine. The article is devoted to the study of problems concerning the development of Russian telemedicine, analysis of existing trends and the possibilities of its application, taking into account the development of communication technology and the legal field. Research on this issue is connected, on the one hand, with analyzing modern capabilities of telemedicine technologies and the need for their application in connection with the complex epidemiological situation in a number of Russia's regions, on the other hand, with the assessment of the level of trust in telemedicine on the part of end users: who, how, when and where can use telemedicine services. The object of our research is telemedicine technology, the subject is the dynamics of perception of new forms of medical services by Russian society. We use a classical approach to studying the problems under consideration: at the first stage, we conduct a comprehensive desk study and analyze secondary information; at the second stage, we collect primary data: on the basis of the developed tools, we conduct an exploratory study of the attitude of Russian society toward telemedicine. The uniqueness and novelty of our findings are due to the comparison of the data concerning the attitude of Russians toward telemedicine, obtained before the outbreak of the pandemic, with the data obtained at the stage of a significant reduction in the incidence of COVID-19 in regions that have become "pilot" ones in the use of telemedicine technologies in primary care in the midst of the epidemic. During data collection and analysis, we applied statistical, mathematical and sociological methods, including content analysis to study legal issues of the possibility of using telemedicine technologies. The study has revealed the main reasons for Russians' distrust of telemedicine, as well as possible ways and areas of its application in the future to provide medical care to the population. The results obtained can be used to study the application of telemedicine in Russia in the system of training and retraining of medical personnel, as well as by health care organizers, lawyers and other specialists who deal with the application of telemedicine technologies, including at the level of legislative and executive authorities.

Key words: quality of life, healthcare organization, telemedicine, telemedicine technologies, attitude toward telemedicine, COVID-19 pandemic, medical care, legal foundations of telemedicine.

Introduction

Nowadays, telemedicine technology is an integral part of healthcare delivery to the population around the world[1], enabling people to have equal access to medicine. The active use of information technology (IT) in the work of medical institutions in providing medical services to the population in primary care has practically become a standard in most countries of the world. The use of such technologies is actively developing in Russia as well. Online medical appointment booking, virtual queue management system, and other IT advances are already being used in Russian polyclinics. The main goal of this direction is to improve the quality of patient care and increase the efficiency of medical personnel, as well as to reduce the cost of medical services.

The demand for telecommunication technology has increased significantly during the COVID-19 pandemic because of the possibility to provide remote patient care and consultation. At the present stage, telemedicine allows many other things: advanced diagnosis and treatment of a whole range of diseases, remote biomonitoring, which is in demand not only among the older generation,

[1] Telemedicine: opportunities and developments in Member States: Report on the second global survey on eHealth. *World Health Organization*. Available at: https://apps.who.int/iris/handle/10665/112505 (accessed: March 10, 2022).

which usually has several chronic diseases, but also among young people, who are increasingly using electronic gadgets to monitor health and diagnose the main indicators of vital functions. In the midst of the pandemic, there were cases where a smart watch saved a person's life by detecting a decrease in blood saturation, thus contributing to the early diagnosis of COVID-19.

Obviously, legal, moral and ethical aspects play an important role in the application of telemedicine technologies in modern conditions. First of all, it is the legal framework, which should provide legitimacy and a legal basis for the use of information concerning the results of tests, indicators taken with medical equipment, etc., which ultimately have an impact on the most important thing – the diagnosis. One question that arises is who will be responsible for making such decisions (as in all other systems that now use elements of "artificial intelligence", such as self-driving cars, decision-making systems, electronic consultants (Kim et al., 2018), expert evaluations (Morozov et al., 2018), etc.)? It is very important at all stages of information processing to ensure information security (doctor-patient privilege) and confidentiality of personal information in accordance with the law. Obviously, electronic communication "doctor – patient" should be carried out through secured communication channels, using special systems with certified and guaranteed security (Zingerman et al., 2017). The purpose of this paper is to identify the dominant factors contributing to the active development of telemedicine technologies in the world, as well as to assess the corresponding trends in Russia.

The article presents the results of a comprehensive study and analysis of the specifics of trends in the use of telemedicine technologies in the world and in the Russian healthcare system, as well as the data that we received during a primary sociological study, the purpose of which was to study the prospects for the development of telemedicine in Russian conditions. The main objective of the research is to analyze the current capabilities of telemedicine technologies, as well as the features and necessity of their use in connection with the current epidemiological situation. The first stage included an analysis not only of trends in the development of telemedicine, but also of the confidence level in it on the part of end users. The second stage involved a comparative analysis of empirical data obtained earlier (before the pandemic) with the results of the author's primary research conducted in a number of Russia's regions using the developed tools.

The main objective of the reconnaissance study is to determine the attitudes of different age groups of Russians toward the use of telemedicine technologies in selected regions: Moscow, large and medium-sized cities in the southeast of the Moscow Oblast, and Ryazan. The choice of regions was primarily based on the capabilities of telemedicine technology implementation, as well as on the position of leaders in the organization of COVID-19 response measures. For example, some polyclinics in the Moscow Oblast were forced to move to a remote work with patients during the outbreak of the Omicron virus variant (this was the first time such a measure had been used in Russia).

The uniqueness and novelty of the work are due to the possibility of comparing data on the attitudes of Russians toward telemedicine, obtained before the pandemic, with indicators of the declining trend of COVID-19 incidence.

Theoretical review and experience of telemedicine application

Despite the fact that the history of telemedicine technology in the world goes back more than 120 years (Bashshur, Shannon, 2009), current trends, challenges, and especially the development of information and communication technology are forcing a new perspective on many issues.

A.V. Vladzimirskii has played a major role in studying the history, trends, and key factors in the

development of telemedicine in the world and Russia. In his numerous works, he has covered the entire spectrum of issues related to this phenomenon (Vladzimirskii, 2017; Vladzimirskii, 2019; Vladzimirskii et al., 2019; Vladzimirskii et al., 2020 et al.). Yu.D. Volynsky considered telemedicine as a part of the information society (Volynskii, 1999), A.I. Grigor'ev, O.I. Orlov, and V.A. Loginov studied the specifics of clinical telemedicine (Grigorev et al., 2001). N.A. Voskolovich gave examples of telemedicine implementation in terms of development of paid services (Voskolovich, 2021). I.A. Zheleznyakova, T.A. Khelisupali, V.V. Omel'yanovskii, and S.N. Tishkina analyzed the adaptation of foreign experience in providing telemedicine services in Russia (Zheleznyakova et al., 2020), and B.V. Zingerman, N.E. Shklovski-Kordi, and A.I. Vorob'ev analyzed features of telemedicine implementation of the "patient – doctor" concept (Zingerman et al., 2017). All of the above-mentioned authors investigated particular areas or specific issues related to the features of the application of such technologies in Russia. Foreign experts focused their attention on applied issues. For example, R.L. Bashshur and G.W. Shannon dealt with the history of telemedicine and the problems of its transformation (Bashshur, Shannon, 2009); N. Charrier, K. Zarca, I. Durand-Zaleski, and C. Calinaud investigated the cost effectiveness and accessibility of telemedicine care to the population (Charrier et al.); D. Giansanti, S. Morelli, V. Macellari, A.G. Ekeland, and A. Grittlund evaluated telemedicine technologies and proposed tools for a quality control system for medical services. The issues of telemedicine quality were also addressed by Russian scientists A.V. Vladzimirskii, S.P. Morozov, S.S. Simenyura, who during the COVID-19 pandemic published several articles on quality assessment of telemedicine consultations. All of these materials were specific in nature, examining a narrow problem in a particular time period. Our article takes a more comprehensive approach.

Currently, we can consider telemedicine to be a conventional term accepted in the academic community (Weinstein, 2018). Telemedicine (from a Greek tele – distance and a Latin meder – to heal), according to a number of scientists, is "... a health care tool that uses telecommunications and electronic information (computer) technology to provide medical care and services at the point of need (where the geographical distance between the health care provider and the patient is a critical factor)" (Vladzimirskii, Lebedev, 2018). At the present stage, the main direction in the development of telemedicine is the implementation of a "patient – doctor" communication system, which can include online consultations, home telemedicine, and remote biomonitoring. There is clinical remote interaction between medical organizations (Kamaev, 2001) and/or individual authorized medical workers (doctors, nurses) (Yarasheva et al., 2020) using telemedicine technology.

Telemedicine in Russian healthcare is also seen as a certain component of information support in the medical field. Such technologies are designed to ensure the realization of the constitutional right of any Russian citizen to receive medical care (Levanov et al., 2017). It is also a modern tool that is used when the state creates conditions for effective and affordable health care for Russians in accordance with constitutional rights (Stolbov, 2015). In isolation, this is also relevant in megalopolises: when accompanying elderly patients, as well as patients with chronic diseases. In this case, telemedicine technology can minimize risks and threats to health conditions and make more efficient use of health care resources (Charrier et al., 2016). Medical videoconferencing, teleconsultations, and teleseminars are becoming available to physicians to conduct any form of consultation and training through the use of information and telecommunication technologies (Zheleznyakova et al., 2020).

Research methodology

Our approach to the study of telemedicine application problems in modern conditions, as well as in the study of societal attitudes toward the possibility of applying new technologies in medicine, is based on the classical variant of sociological research. The design of the data acquisition framework includes two stages: the first is desk research of the analysis results of secondary information on the vectors of telemedicine development, as well as societal attitudes toward using of telemedicine technologies in the provision of medical services in the world and Russia, including during the coronavirus pandemic. The information base consists of Rosstat data, analytical materials, reports of the Ministry of Health of the Russian Federation, international health statistics data, monitoring of health indicators in the framework of the WHO Sustainable Development Goals, the results of research by public organizations.

The second stage is a primary sociological study, the main purpose of which was to examine the attitudes of different age groups of Russians toward the use of telemedicine technologies. We collected primary data using a questionnaire on Google-Forms. For the survey we used the CAWI (Computer Assisted Web Interviewing) method – a computer-based survey without the interviewer's personal presence, when the respondent fills out the questionnaire on their own. A total of 252 respondents completed the survey. The sample is quota based on age distribution. According to experts, sampling error in such an organization of the survey meets the requirements of representativeness. Scope of the study: Moscow, cities of the southeast of the Moscow Oblast (Kolomna, Voskresensk, Egoryevsk, Lukhovitsy, Ozyory, Zaraisk), Ryazan. The cities represented can be called typical in terms of telemedicine technology capabilities and leading in terms of organizing the new infectious diseases response (in this case, COVID-19). Some polyclinics in the Moscow Oblast were forced to switch to a remote work with patients during the surge of new COVID-19 (Omicron) strains due to the current epidemiological situation (this was the first time such a measure had been used in Russia).

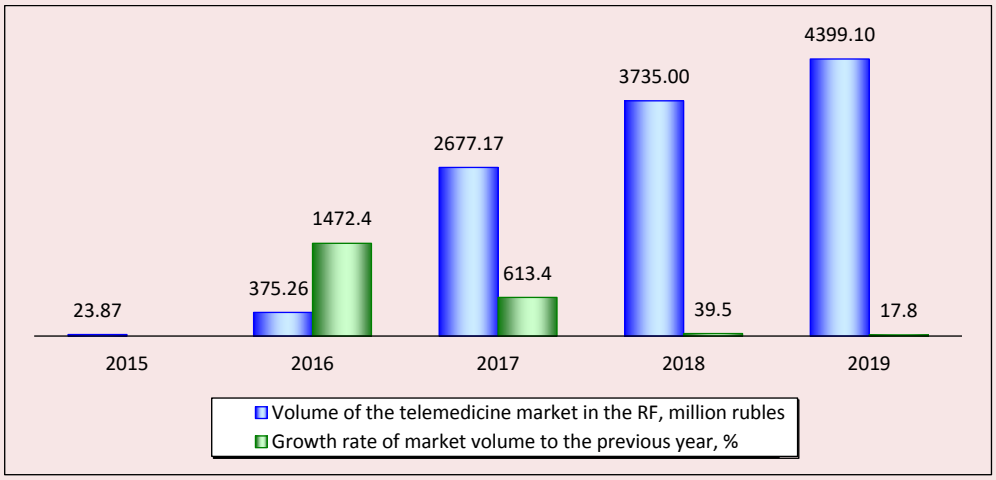
The survey was conducted in March 2022, a time when the downward trend of the COVID-19 pandemic can already be observed. The distribution of respondents by gender is slightly skewed toward the predominance of women (56.4%). It is well known that this part of the respondents is traditionally more attentive to their health and to making decisions concerning treatment for themselves and their family members. For the convenience of further analysis, we divided respondents into four age groups: I – 14 to 18 years old (9.5% of all respondents), II – 19–29 years old (35.4%), III – 30–49 years old (42.3%), and IV – over 50 years old (12.8%). Previously, the respondents had no experience with the use of telemedicine technologies or had encountered only some elements of information technologies when receiving medical services. In addition, those interviewed were not medical or nursing professionals, ensuring that there was no professionally based bias in the responses.

Initially, we put forward two hypotheses: first, whether Russian society, due to the spread of coronavirus disease and the introduction of restrictive "self-isolation" measures, would trust telemedical technologies. Second, whether the younger generation is more inclined to use information telemedicine technologies than people of older age, since they have more experience in using information and communication technologies in everyday life.

Results of the desk research

Currently there is a significant growth in the volume of the telemedicine services market in

Figure 1. Dynamics of the telemedicine services market volume in the Russian Federation, 2015–2019



Source: There is significant growth in the volume of the telemedicine market in Russia. *Magazin issledovanii. RBK*. Available at: https://marketing.rbc.ru/articles/11863/ (accessed: March 10, 2022).

Russia. But analysts, medics, statistical services, and the Ministry of Health have different approaches to its assessment. Some take as a basis only paid medical services provided on the basis of telemedicine technologies; others take into account the costs of purchasing equipment for communications and maintaining information and communication technologies, its implementation and support of medical institutions; others calculate the market potential and proceed from the real and projected need for such direction of medical development under the influence of external challenges, such as a pandemic. In this regard, estimates vary.

One of the options for calculating the dynamics of the market for telemedicine services in Russia is shown in *Figure 1*.

The above estimate was made by analysts at GidMarket on the basis of data from Russian statistics, expert estimates in the field of telemedicine and data from Mobile Medical Technologies LLC. According to these calculations, the market volume in 2019 (before the pandemic) was 4.4 billion rubles. The growth relative to the previous year is 18%. The largest increase relative to the previous year one can observe in 2016 – almost a thousand and a half percent. Over the entire period presented, there is a noticeable upward trend in the volume of the telemedicine technology market (in current prices)[2].

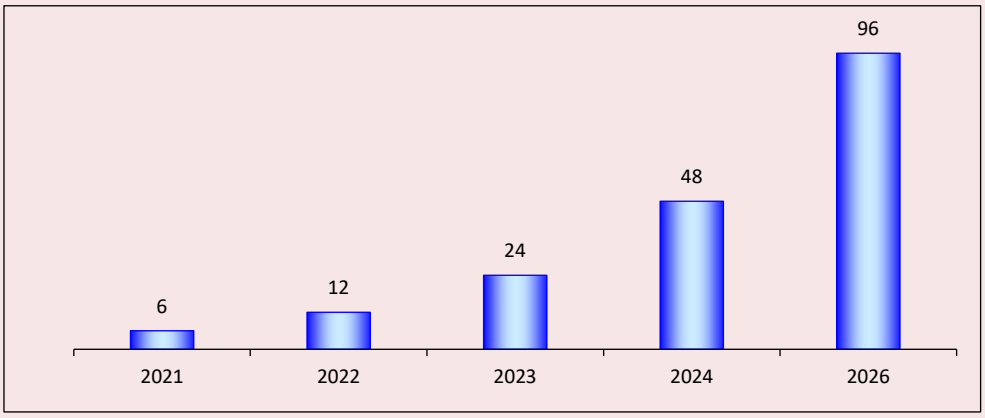
In Russia, the telemedicine market, as well as throughout the world[3], has become extremely important in the era of the COVID-19 pandemic. Investments in this area have skyrocketed. According to experts from VEB Ventures, given on the analytical portal CNews, in the next few years, the average annual growth of telemedicine market can be about 100%[4] *(Fig. 2)*.

[2] There is significant growth in the volume of the telemedicine market in Russia. *Magazin issledovanii. RBK*. Available at: https://marketing.rbc.ru/articles/11863/ (accessed: March 10, 2022).

[3] *World Health Statistics, 2020: Monitoring health indicators in relation to the SDGs, Sustainable Development Goals*. Geneva: World Health Organization, 2020. Available at: https://creativecommons.org/licenses/by-nc-sa/3.0/igo (accessed: March 10, 2022).

[4] Suslov K. The Ministry of Health issued recommendations "on telemedicine". How feasible are they? *Analytical data of the C-News portal*. Available at: https://www.cnews.ru/articles/2021-05-12_minzdrav_vypustil_rekomendatsii_po (accessed: March 10, 2022).

Figure 2. Forecast of telemedicine market dynamics in Russia, billion rubles



Source: CNews based on VEB Venteres data, 2020; IT in healthcare 2020. *Analytical data of the C-News portal.* Available at: https://www.cnews.ru/reviews/it_v_zdravoohranenii_2020/cases/telemeditsina_protiv_pandemii_kak (accessed: March 10, 2022).

Despite visible changes, the Russian telemedicine market is at the stage of sluggish growth. The introduction of telemedicine in other countries began much earlier. Not only the availability of funding channels (private clinics and medical institutions, insurance companies, etc.), but also a significant advance in the field of communications and the development of information technology contributed to this. For example, in the USA, about 70% of insurance companies offer telemedicine services because they save 30 to 40% of money. According to U.S. experts (Ekeland, Grittlund, 2015; Kidholm et al., 2017; Halpren-Ruder et al., 2019), telemonitoring of patients with chronic conditions can reduce costs by nearly twice as much as possible hospitalization for similar surveillance.

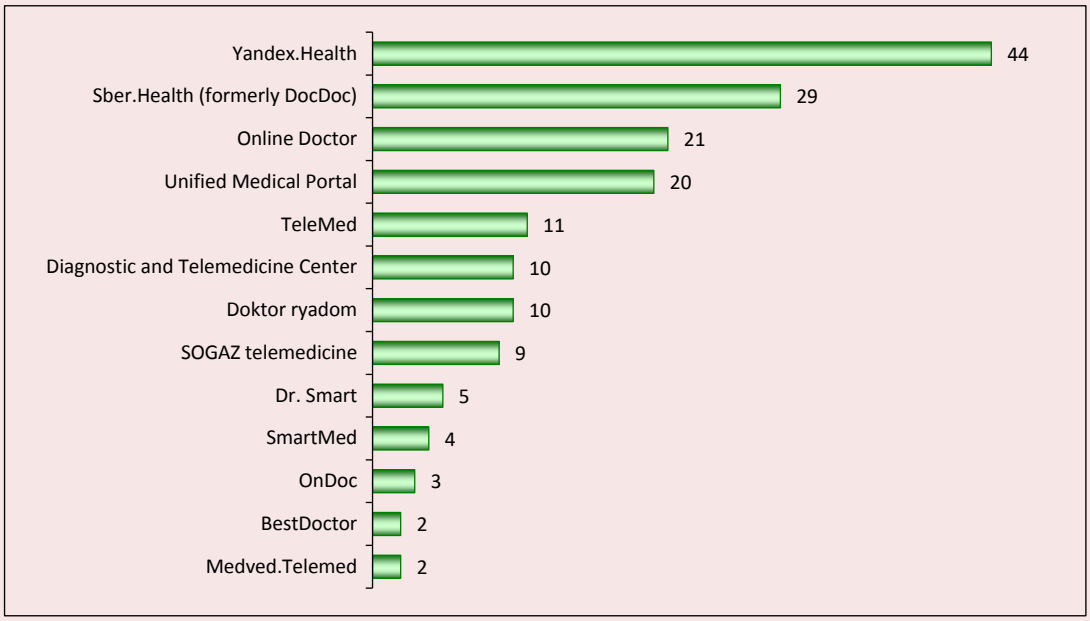
In 2021 the specialists of Romir Holding studied the attitudes of Russians toward telemedicine as part of an initiative survey. Only a quarter of Russian citizens (26%) are familiar with such a system of online consultations, 42% have a rough idea, and a third knows nothing about telemedicine (*Fig. 3*).

According to the data obtained, Yandex.Health can be considered the best-known telemedicine service, Sber.Health comes second, Online Doctor comes third, and every fifth person is familiar with the Unified Medical Portal.

At the height of the pandemic, in May 2020, the All-Russian Center for the Study of Public Opinion (VCIOM) conducted a telemedicine survey[5]. The main objective of the survey was to find out the degree of Russians' awareness of the possibility to receive remote consultations from a doctor via the Internet or telephone and their attitude toward such consultations. More than half of the respondents (62%) were aware of the existence of telemedicine technologies and the possibility of remote consultation with a doctor. Traditionally, in the two capitals awareness of telemedicine is higher: 71% of respondents knew about the possibility to consult a doctor by phone and 73% via the Internet.

[5] Telemedicine in Russia: Today and Tomorrow. *VCIOM.* Press Release No. 4246. Available at: https://infographics.wciom.ru/theme-archive/society/social-problems/most-serious-problems/article/telemedicina-v-rossii-segodnja-i-zavtra.html (accessed: March 10, 2022).

Figure 3. What telemedicine services do you know? % respondents



Source: Only a quarter of Russians trust telemedicine. 2020. *Analytical data of the C-News portal.* Available at: https://romir.ru/studies/lish-chetvert-rossiyan-doveryaet-telemedicine (accessed: March 10, 2022).

There were 8% of respondents who have already had experience in receiving telemedicine services in the form of a consultation, more than half (53%) potentially considered such an opportunity for themselves. According to the VCIOM survey, overall 48% of Russians considered the possibility of visiting a doctor via Internet technologies, of which the largest proportion (57%) were young people between the ages of 18 and 24. The reasons for receiving a telemedicine consultation were as follows: if there are signs of illness – one in four; if you feel "really poorly" or, on the contrary, "nothing serious" – one in ten. The possibility of visiting a doctor remotely is also considered in a situation when there is no possibility to come in person (5%) or when "just a consultation" is needed (5%). At the same time, one-third of Russians (33%) believe that telemedicine technologies should not be used because a personal examination is "necessary when visiting a doctor". Among respondents, 13% doubt the quality of such medical services, and one in ten believes that it is not necessary at all and it is easier to go to a regular appointment[6].

During the COVID-19 pandemic, the demand for physician teleconsultation (Levanov et al., 2014) increased dramatically. Due to the difficult epidemiological situation in many regions (for example, in the city of Moscow and the Moscow Oblast), primary care for those who fell ill with COVID-19 was restructured: polyclinics were forced to switch to remote work. Additional call centers have been set up. Thus, the pandemic has further sharpened the focus on the use of information technology in healthcare. During this period there was a high demand for hardware and software solutions in the field of telemedicine. Absolutely every opportunity was used to reduce the number of face-to-face doctor-patient contacts. In February

[6] Only a quarter of Russians trust telemedicine. *Analytical data from the Romir Portal.* Available at: https://romir.ru/studies/lish-chetvert-rossiyan-doveryaet-telemedicine (accessed: March 10, 2022).

2022, the head of the Russian Ministry of Health assessed the situation as follows: "...First of all, the load falls on the outpatient-clinic stage, and in fact 92.5% receive help exactly in polyclinics. Unprecedentedly high load, the highest load on the entire outpatient and polyclinic unit and on the system as a whole"[7]. At that time, the number of sick health professionals was twice as high as the number of those infected in the fall. Hence the decision on the ability of the RF constituent entities to transfer polyclinics to a remote work mode.

The problem of a shortage of equipment for information and communication exchange existed in Russian healthcare even before the pandemic began, but the sharp increase in the number of patients has greatly exacerbated it. The process of providing medical care was slowing down, which could not but affect its efficiency and quality. During this period, there was a need for services for remote patient examinations in order, among other things, to reduce the risk of infection in the doctors themselves. That is why the development of Russian healthcare at the level of the Russian Ministry of Health began to be directly linked with telemedicine technologies.

The increased demand of patients for telemedicine consultations launched the process of rapid development of this area. According to data from constituent entities of the Russian Federation, more than 1.7 million telemedicine consultations have been provided to patients diagnosed with COVID-19 or pneumonia, acute respiratory infections and influenza. More than 197,000 patients were remotely monitored using telemedicine technology. The National Medical Research Centers of the Ministry of Health of Russia have conducted more than 72,000 telemedicine consultations and consiliums on complex cases at the request of doctors of regional medical organizations. According to the data of state statistical observation according to Form No. 30 in 2020 in the constituent entities of the Russian Federation more than 567 thousand "doctor – doctor" consultations were conducted using telemedicine technologies[8]; more than 6.437 million "doctor – patient" consultations were conducted; more than 800,000 consultations to provide opinions on diagnostic tests; more than 1.72 million patients were on remote monitoring of their health status; the federal anesthesiology and critical care remote consultation centers conducted 27,600 telemedicine consultations on requests from the regional remote consultation centers for complex cases.

As can be seen from the report of the Ministry of Health of the Russian Federation on the results of work in 2020 and tasks for 2021, most areas of development and medical services already provided during the COVID-19 pandemic are largely related to the possibility of using telemedicine technologies. That is why the attitude of the Russian society to telemedicine is of considerable interest in the framework of research.

The main problem is related to the issue of the identity of diagnostic decisions made remotely and in-person (Vladzimirskii, 2015). There are other problematic aspects to be assessed, such as technical reliability, information security, economic feasibility and accessibility of medical care. In addition, between 2000 and 2010, many techniques began to include assessments of patient satisfaction as well as efficiency and effectiveness (Vladzimirskii, 2020).

Currently, all methods of assessing the quality of telemedicine services are divided according to the directions of telemedicine: remote "doctor –

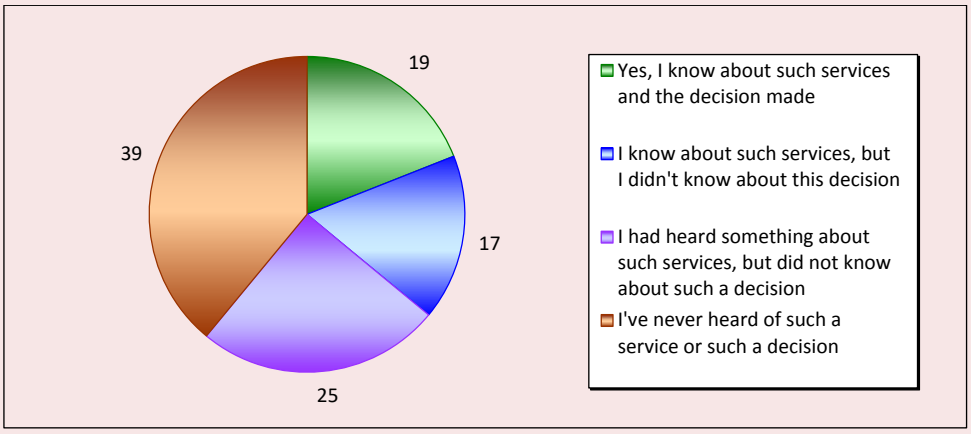
[7] The Ministry of Health of the Russian Federation noted an increased workload on Russian polyclinics due to COVID-19. *Interfaks*. Available at: https://www.interfax.ru/russia/822481 (accessed: March 10, 2022).

[8] On the results of the Ministry of Health of the Russian Federation in 2020 and tasks for 2021. *Ministry of Health of the Russian Federation*. Available at: https://static-0.minzdrav.gov.ru/system/attachments/attaches/000/055/642/original/MZRF_2021_All_08-04-2021-Preview.pdf?1619014721 (accessed: March 10, 2022).

patient" consultation (Zingerman et al., 2017) and "doctor – doctor" counseling (Kobrinskii, 2016). An important step was the emergence of methodological approaches for assessing telemedicine systems (Hersh et al., 2006), which have been published in peer reviews (Hailey et al., 2002), a condition of which has been significant experience with telemedicine technologies (Bergmo, 2009). The systematization of experience and the methodological base allowed a high level of evidence, which is the most critical for public health (Aoki et al., 2003). The problem of quality assessment is complicated by the versatility of care that can be provided in the "patient – doctor" format using telemedicine technologies, and because there are risks of specificity (Halpren-Ruder et al., 2019) of the subject area of remote communication (consultation) (Wootton et al., 2011). Today there is quite a lot of research in the aspect of quality (Shi et al., 2018) and performance of telemedicine "patient – doctor" consultations (Taylor, 2005) and remote monitoring (Resneck et al., 2016), approaches to analysis methodology are systematized (Martin-Khan et al., 2011).

In addition to improving the conceptual approaches for evaluating the quality of telemedicine technologies, it is necessary to take into account the opinion of the end user of medical services. In recent years a number of studies have been conducted using sociological methods, aimed at identifying the attitudes of the Russian society toward telemedicine technologies. For example, according to the IPT Group[9] (2017), about 75% of Russians positively evaluated the possibility of remote communication with a doctor as part of medical care, and 68% considered such a possibility for themselves and/or their family members in the future *(Fig. 4)*.

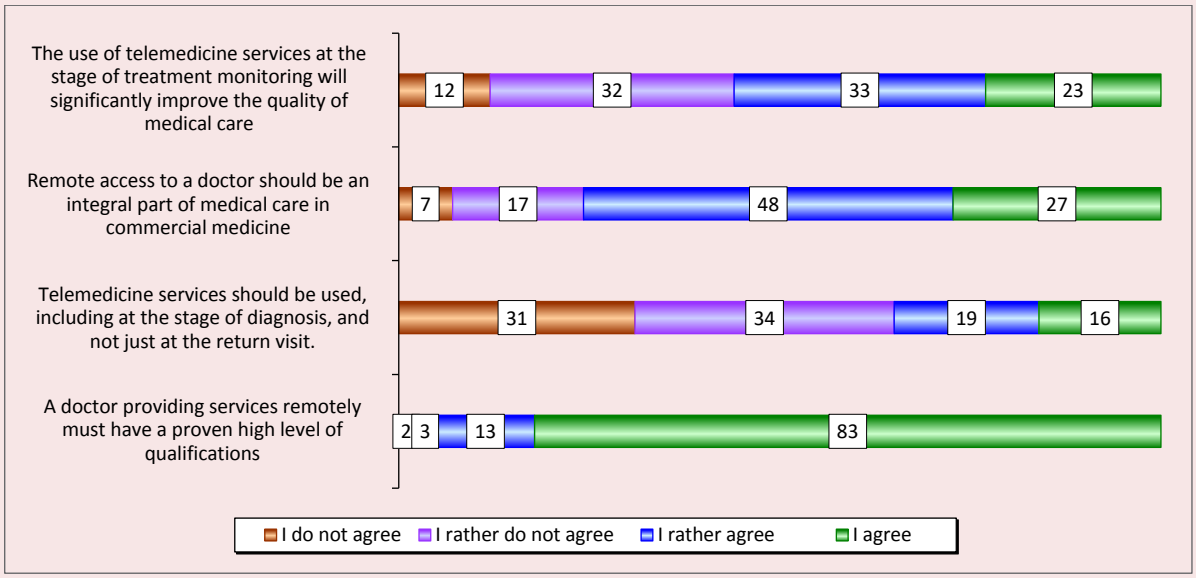
Figure 4. Results of answers to the question "Do you know that it is now possible to receive telemedicine services in the Russian Federation?", % the number of respondents



Source: Among the population, 75% welcomes telemedicine services in commercial medicine (2017). *IPT Group*. Available at: https://iptg.ru/press/smi/75-naseleniya-privetstvuyut-telemeditsinskie-uslugi-v-kommercheskoy-meditsine-issledovanie-ipt-group/ (accessed: March 10, 2022).

[9] Among the population, 75% welcomes telemedicine services in commercial medicine. *IPT Group*. Available at: https://iptg.ru/press/smi/75-naseleniya-privetstvuyut-telemeditsinskie-uslugi-v-kommercheskoy-meditsine-issledovanie-ipt-group/ (accessed: March 10, 2022).

Figure 5. Results of answers to the question "Please indicate to what extent do you agree with the given statements?", %



Source: Among the population, 75% welcomes telemedicine services in commercial medicine (2017). *IPT Group*. Available at: https://iptg.ru/press/smi/75-naseleniya-privetstvuyut-telemeditsinskie-uslugi-v-kommercheskoy-meditsine-issledovanie-ipt-group/ (accessed: March 10, 2022).

In 2017, almost one in five (19%) Russians knew about the existence of such services, a quarter (25%) had heard something about them, and 39% had no idea about it at all *(Fig. 5)*.

Among those surveyed, 56% agreed and 44% disagreed with the statement that the use of telemedicine services in the monitoring stage of the treatment process would significantly improve the quality of medical care. 75% of respondents believe that remote communication with a doctor should become an integral part of medical care in commercial medicine. More than one third (35%) agree that telemedicine services can be used, including at the stage of diagnosis, and not only for return visits to the doctor. And an absolute majority of respondents (96%) agreed that a physician providing services remotely must have a proven high level of qualifications (Kroshilin et al., 2020).

In 2017, 68% of those surveyed agreed to consider using telemedicine for themselves or their family members in the next two years. At the same time, potential patients equally perceived the possibility of providing such services both in state medical institutions (41%) and in private medical clinics and centers (42%). Some respondents (17%) implied the use of telemedicine services in the format of communication (consultation) exclusively with their attending physician (a doctor they know). And 11% of respondents were ready to receive telemedicine services for a fee[10].

Thus, according to the results of a study on the level of trust in telemedicine in 2017, we could say that 75% of the population is ready to use paid telemedicine services in commercial medicine, and more than 40% do not see obstacles to the use of these technologies in public health facilities.

[10] Among 75% the population welcomes telemedicine services in commercial medicine. *IPT Group*. Available at: https://iptg.ru/press/smi/75-naseleniya-privetstvuyut-telemeditsinskie-uslugi-v-kommercheskoy-meditsine-issledovanie-ipt-group/ (accessed March 10, 2022).

The Romir 2021 study of Russians' attitudes toward telemedicine showed that only 4% of respondents fully trust such technologies, a little more than one-fifth (21%) of respondents "rather trust", 57% of respondents have no confidence in telemedicine, and every fifth Russian (19%) does not fully trust it. And 69% of Russians do not plan to use telemedicine technology for medical care in the future. Only 3% of respondents regularly use telemedicine[11].

The Clinical Diagnostic and Telemedicine Research Center of the Moscow Department of Health conducted research to assess the quality of consultations with telemedicine technologies for patients with symptoms of acute respiratory infections (COVID-19) in early 2020. As an experiment, they conducted 20 consultations of simulated patients with signs of acute respiratory illness in 10 popular telemedicine services. It was found that in half of the cases, poor anamnesis (allergological – in 60% of cases, epidemiological – in 35%) was collected when providing medical services, and requesting information about chronic diseases (which posed enormous risks in terms of infection and the course of coronavirus infection) was recorded only in half of the cases. Based on the results obtained, the researchers concluded that telemedicine services did not work: they did not provide medical care at the appropriate level (in particular, in 60% of cases, medication was incorrectly prescribed). According to researchers, within the framework of the application of the considered telemedicine services in the "patient – doctor" system, their performance can be assessed as unsatisfactory (Vladzimirskii et al., 2020).

A more in-depth study of attitudes toward telemedicine was conducted by the Research Institute of Health Organization and Medical Management of the Moscow Department of Health (NIIOZMM) in October 2019 (before the coronavirus pandemic). The survey concerned the implementation of telemedicine technologies in healthcare in Moscow. In contrast to the previously considered studies, in this case the opinion of not only patients, but also doctors was studied. From the point of view of doctors, telemedicine services are needed primarily by patients in remote regions, low-mobility patients, and parents of infants. According to doctors, remote services can be related to consultations such as nutrition or care, various observations and telemetry, as well as prescriptions and other electronic documents (Bogdan et al., 2020).

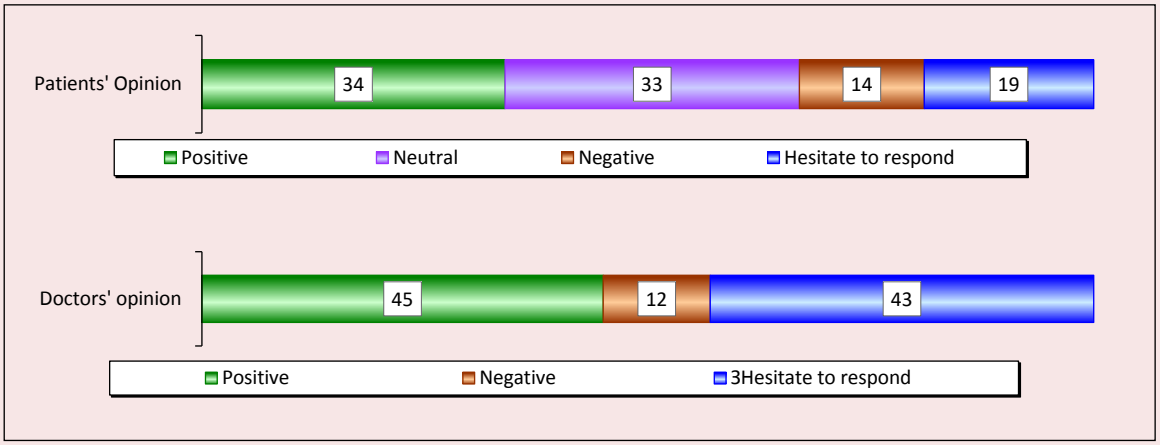
The main advantages of telemedicine technologies, according to the surveyed medical specialists, are, first, the possibility of prompt assistance (26%), second, remote assistance, which is most important for people with limited mobility (25%), and third, increased accessibility of specialists, reduced waiting time (17%). From the patients' point of view, the use of telemedicine is acceptable for general practitioners or physicians (78%), only one-third (27%) consider the use of such technology by specialists, and 15% – by nurses. In general, everyone sees the possibilities of such services in obtaining medical reports and certificates (45%), prescriptions (39%), medical advice on the need for examination (36%), as well as in the correction of previously prescribed treatment (25%). Patients consider messengers (61%), video conferencing (45%), and dedicated apps (23%) as means of communication within telemedicine (Bogdan et al., 2020).

When examining attitudes toward telemedicine in general, the analysts at the Research Institute NIIOZM) obtained the following results *(Fig. 6)*.

As we can see, doctors have a significantly more positive attitude toward the possibility of using telemedicine technologies, the same applies to those who hesitate to respond: there are almost twice

[11] Only a quarter of Russians trust telemedicine. *Analytical data from the Romir Portal*. Available at: https://romir.ru/studies/lish-chetvert-rossiyan-doveryaet-telemedicine (accessed: March 10, 2022).

Figure 6. Attitude toward telemedicine (patients' and doctors' opinions), % of respondents



Source: Telemedicine is coming to Moscow healthcare. *The Research Institute NIIOZMM.* Available at: https://niioz.ru/news/telemeditsina-prikhodit-v-moskovskoe-zdravookhranenie/?sphrase_id=65885 (accessed: March 10, 2022).

as many of them among doctors; the proportion of those who have a negative attitude toward telemedicine among patients and doctors is approximately the same (Bogdan et al., 2020).

Summarizing the secondary analysis of the data concerning the attitude of Russians to the introduction, development and spread of telemedicine technologies, we can say that among doctors more than a third speak positively, 45% of potential and actual patients agree with them; only 14% of doctors and 12% of patients do not share optimism about providing medical services in a remote mode.

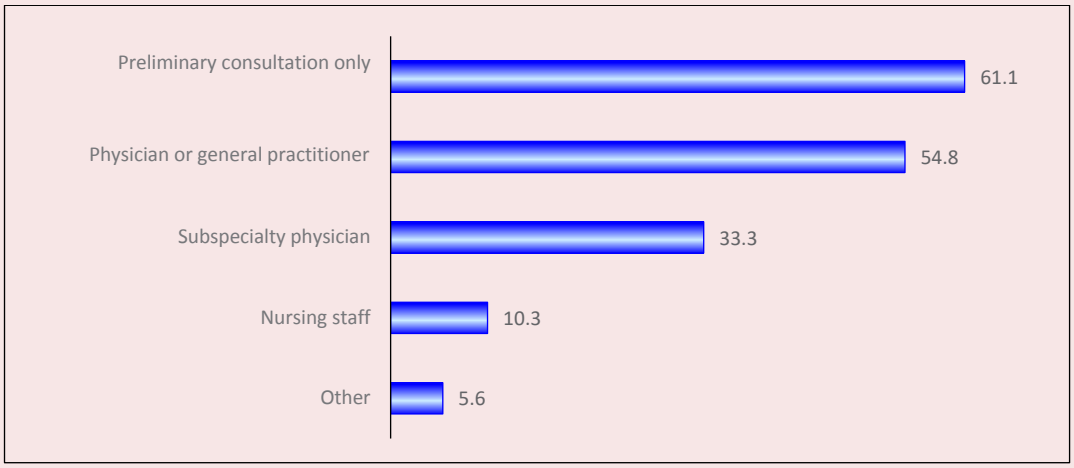
Results of an exploratory sociological study

As part of our continuing study of the conditions and prospects for the use of telemedicine technologies, we conducted our own exploratory sociological study, the purpose of which was to determine the attitudes of Russians toward telemedicine.

As a result of the study, we found that 61.1% of respondents believe it is possible to use telemedicine services only for preliminary consultation; a little more than half admit the use of telemedicine technology when contacting a general practitioner or physician; one-third believe that a remote subspecialty consultation is possible. One in ten respondents did not exclude the possibility of using telemedicine to contact nursing staff *(Fig. 7)*.

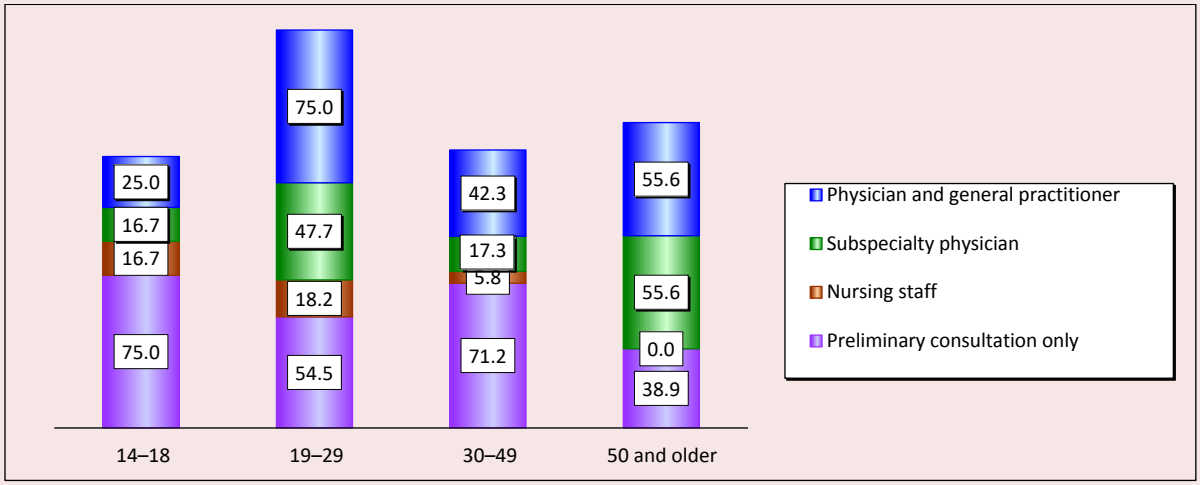
As for the influence of age, three quarters of respondents aged 19–29 recognize the use of telemedicine only for preliminary consultation. More than half of the respondents aged 50 and older agreed with them, and the same number of people in this age group indicated the possibility of remote appointment for general practitioners and physicians. It should be noted that the younger generation (14–18 years old) is less willing than others to use the possibilities of telemedicine: a third less (25%) would agree to a remote appointment with a general practitioner, even less (16.7%) would use the telemedicine opportunities to consult with a subspecialists. At the same time, young people agree to use telemedicine technologies for consultations: 75.0% of respondents in the 14–18 age group and 54.5% in the 19–29 age group said yes. The older generation (50 and older) is not prepared at all to use telemedicine when interacting with nursing staff, and this includes 5.8% of respondents aged 30–49. Younger people (19–29 years old) have less prejudice: 18.2% trust remote consultations by nurses *(Fig. 8)*.

Figure 7. Opinion of respondents on the possibility of providing medical services using telemedicine technologies (several answers are possible), % of respondents



Source: the results of our own research in 2022.

Figure 8. Opinion of respondents in different age groups about the services that could be received using telemedicine (several answers are possible), % of each age group



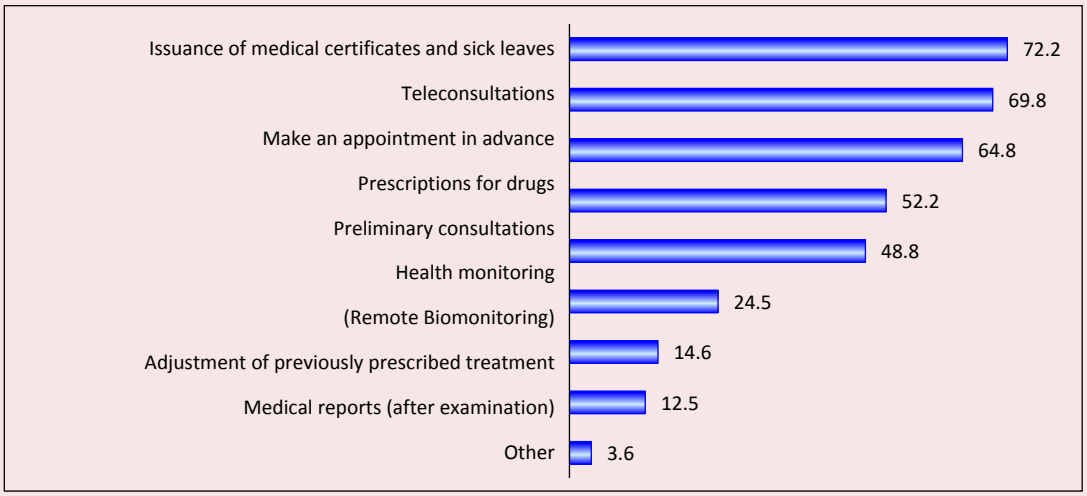
Source: the results of our own research in 2022.

According to the respondents, the most acceptable option for the provision of services using telemedicine is primarily the issuance of health certificates and sick leaves, in second place is the organization of teleconsultations, in third place is pre-registration for an appointment with a doctor, in fourth place is getting electronic prescriptions for drugs. The "primary consultations" option received less than half of the votes *(Fig. 9)*.

Respondents are much less willing to use telemedicine technologies for remote health monitoring (biomonitoring), adjusting previously prescribed treatment, and obtaining a medical opinion after the examination.

According to three-quarters of respondents, the best way to communicate when providing telemedicine services is via video link (since, apparently, the number of people who

Figure 9. What medical services could be provided using telemedicine (several answers are possible), % of respondents

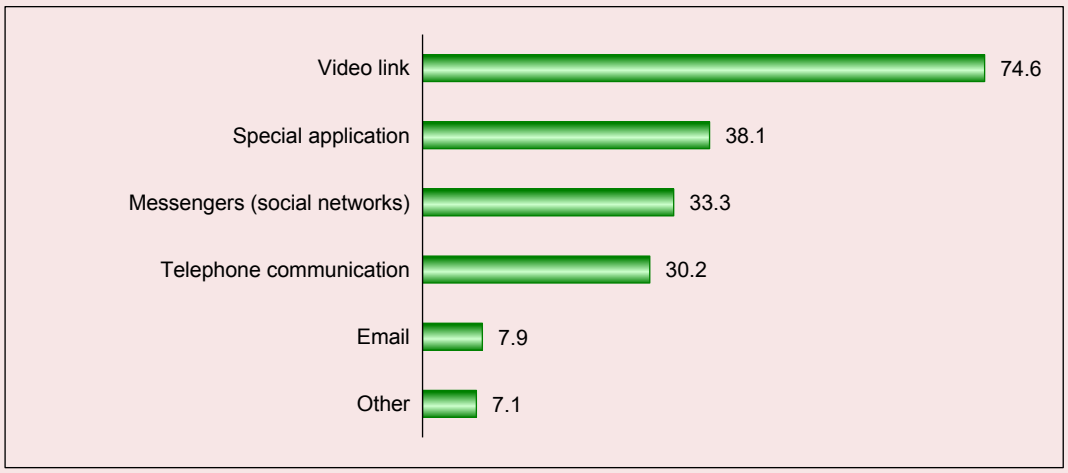


Source: the results of our own research in 2022.

have successfully mastered this method of communication has increased significantly in the face of the coronavirus pandemic in self-isolation). At the same time, noticeably more than a third believe that there should be a dedicated application, and this is primarily argued by the need to protect personal data, which "ordinary" messengers (social networks) cannot provide. In favor of the latter, a third of those surveyed agreed to have consultations over the phone *(Fig. 10)*.

As for the dependence on age, video communication is more preferable for respondents

Figure 10. Distribution of respondents' opinions on the best way to communicate to receive medical treatment (several answers are possible), % of the number of respondents

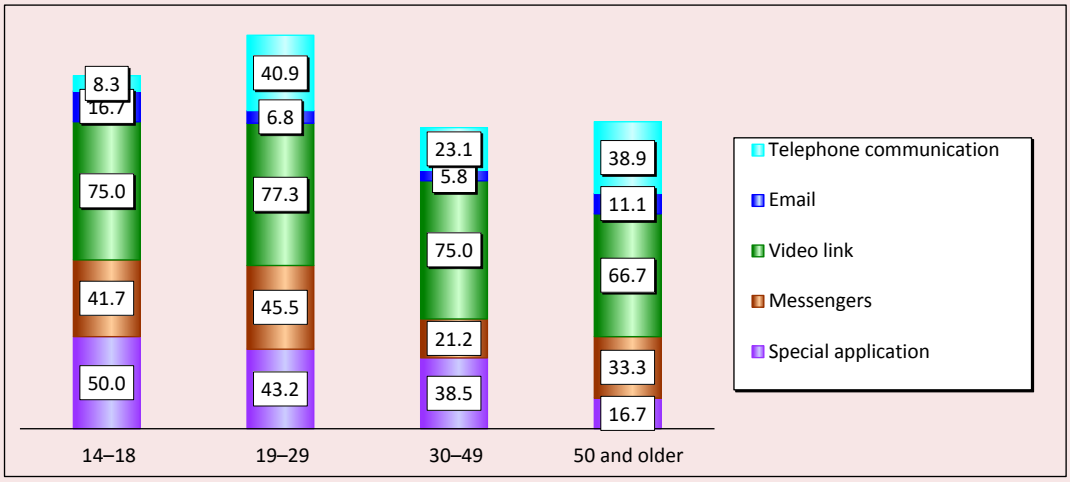


Source: the results of our own research in 2022.

of all ages. Telemedicine advice is more convenient for 38.9% of respondents aged 50 and older, and an even higher proportion of those aged 19–29. Young people are more likely to talk about a dedicated app: 50% of 14- to 18-year-olds and 43.2% of 19- to 29-year-olds indicated this. To a lesser extent, people are interested in using e-mail: the younger generation notes its excessive overload, representatives of older age groups – problems with its use *(Fig. 11)*.

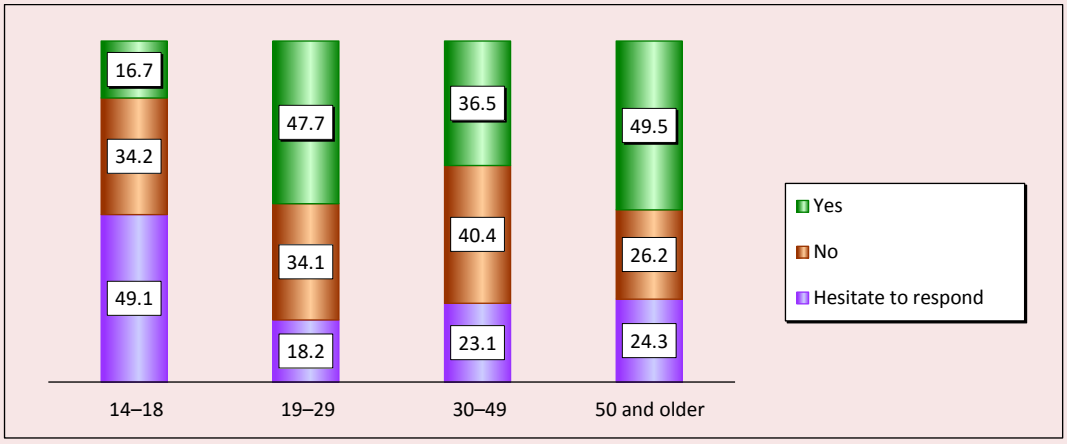
One of the main objectives of the study was to determine the degree of public confidence in the new possibilities of receiving medical services. For this purpose, we asked the question "If you were now offered telemedicine instead of visiting a general practitioner, would you accept it?". On the sample as a whole, 40.5% of respondents agreed, one-fifth (22.2%) hesitated to respond, and the rest refused. The distribution of the answers received in relation to age is shown in *Figure 12*.

Figure 11. Opinion of respondents in different age groups about methods of communication in the provision of telemedicine services (several answers are possible), % of each age group



Source: the results of our own research in 2022.

Figure 12. Results of responses to the question "If you were now offered telemedicine instead of visiting a general practitioner, would you accept?", % of each age group



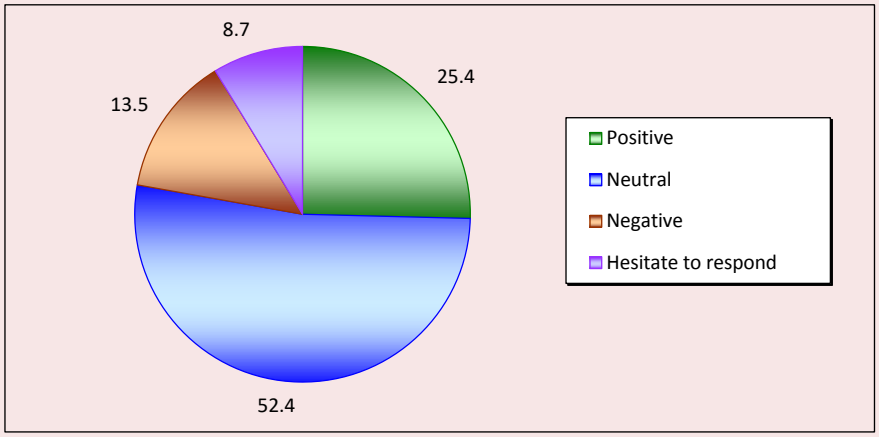
Source: the results of our own research in 2022.

As we can see, the largest proportion of those willing to use a remote consultation with a physician was among the older generation; a little less – in the 19–29 age group, even less, though more than a third – in the 30–49-year-old group. We should note that almost half of the 14–18-year-old respondents were undecided at all, with the least number of those who gave a positive answer (16.7%).

In general, the study showed that a quarter of the respondents had a positive attitude toward telemedicine, more than half had a neutral attitude, and one in ten had a negative attitude *(Fig. 13)*.

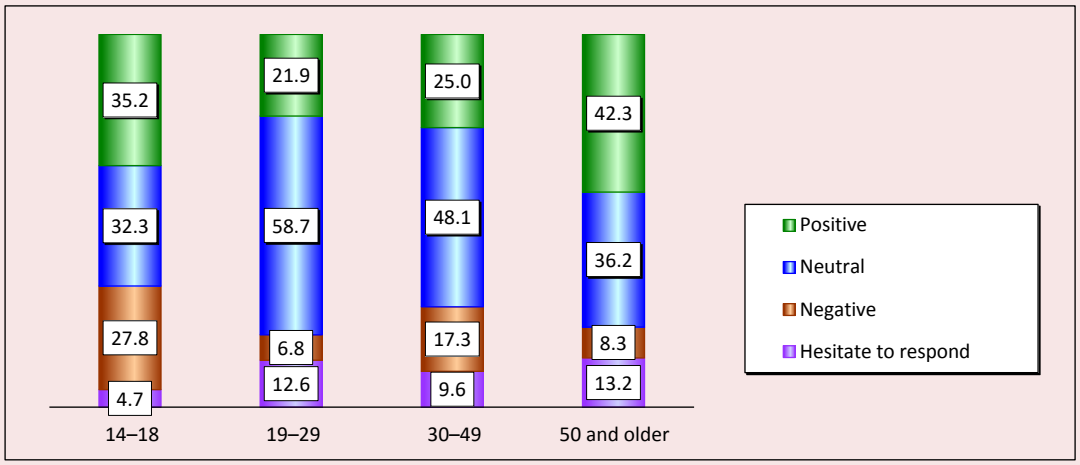
When analyzing the distribution of responses by age *(Fig. 14)*, we found that people aged 50–70 years and the youngest age group have the most positive attitude toward telemedicine technologies.

Figure 13. Respondents' attitudes towards telemedicine, % of respondents



Source: the results of our own research in 2022.

Figure 14. Respondents' attitudes toward telemedicine, % of each age group



Source: the results of our own research in 2022.

Respondents aged 19–29 had the least loyal perception of telemedicine: they most often have a neutral attitude toward it. Most likely due to the absence of chronic diseases and infrequent visits to doctors, they do not see any real problems when making appointments at the clinic and hospital. Negative attitudes are most pronounced in the youngest group and among middle-aged respondents.

Discussion

A primary study conducted allowed obtaining data on the attitudes of Russians toward receiving medical services through telemedicine technologies in regions typical not only in terms of telemedicine technology implementation capabilities, but also in terms of leading organization of the COVID-19 response measures. The survey was conducted at a period when the impact of the pandemic on society was noticeably diminishing (it was at this time that the incidence of the disease went down, including due to reasonable decisions made in the field of prevention and treatment of coronavirus infection). One can compare these results with an earlier study of Russians' attitudes toward telemedicine conducted by the Research Institute NIIOZMM shortly before the pandemic in October 2019 (Bogdan et al., 2020). Thus, there is a unique opportunity to compare the results of two surveys carried out before the pandemic and after its active phase – the decline in the number of recorded cases and the almost complete removal of all restrictions in the regions studied.

Before the pandemic, the use of telemedicine was possible for 67% of respondents; after the pandemic, this number increased by 10%. Remote technologies were perceived positively by 34% of respondents before the pandemic and 25% after the pandemic, but the proportion who viewed them neutrally increased to 52% (33% before the pandemic). There is one percent less of those who have a "negative" attitude toward such technologies, and 5 percent less of those who cannot make up their minds.

Before the pandemic, 45% of respondents agreed to receive medical reports and certificates via telemedicine technologies, and after the acute phase of the pandemic, their proportion increased 1.6-fold (to 72.2%). As for teleconsultation, 36% of respondents had a positive perception before the pandemic and 69.8% afterwards (an almost two-fold increase). Getting prescriptions using telemedicine technology has also become more popular (an increase of 1.3 times). The proportion of those willing to use telemedicine for health monitoring increased 1.4-fold (from 17.0% to 24.5%).

Before the pandemic, 27.0% were willing to get a remote consultation with a subspecialist; after the pandemic, slightly more – 33.3%. The rate of readiness to potentially see a general practitioner or physician via telemedicine technology decreased from 78.0% to 54.8% after the pandemic. However, in the 2022 survey, 40.5% of respondents agreed to get a remote therapist consultation right now (a similar question had not been asked before), and one-fifth were undecided at that time. It seems that much of the reason for this hesitation lies in the convenience of organizing this kind of communication with the doctor. After the pandemic, the respondents indicated video communication as the main means of communication for the organization of telemedicine "doctor – patient" consultations (74.6%); 45% chose this type of communication before the pandemic (1.6 times less frequently). Among those surveyed after the pandemic, 38.1% were in favor of a dedicated application (primarily to protect personal data), while before the pandemic – 23% of respondents. A third of respondents noted that it would be easier to use messengers (social networks); before the pandemic, there were twice as many people willing to use a social network to communicate with a doctor, which was due to the underdevelopment of video communication systems at the time.

Key takeaways

Thus, after analyzing the results of the two studies, we can conclude that Russian citizens have become more loyal to the use of telemedicine technologies for various types of medical care. The main questions that arise from potential and actual patients are mostly related to the accuracy of the recommendations and diagnoses that doctors make and give, communicating with patients only remotely. However, external challenges (e.g., the coronavirus pandemic) that society is facing are forcing the use of such technologies. The best practices and techniques developed during the pandemic, which have proven their validity and relevance, will continue to be replicated in the health care system. The second component of patient wariness about telemedicine has to do with the moral and ethical aspects of organizing communication with doctors. On the one hand, the pandemic period allowed many to gain experience using video communication; on the other hand, there are issues of security, compliance with the Federal Personal Data Law, medical ethics, etc. that have not been fully resolved.

The results of the work confirmed the hypotheses put forward at the beginning of the research: first, indeed, due to the spread of coronavirus infection and the introduction of restrictive measures, Russian society has become more trusting of telemedicine technologies than before the pandemic. Secondly, the younger generation is more predisposed to the use of information telemedicine technologies (higher level of trust in ICTs): according to its representatives, this approach saves time in a medical institution and allows receiving the appropriate level of quality medical services.

Conclusion

Currently, telemedicine in Russia, as well as throughout the world, has become an integral part of the work of medical institutions at virtually all levels. Information technology is now also used for patient consultation at home, remote telemetry for vital signs, and for accompanying critically ill patients. The provision of remote medical care through the use of modern communication technologies has become extremely popular during the peak of COVID-19. Under such conditions, due to the critical situation in the healthcare system and epidemiological indicators, polyclinics in some regions of the country were forced to switch to a remote form of providing medical care to the population in order to preserve the efficiency and more effective work of the primary care. An unprecedented number of call center operators were engaged to assist the population around the clock. This required changes not only in the organization of the direct provision of medical care, but also significant adjustments to the legislation. Such changes were implemented primarily in the regulation of the use of telemedicine technologies, electronic prescriptions, sick-leave certificates, etc. All these measures allowed reducing the level of morbidity and, ultimately, helped the primary care system to survive in the current situation.

It is obvious that today there are still many problems related to the use of telemedicine technologies. There is a need to regulate the workload of doctors when performing such consultations. The issues of payment for such services remain acute (the degree of development and prevalence of information and communication technologies varies in different regions, the density of the population and its spatial dispersion are uneven). It is necessary to simplify the identification of patients as much as possible, because they are mostly elderly people who do not have the necessary level of information technology. Doctors need a clear mechanism for telemedicine, which would allow consulting patients not only from the offices.

At the decision-making stage, it is necessary to draw on the experience of those who are directly involved in the provision of medical services "doctor – patient", which will make it possible to organize the process using the best practices of telemedicine.

Thus, this study proves that during a pandemic, telemedicine technology is necessary, and the best practices can and should be used even in the absence of such a force majeure. Russian doctors and patients already agree to a certain extent and are ready to use telemedicine tools when providing medical care, and the healthcare system has the necessary technology to a certain extent at both the regional and federal levels. There are positive changes in the legal field as well: during the pandemic, amendments to laws, decrees, and orders regulating telemedicine activities were adopted. Telemedicine is a clear trend in the future development of Russian healthcare, which, given the continued improvement in ICTs on the one hand, and the likelihood of new external challenges on the other, will only intensify.

The most promising telemedicine technologies today are remote patient monitoring, which can significantly reduce loss of time and increase the efficiency of medical services (including by reducing the transportation costs of both medical institutions and patients), as well as remote diagnosis and treatment of complex clinical cases. Similar technologies are already being used in the creation of a single database of CT scans of the lungs of people with coronavirus infection. Such a telemedicine system based on elements of artificial intelligence makes it possible to diagnose and determine the degree of lung damage in COVID-19 disease accurately and promptly enough. Another use of telemedicine is the monitoring of public health on the basis of universal medical examinations in the workplace using telemedicine mobile units and systems. Finally, one cannot ignore the prospect of global dissemination and consolidation of advanced professional knowledge and skills through telemedical consultations.

To conclude, in view of the doubts among both the public and the medical community about telemedicine, we would like to quote Dr. Kenneth T. Baird (Bashshur, 2007), whose statements best describes the vision of telemedicine technology in its early days and is just as relevant today: "... telemedicine depends on the doctor and their specialized capabilities. It does not replace them and is not an alternative to a doctor. In fact, telemedicine increases the efficiency of the specialist and empowers them to be at the very center of medical activity". This is what Russian doctors and their patients must experience as they continue to develop telemedicine in Russian healthcare.

References

Aoki N., Dunn K., Johnson-Throop K.A., Turley J.P. (2003). Outcomes and methods in telemedicine evaluation. *Journal of Telemedicine and E-Health*, 9(4), 393–401.

Bashshur R. (2007). Telemedicine, history, challenges and transformation. In: *Presentation at the Second eHealth Congress, October*. Turkey, Antalya, 18–20.

Bashshur R.L., Shannon G.W. (2009). *History of Telemedicine: Evolution, Context, and Transformation*. New York: New Rochelle.

Bergmo T.S. (2009). Can economic evaluation in telemedicine be trusted? A systematic review of the literature. *Cost Effectiveness Resource Allocation*, 7(18). DOI: 10.1186/1478-7547-7-18

Bogdan I.V., Gurylina M.V., Chistyakova D.P. (2020). Prospects and risks of telemedicine: Survey results. In: *Sotsiologiya i obshchestvo: traditsii i innovatsii v sotsial'nom razvitii regionov: sb. dokladov VI Vserossiiskogo sotsiologicheskogo kongressa (Tyumen', 14–16 oktyabrya 2020 g.)* [Sociology and Society:

Traditions and Innovations in Social Development of Regions: Proceedings of the VI All-Russian Sociological Congress (Tyumen, October 14–16, 2020)]. Moscow: ROS; FNISTs RAN. DOI: 10.19181/kongress.2020.307 (in Russian).

Charrier N., Zarca K., Durand-Zaleski I., Calinaud C. (2016). Efficacy and cost effectiveness of telemedicine for improving access to care in the Paris region: Study protocols for eight trials. *BMC Health Service Research*, 8, 16–45. DOI: 10.1186/s12913-016-1281-1

Ekeland A.G., Grïttland A. (2015). Assessment of mast in European patient-centered telemedicine pilots. *International Journal of Technology Assessment in Health Care*, 31(5), 304–311. DOI: 10.1017/S0266462315000574

Grigor'ev A.I., Orlov O.I., Loginov V.A. et al. (2001). *Klinicheskaya telemeditsina: monografiya* [Clinical Telemedicine: Monograph]. Moscow: Slovo.

Hailey D., Roine R., Ohinmaa A. (2002). Systematic review of evidence for the benefits of telemedicine. *Journal of Telemedicine and Telecare*, 8(1), 1–30.

Halpren-Ruder D., Chang A.M., Hollander J.E., Shah A. (2019). Quality assurance in telehealth: Adherence to evidence-based indicators. *Telemedicine Journal and E-Health*, 25(7), 599–603. DOI: 10.1089/tmj.2018.0149

Hersh W.R., Hickam D.H., Severance S.M. et al. (2006). Diagnosis, access and outcomes: Update of a systematic review of telemedicine services. *Journal of Telemedicine and Telecare*, 12(1), 3–31.

Kamaev I.A., Levanov V.M., Sergeev D.V. (2001). *Telemeditsina: klinicheskie, organizatsionnye, pravovye, tekhnologicheskie, ekonomicheskie aspekty: monografiya* [Telemedicine: Clinical, Organizational, Legal, Technological, and Economic Aspects: Monograph]. Nizhny Novgorod: NGMA.

Kidholm K., Clemensen J., Caffery L.J., Smith A.C. (2017). The Model for Assessment of Telemedicine (MAST): A scoping review of empirical studies. *Journal of Telemedicine and Telecare*, 23(9), 803–813. DOI: 10.1177/1357633X17721815

Kim E.J. et al. (2019). Cardiology electronic consultation (e-consult) use by primary care providers at VA medical centres in New England. *Journal of Telemedicine and Telecare*, 25(6), 370–377. DOI: 10.1177/1357633X18774468

Kobrinskii B.A. (2016). *Telemeditsina v sisteme prakticheskogo zdravookhraneniya* [Telemedicine in the Practical Healthcare System]. Moscow: Berlin: Directmedia.

Kroshilin S.V., Medvedeva E.I., Aleksandrova O.A. et al. (2020). Analysis of professional training and demand for nursing staff in the context of modern health policy. *Ekonomika i predprinimatel'stvo= Journal of Economy and entrepreneurship,* 8(121), 1148–1161. DOI: 10.34925/EIP.2020.121.8.230 (in Russian).

Levanov V.M., Kirpicheva I.S., Yashin A.A. et al. (2014). Typical mistakes in teleconsultations. *Meditsinskii al'manakh=Medical Almanac,* 1(31), 15–18 (in Russian).

Levanov V.M., Perevedentsev O.V., Sergeev D.V. et al. (2017). Telemedicine legislation: 20 years of development. *Zhurnal telemeditsiny i elektronnogo zdravookhraneniya=Russian Journal of Telemedicine and E-Health,* 3 (in Russian).

Martin-Khan M. et al. (2011). A systematic review of studies concerning observer agreement during medical specialist diagnosis using videoconferencing. *Journal of Telemedicine and Telecare*, 17(7), 350–357.

Morozov S.P. et al. (2018). Telemedicine-based system for quality management and peer review in radiology. *Insights into Imaging*, 9(3), 337–341.

Morozov S.P., Vladzimirskii A.V., Simenyura S.S. (2020). The quality of primary direct-to-consumer telemedicine consultations (by results of testing telemedicine services). *Vrach i informatsionnye tekhnologii=Information technologies for the Physician,* 1, 51–62 (in Russian).

Resneck J.S. Jr., Abrouk M., Steuer M. et al. (2016). Choice, transparency, coordination, and quality among direct-to-consumer telemedicine websites and apps treating skin disease. *JAMA Dermatology*, 152(7), 68–75. DOI: 10.1001/jamadermatol.2016.1774

Shi Z., Mehrotra A., Gidengil C.A. et al. (2018). Quality of care for acute respiratory infections during direct-to-consumer telemedicine visits for adults. *Health Affairs (Millwood)*, 37(12), 20–23. DOI: 10.1377/hlthaff.2018.05091

Stolbov A.P. (2015). About the definition and classification of telemedicine services. *Vrach i informatsionnye tekhnologii=Information technologies for the Physician,* 2, 12–27 (in Russian).

Taylor P. (2005). Evaluating telemedicine systems and services. *Journal of Telemedicine and Telecare*, 1, 167–177.

Vladzimirskii A.V. (2015). The first 150 years of a telemedicine history. *Zhurnal mezhdunarodnogo obshchestva telemeditsiny i elektronnogo zdravookhraneniya – Rossiya=Russian Journal of Telemedicine and E-Health,* 1(1), 10–16 (in Russian).

Vladzimirskii A.V. (2017). Patient initiated direct-to-consumer telemedicine consultations: First step for a methodology systematization. *Zhurnal telemeditsiny i elektronnogo zdravookhraneniya=Russian Journal of Telemedicine and E-Health,* 2, 109–120 (in Russian).

Vladzimirskii A.V. (2019). *Istoriya telemeditsiny: stoya na plechakh gigantov (1850–1979)* [History of Telemedicine: Standing on the Shoulders of Giants (1850–1979)]. Moscow: De`Libri.

Vladzimirskii A.V. (2020). Matrix for direct-to-consumer telemedicine quality assessing. *Zhurnal telemeditsiny i elektronnogo zdravookhraneniya=Russian Journal of Telemedicine and E-Health,* 6(4), 34–44. DOI: https://doi.org/10.29188/2542-2413-2020-6-4-34-44 (in Russian).

Vladzimirskii A.V., Lebedev G.S. (2018). *Telemeditsina: monografiya* [Telemedicine: Monograph]. Moscow: GEOTAR-Media.

Vladzimirskii A.V., Morozov S.P., Urvantseva I.A. et al. (2019). *Primenenie telemeditsinskikh tekhnologii v kardiologii* [Telemedicine in Cardiology]. Surgut: SurGU.

Vladzimirskii A.V., Morozov S.P., Simenyura S.S. (2020). Telemedicine and COVID-19: Quality of patient-initiated teleconsultations in case of acute respiratory disease. *Vrach i informatsionnye tekhnologii=Information Technologies for the Physician,* 2, 52–63. DOI: 10.37690/1811-0193-2020-2-52-63 (in Russian).

Volynskii Yu.D. (1999). Telemedicine is part of the information society. *Informatsionnoe obshchestvo=Information Society,* 5, 15–21 (in Russian).

Voskolovich N.A. (2021). *Ekonomika platnykh uslug* [Economics of Paid Services]. Moscow: Yurait.

Weinstein R.S. et al. (2018). Clinical examination component of telemedicine, telehealth, mhealth, and connected health medical practices. *Medical Clinics of North America*, 102(3), 533–544.

Wootton R., Vladzymyrskyy A., Zolfo M., Bonnardot L. (2011). Experience with low-cost telemedicine in three different settings. Recommendations based on a proposed framework for network performance evaluation. *Global Health Action*, 4. DOI: 10.3402/gha.v4i0.7214

Yarasheva A.V., Aleksandrova O.A., Medvedeva E.I. (2020). Problems and prospects of personnel support of the Moscow healthcare system. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz=Economic and Social Changes: Facts, Trends, Forecast,* 13(1), 174–190. DOI: 10.15838/esc.2020.1.67.10 (in Russian).

Zheleznyakova I.A., Khelisupali T.A., Omel'yanovskii V.V. et al. (2020). Application of foreign experience of telemedicine services in the Russian Federation. *Meditsinskie tekhnologii. Otsenka i vybor=Medical Technologies. Assessment and Choice,* 2, 26–34. DOI: https://doi.org/10.17116/medtech20204002126 (in Russian).

Zingerman B.V., Shklovskii-Kordi N.E., Vorob'ev A.I. (2017). About telemedicine "Patient to Doctor". *Vrach i informatsionnye tekhnologii=Information Technologies for the Physician,* 61–79 (in Russian).

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Identifying the Dynamics of Changes in Russia's Human Potential in the Context of the Experience of Eurasian Integration

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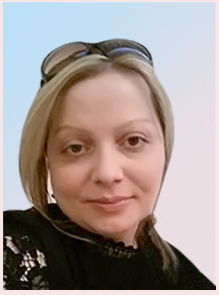

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Abstract. The problem of identifying the dynamics of changes in the human potential of the Eurasian Economic Union is in the focus of attention of the EAEU member states; each of them takes its own measures against economic and political risks and threats on the way toward ensuring national demographic security. Russia has formulated and operates its own systems for assessing and monitoring demographic security. However, due to the complex nature of the problem of ensuring the demographic security of the EAEU countries, it must be considered and solved through the implementation of state programs not only within the country, but also within the framework of the Eurasian Economic Union as a whole. Our aim is to identify negative trends in demographic development in all post-Soviet countries during the collapse of the USSR, which led to a decrease in human potential in Russia and other EAEU countries, and to substantiate the system of indicators and indices of demographic security in the context

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of Eurasian integration. We consider the resource opportunities that the EAEU countries obtain due to the functioning of a single integration association, and provide the overview of trends, problems and contradictions of integration processes. Based on the comparative analysis of the demographic situation in the EAEU member states, we can talk about the general indicators of crisis changes: a decrease in the birth rate, an increase in mortality, increased mobility of the population, although each country in these years was characterized by its own special dominants reflecting the demographic situation. Our systematic measurements of the dynamics of changes in Russia's human potential in the context of integration processes, based on the idea of an empirical model of integration, planning and forecasting within the framework of the Eurasian Economic Union, allowed us to identify quantitative and qualitative signs of the functioning of the demographic development of the EAEU countries and develop a number of significant recommendations. The results of the study can be used in the development of the state policy of Russia and the EAEU countries in the field of ensuring the stability of demographic security in the conditions of integration.

Key words: globalization, demographic security, Eurasian integration, human development index, international cooperation, migration, population, fertility and mortality, human potential, human capital.

Introduction

Population of the Eurasian Economic Union (hereinafter referred to as the EAEU) is its real strategic resource. Eurasian integration, of course, has achieved serious success and continues developing, but in this regard, it is of scientific and practical interest to identify the dynamics of changes in the EAEU human potential in the context of integration. The integration goals of the EAEU require increasing its human potential due to fertility, mortality and migration, and ensuring demographic security.

The existing experience of the EAEU functioning in the conditions of the global economic crisis has shown the importance of taking joint measures, as well as expanding integration cooperation. However, the EAEU development is constrained by both external and internal factors (Osadchaya, 2021, p. 9). Integration processes can be represented by a variety of social signs and expressed by systems of indicators: economic, political, socio-cultural and social, resource, procedural and performance. If we record the achievements of Eurasian integration, then among them we can note the creation of a single customs space, providing citizens of the EAEU member states with opportunities for a comfortable common labor market (Vartanova, 2021).

Taking into account the accumulated experience of defining the category, we believe that in the context of integration processes and new globalization challenges, the human potential of the EAEU is "a set of quantitative and qualitative indicators of the population that fundamentally affect the achievement of the Eurasian integration goals characterizing the ability to ensure the sustainable development of the Union and well-being, ensuring demographic security, preventing threats in accordance with the national demographic interests of each member country of the Union" (Osadchaya, 2019).

In order to identify the dynamics of changes in the EAEU human potential in the context of integration, we have conducted a survey of experts representing the scientific community, Eurasian associations and organizations. The survey was attended by 50 experts from member countries

and candidates for membership in the Eurasian Economic Union. The first set of questions was devoted to the general assessment of integration processes within the EAEU. In accordance with the purpose of the research, we have set the following tasks:

1) to give a sociological characteristic of the success of the integration processes of the member states and candidates for membership in the EAEU;

2) to assess the dynamics of human potential changes in the context of Eurasian integration;

3) to invite the EAEU regulators to develop recommendations for conducting more in-depth studies of human potential changes of the EAEU countries in the context of integration and new globalization challenges.

Structurally, the expert interview guide included three main blocks of questions. For instance, when assessing the dynamics of human potential changes (Osadchaya, Vartanova, 2021), we have noted that each of the states has its own special structure for regulating the processes of demographic development reflecting the features of the country's political structure.

When analyzing the success of integration processes (Osadchaya, 2021), most experts pointed to the low pace of the integration process. According to experts, the EAEU has turned into a successful integration association demonstrating an attractive model of cooperation based on the principle of voluntariness. However, imbalances persist in it; integration compromises are not easily achieved. Demographic policy as an integral part of the state policy of the CIS states was based on the principles and norms of international law and international treaties (Osadchaya, 2019).

Literature review

Many aspects of the problem under consideration are reflected in the works of scientists of the Institute for Demographic Research FCTAS RAS (IDR FCTAS RAS). Theoretical and empirical prerequisites for the development of studying the dynamics of human potential changes in the EAEU member states were discussed in the works of S.V. Ryazantsev, L.L. Rybakovsky, V.V. Kirpichev, A.G. Luchkin, G.I. Osadchaya, M.L. Vartanova, E.P. Sigareva, V.T. Sakaev, A.V. Topilin, A.G. Zlotnikov, A.K. Smalyugi, A.I. Kuzmin, etc. The main part of the analyzed sources is based on the data of the Eurasian Economic Commission for the previous five years.

A significant contribution to the research development was made by the works of the authors' team of the Department for the Study of Socio-Demographic Processes of IDR FCTAS RAS (Osadchaya, Vartanova, 2021; Osadchaya et al., 2020; Osadchaya et al., 2022).

These works sufficiently cover the issues of studying human potential of the EAEU member states. However, the problem associated with the formation of a political state mechanism for ensuring demographic security in the context of international Eurasian cooperation has not yet been sufficiently studied; its relevance and vastness have predetermined the choice of the research topic, its goals and objectives.

The information base of the work is the Internet resources of the Eurasian Economic Commission (EEC), and state statistics bodies of the EAEU member states. The article takes into account the statistics of the EEC of the EAEU and the Central Banks of the EAEU member states, conducted a review of studies of regulatory documents and modern foreign sources. In the course of their scientific generalization, we have given an assessment of the effectiveness of the demographic policy of the CIS countries with sufficient justification, and identified the most priority directions of the demographic policy of the Russian Federation.

Methodology and method

The relevance of the work provides a basis for developing a scientifically based approach to identifying the dynamics of human potential

changes of the EAEU in the context of integration of the participating countries.

As part of the research preparation, we have used mainly general scientific methods of cognition within the framework of historical, logical analysis of international human rights documents in ensuring gender equality in family relations and demographic situation of the EAEU member states and migration processes of the CIS countries in the context of globalization (Zenchenko, Vartanova, 2013), synthesis, modeling of historical situations, analogies with modernity.

In the process of data processing, studying the accumulated material, we have used the following methods: monographic (research of the works of foreign scientists on the problem of food security); economic and statistical (analysis of the demographic situation in the EAEU member states, the level of spending of the state budget on healthcare); abstract-logical (substantiation of the relationship of indicators on the number of births and life expectancy) with general economic indicators of natural population movement in the EAEU member states); expert assessment (identification of priority measures to ensure demographic security).

For the purpose of qualitative analysis, we have used the following methods of data collection and processing:

– data collation;

– collecting data from open official sources (EEC data);

– comparison data analysis;

– integration of the data obtained, facts discovered and trends identified in the EEC countries.

The use of methodological tools in the study has made it possible to enrich the scientific apparatus for solving problems of ensuring demographic security, the development of various aspects of human potential in the context of integration.

Features of demographic policy of the CIS countries in the period of socio-economic transformation

Following the results of the first decade of the formation of independent states, it is difficult to talk about the effectiveness of the state demographic policy, since at that time only a legal framework was being created in all sectors of the economy, politics and finance.

Assessing the effectiveness of Russia's demographic policy in the 1990s, we can say that, despite the measures taken, in general, it was impossible to overcome the natural decline, primarily due to unresolved socio-economic problems. The Russian Federation was one of the first post-Soviet countries to return demographic development issues to the Government's agenda (Rybakovsky, 2003). The focus was on two problems: depopulation and intensification of migration flows from post-Soviet countries to Russia.

Problem 1. The negative changes, accumulated in 1989–1991 in the demographic development of the country, were fully manifested in 1992–1995. The demographic crisis has taken a critical form. In 1999, a decrease in the population was observed in 82 out of 89 entities of the Russian Federation. In 1993, the "Concept of State Family Policy" was adopted. Presidential Decree 1696, dated August 18, 1994 approved the Federal program "Children of Russia"[1], which operated from 1994 to 2010. Its main goal was to provide social guarantees for children, their access to education and healthcare.

Living standards decline of all social groups contributed to the creation in 1999 of a new Federal Program "On State Social Assistance" (Federal Law 178, dated July 17, 1999) which extended special assistance programs to large and poor families.

[1] Federal Program "Children of Russia": RF Presidential Decree 1696, dated August 18, 1994. Available at: http://www.kremlin.ru/acts/bank/6826 (accessed: February 20, 2022).

CIS countries also took measures. For example, in order to further improve the demographic situation, the Development Concept "Azerbaijan 2020: Look into the future" was formed by the Presidential Decree of Azerbaijan 186, dated November 29, 2009. The problems of demographic development of Armenia (Eganyan, 2000) in these years were regulated by the Constitution of the Republic of Armenia, adopted in 1995, but it was quite difficult to overcome the negative trends of the 1990s in the demographic development of the country[2]. In 2000, the Government of Kazakhstan approved the Concept of the State Demographic Policy of the Republic of Kazakhstan[3]. Experts assess the results of Kazakhstan's demographic policy as positive contributing to preventing the process of depopulation and demographic crisis in the future (Mansurov, 2014). The demographic situation in Kyrgyzstan in the 1990s remained difficult, high infant and maternal mortality remained, the demographic processes in the country were influenced by a sharp increase in the poverty level. As a result, the Concept of the State Demographic and Migration Policy of the Kyrgyz Republic was adopted[4].

The Republic of Moldova was no exception in this regard in the post-Soviet space in the 1990s. Experts name two of the most pronounced problems for this country: low birth rate and mass departure of citizens abroad. Strategic priorities in the field of demography were formulated in the Constitution of the Republic of Moldova of 1994.

The Concept of State Support of the Family was a key tool for the implementation of the Concept of Demographic Development of Ukraine. In Tajikistan, the main documents regulating demographic policy until 2003 were the Constitution of the Republic of Tajikistan, adopted in 1994, and the Family Code of the Republic of Tajikistan, dated November 13, 1998 which regulates issues of family, marriage, motherhood, fatherhood and childhood. In the 1990s, Uzbekistan remained a state with a growing population, characterized by a high migration outflow of Russians, Ukrainians, Crimean Tatars, and Germans to their historical homeland and high labor migration. In order to regulate the demographic situation, the country's leadership focused on supporting the family.

Turkmenistan belongs to the countries with rapid population growth. For instance, the growth rate in the 1990s was 1.6% annually, but a sharp deterioration in the social situation, unemployment, as a consequence – a drop in the level and quality of life, led to mass migration (Vorob'eva, Topilin, 2019). Demographic issues in the state in the 2000s were regulated by the Law of Turkmenistan "On Migration", etc.

Problem 2. The beginning of the 1990s was characterized by the implementation of the Federal Program "Migration" which operated from 1993 to 2001 helping the arriving forced migrants and their families to find home. Similar programs have been adopted in other CIS countries: for example, in Georgia it was for the socio-economic support of forced migrants, displaced persons, Meskhetin Turks and refugees from South Ossetia and Abkhazia; in Azerbaijan – for the settlement of refugees from Nagorno-Karabakh (Glushkova, Khoreva, 2014); in Armenia – victims of the Spitak earthquake and refugees from Azerbaijan and Nagorno-Karabakh, in Ukraine – for internally displaced persons; in Moldova – for residents of the Transnistrian region; the program "On compensation for lost housing" for forced migrants during the fighting in Chechnya in 1994–2001.

[2] National Security Strategy of the Republic of Armenia – 2020. Available at: http://parliament-wa.info/ru/archives/14344 (accessed: September 08, 2020).

[3] The State Demographic Policy Concept of the Republic of Kazakhstan: Government Resolution of the Republic of Kazakhstan 127, dated August 17, 2000. Available at: https://adilet.zan.kz/rus/docs/P000001272 (accessed: February 21, 2022).

[4] The concept of the State demographic and migration policy of the Kyrgyz Republic: Presidential Decree of the Kyrgyz Republic 102, dated April 28, 2000. Available at: http://continent-online.com/document/?doc_id=30251138 (accessed: February 21, 2022).

Describing Russia's demographic policy in the 1990s, it is necessary to mention three important normative documents of programmatic importance: the Concept of National Security of the Russian Federation, approved by Presidential Decree 1300, dated December 17, 1997, the Concept of National Security of the Russian Federation, approved by the President Decree 24, dated January 10, 2000, as well as the Concept of Demographic adopted in 2001 in which population policy is considered as a key element of political activity in the field of national security.

By the mid-2000s, internal conditions had been created in the CIS countries to assess the path of independence passed over the years of reforms and reflection on the features of the demographic situation (Molodikova, Nozdrina, 1998). Each of the states has its own structure for regulating the demographic development processes (Rybakovsky, 2019) reflecting the characteristics of the political system.

As the study of the features of Russia's demographic policy during the period of socio-economic transformation showed, almost every country was characterized by its own types of problems. Depopulation has emerged in Russia, Belarus and Ukraine (Zlotnikov, Smalyuga, 2017). For Armenia, Georgia, Moldova, with the relative stability of the population, the migration outflow has become a problem. In Azerbaijan, Kyrgyzstan, Tajikistan, Uzbekistan, due to the increase in the number of working-age population, a labor surplus has formed; problems have arisen related to migration, changes in the gender and age structure.

In such a situation, the governments of the CIS countries and the Russian Federation have intensified work on the formation of demographic policy focusing it on maintaining the current demographic growth (Topilin, 2018), the main demographic needs and regulation of migration processes.

In 2019, the Russian Federation approved the national project "Demography", which includes five federal projects: "Financial support for families at the birth of children"; "Employment promotion"; "Elder generation"; "Strengthening public health"; "Sport is the norm of life", as well as the Decree "On national goals for the development of Russia until 2030"[5].

The features of demographic processes and problems in each of the post-Soviet countries are manifested in all areas of demographic policy: a set of measures of state or public programs, the development of laws, special regulatory documents, measures to form a positive attitude in society, programs are being implemented to promote family values and create favorable conditions for large families (Ryazantsev et al., 2017), moreover, special attention is paid to their implementation at the regional level, the system of measures to fulfill the tasks of demographic policy is being clarified.

Comparative analysis of Russia's demographic situation in the context of Eurasian integration

Currently, there is a real contradiction between the need to increase Russia's human potential as part of the Eurasian Economic Union, strengthening the positive impact of Eurasian integration on it, and the real state of the demographic situation in the CIS countries and the EAEU member states (*Tab. 1*).

Regional conventions specify general provisions taking into account the traditions of continents and countries. We should note that the experts of the EAEU states regularly analyze the implementation of this concept. Time intervals of changes in the ranking of countries on the Human Development Index (HDI) for 1990–2000, 2000–2010, 2010–2018 and 1990–2018. They allow revealing the dynamics of social support by the population of

[5] Available at: http://publication.pravo.gov.ru/Document/View/0001202007210012 (accessed: May, 25, 2021).

Table 1. Indicators of natural population movement in the EAEU member states, people

	2014	2015	2016	2017	2018	2019
Armenia						
Number of births	43,031	41,763	43,031	41,763	43,031	41,763
Number of deaths	27,714	27,878	28,226	27,157	25,751	26,200
Natural population growth (+), decline (-)	15,317	13,885	12,366	10,543	10,823	9,900
Belarus						
Number of births	118,534	119,028	117,779	102,556	94,042	87,800
Number of deaths	121,542	120,026	119,379	119,311	120,053	120,900
Natural population growth (+), decline (-)	-3,008	-998	-1,600	-16,755	-26,011	-33,100
Kazakhstan						
Number of births	399,309	398,458	400,694	390,262	397,799	403,100
Number of deaths	132,287	130,811	131,231	129,009	130,448	133,500
Natural population growth (+), decline (-)	267,022	267,647	269,463	261,253	267,351	269.6
Kyrgyzstan						
Number of births	161,813	163,452	158,160	153,620	171,149	173,500
Number of deaths	35,564	34,808	33,475	33,166	32,989	33,300
Natural population growth (+), decline (-)	126,249	128,644	124,685	120,454	138,160	140,200
Russia						
Number of births	1,942683	1,940579	1,888729	1,690307	1,604344	1,484500
Number of deaths	1,912347	1,908541	1,891015	1,826125	1,828910	1,800700
Natural population growth (+), decline (-)	30,336	32,038	-2,286	-135,818	-224,566	-316,200
Eurasian Economic Union						
Number of births	2,665370	2,663280	2,605954	2,374445	2,303908	2,185000
Number of deaths	2,229454	2,222064	2,203326	2,134768	2,138151	2,114600
Natural population growth (+), decline (-)	435,916	441,216	402,628	239,677	165,757	70,400

Source: ECE. Statistics. Available at: http://www.eurasiancommission.org/ru/act/integr_i_makroec/dep_stat/econstat/Pages/express_demography.aspx (accessed: September 04, 2020).

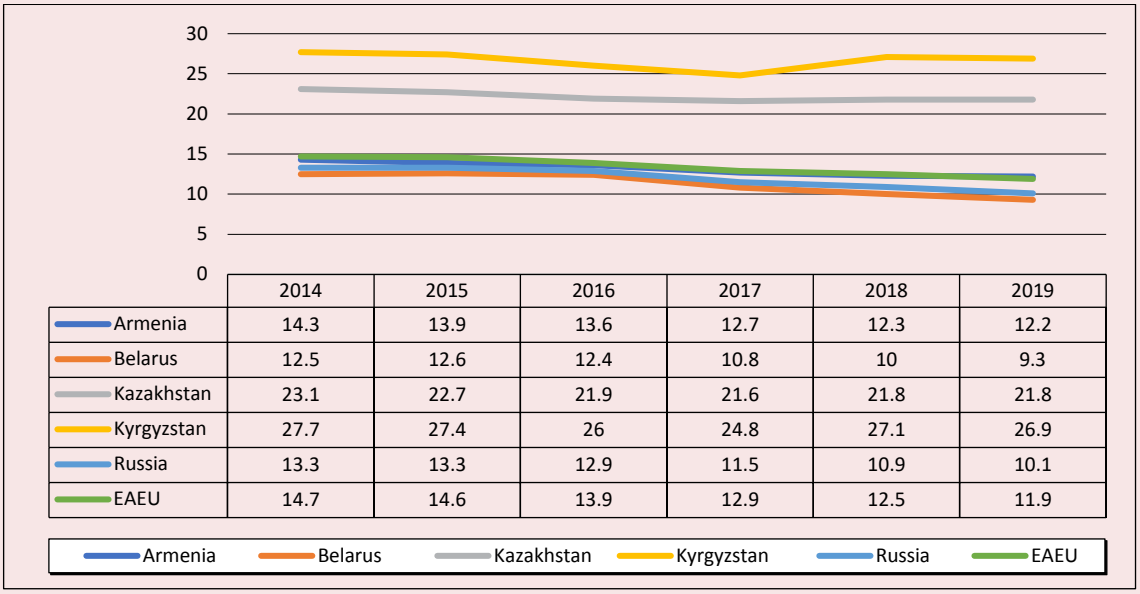
integration processes in the EAEU countries (Kuur, 2020) in 2014–2018, to characterize the factors of reducing the social base of the EAEU, as well as to substantiate the main directions, practices and tools for expanding social support for integration. For example, the Convention on Maternity Protection (no. 3) of 1919, the Convention on Maternity Protection (no. 103, revised) of 1952, Recommendation no. 95 on Maternity Protection of 1952 are taken into account. The countries also signed the Convention on the Status of Refugees (1951) and it's Protocol (1967).

One of the most important characteristics of human potential is public health which is concentrated in the indicator "life expectancy", since it is determined by a variety of factors: climatic conditions, living conditions and living standards, environmental factors, effectiveness of the system.

As part of strengthening the economic integration and the emergence of new globalization challenges, Eurasian migration processes face numerous critical challenges. The presented data allow estimating the number of births in the EAEU countries per 1000 people in January – December from 2014 to 2019 (*Fig. 1*).

Although life expectancy in Russia has increased annually since 2005 compared to the EAEU member states by 0.7% and amounted to more than 71 years in 2018 (*Tab. 2*), and in 2019, according to the Russian Ministry of Health, and up to 73.7 years, in 2020 it again decreased to 71.5. At the same time, life expectancy indicators in the EAEU countries are much lower than in the developed countries of the world (Popov, Kalachikova, 2015). According to the EEC, the EAEU member states in the ranking of life expectancy among 190 countries of the world since 2018 are in the corridor from 82 to 127 places, while the first places are occupied by Hong Kong (84.1 years), Japan (83.9), Switzerland (83.5), Spain (83.3), and Italy (83.2).

Figure 1. Number of births in the EAEU countries per 1,000 people in January – December from 2014 to 2019



	2014	2015	2016	2017	2018	2019
Armenia	14.3	13.9	13.6	12.7	12.3	12.2
Belarus	12.5	12.6	12.4	10.8	10	9.3
Kazakhstan	23.1	22.7	21.9	21.6	21.8	21.8
Kyrgyzstan	27.7	27.4	26	24.8	27.1	26.9
Russia	13.3	13.3	12.9	11.5	10.9	10.1
EAEU	14.7	14.6	13.9	12.9	12.5	11.9

According to: *The Eurasian Economic Union (2020): Brief Statistical Collection*. ECE. Moscow.

Table 2. Life expectancy of the EAEU member states, years

Country	2015		2018	
	Life expectancy	Rating	Life expectancy	Rating
Armenia	74.7	74	74.8	82
Belarus	71.3	108	73.1	104
Kazakhstan	69.4	123	70.0	127
Kyrgyzstan	70.6	113	71.1	118
Russia	70.1	116	71.2	116

According to: *The Eurasian Economic Union (2020): Brief Statistical Collection*. ECE. Moscow.

Table 3. Government spending on healthcare in the EAEU countries (2014–2016), % of GDP

Country	2014	2016
Armenia	4.5	9.9
Belarus	5.7	6.3
Kazakhstan	4.36	3.5
Kyrgyzstan	6.7	6.6
Russia	7.07	5.3

According to: *The Eurasian Economic Union (2020): Brief Statistical Collection*. ECE. Moscow.

The reserve for improving the indicator is to increase healthcare spending (*Tab. 3*). In countries with a very high human development level, healthcare spending averages 12.2% of GDP (total healthcare spending as % of GDP in 2016: USA – 17.1%, Switzerland – 12.2%, France – 11.5%; and Germany – 11.1%).

Thus, we believe that the formation and development of healthcare system will contribute to strengthening public health, ensuring safety and quality of socially important goods for people's life and health, and environmental protection.

The human capital dynamics in the EAEU member states has shown positive growth in recent years. According to the results of Bloomberg study, conducted in 2016, Kazakhstan ranked 45th out of 55 countries, Belarus – 48th, and Russia was on the last – 55th. The development of human resources is connected with the use of opportunities provided by the Eurasian Union. For instance, the human development index for 2010–2017 increased in Armenia, Kazakhstan, Kyrgyzstan, Russia and retained its value in Belarus. It is worth noting that all states, except Kyrgyzstan, are included, according to the UN methodology, in the group of countries with a high HDI level, Kyrgyzstan – with an average level.

However, today the idea of Eurasian integration has not penetrated deeply into the consciousness of people. For example, only 2% of Russian citizens identify themselves with the EAEU, 8.2% – Armenia, 5.5% – Kyrgyzstan, 1.8% – Kazakhstan. However, among visitors from Belarus, 17.3% identify themselves with the Eurasian Union which can be explained by some inertia associated with the non-differentiation of the union state of Russia and Belarus (Sechko, Taranova, 2011), created in 1999, and the EAEU.

Describing human potential dynamics which the EAEU countries need to build for the consolidation of integration processes, we can identify the following areas.

1. Building the dynamics of human potential changes on the basis of socio-cultural and educational exchanges.

2. One of the key tools in the implementation of the human development index is the formation of communicative space in the information environment, work in this direction in a form understandable to young people. But the most important thing, probably, is not to forget that the modern information environment requires filling with these common historical narratives, common meanings, let them be actualized in modern forms and adapted specifically for the perception of citizens of the EAEU member states.

3. It is necessary to build demographic policy (Sakaev, 2017) with the setting of goals and objectives of a joint long- and medium-term strategy for the human potential development of the EAEU member states.

In the final ranking, all states are ranked on the HDI basis and fall into one of four categories:

– countries with very high HDI level;
– countries with high HDI level;
– countries with average HDI level;
– countries with low HDI level.

As mechanisms for using new methods that would contribute to maintaining the human development index of the EAEU member states (Castle, Cora, 2016, p. 278) and broadcast positive images of integration in the face of new globalization challenges, experts indicate the following:

1) creation of centers for generating positive network information

2) development of quantitative and qualitative indicators of the dynamics of human potential changes in the context of new globalization challenges;

3) systematic monitoring of human potential dynamics with identification and analysis of migration processes in the post-Soviet space.

The main areas that experts consider to be priorities for studying changes in human potential dynamics in the context of Eurasian integration are the following:

1) informing population of the EAEU states about the benefits of Eurasian integration both at the country level as a whole and at the global level;

2) formation of common information field within the information space of "new media" (Osadchaya, 2019) in order to position the positive aspects of integration;

3) development of methodology on quantitative and qualitative characteristics of all aspects of the human development index;

4) creating an index for assessing the human potential of memory policy in the EAEU countries;

5) formation of common Eurasian idea in the context of new globalization challenges.

Results

The main theoretical and practical idea of the human potential development in the context of the experience of Eurasian integration is the possibility of the EAEU member states forming their own state policy, making decisions in each territory taking into account the indicators of fertility, mortality and migration, ensuring national demographic security (Maksimova et al., 2020), local traditions, features, and interests of the population. At the same time, the effectiveness of resolving issues today is largely determined by the interaction degree at the interstate level.

In the long- and medium-term strategy of building the human potential of the EAEU member states, it seems important to provide:

1) mortality reduction, especially the high mortality of working-age men from external causes;

2) preserving and strengthening public health, increasing the role of disease prevention healthy lifestyle formation;

3) regulation of applied scientific and epidemiological studies to substantiate the improvement of Russia's legislation and the methodological base;

4) development of the family support system in the case of children's birth and upbringing;

5) phased elimination of workplaces with harmful or dangerous working conditions for the reproductive public health;

6) management of migration processes in order to reduce the shortage of labor resources in accordance with the economic needs;

7) optimization of migration processes in connection with the formation of common labor market within the framework of integration processes in the Eurasian space;

8) ensuring protection against natural and man-made emergencies.

We have identified the dynamics of human potential changes of the EAEU countries in the context of integration contributes to the development of a number of recommendations:

– to develop social integration, aimed at interstate cooperation, gradually transforming it toward unification based on the civil society principles;

– to promote the development of not only youth non-governmental non-profit organizations, but also those whose main founders, managers, employees, participants and volunteers are mainly

elderly people, since the world's population is gradually "aging" and public opinion will largely be formed by representatives of older generations;

– to initiate cooperation of national non-governmental non-profit organizations registered and operating in individual countries and which have defined their mission as the development of science, in order to monitor public sentiment and formulate scientifically sound conclusions within the framework of the social integration of the EAEU countries;

– to provide organizational support to international and national non-governmental non-profit organizations whose activities include the implementation of joint online and offline activities in the fields of history, culture, social work, public health, education in order to combine efforts to implement social integration based on historical memory;

– to initiate the creation of network educational programs of journalism training areas in the field of Eurasian integration issues, with the involvement of information, material, technical, intellectual resources of educational institutions, non-governmental non-profit organizations, research centers including the Institute for Demographic Research of RAS;

– to make a proposal to the Presidential Grants Fund for NGOs (Russian Federation) together with grant-givers and charitable foundations operating in the EAEU member states to organize a one-time international targeted competition (in 2022), aimed at developing new ideas in the field of social integration.

Conclusion

The Eurasian Economic Union has the status of an international non-governmental organization. An analysis of the work of a number of EAEU experts (Goldstone, 2002) and the scientists' works in the field of global trends (Nichiporuk, 2000) shows that international interactions are increasingly initiated and implemented with the organizational and coordinating role of international non-governmental structures. The integration function in the sphere of politics, economics, culture, social work is moving from state structures to public ones (Yakovets, Soluttsev, 2016). And, judging by the analytical data, this trend will only intensify.

As a result, we recommend conducting more in-depth studies of the EAEU human potential in the context of integration and new globalization challenges. It is also possible that if more disaggregated data had been used, the result would have been different. These are topics for future research. Since the issue of human potential changes in the EAEU conditions has not been sufficiently studied, we believe that work in this direction will be an invaluable find for researchers, analysts, practitioners in the field of international relations and the world economy, as well as for a wide range of readers interested in political problems of international relations and global development. We expect that the developed proposals will update the state policy in the field of national demographic security and activate the issues of demographic policy of the member countries of the Eurasian Economic Union in the context of integration.

References

Castle A., Cora M.D. (2016). *Regional Economic Integration and Globalization*. Scotts Valley: Create Space Independent Publishing Platform.

Eganyan R. (2000). Demographic realities and prospects of the Republic of Armenia on the threshold of the 21st century. In: Iontsev V.A. (Ed.). *Mezhdunarodnaya migratsiya naseleniya: Rossiya i sovremennyi mir* [International Population Migration: Russia and Modern World]. Moscow: MAKS Press (in Russian).

Glushkova V.G., Khoreva O.B. (2014). The demographic security of Russia and its regions: Problems and solutions. *Gumanitarnye nauki. Vestnik finansovogo universiteta=Humanities and Social Sciences. Bulletin of the Financial University*, 3, 14–25 (in Russian).

Goldstone J.A. (2002). Population and security: How demographic change can lead to violent. *Journal of International Affairs,* 56(1), 3–22.

Kuur O.V. (2020). Assessment of the effectiveness of the integrative development of the EAEU status participants: Financial and economic aspect. *Fundamental'nye issledovaniya=Fundamental Research*, 5, 105–111 (in Russian).

Maksimova A.S., Ryazantsev S.V., Lukyanets A.S., Moiseeva E.M. (2020). Methodological bases for assessing sociodemographic and migration consequences of man-made disasters. *Amazonia Investiga,* 9(29), 213–223.

Mansurov T. (2014). *Evraziiskii proekt Nursultana Nazarbaeva, voploshchennyi v zhizn'. K 20-letiyu evraziiskogo proekta* [The Eurasian Implemented Project of Nursultan Nazarbayev. To the 20th Anniversary of the Eurasian Project]. Moscow.

Molodikova I.N., Nozdrina N.N. (1998). Migration flows to Russia and their impact on the territorial distribution of the population. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 6, 121–133 (in Russian).

Nichiporuk B. (2000). *The Security Dynamics of Demographic Factors.* Washington, D.C.: RAND.

Osadchaya G.I. (2019). Socio-demographic aspects of integration processes in the Eurasian Economic Union. In: *Stanovlenie Evraziiskogo ekonomicheskogo soyuza: idei, real'nost', potentsial* [Formation of the Eurasian Economic Union: Ideas, Reality, Potential]. Moscow: Ekon-Inform (in Russian).

Osadchaya G.I. (2021). *Evraziiskii ekonomicheskii soyuz: potentsial razvitiya, format sotrudnichestva* [Eurasian Economic Union: Development Potential, Cooperation Format]. Moscow: Ekon-Inform.

Osadchaya G.I., Vartanova M.L. (2021). Demographic security and trends in migration processes in the Eurasian Economic Union during the Covid-19 pandemic. *Voprosy upravleniya=Management Issues*, 1(68), 62–74 (in Russian).

Popov A.V., Kalachikova O.N. (2015). Integral Indices in evaluating the demographic security of areas. *Natsional'nye interesy: prioritety i bezopasnost'=National Interests: Priorities and Security*, 46, 56–66 (in Russian).

Ryazantsev S.V., Ter-Akopov A.A., Pis'mennaya E.E., Khramova M.N. (2017). Scenarios for the development of the migration situation in the EAEU in the context of strengthening economic integration. *Analiticheskii vestnik=Analytical Bulletin*, 19(676), 8–18 (in Russian).

Rybakovsky L.L. (2003). Demographic security. *Zhurnal lichnoi, natsional'noi i kollektivnoi bezopasnosti=Journal of Personal, National and Collective Security*, 3, 124–156 (in Russian).

Rybakovsky O.L., Tayunova O.A. (2019). Demographic potential: From the history of the concept. *Narodonaselenie=Population*, 2, 17–25 (in Russian).

Sakaev V.T. (2017). Eurasian Economic Union: The aspects of political demography. *Izvestiya Ural'skogo federal'nogo universiteta. Ser. 3: Obshchestvennye nauki=Tempus et Memoria*, 12, 2(164), 141–153 (in Russian).

Sechko N.N., Taranova E.V. (2011). The demographic policy of Belarus and Russia in the context of the improvement of life quality of the population. *Sotsiologicheskii al'manakh IS NAN Belarusi=Sociological Almanac of the Institute of Sociology the National Academy of Sciences of Belarus*, 182–191 (in Russian).

Topilin A.V. (2018). The impact of migration on demographic growth and the birth rate in the Russian regions. *Nauka. Kul'tura. Obshchestvo=Science. Culture. Society*, 4, 59–66 (in Russian).

Vartanova M.L. (2021). National priorities and prospects for the development of the Eurasian Economic Integration. In: Fomin E.V. (Ed.). *Ekonomika i pravo: monografiya* [Economics in Law: Monograph]. Cheboksary: Sreda (in Russian).

Vorob'eva O.D., Topilin A.V. (2019). Migration growth of the Russian population: Statistical and real. In: Ryazantsev S.V., Rostovskaya T.K. (Eds.). *Natsional'nye demograficheskie prioritety: novye podkhody, tendentsii. Ser. "Demografiya. Sotsiologiya. Ekonomika"* [National Demographic Priorities: New Approaches, Trends. Series "Demography. Sociology. Economy"]. Moscow (in Russian).

Yakovets Yu., Rastvortsev E. (2016). On the system of sustainable development goals and strategies of the Eurasian Economic Union. *Ekonomicheskie strategii=Economic Strategies*, 7(141), 6–21 (in Russian).

Zenchenko S.V., Vartanova M.L. (2013). Analysis of trends in international labor migration flows in the context of world global processes. *Regional'nye problemy preobrazovaniya ekonomiki=Regional Problems of Economic Transformation*, 1(35), 47–58 (in Russian).

Zlotnikov A.G., Smalyuga A.K. (2017). Belarusian migration in the Eurasian reflection. In: *Demograficheskii potentsial stran EAES: VIII Ural'skii demograficheskii forum: Mezhdunarodnaya nauchnaya konferentsiya: sb. Stat. Tom 2* [Demographic Potential of the EAEU Countries: 8th Ural Demographic Forum: International Scientific Conference: Collection of Articles. Volume 2]. Yekaterinburg (in Russian).

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A Comparison of Innovation Strategies of Regional Development Agencies in Turkey

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Abstract. This paper aims to assess the regional innovation system of Turkey by comparing regional innovation strategies developed by regional development agencies. Focusing on the specific regional innovation strategy documents and addressing first, reports, researches and publications on the official websites of the agencies, and next, the in-depth interviews conducted with the representatives of regional development agencies by phone and/or e-mail, the paper examines and comparatively evaluates the efforts of the regional development agencies contributing to the regional innovation system. Comparative evaluation reveals that some regional development agencies have created a specific regional innovation strategy whereas the others have not yet developed such strategies, but conduct various studies on different innovation dimensions, although these studies are exclusive and far from a holistic approach. The comparative evaluation also reveals that regional innovation strategies differ in terms of regional priorities.

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Nevertheless, similar strategies developed by regional development agencies address the following issues: developing the research and innovation culture; research and innovation infrastructure; institutional structure; human resources; financial resources; effective communication, cooperation and coordination; entrepreneurship and innovation ecosystem; awareness of innovation activities; clusters; priority sectors; social innovation; intellectual property rights and commercialization. Although there are some efforts to improve the regional innovation systems by regional development agencies, the comparative evaluation demonstrates that they have not yet reached the desired level of producing a holistic regional innovation strategy and they should be more effective as a key actor in the regional innovation systems.

Key words: regional innovation system, regional development agencies, regional innovation strategies, Turkey.

Introduction

Innovation is increasingly regarded as one of the key engines for economic growth and prosperity. In a knowledge-based economy, economic performance depends on competition as a driver of improved productivity, and innovation as new technologies, techniques and ways of working that drive improved productivity. Innovation is increasingly acknowledged as an important driver of value creation, economic growth and social welfare, while innovation performance is an important criterion for improving international competitive power (Özen, Baycan, 2014).

The production of goods and services is becoming more and more knowledge/science/technology and skills-intensive[1]. As a reflection of this knowledge/science/technology/skills-intensive global competitive structure, challenges on innovation make the innovation systems, policies and strategies diversified both in national and regional levels. In this context, there are different responses and reactions of different countries and regions to this competitive environment.

Every structure from micro to macro scale (firm, region, nation etc.) strives in this competitive environment in such a way that some try to create changes by pioneering, while others try to recognize, follow and adapt these changes. Globalization increases the need for innovation policy, and also affects the design and implementation of innovation policies (Edquist, 2008); every society strives for innovation that corresponds to its needs and capabilities[2].

Due to the production, development, diffusion, application and use of technology and knowledge, innovation systems have become the focus of interest not only for academics but also for decision makers at the national and regional level in terms of economic development and social welfare.

Since the innovation system is a tool for economic and social development, countries and regions create policies, strategies and plans for the establishment and management of effective innovation systems (Özen, Baycan, 2015). "Innovation systems" is an interactive and integrated process which is composed of the network and relationships of various creators/actors (institutions in the public and private sectors such as firms, universities, government agencies, technical agencies and R&D public infrastructure etc) (Özen, Baycan, 2015). The relations between various actors are very important for the function and change of innovation systems (Edquist, Johnson, 2000, p. 60).

[1] Managing National Innovation Systems. P. 15. Available at: http: //dx.doi.org/10.1787/9789264189416-en

[2] Innovation Policy: A Guide for Developing Countries. P. 7. DOI: 10.1596/978-0-8213-8269-1. Available at: http://documents1.worldbank.org/curated/en/251181468340760891/pdf/548930PUB0EPI11C10Disclosed061312010.pdf

Improving the coordination mechanisms (Pellegrin et al., 2010, p. 16) and the flows of knowledge[3], technology and information[4] among these various actors strengthen innovation processes by promoting systematic and qualified interactions (Pellegrin et al., 2010, p. 16) and dynamic networks (Feinson, 2003, p. 19) between them.

Regional innovation systems are complex and interactive networks not only in national but also in global ties and connections via international agencies and innovation systems. Within these systems, regions not only have innovation performances at different levels, but also make progress in different ways depending on factors like their positions in the system and changes in national policies.

Despite the free movement of capital and labor as a result of globalization, the importance of regions is increasing as a process of knowledge production, use and "accumulation of knowledge remains locally embedded and spatially concentrated"[5]. The regional innovation system approach helps to explain the regional dimension of production and the regional disparities of innovation capacity and economic power (Schrempf et al., 2013), and highlights the diversity of regions in the countries, the differing dynamics of innovation and the interactions between organizations in a particular system[6]. The analysis of a regional innovation system allows creating and disseminating economically relevant information in a certain region, and also identifying key actors and resources (such as existing infrastructures, sources of information and resources of expertise, financing, etc.). A system concept helps to clarify what kind of support is established and what inter-regional cooperation opportunities are at which policy level (local, regional, national, transnational)[7]. The regional innovation systems concept is composed of different types of actors (big or small, local or multinational firms, universities, public research facilities, technology centers and cluster associations etc.) and the linkages and relationships between these actors[8] (Edquist, 2005; Asheim et al., 2013; zen et al, 2018). Regional innovation systems have recently been of great importance. The OECD[9] explains why regions occupy an increasing role in regional innovation policies and why they are key actors in forming and shaping virtuous innovation trajectories, and mobilising untapped potential for national growth. Especially when they have set up the necessary administrative mechanisms to support clusters and innovative enterprises, regions represent economically more meaningful communities, and can easily define the flow of real economic activities and make use of the synergy and connections between economic actors (Cooke et al., 2000; Cook, Memedovic, 2003). The emergence of clusters as a local innovation system and the emphasis on competition superiority are related to the presence of regional and local innovation systems. Hence, it shows that regional innovation systems form the basis for national competitive advantage (McCall, 2010).

With having local dynamics and knowledge, regional level is important for economic development and for the design and implementation of innovation policies and strategies. Therefore

[3] National Innovation Systems. P. 3. Available at: http://www.oecd.org/science/inno/2101733.pdf (accessed: August 19, 2014).

[4] National Innovation Systems. P. 7. Available at: http://www.oecd.org/science/inno/2101733.pdf (accessed: August 19, 2014).

[5] Regional Innovation Scoreboard. P. 74. Available at: https://data.europa.eu/doi/10.2769/88893

[6] Regions and Innovation Policy. OECD Reviews of Regional Innovation. OECD Publishing, 2011.

[7] Innovating Regions in Europe (IRE) Secretariat. Final Report. ERIS Working Group, 2008.

[8] Regions and Innovation Policy. OECD Reviews of Regional Innovation, OECD Publishing; European Commission, Directorate-General for Enterprise and Industry. Regional Innovation Scoreboard 2014. P. 74. Available at: https://data.europa.eu/doi/10.2769/88893

[9] Regions and Innovation Policy. OECD Reviews of Regional Innovation. OECD Publishing, 2011.

institutional structure at regional level gains importance. Thanks to regional dynamics, interactions, networks, flows and linkages, regional development agencies (RDAs) are effective regional actors in regional planning and regional innovation systems.

Since regional innovation strategy projects were launched by the European Union (EU) in 1994, the strategies on innovation systems are recognized as a key issue in capacity and performances of regional innovation systems. In order to implement and manage an effective innovation system, the regional innovation strategy is an important tool for regional stakeholders within a framework of a common platform to define the strategic objectives and the sequence of activities of the R&D and innovation of the region to reach the goals over the long term (Zabala-Iturriagagoitia et al, 2008; Lewandowska, 2012).

Aim and structure of the research

This paper aims to assess the regional innovation system of Turkey by making a comparison of regional innovation strategies developed by RDAs. For this assessment, in-depth interviews with the representatives (heads of departments and specialists) from the RDAs were carried out by phone and/or e-mail to determine how RDAs approach innovation. In these in-depth interviews, the representatives were asked whether they have regional innovation strategies, financial support programs or any other initiatives in this regard. Therefore the data and information were collected from in-depth interviews with the representatives in addition to the official websites of the RDAs including regional plans, work programs, action plans, support programs, reports, publications of strategies and researches as thematic and sector analyses. On the basis of collected data and information, regional innovation strategies or the inititatives of the RDAs were compared and assessed.

The importance of regional innovation systems, regional innovation policies and the RDAs are described briefly in the introduction. In this section, the research aim and structure of the study are explained. The third section focuses on the historical development process of regional innovation systems and RDAs in Turkey, presents the structure of the regions at NUTS-2 level and makes an assessment on evolution of RDAs and policies over time. In order to assess Turkey's regional innovation system, final section focuses on the examination, interpretation and a comparison of regional innovation strategies of the RDAs and the challenges they have faced.

Regional innovation systems in Turkey

Regional development policies in Turkey have been restructured and transformed with the declaration of Turkey as an official candidate in the EU at the 1999 Helsinki Summit, and have become a hot topic with a totally new perspective to provide a cohesion to the EU policies. In line with this cohesion process, as a beginning step, Turkey accepted the Nomenclature of Territorial Units for Statistics (NUTS) classification and defined its new regions as compatible to NUTS in 2002[10] and decided to establish development agencies (DAs)[11]. As a result, today Turkey has 26 RDAs, respectively 2 RDAs (İzmir and Çukurova) in 2007[12],

[10] Decree of the Council of Ministers 4720 "Decision regarding the definition of the classification of territorial units for the collection and development of regional statistics, making socio-economic analysis of regions, determining the framework of regional policies and creating a comparable statistical database in accordance with the european union regional statistics system", dated September 28, 2002. Available at: https://www.resmigazete.gov.tr/eskiler/2002/09/20020922.htm (in Turkish).

[11] Law on the establishment, coordination and duties of development agencies 5449, dated January 25, 2006. In: *The Official Gazette of Turkey, 45, 26074, dated February 8. Available at: http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5449.pdf* (in Turkish).

[12] Decree of the Council of Ministers 10550 "Decision on establishment of development agencies in some level 2 regions", dated May 31, 2006. Available at: https://www.resmigazete.gov.tr/eskiler/2006/07/20060706-1.htm (in Turkish).

8 RDAs (İstanbul, Konya, Samsun, Erzurum, Van, Gaziantep, Diyarbakır and Mardin) in 2008[13] and finally 16 remaining RDAs in 2009[14]. Therefore, the development of RDAs[15] can be mentioned as one of the milestones in the historical background of the regional structure of Turkey.

Besides having a regional structure at NUTS-2 level, within the scope of the Innovating Regions of Europe (IRE) Network, in 2005, just like Bulgaria, Czech Republic, Estonia, Hungary, Israel, Lithuania, Malta, Norway, Poland, Romania, Slovakia, Switzerland, Turkey has also been involved 33 New-RIS projects in certain regions such as Mersin and Eskişehir (Metin, 2010).

Also, in the 2011 Progress Report[16], the preparation of regional plans in 24 of the 26 NUTS-2 regions under the coordination of DAs is shown as a progress within the institutional framework. Regional plans determine the relationships among plans, policies and strategies produced at the national level and the activities to be carried out at the local level. Besides producing the regional plans, with the production of regional innovation strategy documents in two RDAs (İzmir Development Agency and Middle Black Sea Development Agency denoted as İZKA and OKA, respectively) in 2012, the agencies have shown that they are playing a concrete role in innovation with their effective work. In addition to these two agencies, some other RDAs have also created regional innovation strategy documents in the following years. Therefore, the pioneering of these regional innovation strategy documents in 2012 is a milestone in regional innovation systems.

Regional innovation strategies of regional development agencies in Turkey

The RIS-Mersin project, started in 2005 as a region in IRE Network within the 6th Framework Programme of the EU, has an importance according to the reason of being the first regional innovation systems project of Turkey covering only Mersin province independently from the development agency.

Examination of the regional innovation strategies of the RDAs shows that some have already started to create regional innovation strategies since 2012 *(Fig. 1 and 2)*. A comparison of the regional innovation strategies is evaluated in terms of the visions in the regional plans and regional innovation strategies *(Tab. 1)*, main provisions of innovation strategies *(Tab. 2)* and studies of the RDAs after regional innovation strategy[17] as implementation, evaluation and monitoring mechanisms *(Fig. 3)*.

Regional development agencies generally create their innovation strategies together with advisory boards and technical commitees including representatives of relevant public and private sector actors, non-governmental organizations (NGOs), universities and national institutions. The RDAs generally used processes as the following steps: literature review, field works, current situation analysis on R&D and innovation, workshops, surveys, interviews, focus group meetings

[13] Decree of the Council of Ministers 14306 "Decision on establishment of development agencies in some level 2 regions", dated November 10, 2008. Available at: https://www.resmigazete.gov.tr/eskiler/2008/11/20081122-3.htm (in Turkish)

[14] Decree of the Council of Ministers 15236 "Decision on establishment of development agencies in some Level 2 regions", dated July 14, 2009. Available at: https://www.resmigazete.gov.tr/eskiler/2009/07/20090725-5.htm (in Turkish)

[15] Law on the establishment, coordination and duties of development agencies 5449, dated January 25, 2006. In: *The Official Gazette of Turkey, 45, 26074, dated February 8. Available at: http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5449.pdf (in Turkish)*.

[16] Turkey 2011 Progress Report. Commission Staff Working Paper. P. 83. Available at: https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/key_documents/2011/package/tr_rapport_2011_en.pdf

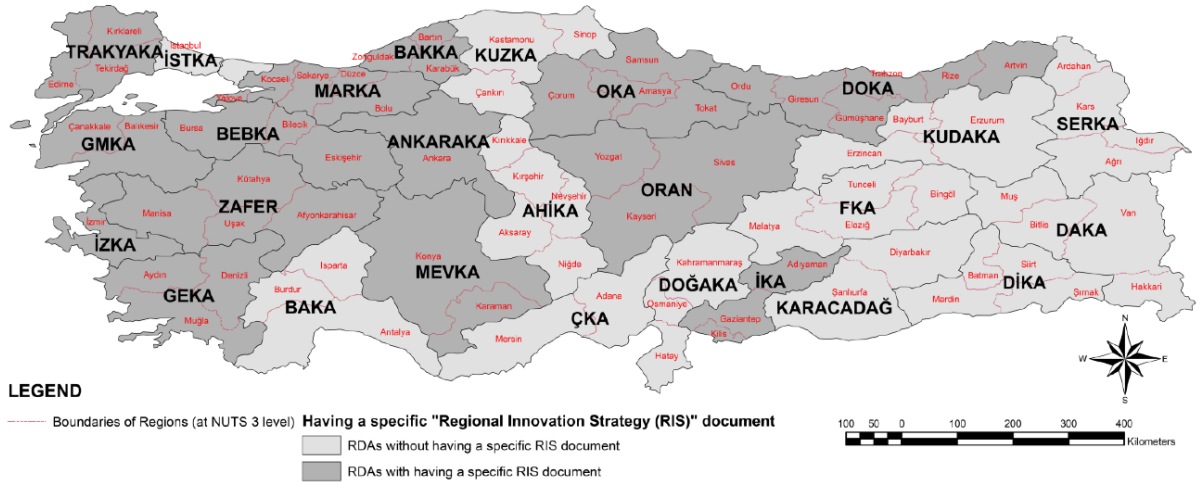
[17] Although there were some exclusive studies related to innovation before the regional innovation strategy documents, the success of the regional innovation strategy is considered based on the studies of the RDAs after the production year of the regional innovation strategy documents.

Figure 1. RDAs having a specific "Regional Innovation Strategies" document

Regional Development Agencies in Turkey (NUTS-2 Level)

	NUTS 2	RDA	PROVINCES IN THE REGION	ESTABLISHMENT YEAR
1	TR 62	Çukurova D. A. (ÇKA)	**Adana**, Mersin	2007
2	TR 31	İzmir D. A. (İZKA)	**İzmir**	2007
3	TR 10	İstanbul D. A. (İSTKA)	**İstanbul**	2008
4	TR 52	Mevlana D. A. (MEVKA)	Karaman, **Konya**	2008
5	TR 83	Middle Black Sea D. A. (OKA)	Amasya, Çorum, **Samsun**, Tokat	2008
6	TR A1	Northeast Anatolia D. A. (KUDAKA)	Bayburt, Erzincan, **Erzurum**	2008
7	TR B2	Eastern Anatolia D. A. (DAKA)	Bitlis, Hakkari, Muş, **Van**	2008
8	TR C1	Silkroad D. A. (İKA)	Adıyaman, **Gaziantep**, Kilis	2008
9	TR C2	Karacadağ D. A. (KARACADAĞ)	**Diyarbakır**, Şanlıurfa	2008
10	TR C3	Tigris D. A. (DİKA)	Batman, **Mardin**, Şırnak, Siirt	2008
11	TR 21	Trakya D. A. (TRAKYAKA)	Edirne, Kırklareli, **Tekirdağ**	2009
12	TR 22	South Marmara D. A. (GMKA)	**Balıkesir**, Çanakkale	2009
13	TR 32	Southern Aegean D. A. (GEKA)	Aydın, **Denizli**, Muğla	2009
14	TR 33	Zafer D. A. (ZAFER)	Afyonkarahisar, **Kütahya**, Manisa, Uşak	2009
15	TR 41	Bursa, Eskişehir, Bilecik D. A. (BEBKA)	Bilecik, **Bursa**, Eskişehir	2009
16	TR 42	East Marmara D. A. (MARKA)	Bolu, Düzce, **Kocaeli**, Sakarya, Yalova	2009
17	TR 51	Ankara D. A. (ANKARAKA)	**Ankara**	2009
18	TR 61	West Mediterranean D. A. (BAKA)	Antalya, Burdur, **Isparta**	2009
19	TR 63	Eastern Mediterranean D. A. (DOĞAKA)	**Hatay**, Kahramanmaraş, Osmaniye	2009
20	TR 71	Ahiler D. A. (AHİKA)	Aksaray, Kırıkkale, Kırşehir, Niğde, **Nevşehir**	2009
21	TR 72	Central Anatolia D. A. (ORAN)	**Kayseri**, Sivas, Yozgat	2009
22	TR 81	Western Black Sea D. A. (BAKKA)	Bartın, Karabük, **Zonguldak**	2009
23	TR 82	North Anatolian D. A. (KUZKA)	Çankırı, **Kastamonu**, Sinop	2009
24	TR 90	Eastern Black Sea D. A. (DOKA)	Artvin, Giresun, Gümüşhane, Ordu, Rize, **Trabzon**	2009
25	TR A2	Serhat D. A. (SERKA)	Ağrı, Ardahan, Iğdır, **Kars**	2009
26	TR B1	Fırat D. A. (FKA)	Bingöl, Elazığ, **Malatya**, Tunceli	2009

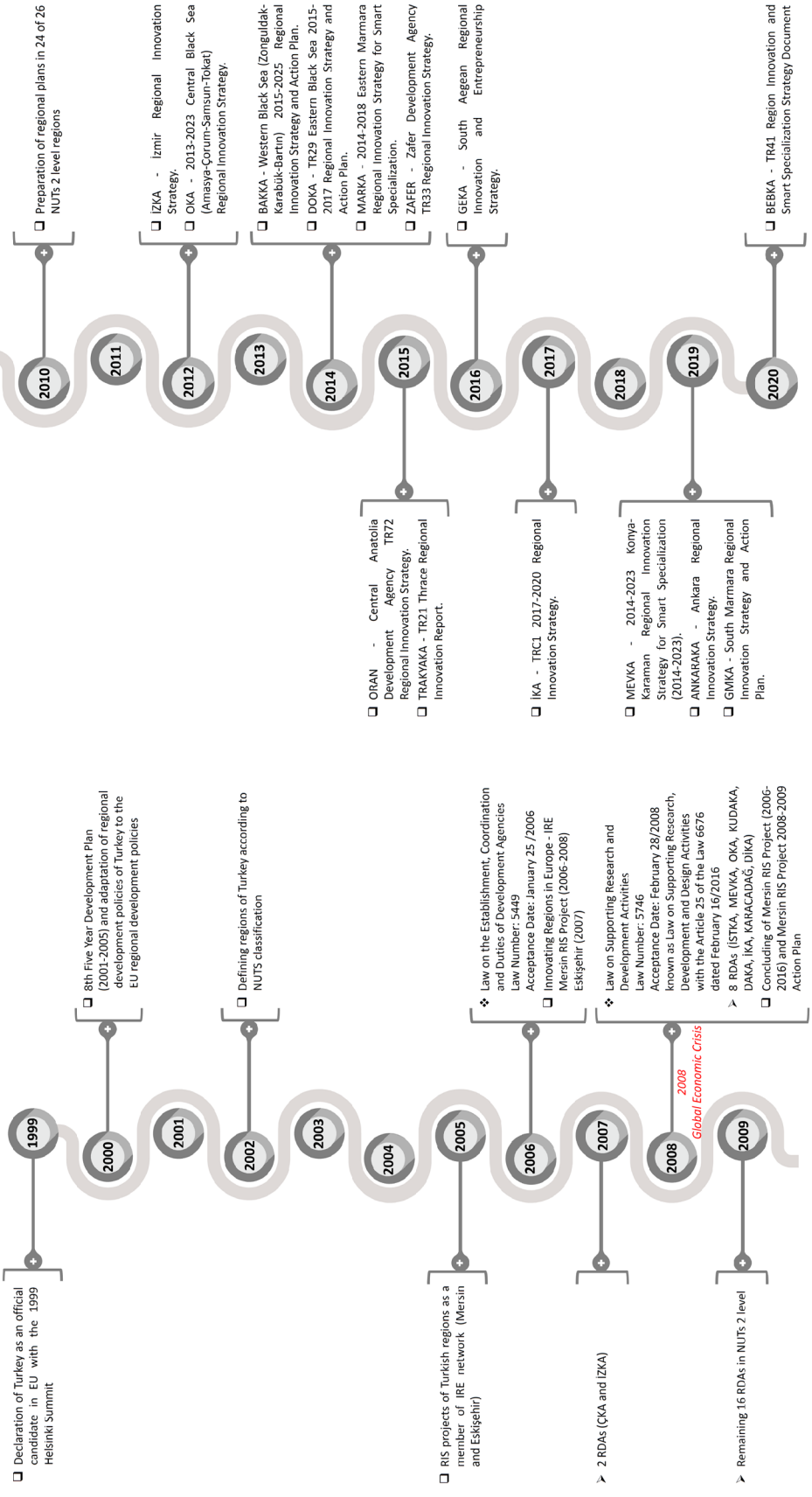
(*): Central provinces of the RDAs are given in bold in the text.



- ❑ 2012 : İZKA - İzmir Regional Innovation Strategy.
- ❑ 2012 : OKA - Middle Black Sea (Amasya-Çorum-Samsun-Tokat) Regional Innovation Strategy (2013-2023).
- ❑ 2014 : BAKKA - Western Black Sea (Zonguldak-Karabük-Bartın) 2015-2025 Regional Innovation Strategy and Action Plan.
- ❑ 2014 : DOKA - TR90 Eastern Black Sea Regional Innovation Strategy and Action Plan 2015-2017.
- ❑ 2014 : MARKA - East Marmara Regional Innovation Strategy for Smart Specialization 2014-2018.
- ❑ 2014 : ZAFER - Zafer Development Agency TR33 Regional Innovation Strategy.
- ❑ 2015 : ORAN - Central Anatolia Development Agency TR72 Regional Innovation Strategy
- ❑ 2015 : TRAKYAKA - TR21 Thrace Regional Innovation Report.
- ❑ 2016 : GEKA - South Aegean Regional Innovation and Entrepreneurship Strategy.
- ❑ 2017 : İKA - TRC1 2017-2020 Regional Innovation Strategy.
- ❑ 2019 : MEVKA - Konya-Karaman Regional Innovation Strategy for Smart Specialization (2014-2023).
- ❑ 2019 : ANKARAKA - Ankara Regional Innovation Strategy
- ❑ 2019 : GMKA - South Marmara Regional Innovation Strategy and Action Plan.
- ❑ 2020 : BEBKA - TR41 Region Innovation and Smart Specialization Strategy Document

Source: own elaboration.

Figure 2. Milestones of historical development process of regional innovation systems in Turkey



Source: own elaboration.

with a participation of representatives of relevant public and private sector actors, non-governmental organisations, universities and representatives from national institutions, SWOT and/or PEST analyses, stakeholder analysis, examination of different parameters, defining regional innovation ecosystem, measurement of innovation potential, supply, demand and capacity, determination of vision, priorities, innovation strategies, targets and actions.

When the visions in the regional plans of these 14 RDAs are examined; it is seen that most of the RDAs (İZKA, DOKA, MARKA, TRAKYAKA, GEKA, İKA, ANKARAKA and BEBKA) put emphasize on innovation in their visions of the regional plans. Although remaining RDAs are not directly focused on innovation in the regional vision, they have included innovation-related concepts such as learning region, competitiveness, knowledge, human and social capital. If the visions in the regional plans and the regional innovation strategies are compared, it has been determined that some agencies have defined innovation visions to create regional innovation strategies, and some have produced strategies in line with their regional plans without creating an innovation vision (see Tab. 1).

Table 1. Comparison of the visions

RDA	Vision in the regional plan	Innovation vision in the regional innovation strategies
İZKA	"İzmir as the centre of attraction of the Mediterranean, producing information, design and innovation" (İzmir Development Agency, 2014-2023 İzmir Regional Plan).	The regional innovation vision was not defined (İzmir Regional Innovation Strategy).
OKA	An environmentally sensitive, competitive, rapidly developing region, which has become Turkey's gateway to the Black Sea and which has raised its quality of life (Yeşilırmak Basin Development Project (Amasya, Çorum, Samsun, Tokat) Regional Development Master Plan, 2006).	"Thanks to innovative and entrepreneur society together with its competitive sectors, Middle Black Sea Region will be a pioneer region for development at national and international level in 2023 (Middle Black Sea (Amasya-Çorum-Samsun-Tokat) Regional Innovation Strategy (2013-2023))".
BAKKA	Becoming a region which has broken its dependent economic condition and raised its life quality (2014-2023 Western Black Sea Regional Plan).	Becoming a region with a high level of prosperity and quality of life which have succeeded the sustainable development with innovative and powerful sectors and competitive brandmarks in both national and international area in 2025 (Western Black Sea (Zonguldak-Karabük-Bartın) 2015-2025 Regional Innovation Strategy and Action Plan).
DOKA	The Eastern Black Sea with innovative and competitive economy, improved social welfare and quality of life by ensuring rural-urban integration, livable spaces, a sustainable environment and high human quality (TR90 Eastern Black Sea Regional Plan 2014-2023).	Eastern Black Sea Region converting its original values and unique resources into competitive and dynamic products and services. Competitive and dynamic Eastern Black Sea (TR90 Eastern Black Sea Regional Innovation Strategy and Action Plan 2015-2017).
MARKA	To be a human and knowledge-oriented and open to innovations trademark region in global competition and sustainable development, powered by its strategic location and collaboration networks, producing value with its versatile economic structure, steering the future with its rich human potential, making a difference with its quality of life (East Marmara 2014-2023 Regional Plan).	"Becoming a national technology commercialization center that can produce information and develop technology, follow global innovations and shapes itself, has specialized in automotive, machinery and electrical machines, and develops key enabling technologies (East Marmara Regional Innovation Strategy for Smart Specialization 2014-2018)."
ZAFER	A learning region that pursues ecological balance, creates added value with its knowledge-based economy, increases competitiveness and quality of life, develops in a balanced way (TR33 Regional Plan 2014-2023).	The starting point of this project is to increase the competitiveness, which is in the vision and one of the development axes determined in the 2010-2013 Regional Plan (TR33 Regional Innovation Strategy).

End of Table 1

RDA	Vision in the regional plan	Innovation vision in the regional innovation strategies
ORAN	"Competitive in national and international level, accessible to humanity and social capital, improved potentials, improved quality of life by improving urban and social infrastructures, accessible Central Anatolia (TR72 Region 2014-2023 Regional Plan)".	It has been defined that a «Regional innovation strategy» will be developed under the priority of Competitiveness Axis «Development of R&D and Innovation» in the TR72 Region 2014-2023 Regional Plan. Innovation committees were formed from the relevant institutions and individuals in the provinces and their opinions were taken and the innovation vision and innovation strategies were determined (Central Anatolia Development Agency TR72 Regional Innovation Strategy).
TRAKYAKA	"Thrace developing with its high added value production whilst preserving its natural and cultural values, where collaboration and innovation prevails, and where the standard of life and wellbeing is at its highest (TR21 Thrace Region 2014-2023 Regional Plan Summary)".	The regional innovation vision was not defined, and it was stated that the study was carried out to increase the innovation capacity of the region based on the regional vision in the Regional Plan (TR21 Thrace Regional Innovation Report).
GEKA	South Aegean as a global tourism focus with a high quality of life, producing based on innovation, protecting its nature (TR32 Level 2 Region 2014-2023 Region Plan).	The regional innovation vision was not defined (South Aegean Regional Innovation and Entrepreneurship Strategy).
İKA	Silkroad as the center of attraction of the Middle East, with high quality of life, strong human capital, competitive and innovative capacity (TRC1 Gaziantep-Adıyaman-Kilis Regional Plan 2014-2023).	Center of Innovation from Tradition to Future: Silk Road (TRC1 Regional Innovation Strategy 2017-2020).
MEVKA	Becoming a region with high and balanced prosperity level, integrated with international economies, preferred by people to work, produce and live in under the principle of compassion and tolerance (Konya-Karaman 2014-2023 Region Plan).	The regional innovation vision was not defined, and it was stated that the study was carried out based on the regional vision in the Regional Plan because this document is a sub-strategy document of the 2014-2023 Regional Plan (Konya-Karaman Regional Innovation Strategy for Smart Specialization (2014-2023)).
ANKARAKA	"Presenting a High Quality of Life and Competing With the World, the Capital of Knowledge and Innovation Ankara (Ankara Regional Plan 2014-2023)".	Visions in the health, informatics and agriculture-food sectors, which are the 3 pilot sectors selected within the scope of creating a future vision within the scope of the Regional Innovation Strategy, adhering to the regional vision in the Ankara Regional Plan (Ankara Regional Innovation Strategy).
GMKA	"A South Marmara with more qualified labor, competitiveness and viability (TR22 South Marmara Regional Plan 2014-2023)".	The South Marmara Region will be a region that has achieved its development goal in 2023 with its trained human resources, educational institutions, innovation and entrepreneurship culture and competitive sectors. (South Marmara Regional Innovation Strategy and Action Plan)
BEBKA	Internationally competitive, sustainable production, innovation and life center carrying the heritage of the past from establishment to salvation into the future by adding value (Bursa, Eskişehir, Bilecik Regional Plan 2014-2023).	The regional innovation vision was not defined, and it was stated that the study was carried out based on the regional vision in the Regional Plan. The innovation and smart specialization strategy prepared for the TR41 Region has also been considered within the framework of the vision defined in the regional plan, and it adopts a more competitive, more innovative and more sustainable approach taking regional characteristics into account (TR41 Region Innovation and Smart Specialization Strategy Document).
Source: own elaboration based on the regional plans and the regional innovation strategies documents of RDAs.		

According to the regional innovation strategies of the RDAs, only 14 of the RDAs currently have a specific regional innovation strategy including İZKA and OKA as the leading agencies to produce regional innovation strategies. Although some RDAs do not have specific regional innovation strategies, they have various studies on different innovation dimensions, but these studies are exclusive and far from a holistic approach. Unfortunately, some agencies are currently unable to prioritize innovation.

While 12 (İZKA, OKA, BAKKA, DOKA, MARKA, ZAFER, ORAN, TRAKYAKA, İKA, MEVKA, GMKA and BEBKA) of these 14 agencies produced strategies on innovation dimensions, only two (GEKA and ANKARAKA) created sectoral strategies. GEKA defined problems and recommendations regarding competitive sectors in each province, and ANKARAKA developed priority strategies, targets and action plans for five prominent sectors *(Tab. 2)*.

If the regional innovation strategies of these 14 agencies are evaluated, they are similarly focusing on the following:

– creating and developing the research and innovation culture,
– strengthening the research and innovation infrastructure,
– developing the institutional structure,
– developing human resources,
– increasing the accessibility to various financial resources (funding, support programmes etc.),
– improving effective communication, cooperation and coordination,
– developing the entrepreneurship and innovation ecosystem,
– organizing and increasing the awareness activities,
– establishing and developing clusters,
– focusing on specialized/priority/prominent/strategic sectors,
– encouraging social innovation,
– increasing IPR and commercialization.

When the agency studies conducted after the regional innovation strategies are examined, it is seen that the agencies that produced the strategies in the past years have made substantial headway.

Table 2. Comparison of main strategies in the regional innovation strategy documents

RDA	Innovation strategies
İZKA	Strategic Priorities: 1. Strengthening the research and innovation infrastructure. 2. Developing institutional structure and capacity in science and technology fields. 3. Developing human resources in science and technology fields. 4. Patenting research results and supporting commercialisation. 5. Facilitating access to funding. 6. Improving the entrepreneurship and innovation ecosystem.
OKA	Strategic Goals: 1. Turning the region into an international brand mark (for) having high competitiveness in strategic sectors. 2. Becoming an attraction center for qualified labor thanks to companies with high innovation performance. 3. Hosting R&D and innovation centers of national and international companies thanks to suitable environment for innovation and incentives. 4. Increasing the comfort and the quality of life of the whole society through “Inclusive innovation” approach. Strategic Breakthroughs: 1. Increasing innovation performance of private sector and increasing entrepreneurship based on innovation. 2. Strengthening R&D and Innovation Infrastructure and Human Resources. 3. Encouraging and disseminating social innovation and innovation in public services.

Continuation of Table 2

RDA	Innovation strategies
BAKKA	Strategic Goals: 1. To become the locomotive of regional development of priority sectors of Western Black Sea Region through the R&D and innovation. 2. Converting of regional economy into an innovation and information based economy that successfully executes the information and technology transfer from universities to the firms and public sector. 3. Becoming a center of attraction for qualified investments with the creation of a dynamic innovation ecosystem. 4. Establishment of a culture using innovation as a driving force in social development and therefore providing the increase of the prosperity and the quality of life. Strategic Breakthroughs: 1. Ensuring Awareness and Consensus in Innovation Based Development. 2. Strengthening the Information and Technology Generation and Transfer Capabilities of universities. 3. Increasing the quantity and quality of R&D and innovation activities in priority sectors.
DOKA	Development Axes: 1. Creating innovation culture. 2. Strengthening of regional innovation systems. 3. Increasing innovative output.
MARKA	Strategic Priorities: 1. Focusing on Prioritized Areas. 2. Innovation Infrastructure. 3. Cooperation and Innovation Culture. 4. Financing. 5. Promotion and Dissemination.
ZAFER	Strategic Priorities: 1. Improving human resources. 2. Strengthening the research and innovation infrastructure. 3. Strengthening the institutional structure. 4. Improving the market conditions. 5. Improving social capital and supporting networks.
ORAN	Strategic Priorities: 1. Increasing the Utilization Rate of Supports, Facilitating Access to Finance and Improving Institutional Capacity. 2. Increasing Cooperation Between Institutions. 3. Increasing the Technology Level. 4. Improving Research Infrastructure. 5. Improving Intellectual Property Rights. 6. Introducing, Disseminating and Updating the Regional Innovation Strategy.
TRAKYAKA	Strategic Goals: 1. Development of entrepreneurship and innovation ecosystem. 2: Strengthening the research and innovation infrastructure. 3: Support the patenting and commercialization of research results.
GEKA	1. Problems and recommendations regarding competitive sectors in Aydın 1.1 Dried Fruit and Nuts (Figs) Sector. 1.2 Olive and Olive Oil Sector. 1.3 Milk and Dairy Industry Sector. 1.4 Food and Agricultural Machinery Industry. 2. Problems and recommendations regarding competitive sectors in Denizli 2.1 Milk and Dairy Industry Sector. 2.2 Fruit-Vegetable and Medicinal-Aromatic Plants Sector. 2.3 Cable Sector. 2.4 Textile Sector. 3. Problems and recommendations regarding competitive sectors in Muğla 3.1. Aquaculture Sector. 3.2. Marble Sector. 3.3. Yacht and Boat Manufacturing Sector. 3.4. Beekeeping and Honey Products Sector.

End of Table 2

RDA	Innovation strategies
İKA	Priority Axes: 1. Developing innovation awareness, capacity and willingness. 2. Increasing accessibility to innovation support elements. 3. Increasing cooperation among innovation ecosystem members.
MEVKA	Strategic Goals: 1. Developing R&D and innovation culture. 2. Improving the infrastructure. 3. Strengthening human capital. 4. Strengthening collaborations on the basis of smart specialization. 5. Increasing access to financial resources.
ANKARAKA	Priority strategies for five prominent sectors: IT Sector 1. Use of new technologies in the IT sector. 2. Generalizing the use of information technologies in the sectors. Medicine and Medical Devices Sector 1. Development of export in the medicine and medical device sector. 2. Advanced technology high value-added products. 3. R&D and development of production ecosystem. Construction Machinery Sector 1. Creating the brand value of "Turkish Construction Machinery" and introducing to the world. 2. Development of domestic production in critical parts. 3. Qualified engineer and interim staff training. Defence and Aviation Sector 1. Increasing export capacity in the defence and aviation sector. 2. Production capacity improvement. 3. Development of human resources competences. Agriculture and Food Sector 1. Realizing the digital transformation in the agriculture and food industry in Ankara / creating a high added value and efficient sector focusing on advanced technology and agricultural industry and biotechnology. 2. Increasing the share of special agricultural products of Ankara in foreign trade.
GMKA	Strategic Priorities: 1. Increasing the R&D and Innovation Capacity and Performance of the Private Sector. 2. Development of Entrepreneurship and Innovation Culture in the Region. 3. Strengthening the Education, Research and Innovation Infrastructure in the Region.
BEBKA	Eight intervention areas forming the TR41 Region Smart Specialization Strategy Action Plan: 1. Supporting capacity building and collaborations in R&D centers. 2. Development of support and coordination opportunities within the scope of localization. 3. Developing the capacity to create and manage a common platform. 4. Increasing the transitivity between industry and university. 5. Supporting capacity building in firms and developing human resources. 6. Ensuring the internalization of open innovation concept by firms and supporting access to open innovation platforms. 7. Development of firms in the position of supplier of main industrial firms. 8. Developing the role and supports of the Development Agency in the smart specialization process.
Source: own elaboration based on the regional plans and the regional innovation strategies documents of RDAs.	

As the next step, the support programs, reports, publications, strategies and researches as thematic and sector analyses produced by the RDAs were examined in detail in order to understand whether the implementation of the regional innovation strategies could be realized or not. Although producing and implementing dates of the regional innovation strategies of the RDAs differ from one another, RDAs have studies focusing on the local production and prominent sectors of the regions. The main reasons why regions vary in success of the regional innovation strategies are related to the diversities in the dynamics/features, local production, sectoral specialization and the R&D, knowledge and innovation potentials of the regions *(Fig. 3)*.

After the regional innovation strategy, it has been determined that İZKA's works and financial support programs are focused mainly on knowledge, entrepreneurship, information communication technologies, renewable energy, small and medium-sized enterprises (SMEs), small scale industrial zones, clusters and prominent sectors especially environmental technologies. The innovation success stories, the measurement of innovation indicators, the production of innovation ecosystem analysis and monitoring reports, and the creation of evaluation reports of financial support programs after the regional innovation strategies make ZKA successful at the achiving the goals.

OKA's works and financial support programs mainly consider entrepreneurship, foreign trade, exports and imports, market, competitiveness, SMEs, organized industrial zones (OIZs), crossborder collaboration, public-university-industry collaboration, youth employment, vocational and technical education, social innovation, R&D centers, regional business incubation centers network, and geographically indicated products. Also OKA produced many pre-feasibility reports in various sectors. Like İZKA, the creation of the audit and evaluation reports of the financial support programs, the production of regional innovation strategy activities and the mid-term evaluation report of the regional innovation strategy make OKA successful, too.

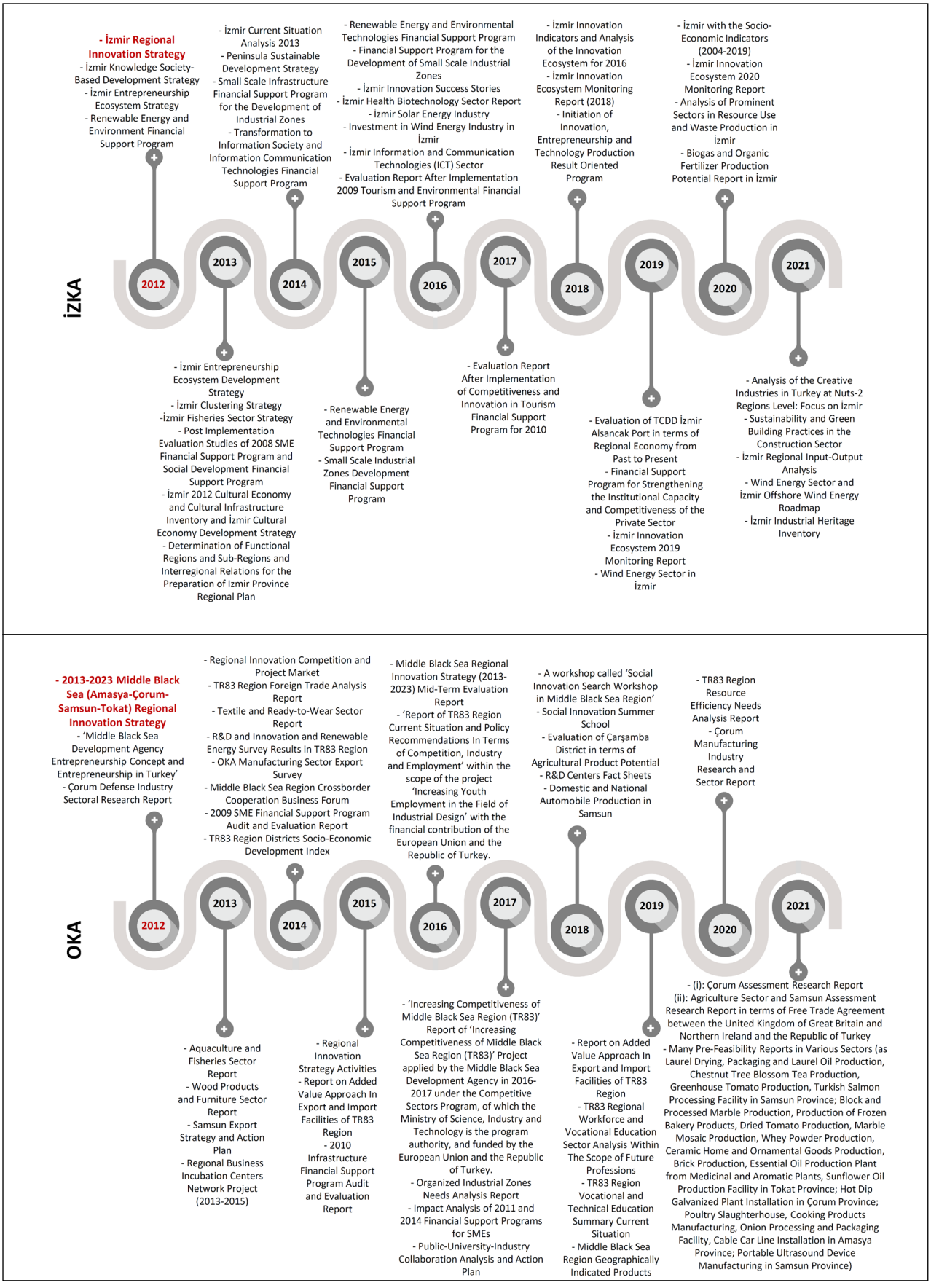
BAKKA focuses on prominent sectors, migration, competitiveness, exports, OIZs, SMEs, technology centers, clusters, local values, geographical indications products, and labor market. There are many pre-feasibility reports in various sectors. BAKKA produced evaluation reports after the support programmes. For Bart n province, BAKKA has "R&D and innovation potential" report and R&D, innovation and entrepreneurship ecosystem analysis.

DOKA's works and financial support programs are related mainly on clusters, SMEs, alternative financing sources, local products, women and youth entrepreneurship, geographical indications, foreign trade and target market. As previous RDAs, DOKA has many pre-feasibility reports in various sectors based on agro-industries. There are evaluation and impact analysis reports after the financial support programs.

MARKA focuses on immigration, OIZs, logistic centers, technology transfer, informatics valley, entrepreneurship, vocational education, R&D centers, SMEs, and various prominent sectors mainly informatics and manifacturing sectors. The RDA provides innovation mentorship to the SMEs.

ZAFER works on exports, branding and marketing, industrial inventory, SMEs, clusters, professional competencies, entrepreneurship, vocational education, competitiveness, product diversity, local products, logistic centers, patent and trademark capacities, OIZs, and various prominent sectors mainly on traditional arts, gastronomy, machinery, mining, agriculture, environment and energy.

Figure 3. Studies of the RDAs after regional innovation strategy



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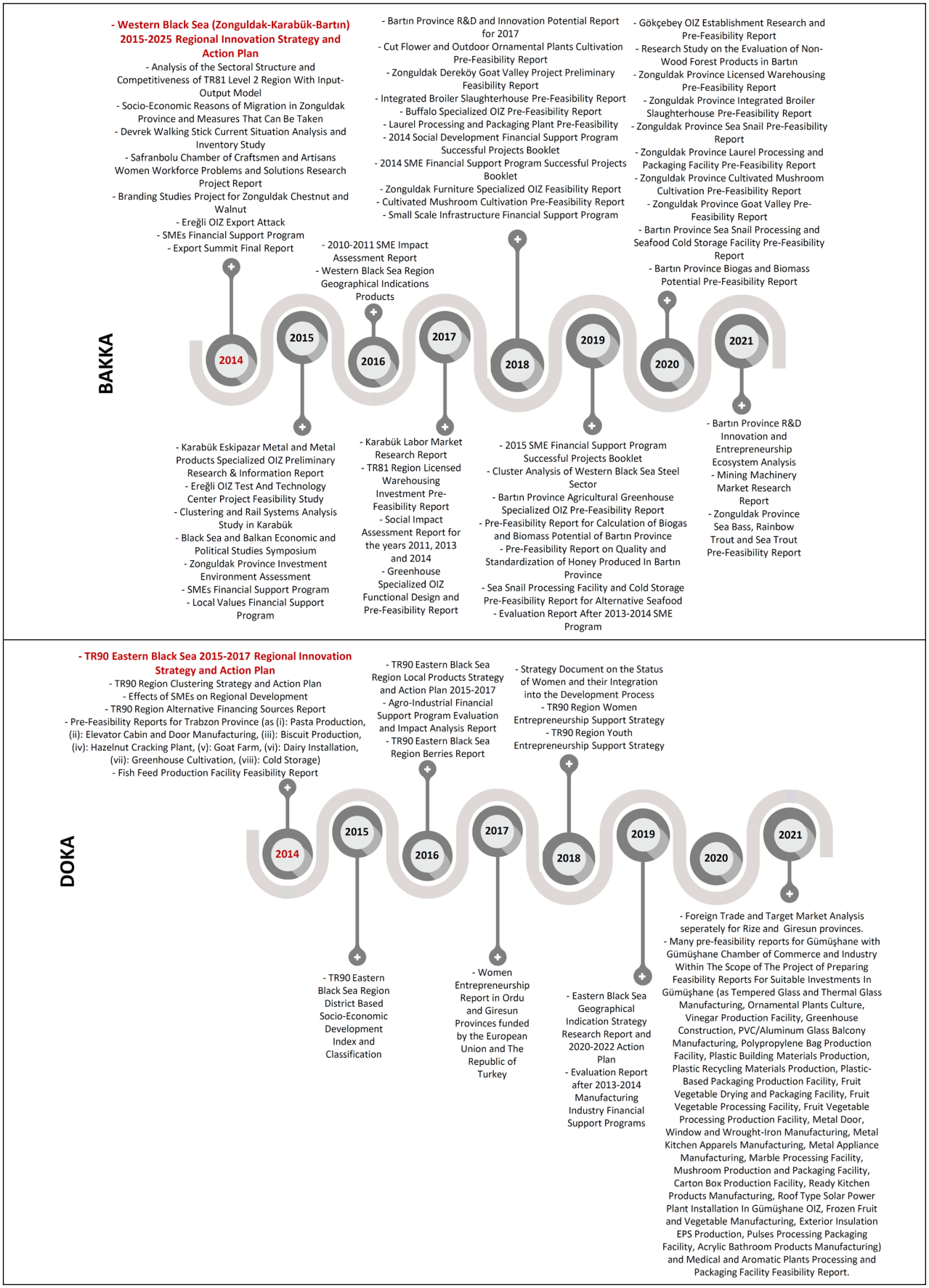

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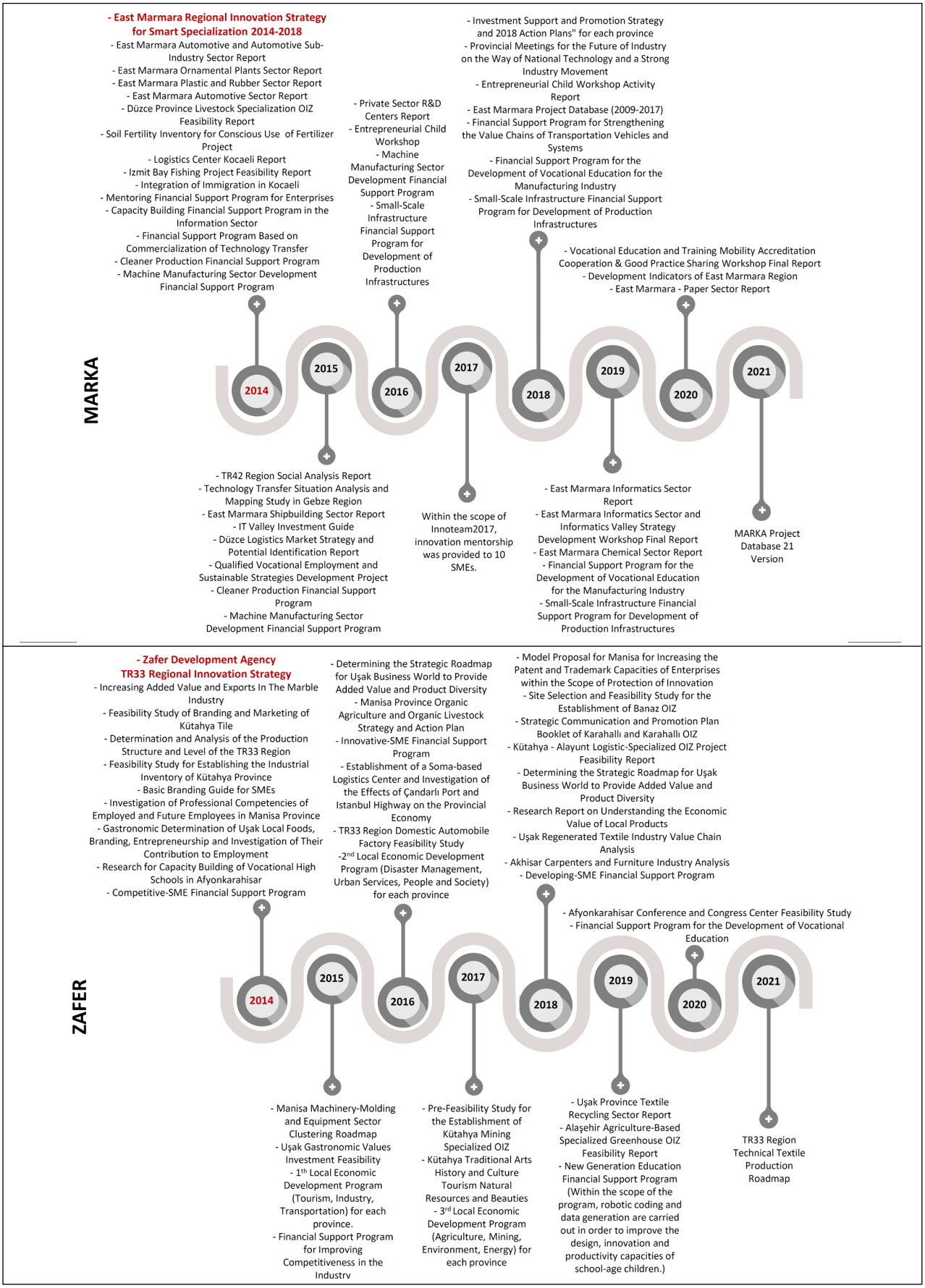

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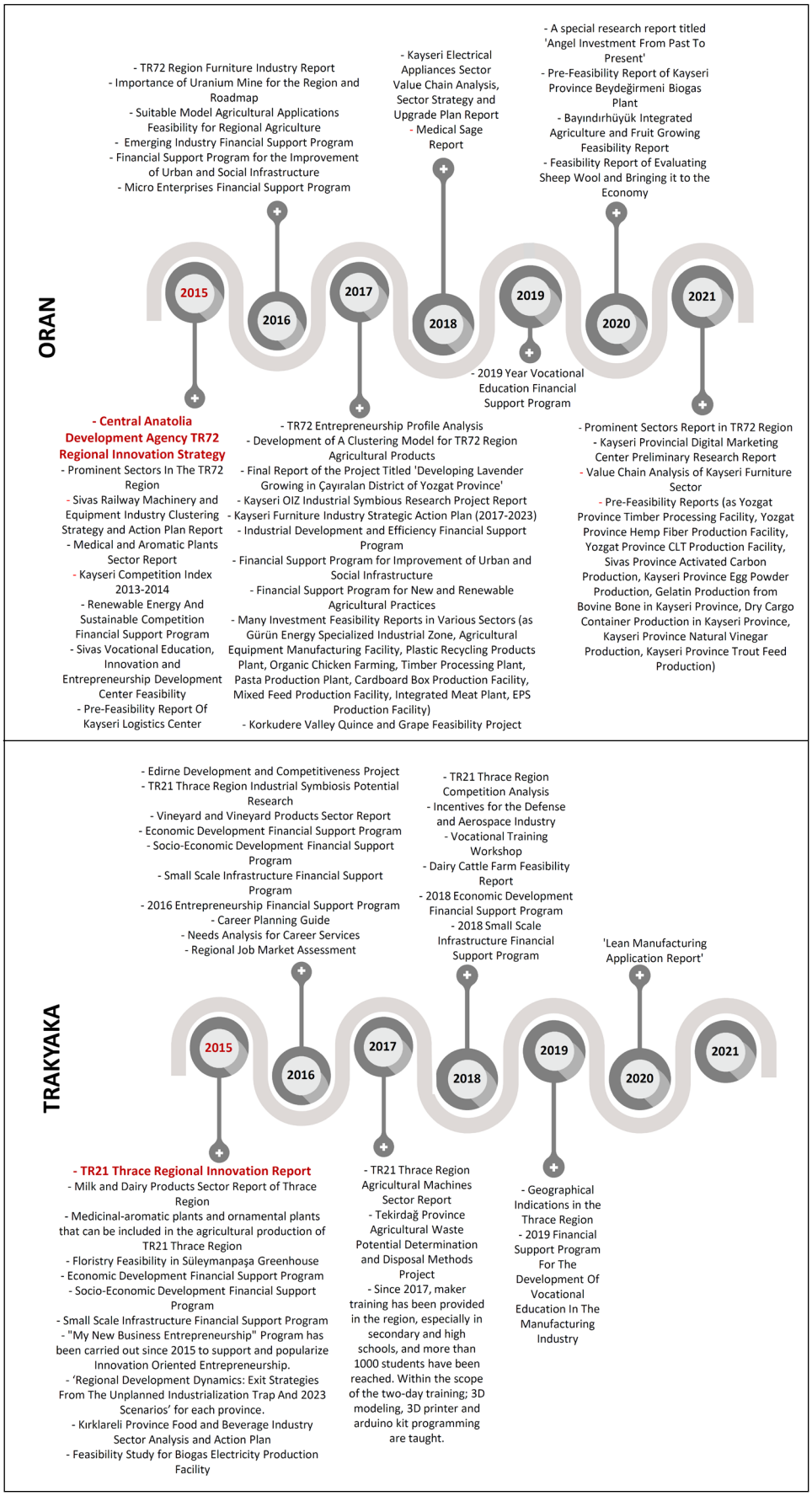

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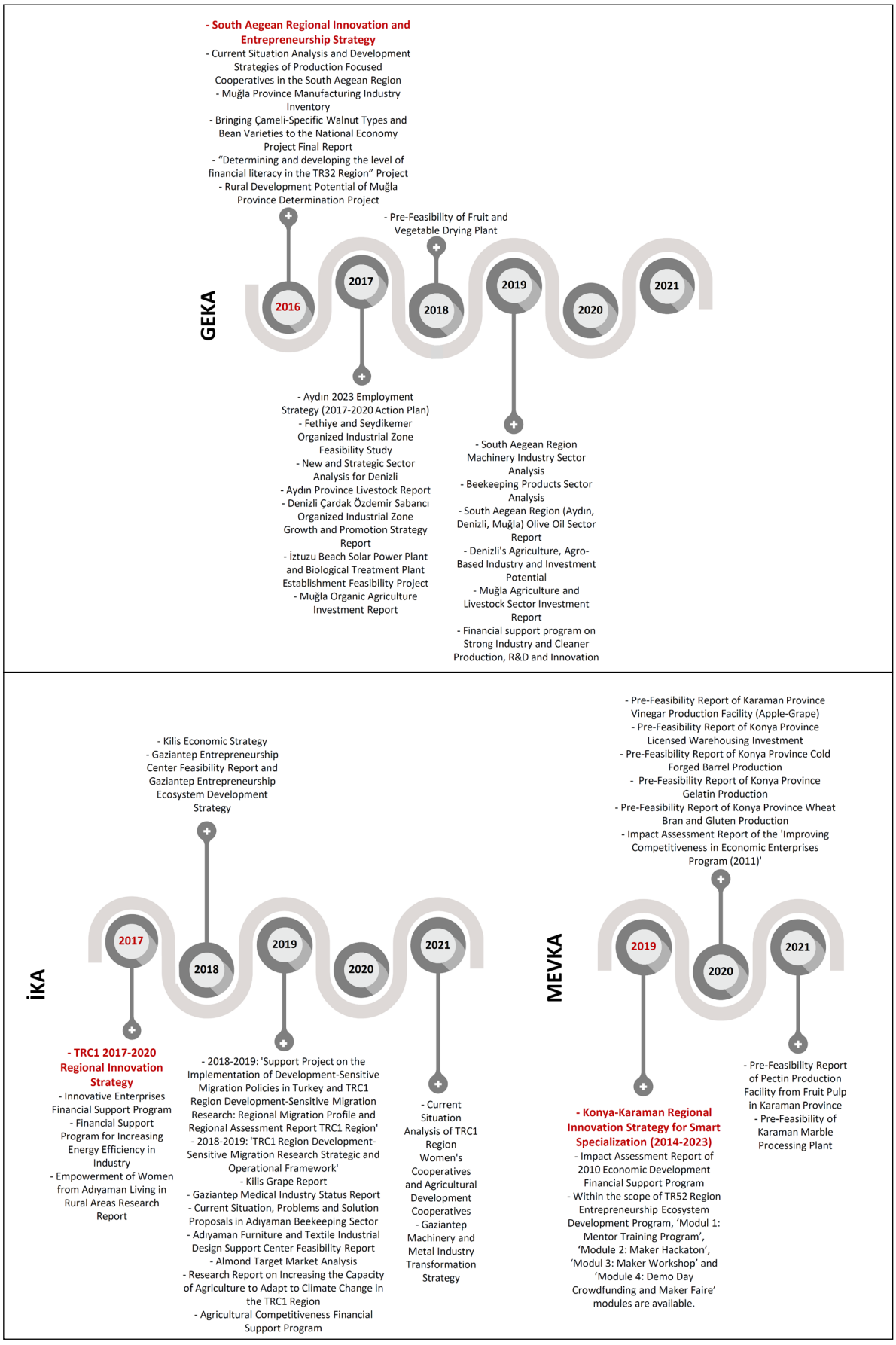

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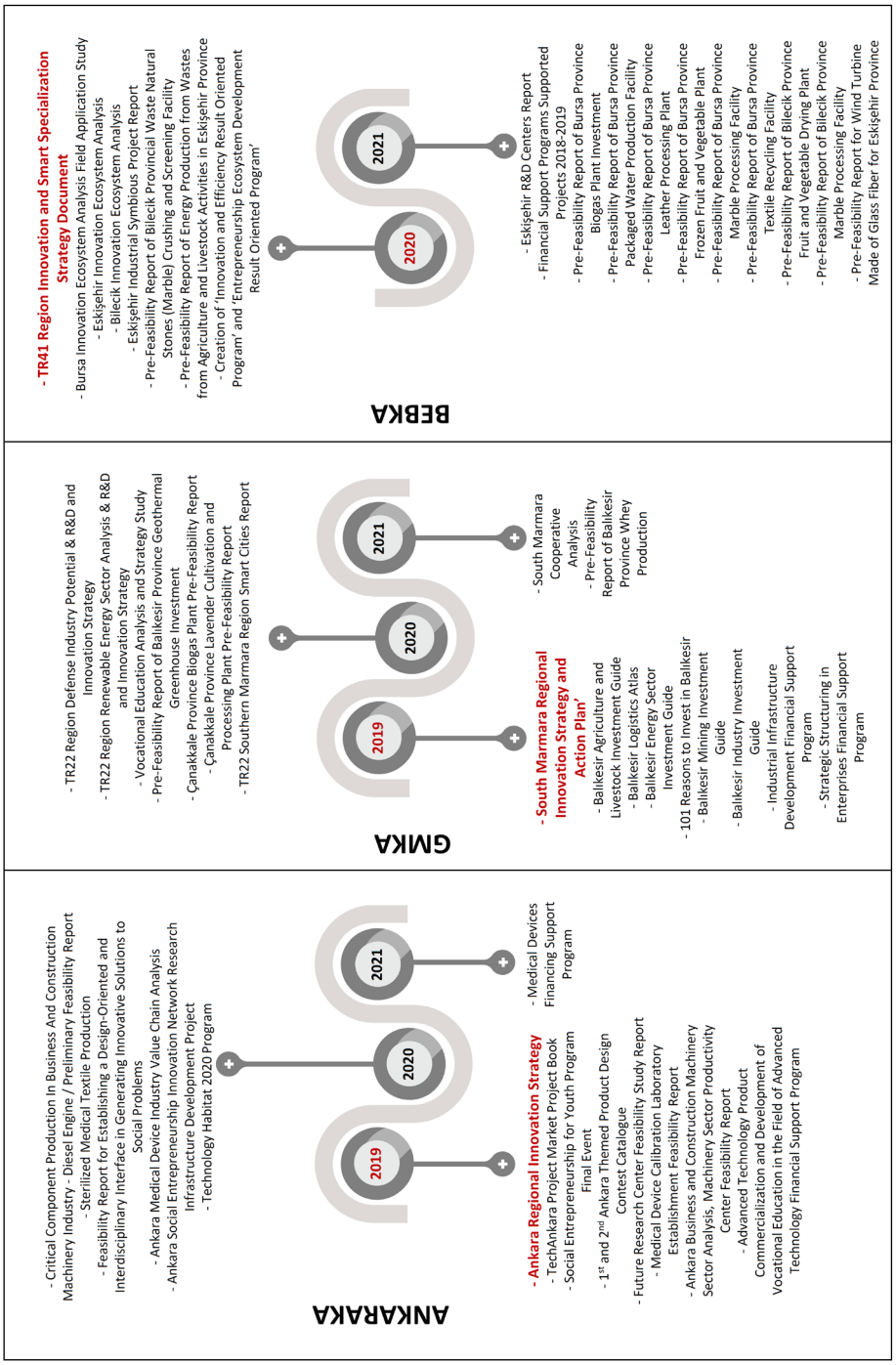

Source: own elaboration based on the work programs, action plans, support programs, reports, publications of strategies and researches as thematic and sector analyses of the RDAs.

ORAN deals with entrepreneurship, logistic centers, competitiveness, industrial symbiosis, renewable energy, vocational education, clusters, digital marketing, and sectors mainly as furniture industry, medical services, energy and agriculture. There are many pre-feasibility reports based on production and investment related to the prominent sectors. There is also a special research report on angel investments.

TRAKYAKA's works focus on issues such as competitiveness, industrial symbiosis, entrepreneurship, career services, job market, vocational education, maker training, geographical indications, and the RDA has sectoral reports mainly based on agriculture and livestock. In order to support and popularize innovation oriented entrepreneurship, a program also has been carried out since 2015 by TRAKYAKA.

GEKA works are related to entrepreneurship, cooperatives, manufacturing industry inventory, financial literacy, OIZs, R&D, and strategic sectors such as agriculture and livestock.

İKA focuses on entrepreneurship, agricultural competitiveness, target market, migration policies, empowerment and cooperatives of women, and various sectors especially agriculture.

MEVKA has entrepreneurship ecosystem development program. The RDA has some pre-feasibility reports related to various sectors. MEVKA also produced impact assessment reports of previous programs.

ANKARAKA focuses on market, social entrepreneurship for youth program, "product commercialization and development of vocational education in the field of advanced technology", social entrepreneurship, and sectors such as the IT sector, medicine and medical devices sector, construction machinery sector, defence and aviation sector and agriculture and food sector.

GMKA has specific strategy documents as "Defense Industry Potential & R&D and Innovation Strategy" and "Renewable Energy Sector Analysis & R&D and Innovation Strategy" in addition to the regional innovation strategy. The RDA is also interested in vocational education analysis and strategy study. GMKA deals with enterprises and cooperatives.

BEBKA has innovation ecosystem analysis, and many pre-feasibility reports for various sectors. The RDA also has reports of "industrial symbious project" and "R&D centers" for Eskişehir province.

Comparative evaluation and concluding remarks

This paper evaluates the regional innovation system of Turkey by comparing the regional innovation strategies of RDAs. It was seen that only 14 RDAs have regional innovation strategies. When the visions in the regional plans of these are examined, it is observed that most of these 14 RDAs focused on innovation in their visions of the regional plans, however some RDAs did not put emphasize directly on innovation in the regional vision but included some innovation-related concepts. In order to produce regional innovation strategies, some of the RDAs have created innovation visions, while the others made progresses in innovation strategies in line with their regional plans without creating an innovation vision. The paper states that the visions defined in the regional plans and regional innovation strategies of the RDAs differ in terms of regional dynamics.

Comparative evaluation reveals that some agencies have created a specific regional innovation strategy whereas the others have not yet developed specific regional innovation strategies and have various studies on different innovation dimensions, but these studies are exclusive and far from a holistic approach. The comparative evaluation also reveals that regional innovation strategies of the RDAs differ

in terms of regional priorities. Nevertheless, similar strategies created by the RDAs address developing the research and innovation culture; research and innovation infrastructure; institutional structure; human resources; financial resources; effective communication, cooperation and coordination; entrepreneurship and innovation ecosystem; awareness of innovation activities clusters, specialized/priority/prominent/strategic sectors; social innovation, IPR and commercialization, etc.

Although there are some efforts to improve the regional innovation systems by the RDAs, the comparative evaluation demonstrates that RDAs have not yet reached the desired level of producing a holistic regional innovation strategy and they should be more effective as a key actor in the regional innovation systems.

Most of the agencies create studies, publications, action plans, work plans and support programs to realize their innovation strategies and generally give priorities to innovation in the financial support programs. In addition, İZKA and OKA, as the leading agencies, create innovation ecosystem analysis, evaluation and monitoring reports in certain years to reveal how much they have achieved their innovation strategies.

On the one hand, the success of produced innovation strategies depends on the future work of these RDAs. On the other hand, in order to be successful, it is essential to determine how the strategies will be reflected and integrated with the spatial patterns.

Regional innovation system of Turkey will be successful if these efforts can be evaluated and implemented with a broad participation of actors including the representatives of relevant public and private sector, NGOs, universities and national institutions that are effective in regional innovation system and an integrated interactive innovation process including a defined realistic regional vision, strategic goals, strategic breakthroughs and action plans. If the determination of how these strategies will be reflected and integrated into spatial patterns is not considered as an important issue, the strategies will remain only in theory.

Designing and developing regional innovation strategies is not enough to establish and manage an effective regional innovation system. It is important that these strategies should be carried out with the responsible stakeholders within the specified time periods. Potential factors that would limit the implementation of the strategies should be determined in advance and minimized. Furthermore, the implementation of the strategies, monitoring, evaluation and performance measurement gain importance in innovation processes.

References

Asheim B., Bugge M., Coenen L., Herstad S. (2013). What does evolutionary economic geography bring to the table? Reconceptualising regional innovation systems. *CIRCLE Papers*, 5.

Cook P., Memedovic O. (2003). *Strategies for Regional Innovation Systems: Learning Transfer and Applications*. Vienna: UNIDO.

Cooke P., Boekholt P., Tödtling F. (2000). *The Governance of Innovation in Europe*. London: Pinter.

Edquist C. (2005). Systems of innovation – perspectives and challenges. In: Fagerberg J., Mowery D.C., Nelson, R.R. (Eds.). *The Oxford Handbook of Innovation*. Oxford: Oxford University Press.

Edquist C. (2008). Identification of policy problems in systems of innovation through diagnostic analysis. In: *The 6th Globelics International Conference*. Mexico, Mexico City, dated September 24–26, 2008. Available at: https://smartech.gatech.edu/bitstream/handle/1853/36896/Charles_%20Edquist_Identification%20_of_%20Policy_Problems.pdf?sequence=1

Edquist C., Johnson B. J. (2000). Institutions and organisations in systems of innovation. Chapter 8. In: Edquist C., McKelvey M. (Eds.). *Systems of Innovation: Growth, Competitiveness and Employment*. UK: Edward Elgar Publishing. ISBN: 1858985730

Feinson S. (2003). National innovation systems overview and country cases. In: *Knowledge Flows and Knowledge Collectives: Understanding the Role of Science and Technology Policies in Development. Volume 1: Knowledge Flows, Innovation, and Learning in Developing Countries*. Center for Science, Policy and Outcomes, Columbia University. Pp. 13–38.

Lewandowska A. (2012). Regional innovation strategy as a management instrument of innovation policy in the region. Poland. Regional management. *Theory, Practice and Development, Scientific Papers*, 129–133. Available at: https://www.researchgate.net/publication/273949395_Regional_Innovation_Strategy_as_a_management_instrument_of_innovation_policy_in_the_region_Poland

McCall T. (2010). Regional Innovation Systems. *Institute for Regional Development, University of Tasmania*. Available at: http://www.utas.edu.au/__data/assets/pdf_file/0007/61936/McCall.-T.-2010,-Regional-Innovationsystems.pdf

Metin H. (2010). *Social and Institutional Impacts of Mersin Regional Innovation Strategy: Stakeholders' Perspective. A Thesis Submitted to the Graduate School of Natural and Applied Sciences of Middle East Technical University, in Partial Fulfillment of the Requirements for the Degree of Master of Science in City and Regional Planning, April 2010*. Available at: https://etd.lib.metu.edu.tr/upload/12611821/index.pdf

Özen, B.S., Baycan T. (2014). Turkey's national innovation system performance: Recent progress and ongoing challenges. In: *54th Congress of European Regional Science Association (ERSA) Regional Development & Globalization: Best Practices*, August 26–29, 2014. Russia: Saint Petersburg.

Özen B.S,. ve Baycan T. (2015). An Assessment of Turkish regional innovation system over regional innovation strategies developed by regional development agencies. In: *55th Congress of European Regional Science Association (ERSA) World Renaissance: Changing Roles for People and Places*, August 25–29, 2015. Portugal: Lisbon.

Özen B.S., Baycan T., Filiztekin A. (2018). Türkiye'de Bölgesel İnovasyon Performanslarının 2000 Yılından Günümüze Değişimi. In: M. Karagül, L.G. Kaya, O. Sungur (Eds.). *Bölgesel Kalkınma ve Bölge Bilimi Üzerine Yazılar*. Nobel Akademik Yayıncılık (in Turkish).

Pellegrin I., Balestro M.V., Valle J.A. et al. (2010). Dynamizing innovation systems through induced innovation networks: A conceptual framework and the case of the oil industry in Brazil. *Journal of Technology Management and Innovation*, 5(3), 15–35. DOI: http://dx.doi.org/10.4067/s0718- 27242010000300002

Schrempf B., Kaplan D., Schroeder D. (2013). *National, regional, and sectoral systems of innovation — an overview. Report for FP7 Project "Progress"*. Available at: progressproject.eu

Zabala-Iturriagagoitia J.M., Jiménez-Sáez F., Castro-Martínez E. (2008). Evaluating European Regional Innovation Strategies. *European Planning Studies*, 16(8), 1145–1160. DOI: 10.1080/09654310802315849

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Sino-Russian Cooperation in the Arctic: Current Situation, New Directions and Challenges

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Abstract. Russia's chairmanship of the Arctic Council from 2021 to 2023 provides new opportunities for China and Russia to deepen Arctic cooperation, especially on the issue of "sustainable development". Therefore, further research on Sino-Russian Arctic sustainable cooperation is of positive significance for deepening Arctic cooperation between Russia and China. In particular, it is necessary to re-examine the new directions of Sino-Russian Arctic cooperation in the context of today's drastic changes in the international geopolitical situation. The purpose of the article is to analyze the current situation, new directions and challenges of Sino-Russian Arctic sustainable cooperation and to provide concrete paths for deepening cooperation. To achieve this goal, the article analyzes the national policies of China and Russia, identifies the common interests of both countries, and then analyzes the current situation, new directions and problems faced by the Arctic sustainable cooperation between the two countries in the

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context of the reality of the Russian Arctic region. The innovation of this article is to provide a new path for deepening Arctic cooperation between the two countries based on the perspective of Chinese scholars and a more comprehensive understanding of China's Arctic policy. The significance of this article is that the research content and conclusions can be used to promote the process of Arctic sustainable development cooperation between the two countries at the social and even national levels.

Key words: China, Russia, Arctic, sustainable development, Sino-Russian cooperation, global challenges.

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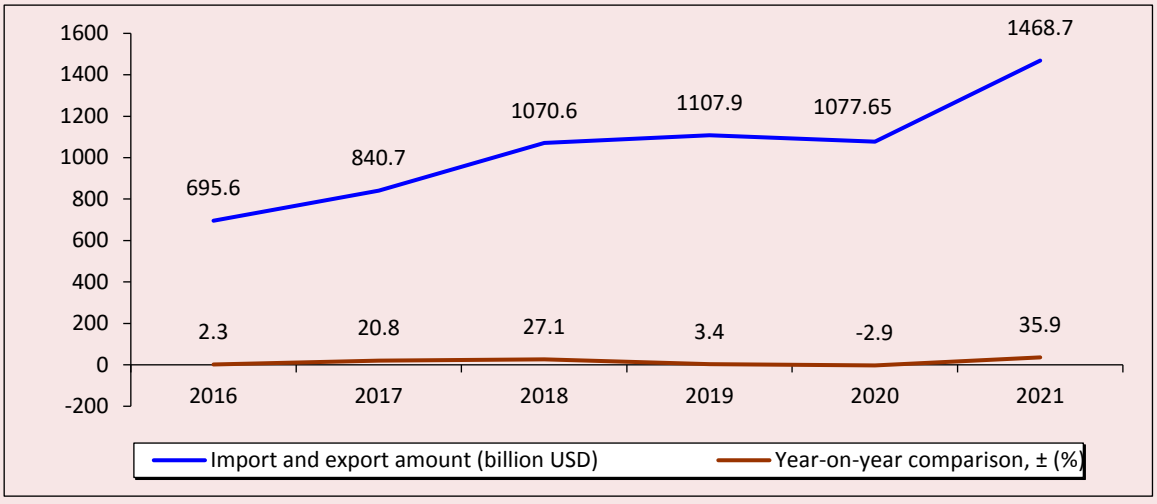
Introduction

In May 2021, Russia succeeded the chairmanship of the Arctic Council and put forward the goal of achieving sustainable development in the Arctic. At the same time, sustainable development is an important direction for the development of the Arctic region in Russia in 2020–2035. It can be seen that, in addition to mineral resources exploration, Russia has started to seek a diversified model of sustainable development in the Arctic.

Russia's new development model provides opportunities for China and Russia to deepen Arctic cooperation. In recent years, China and Russia have developed friendly relations, with notable achievements in bilateral trade volume, scientific and technological development and mutual tourism visits *(Fig. 1, Fig. 2, Tab. 1)*. Under the guidance of friendly relations, Sino-Russian Arctic cooperation will continue to deepen, while

Figure 1: Bilateral trade volume between China and Russia in 2016–2021



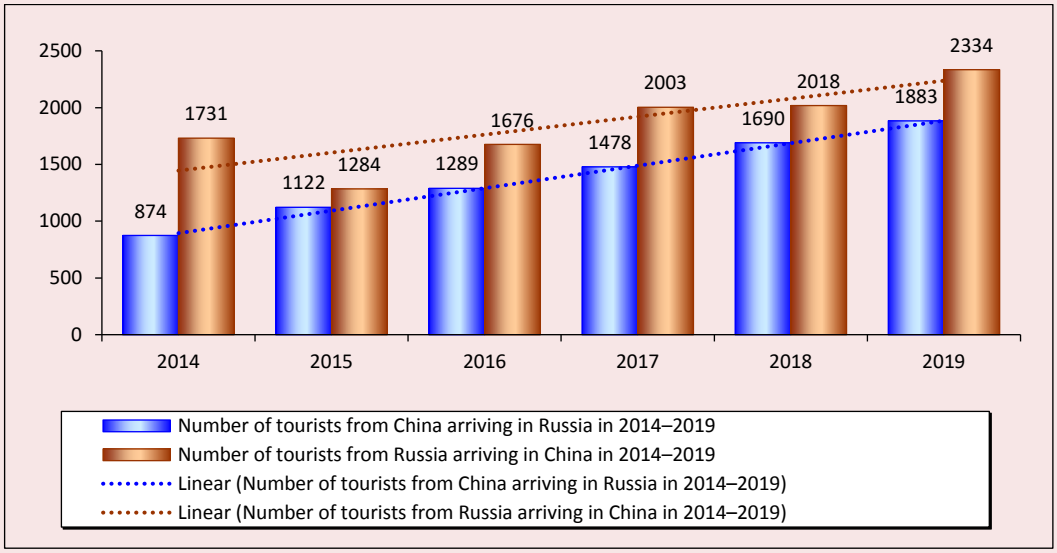
Source: National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/easyquery.htm?cn=C01; Ministry of Commerce PRC. Available at: http://petersburg.mofcom.gov.cn/article/jmxw/202201/20220103237286.shtml (accessed: May 20, 2022).

Table 1. Achievements of Sino-Russian cooperation in the field of science and technology innovation

Date	Key Events
2015	The first Chinese-Russian Forum of High Technologies (Moscow) was held
2016	Co-signed "Memorandum of Understanding on Cooperation on Innovation" was signed
2017	The first Chinese-Russian Innovation Dialogue (Beijing) was held
2018	The Silk Road Chinese-Russian Innovation Park was built
2019	The Sino-Russian Joint Innovation Investment Fund was established
2020–2021	The Year of Chinese-Russian Scientific, Technical and Innovation Cooperation was organized

Source: own compilation based on information and news from the official website of Ministry of Science and Technology PRC. Available at: http://www.most.gov.cn/index.html (accessed: May 18, 2022).

Figure 2. Volume of mutual visits of tourists between Russia and China in 2014–2019



Data for 2020–2021 are not representative due to the negative impact of the COVID-19 on global tourism in 2020–2021; therefore, they are not included in the figures.

Source: National Bureau of Statistics of China. Available at: https://data.stats.gov.cn/search.htm?s=%E4%BF%84%E7%BD%97%E6%96%AF; Federal State Statistics Service of Russia. Available at: https://rosstat.gov.ru/folder/210/document/13241 (accessed: May 19, 2022).

issues related to the sustainable development[1] of the Arctic – including scientific research, ecological protection and polar tourism – are expected to become new directions for Arctic cooperation between the two countries.

The purpose of this study is to analyze current Sino-Russian cooperation in the sustainable development of the Arctic, and to specify new directions for cooperation in the context of new opportunities. Our findings can be used in practice

[1] According to the Sustainable Development Agenda, Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social inclusion and environmental protection. Therefore, the authors of this paper argue that the issue of "sustainable development" in the Arctic context is to promote Arctic economic prosperity while protecting Arctic ecological security. The three main issues are scientific research, ecological protection and polar tourism. For more information on the UN's interpretation of the sustainable development agenda, see: https://www.un.org/sustainabledevelopment/zh/development-agenda/

to promote international cooperation between Russia and China in the field of sustainable development of the Arctic. Research objectives include: 1) studying the current situation of Russian-Chinese cooperation in the sustainable development of the Arctic; 2) identifying new opportunities for Russian-Chinese cooperation in the sustainable field of the Arctic; 3) analyzing the challenges to be faced by new opportunities for Russian-Chinese cooperation in the sustainable field of the Arctic. Thus, the main research theme is the new opportunities for Sino-Russian cooperation in the field of sustainable development of the Arctic in the current geopolitical context.

Research methods

The research is based on the literature of domestic and foreign experts in the field of Sino-Russian Arctic cooperation. The information base includes the Arctic policies and regulations of China and Russia, as well as information and data from official departments of China and Russia and foreign analysis centers.

Domestic and foreign scholars have made significant contribution to the research on Arctic international cooperation from a macro perspective. The Russian International Affairs Committee has written monographs *Arctic Region: Issues of International Cooperation* (Zagorsky, 2011), *Current Stage of International Cooperation in the Arctic: Search for Answers to the Challenges of Economic Development* (Lipina et al., 2021), as well as issues such as cooperation between international organizations in the Arctic (Konyshev, 2011), many of which involve Sino-Russian cooperation in the Arctic. Chinese scholars have also conducted extensive research on Arctic international cooperation, including research on legal norms (Bai, Wang, 2020), cooperation mechanisms and cooperation opportunities (Deng et al., 2017; Liu et al., 2019). It is pointed out in (Kuklina, 2020) that Russia is an important partner for China to carry out Arctic cooperation.

It should be noted that academic achievements focusing on Sino-Russian Arctic cooperation are also abundant. For example, many Russian scholars discussed the theoretical and practical differences between China and Russia in the Arctic (Zagorsky, 2016). Although some Russian scholars are skeptical about China's Arctic strategy (Morozov, 2015), the majority of Russian scholars have a more positive attitude toward Sino-Russian Arctic cooperation. A.N. Pilyasov from the perspective of global and regional governance theory believes that China's Arctic strategy is a vision for the Arctic and a recognition of its participation in the Arctic from the perspective of globalization (Pilyasov, 2018). V.P. Zhuravel sees China's Arctic strategy as positive, commercial, and mostly friendly (Zhuravel, 2018). In general, Russian scholars recognize that modern Sino-Russian relations are based on equality, reciprocity, interests, respect and non-interference in domestic affairs (Kuznetsov, 2014). Sino-Russian Arctic cooperation is an important driving force for the sustainable development of the Arctic region (Pecheritsa, 2020; Petrovsky, Filippova, 2018). Sino-Russian Arctic cooperation has broad prospects and will continue to deepen (Camilla, 2017, Kolzina, Mindubaeva, 2020). Chinese scholars generally recognize the huge and unique development potential of bilateral cooperation between two countries based on the research of the composite interdependence theory, the hierarchy of needs theory, etc. (Voronenko, Bai, 2017, Guo, Yang, 2020). Xu Guangmiao pointed out that under the current geopolitical background, Russia and China should jointly face the challenges of the Arctic region (Xu, Klintsev, 2020).

However, most of the expectations of scholars for Sino-Russian Arctic cooperation are pinned in the field of Arctic energy and shipping. V.A. Alexandrova studied the realized Arctic energy cooperation projects and challenges they faced (Alexandrova, 2019). Kalfaoglu pointed out that Sino-Russian cooperation in the field of

Arctic shipping has great potential (Kalfaoglu, 2018). Although some scholars pointed out that China's Arctic interests include scientific research, environmental protection, etc. (Hong, 2018). However, further research is needed on the specific cooperation situation in sustainable fields such as Arctic scientific research, environmental protection and polar tourism. Therefore, it is necessary to sort out the current situation regarding Sino-Russian Arctic sustainable cooperation, and, based on the analysis, put forward new opportunities and possible challenges so as to promote Sino-Russian Arctic sustainable cooperation.

Specific research methods include literature analysis and empirical research, as well as data forecasting. Through the interpretation of the official Arctic policies and academic achievements of China and Russia, the direction of cooperation in the field of Arctic sustainability is studied. Through empirical research on the current situation of cooperation, the challenges are analyzed. The prospects for cooperation are forecasted with the help of the data of the two countries' interaction. Based on the methods used, it is concluded that Sino-Russian cooperation in the field of Arctic sustainability is still in its infancy, and in the current geopolitical context, new opportunities for Arctic cooperation between the two countries are emerging.

Current situation regarding Sino-Russian cooperation on the issue of sustainable development of the Arctic

Cooperation between Russia and China on the topic of sustainable development of the Arctic has been demonstrated in the official policies of both sides *(Tab. 2)*:

In terms of specific issues, the current status of cooperation between the two countries is as follows:

Scientific research

At the official state level, joint Sino-Russian scientific research in the Arctic "normalized"

Since the first joint Sino-Russian scientific research in the Arctic in 2016, scientific research activities between two countries in the Russian Arctic have become "normalized" *(Tab. 3)*. Among them, the First Institute of Oceanography MNR and the Pacific Oceanological Institute, Far Eastern Branch of RAS were the main participants. Nowadays, Chinese scientists have conducted comprehensive expeditions in a number of disciplines, including marine geology, physical oceanography and atmospheric chemistry, marking a historic breakthrough in Chinese-Russian scientific cooperation in the Arctic. Chinese research institutions also actively participate in Russian-led scientific research activities in the Arctic.

Table 2. Official statements of Russia and China on Arctic cooperation

Date	Official Statements	Contents	Key words
July 4, 2017	Sino-Russian Joint Statement on further deepening of the comprehensive strategic partnership for cooperation	For the first time, it is proposed to support cooperation in joint scientific expeditions, polar tourism and ecological protection.	Arctic sustainable development; scientific research; polar tourism; Ecological protection
June 8, 2018	Joint Statement of the PRC and the RF	Strengthening Sino-Russian cooperation on sustainable development of the Arctic, including support for cooperation in scientific research, tourism and ecology.	
June 5, 2019	Joint statement of China and Russia on the development of a new era of comprehensive strategic cooperative partnership	Promote Sino-Russian cooperation on sustainable development of the Arctic and expand cooperation in the fields of scientific research, tourism and ecological protection.	
February 4, 2022	Sino-Russian Joint Statement on international relations and sustainable global development in the new era	The two sides agreed to further deepen practical cooperation on sustainable development of the Arctic	
Source: own compilation according to the joint statements of China and Russia from 2017 to 2022.			

Table 3. Sino-Russian joint scientific expeditions

Date	Description	Major place of scientific expedition	Chinese major participant	Russian major participant
August – September 2016	First joint Sino-Russian scientific expedition to the Arctic	Chukchi Sea, East Siberian Sea	First Institute of Oceanography MNR	Pacific Oceanological Institute, Far Eastern Branch of RAS
September – October 2018	Second joint Sino-Russian scientific expedition to the Arctic	Chukchi Sea, East Siberian Sea, Laptev Sea		
September – November 2020	Third Sino-Russian scientific expedition to the Arctic	Chukchi Sea, East Siberian Sea, Laptev Sea		

Source: Zou J., Jie X., Zheng H., Shi X. (2021). The fruitful cooperation between China and Russia in marine and polar regions-a chronicle of cooperation with Russia by the First Institute of Oceanography of the Ministry of Natural Resources. *International Talent Exchange,* 11, 20–22.

Russia and China have established partnership relations at the level of scientific institutions.

First, as mentioned above, the First Institute of Oceanography MNR and the Pacific Oceanological Institute, Far Eastern Branch of RAS have been cooperating on Arctic scientific research topics for a long time. In September 2017, two sides jointly established the Joint Research Center on Oceans and Climate in Vladivostok[2]. Then in June 2018, following talks between both heads of States, the Chinese Academy of Sciences (CAS) and the Russian Academy of Sciences signed a cooperation agreement. In July 2019, a ceremony to sign a roadmap for cooperation was held in Moscow. The document provides a number of activities, such as joint maritime expeditions in the eastern Arctic to identify sources of methane emissions[3].

Second, an Arctic scientific research center has been established at the official level. In April 2019, China and Russia signed an agreement to establish the Arctic Research Center. The Russian lead institution is Shirshov Institute of Oceanology of RAS, and the Chinese lead institution is Pilot National Laboratory for Marine Science and Technology (Qingdao). The two sides planned to conduct at least five joint expeditions over the next five years[4]. In August 2019, Russian and Chinese researchers made the first joint expedition to the Arctic continental shelf located in the East Siberian Sea[5].

China and Russia jointly participate in international polar scientific research activities

In addition to the guidance of official and scientific institutions, Russia and China actively participate in international scientific research activities under the multilateral framework of the Arctic Council and the International Arctic Science Committee (IASC). In 2017, the Agreement on Strengthening International Arctic Scientific Cooperation was signed among the Arctic Council member states. Russia as a major Arctic Council member state and China as an Arctic Council observer state both highly support international scientific cooperation activities, such as Multidisciplinary Drifting Observatory for the Study of Arctic Climate (MOSAiC), and Sustainable Arctic Observatory Network (SAON) project.

[2] Sino-Russian Joint Research Centre on Oceans and Climate to promote cooperation between the two countries in Arctic scientific research and other fields. October 10, 2017. Available at: http://sputniknews.cn/society/201710101023773921/(accessed: March 29, 2022).

[3] The Russian Academy of Sciences and the Chinese Academy of Sciences will sign a roadmap for cooperation. July 18, 2019. Available at: https://ria.ru/20190718/1556641478.html(accessed: March 30, 2022).

[4] Russia and China are creating a center for Arctic research. April 11, 2019. Available at: https://ria.ru/20190411/1552576382.html (accessed: March 30, 2022).

[5] Scientists from Russia and China will study the Arctic shelf of Siberia during the first joint expedition. August 5, 2019. Available at: https://tass.ru/nauka/6733215 (accessed: March 30, 2022).

Ecological and environmental protection

Cooperation between Russia and China in the field of ecological protection started in the early 1990s and has been advancing, especially on the topic of transboundary water pollution prevention and control. However, specifically in the Arctic, China and Russia have not yet formed a stable framework for cooperation, and only cooperate at the level of bilateral scientific institutions. For example, in June 2019, the government of Yamalo-Nenets Autonomous Okrug of Russia and the ecological and environmental research center CAS signed a memorandum to implement joint projects on conservation of migratory birds[6].

Of course, China and Russia share many similar characteristics and common problems in the geographic and ecological fields. The achievements of cooperation between two countries in the field of ecology and environmental protection will also provide experience to expand cooperation in the Arctic ecological and environmental protection (Yang, Zhao, 2019).

At the official level, ecological and environmental issues are given high priority

The issue of ecological protection has always been a key topic of discussion at the meetings of the Russian-Chinese Prime Minister's Committee for regular meetings. The two sides have been interacting extensively on the mechanism of response to cross-border environmental emergencies, exchanging experience on environmental impact assessment, and developing cooperation on cross-border ecological and natural reserves. Specifically, the Amur River Basin Nature Reserve and the Bastak Reserve on the Russian side and the Three Rivers – Hun River, Hunchun and Wangqing Nature Reserves on the Chinese side were discussed. In addition, the two sides have reached a broad consensus on cooperation in protecting tigers and restoring migratory birds, and are actively carrying out joint activities in the Daur and Lake Khanka international nature reserves[7].

Russia and China are actively cooperating on the monitoring of transboundary water bodies.

For many years, Russia and China have been maintaining long-term interdepartmental cooperation around the issue of monitoring transboundary waters, especially since 2006, the two sides have been insisting on joint sampling from the Heilongjiang (Amur River), Ussuri, Erguna, Suifen (Razdolynaya River) and Xingkai (Lake Khanka) located on the Russian-Chinese border to monitor river water quality and maintain ecological safety in the border river basin, and have made significant achievements. As a result of active work, in 2018 the Russian side reduced 35.89 million cubic meters of emissions to 687.2 million cubic meters[8]. Also belonging to transboundary water bodies, cooperation on protection of the Heilongjiang River (Amur River) provides experience for the joint work on protection of transboundary water resources of the Irtysh-Obi River, which flows through the Arctic regions of China, Kazakhstan and Russia (Mei, Guo, 2017).

At the level of multilateral/bilateral mechanisms, China and Russia have a broad foundation of cooperation

First, at the level of multilateral mechanisms, the UN Charter, UN Convention on the Law of the Sea, Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972), International Convention for the Prevention of Pollution from Ships (1973/1978),

[6] Scientists from China and Russia will study the migration of rare birds and conduct research on the population of the Siberian Crane. June 16, 2019. Available at: https://tass.ru/ural-news/6555550 (accessed: March 25, 2022).

[7] Cooperation between Russia and China in the field of environmental protection and rational use of natural resources will develop. November 7, 2018. Available at: https://www.mnr.gov.ru/press/news/sotrudnichestvo_rossii_i_kitaya_v_oblasti_okhrany_okruzhayushchey_sredy_aktivno_razvivaetsya/ (accessed: March 25, 2022).

[8] Russia reduces 35.8 million cubic meters of sewage to the Amur River in 2018. June 17, 2019. Available at: http://sputniknews.cn/society/201906171028773005/ (accessed: March 25, 2022).

International Convention on Oil Pollution Preparedness, Response and Cooperation (1990) provide legal support for the expansion of ecological and environmental cooperation between Russia and China in the Arctic region.

At the level of bilateral mechanisms, two sides have concluded numerous documents on cooperation in the field of ecological and environmental protection issues, including the Agreement in the field of Environmental Protection (1994), Declaration on Protection of the Tiger (1995), Agreement on Cooperation about Forest Resources (2000), Agreement on Rational Use and Protection of Transboundary Water Resources (2008), which provide legal guidelines for bilateral cooperation in the Arctic region (Rednikova et al., 2018).

Under the background of the dramatic impact of global climate change, Russia is committed to regulating pollution in the Arctic and protecting the natural environment of the Arctic (Savostova, Biryukov, 2019). As China is an active participant in Arctic affairs, the changes of Arctic environment are closely related to China's development fate. Cooperation on Arctic ecological and environmental issues will not only provide effective protection of the unique natural environment, but also feed the economic cooperation between the two countries.

Polar tourism

Due to the lack of tourism infrastructure, the number of tourists visiting the Russian Arctic is low compared to the rest parts of Russia, with almost 1.2 million tourists visiting the Arctic in 2019, which is less than 1% of the total number of tourists in Russia. In order to stimulate the development of polar tourism, Russia's strategy for the development of Russia's Arctic region was released with the aim of promoting new economic activities in the Arctic and developing polar tourism.

Among the Arctic region, the Murmansk Oblast is a leader in the flow of tourists to the Russian Arctic[9]. Murmansk has shown active performance in development of polar tourism cooperation. In April 2019, Murmansk Arctic State University announced cooperation with China in polar tourism[10]. In November 2019, Murmansk hosted the international conference "Arctic Vision", which attracted tour operators from China[11]. It can be seen that China and Russia still have a broad basis for polar tourism cooperation.

By reviewing the current situation of Sino-Russian cooperation on Arctic sustainable development issues – scientific research, ecology and tourism – the following features can be summarized: 1) cooperation in the field of Arctic scientific research is well developed and is expected to be further deepened in the future; 2) cooperation in the field of ecology and environmental protection is currently focused on the protection of transboundary water resources, and the successful experience and legal documents can provide the basis for cooperation to expand their interaction in the Arctic region; 3) cooperation in the field of polar tourism is still in its initial stage, but two sides can further explore multi-project tourism cooperation.

New opportunities for cooperation between the two sides during the Russian chairmanship of the Arctic Council

The concept of sustainable development has been a consistent approach of the Arctic Council since its establishment. During Russia's chairmanship of the Arctic Council, Russia may actively develop a chairmanship agenda in line with the Arctic Council development concept.

[9] YNAR, Murmansk and Arkhangelsk regions have become leaders in terms of tourist flow in the Arctic regions of Russia. June 4, 2020. Available at: https://ru.arctic.ru/tourism/20200604/946049.html (accessed: March 25, 2022).

[10] Eurasian Arctic Centre plans joint development project with China. April 17, 2019. Available at: http://sputniknews.cn/society/201904171028218668/ (accessed: March 25, 2022).

[11] Tour operators from China and Thailand will come to Murmansk for the Arctic Horizons. November 7, 2019. Available at: https://nord-news.ru/news/2019/11/06/?newsid=116653 (accessed: March 25, 2022).

Therefore, Russia is bound to pay more attention to sustainable issues, such as scientific research, ecology and tourism. Thus, there is a potential space for cooperation in the following sustainable development projects:

Arctic scientific research: "Snowflake" International Arctic Station

The "Snowflake" International Arctic Station is a research project led by Moscow Institute of Physics and Technology, which is scheduled to be established in Yamalo-Nenets Autonomous Okrug in 2022, and to provide a practical platform for discussions on sustainable development topics between Russia and its international partners in the framework of the Arctic Council[12]. Russia is actively seeking international cooperation. A cooperation fund has been established with South Korea for the development of hydrogen energy based on the "Snowflake" Arctic Station. Russia has also shown interest in inviting China to participate in the project. Vasiliev, who is leading the project, has said that "China can contribute to the construction of the international Arctic station and the two sides are discussing joint cooperation"[13].

In the context of global energy market transformation, China is also actively responding to the strategy of promoting clean, low-carbon, safe and efficient use of energy, as a green and clean energy source, is expected to become an emerging strategic energy industry in China. Therefore, both sides have the potential to cooperate.

Arctic ecological and environmental protection field: Technical cooperation for environmental monitoring system

In May 2020, a diesel fuel storage tank at Norilsk-Tamil Energy was damaged when its columns suffered sinking, resulting in a fuel spill of about 21,000 cubic meters[14]. This was the largest known spill of petroleum products in the Russian Arctic, causing irreversible damage to the local ecosystem. According to the company involved, Norilsk, the main cause of the accident was melting of permafrost that caused the support tank to shift. The Arctic ecosystem is fragile and global climate change could lead to severe environmental damage in the Arctic (Bai et al., 2020).

The Norilsk accident demonstrates the importance of ecological protection and establishing a permanent monitoring mechanism for the effects of environmental change in the Arctic. The RF President Vladimir Putin said a system for monitoring permafrost conditions in the Arctic and predicting the risk of permafrost melting should be rebuilt. China may participate in the project and seek cooperation in technical and other fields. Permafrost is also found in China and can be divided into high-latitude and high-altitude permafrost, such as Changbai Mountains, Wutai Mountains. The cooperation between two countries will be mutually beneficial.

Polar tourism: the Russian Arctic National Park

According to statistics, China is the most visited country in the Russian Arctic *(Fig. 3)*. Chinese tourists have great interest in Arctic scenery, therefore the Russian Arctic National Park will be a good project for cooperation (Kuklina, Cheban, 2019). Russian Arctic National Park (Arkhangelsk Oblast) is the largest nature reserve in Russia, established to preserve the cultural, historical and natural heritage of the western Arctic region of Russia[15]. Every summer, tourists from all over the

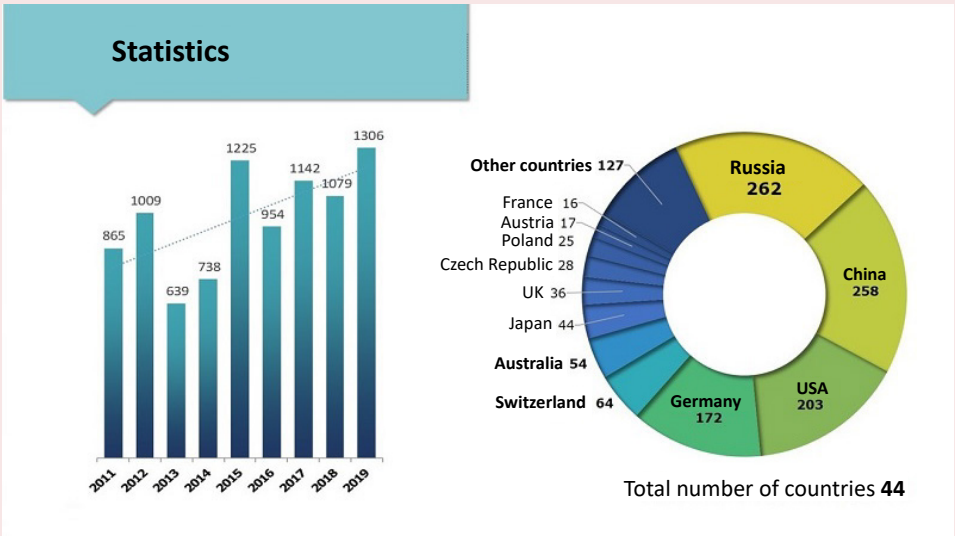
[12] For more information, see the Snowflake Arctic Station website: https://arctic-mipt.com/

[13] Russian expert: China may participate in building international Arctic station in Russia. January 21, 2020. Available at: http://sputniknews.cn/society/202001211030492192/ (accessed: March 25, 2022).

[14] What will be pulled after the accident near Norilsk. June 20, 2019. Available at: https://www.kommersant.ru/doc/4366214?utm_source=yxnews&utm_medium=desktop&utm_referrer=https%3A%2F%2Fyandex.ru%2Fnews&fbclid=IwAR3o-qLKNPh-FNtmCFyHaBxEguQLbZ_aHlhsHgY-Nfe0rtTYAZZ0F7_RhL8#id1905469 (accessed: March 23, 2022).

[15] Arkhangelsk Oblast Acting Governor Alexander Tsybulsky examines Russian Arctic Park's projects. June 1, 2020. Available at: https://arctic.ru/infrastructure/20200601/945736.html (accessed: March 23, 2022).

Figure 3. Countries visiting the Russian Arctic National Park in 2019



Source: 1,306 people from 44 countries visited the territory of the Russian Arctic National Park in the summer of 2019. See official website of the Russian Arctic National Park. Available at: http://www.rus-arc.ru/ru/Tourism/Statistics (accessed: May 3, 2022).

world visit the park by icebreakers. Chinese tourists are no strangers to the Russian Arctic National Park, one-third of the world's visitors to the national park are Chinese citizens, and the number has grown rapidly in recent years *(Fig. 3)*[16].

The park is currently working on the construction of an interactive Arctic museum and visitor center, and it is expected that two modern complexes will be built in the Frans Josef Land archipelago and Novaya Archipelago for tourism development and scientific research. Therefore, at the official level, two sides can conclude a memorandum on tourism cooperation and give administrative support to tourists in terms of policy such as relaxation of visa restrictions; at the enterprise level, promote a comprehensive interface between businesses engaged in tourism activities on both sides to improve the visitor experience.

Nowadays, the geopolitical situation in the world has become more complicated, the Ukraine crisis has led to a freezing point in relations between Russia and the U.S.-led Western countries, even affecting Russia's influence in the Arctic region, forcing Russia to gradually turn its attention to cooperation with China and other observer states to maintain its influence in the Arctic. From China's point of view, cooperation with Russia in the Arctic will help China to demonstrate itself as a responsible power. Therefore, China and Russia have broader prospects for cooperation on Arctic issues, especially sustainable development issues.

Difficulties in the development of new directions of Russian-Chinese Arctic cooperation

The challenges to Sino-Russian Arctic cooperation have been studied by Chinese and international scholars (Kirilenko, Lebedev, 2019), and the general view can be summarized as follows: on the one hand, Russia is cautious about China's involvement in the Arctic, fearing that China's participation will weaken Russia's Arctic dominance (Gudev, 2018); on the other hand, China has doubts about investing capital and technology in the Arctic due to the severe natural conditions in

[16] Data from official website of the Russian Arctic National Park. Available at: http://www.rusarc.ru/ru/Tourism/Statistics (accessed: March 23, 2022).

the Russian Arctic and national policy restrictions. Specifically on the issue of sustainable development of the Arctic, the new direction of Sino-Russian cooperation faces the following challenges:

Internal factor: How does Russia balance Arctic ecology and environmental protection with mineral resource development?

Sustainable development is a key goal for Russia's development in the Arctic region. Russian President Vladimir Putin has emphasized the concept of sustainable development in public, saying that he will pay attention to the ecological protection of the Arctic (Lassi, Alexander, 2022). In this context, Russia has proposed to support projects to reduce emissions and address the consequences of accumulated environmental damage in the Arctic[17]. At the same time, it has suspended cooperation projects with China, citing fears of environmental damage (Zhao, 2018). The Chinese methanol plant project in the Far East region was suspended because it failed to pass the residents' review, and the government said it would respect the residents' wishes[18]. This shows the high level of attention given to environmental protection at the official level in Russia.

However, it is noteworthy that Russia has not given up the development of mineral resources while showing the importance of environmental protection, especially when there is a conflict between the development of mineral resources and environmental protection in the Arctic, the Russian government has shown a tendency to give priority to the development of mineral resources. For example, the Russian government plans to amend the legislation to allow private investors to participate in Arctic shelf oil and gas development projects[19]. The attitude of the Murmansk Oblast government in the case of negative impacts of Gazprom's resource development project (the Shtokman condensate field extraction project) on the bird habitat of the Teriberka Nature Reserve – that it does not see a threat to the future nature park from the gas field extraction project[20], shows that the priority given to mineral resources development between mineral resources development and Arctic ecological protection at the local level.

The analysis shows that the suspension of Russian cooperation projects with China on environmental grounds seems to be an isolated case, and there are more examples that prove in reverse that mineral resource development in the Arctic remains an important concern for the development of the Arctic and has a tendency to take precedence over Arctic environmental protection. In this context, will the depth of cooperation between Russia and China on the issue of sustainable development in the Arctic be affected? The key factor affecting the cooperation is how Russia to balance the ecological and environmental protection of the Arctic with the development of mineral resources.

External factor: Arctic militarization trends distract Russia from developing the Arctic

As all know, there is a growing atmosphere of militarization in the Arctic *(Tab. 4)*, the main reason is the deterioration of relations between Russia and Western countries led by the United States after the Ukraine crisis in 2014. The U.S. government perceives Russia as a competitor that

[17] Russian Arctic Council Chairmanship: "Will Welcome more Active Engagement of the Observer States". March 8, 2021. Available at: https://www.highnorthnews.com/en/russian-arctic-council-chairmanship-will-welcome-more-active-engagement-observer-states (accessed: March 27, 2022).

[18] Residents of Russia's Khabarovsk Krai do not support Chinese company's project to build methanol plant. March 22, 2021. Available at: http://sputniknews.cn/russia/202103221033318617/ (accessed: March 29, 2022).

[19] A bill to abolish environmental impact assessments for boreholes in the Arctic has been supported by the government. April 29, 2021. Available at: https://ru.arctic.ru/ecology/20210429/993062.html (accessed: March 26, 2022).

[20] Gazprom refused to transfer the subsoil areas of the Shtokman project to the Teriberka natural park. March 16, 2021. Available at: https://pro-arctic.ru/16/03/2021/news/42998#read (accessed: March 26, 2022).

Table 4. Military activities of Arctic States in the Arctic in 2018–2022

Year	Russia	U.S. (NATO)
2018	Military exercises: annual readiness exercise of Russia's Strategic Forces	Military exercises: Trident Junction 2018; Ice Exercise 2018 Norex; Dynamic mongoose
	Construction of new electronic warfare center	Reboot US Navy 2nd Fleet
2019	Military exercises: Northern Fleet Exercises in the Barents Sea; Nuclear submarine exercises; Tsentr-19; Ocean Shield 2019; Thunder 2019	Military exercises: Arctic Expeditionary Force Capability Exercise; ICEX Exercise; Bold Quest; Aerial military exercises in the Arctic Circle
	Construction of Northern Clover military base	Construction of Military radar facility in Vardø, Norway Construction of temporary long-range maritime operations center in Iceland
	Deployment of electronic warfare systems	Released new edition of Arctic Strategic Outlook of Coast Guard; DoD Arctic Strategy; US Navy Arctic strategy; DHS Arctic Strategic Approach
2020	Military exercises: Ocean Shield exercise; Northern Fleet Tactical Exercise; Northern Fleet Anti-Submarine Warfare Exercise	Military exercises: Dynamic Mongoos; Reindeer II; Cold Response 2020 FONOP: NATO warships entered Russian Arctic waters
	Established interdepartmental committee for safeguarding Arctic national interests under the framework of security conference meeting	Released US Air Force Arctic Strategy
		High-intensity approach flight operations against Russia
2021	Military exercise: Umka-21; Zapad-21	Military exercise: Vintersol 2021; Formidable Shield; Dynamic Mongoose; Arctic Fighter Meet 21
	Upgrade Northern Fleet became its fifth military district	Update the agreement between Norway and the United States on defense cooperation
	Launched new hypersonic Tsirkon cruise missile	Sent B-1B bombers to Norway for the first time
	Modernization of military air bases in the Arctic	Established the Ted Stevens Center for Arctic Security Studies
2022	Military exercise: Military missile of Northern Fleet firing exercise	Military exercise: Cold Response 2022
	…	…

Source: own compilation according to news from NATO website and report of SIPRI: Ian Anthony, Ekaterina Klimenko, Fei Su. A Strategic Triangle in The Arctic? Implications of China–Russia–United States power dynamics for regional security. *SIPRI Insights on Peace and Security*. No. 2021/3. March 2021.

openly "challenges U.S. power" and a "spoiler of Arctic peace" (Trenin, 2020). In May and September 2020, the U.S., together with NATO allies (the UK, Norway, Denmark, etc.), conducted military exercises in the Barents Sea, with allied ships entering Russia's exclusive economic zone during the September exercise[21], demonstrating the U.S.-led NATO bloc's determination to enter Arctic waters (Erokhin, 2020). Russia also responded, including upgrading the Northern Fleet to Russia's fifth largest military region, reopening Arctic military bases. While each side says its actions are purely defensive and forced, leading to a peculiar phenomenon in the Arctic, All countries are saying that "the Arctic is a zone of peace and stability", while all parties are accelerating the transformation of the Arctic into a theater of military operations. The "militarization" is gradually turning the Arctic into a place of military confrontation.

The militarization of the Arctic will inevitably affect the development of the Russian Arctic region. On the one hand, the militarization of the Arctic region will trigger serious alarm among international investors, they may not be determined to make large-scale investments in the Russian Arctic, even the development of projects on the topic of sustainable development. On the other hand,

[21] In a controversial move, Norway sails frigate into Russian Arctic EEZ together with UK, US navy ships. September 9, 2020. Available at: https://www.arctictoday.com/in-a-controversial-move-norway-sails-frigate-into-russian-arctic-eez-together-with-uk-us-navy-ships/ (accessed: March 26, 2022).

as a key "influencer" in the militarization of the Arctic, Russia will certainly devote more energy to issues related to military operations in the Arctic, which will certainly lead to the lack of necessary support for economic development in the Arctic region, which will ultimately affect the cooperation projects. Therefore, the unstable international situation in the Arctic will become an important external factor hindering the cooperation between Russia and China in the Arctic.

Incidental factor: Global spread of epidemic puts limits on Sino-Russian Arctic cooperation.

From late March 2020, the COVID-19 spread rapidly across Russia. Until now, the cumulative number of infected cases in Russia has reached 10 million. The full spread of the epidemic also affects the international cooperation in the Russian Arctic.

First of all, the epidemic has caused widespread infection of employees at the Arctic project plants, which has led to the stagnation of projects and hindered the process of infrastructure construction and project development in the Arctic region. At the same time, as the epidemic swept across the globe, foreign capital had to make a more conservative choice and withdraw from international cooperation projects in the Arctic, which gave a negative impact on the sustainable development of the Arctic region. Second, the epidemic prevention and control measures bring heavy obstacles to the development of cooperative projects. The importance attached to the prevention and control of the new coronavirus has also affected the development of Sino-Russian scientific expeditions in the Arctic, for example, the joint Sino-Russian scientific expedition and cooperative polar tourism projects have been postponed.

In summary, although the Russian chairmanship of the Arctic Council has created new directions for Sino-Russia cooperation on the issue of sustainable development of the Arctic, the negative impact of the external trend of militarization of the Arctic region, and the global spread of the epidemic all pose many problems for Sino-Russian cooperation in the Arctic.

Conclusion

For a long time, Sino-Russian cooperation has relied on the strategic leadership of the heads of both countries, but there is still a lack of consensus and endogenous driving force for cooperation from the political elite in both countries, while there is still a "China-phobia" on specific economic issues (Alexeeva, Lasserre, 2018). In particular, on the issue of sustainable development, Russia does not have a deep understanding of China's image of cooperation and believes that China is not keen on issues related to environmental protection, nor is it willing to spend energy and financial resources on them. From the abovementioned point of view, it is clear that Russia and China still have a long way to go in terms of cooperation on the issue of sustainable development in the Arctic.

Today, world geopolitical situation has changed dramatically, and behind the Russian-Ukrainian conflict is a drastic change in the geopolitical pattern of the entire European region. While the arctic geopolitics is the epitome of the geopolitical changes in Europe. The systemic crisis of Russia's relations with the West will inevitably affect the change of the Arctic geopolitical pattern, and even lead to Russia's Arctic role being isolated by other "Arctic 7" countries, then the Arctic has become a new stage for great power political games. In this context, cooperation with countries in Northeast Asia will be an important starting point for Russia to maintain the influence of Arctic powers, and certainly China plays a key role in it. China has always stressed its willingness to work with Russia to deepen cooperation in sustainable areas such as Arctic scientific expeditions, ecological protection and polar tourism.

While the international community has often criticized the lack of intrinsic motivation for Sino-Russian cooperation, Russia is well aware that China has always been an irreplaceable and

powerful player for Russia, whether in terms of capital, technology or market demand. In March 2021, Sergey Lavrov gave a joint interview to Chinese media and clearly stated that "for us, China is a real strategic partner and like-minded nation, and our cooperation in the international arena will help stabilize the global and regional situation"[22]. Under the development of friendly relations between the two countries, the sustainable Sino-Russian Arctic cooperation will build on the existing achievements and make new achievements in the fields of scientific research, environmental protection and polar tourism.

References

Alexandrova V.A. (2019). Cooperation between Russia and China in the Russian Arctic. *Skiff. Issues of Student Science*, 5, 447–451 (in Russian).

Alexeeva O.V., Lasserre F. (2018). An analysis on Sino-Russian cooperation in the Arctic in the BRI era. *Advances in Polar Sciences*, 29(4), 269–282. DOI:10.13679/j.advps.2018.4.000xx

Bai J., Wang L. (2020). A study on the legal regulation of China's participation in multi-level cooperation in Arctic governance. *Hebei Law*, 3(38), 66–79. DOI:10.16494/j.cnki.1002-3933.2020.03.005 (in Chinese).

Bai J., Wang L., Li Y. (2020). The economic and social development trend of the Russian Arctic and new opportunities for Sino-Russian Arctic cooperation. *East Asian Review*, 2, 189–217 (in Chinese).

Camilla T.N., Klimenko E. (2017). Emerging Chinese-Russian cooperation in the Arctic: Possibilities and constraints, *SIPRI Policy Paper,* 46. Available at: https://www.sipri.org/sites/default/files/2017-06/emerging-chinese-russian-cooperation-arctic.pdf (accessed: May 2, 2022).

Deng B., Zou L., Tu J. (2017). International cooperation in the Arctic in the post-Ukrainian crisis context: A perspective of "complex interdependence". *Advances in Polar Science*, 4(29), 522–530. DOI:10.13679/j.jdyj.2017.4.522 (in Chinese).

Erokhin V.L. (2020). The Arctic in Russian-Chinese relations: From politics to economics. *The World of Russian-Speaking Countries*, 4, 26–36 (in Russian).

Gudev P. (2018). Arctic ambitions of Celestial Empire. *Russia in Global Politics*. Available at: https://www.globalaffairs.ru/global-processes/Arkticheskie-ambitcii-Podnebesnoi-19711 (accessed: March 18, 2022).

Guo P., Yang N. (2020). On the complex relationship between China, the United States and Russia in the Arctic. *Northeast Asia Forum*, 1, 26–41. DOI:10.13654/j.cnki.naf.2020.01.002 (in Chinese).

Hong N. (2018). *China's Interests in the Arctic: Opportunities and Challenges*. Washington: Institute for China-America Studies.

Kalfaoglu R. (2018). Sino-Russian cooperation in the Arctic: Prospects for development. *Vestnik of the Moscow State Regional University*, 2, 108–128 (in Russian).

Kirilenko V.P., Lebedev A.S. (2019). Trade and economic cooperation between Russia and China in the Arctic Region. *Russia in the Global World*, 14-15, 19–25 (in Russian).

Kolzina A.L., Mindubaeva A.A. (2020). The Polar Silk Road as an area of strategic partnership between the Russian Federation and the People's Republic of China. *Vestnik of the Udmurtian University. Sociology. Political Science. International Relations,* 4(2), 186–195 (in Russian).

Konyshev V.N., Sergunin A.A. (2011). International organizations and cooperation in the Arctic. *Vestnik of International Organizations*, 3(34), 27–36 (in Russian).

Kuklina E. A. (2020). Russian-Chinese strategic partnership in the Arctic as an imperative of our time. *Great Eurasia: Development, Security, Cooperation*, 3, 195–198 (in Russian).

Kuklina E.A., Cheban M. (2019). Polar tourism as a promising direction of development of concession projects in the Russian Federation. *Economy of the New World*, 3, 6–12 (in Russian).

[22] Interview by Minister of Foreign Affairs of the Russian Federation Sergey Lavrov to the Chinese media. March 22, 2021. Available at: https://archive.mid.ru/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/4646592 (accessed: March 26, 2022).

Kuznetsov A.M. (2014). "Peaceful Development of China" and some problems of modern theory of International Relations. *Political Conceptology: Journal of Metadisciplinary Research*, 3, 166–177 (in Russian).

Lassi H., Alexander S., Gleb Y. (2022). *Russian Strategies in the Arctic: Avoiding a New Cold War.* Available at: https://valdaiclub.com/a/reports/russian_strategies_in_the_arctic_avoiding_a_new_cold_war/ (accessed: May 1, 2022).

Lipina S.A., Fadeev A.M., Zaikov K.S. et al. (2021). Current stage of international cooperation in the Arctic: Search for answers to the challenges of economic development. *Economic and Social Changes: Facts, Trends, Forecast*, 14(4), 251–265. DOI: 10.15838/esc.2021.4.76.15

Liu G., Xu Q., Chen Y. (2019). Oil and gas resources and cooperation opportunities on the Polar Silk Road. *China Oil & Gas*, 2(26), 24–27 (in Chinese).

Mei C., Guo P. (2017). The Irtysh River-the Ob River: A possible path to the integration of Asia and Europe. *World Knowledge*, 1, 38–39 (in Chinese).

Morozov Y.V., Klimenko A.F. (2015). Countries of North-East Asia in the "Arctic Race". *China in World and Regional Politics (History and Modernity)*, 20, 173–191 (in Russian).

Pecheritsa V.F. (2020). Arctic strategies of China and Russia: Similarities and differences. *Russian and Chinese Studies*, 4(1), 44–52. DOI: 10.17150/2587- 7445.2020.4(1).44-52 (in Russian).

Petrovsky V.E. Filippova L.V. (2018). China's strategy for Arctic development and prospects for Russian-Chinese cooperation in the region. *China in World and Regional Politics. History and Modernity*, 23, 171–179 (in Russian).

Pilyasov A.N. (2018). The magnet of globalization – China's Arctic policy. *Arctic: Ecology and Economy*, 3(31), 112–122. DOI: 10.25283/2223-4594-2018-3-112-122 (in Russian).

Rednikova T., Kudelkin N, Ma S. (2018). State policy of Russia and the People's Republic of China in the field of environmental protection in the Arctic: prospects for international and bilateral cooperation. *International Law and International Organizations*, 2, 17–31 (in Russian).

Savostova T.L., Biryukov A.L. (2019). Russian-Chinese cooperation in the Arctic: Effective management of regional systems development, *Innovation and Investment*, 7, 86–91 (in Russian).

Trenin D. (2020). *Russia and China in the Arctic: Cooperation, Competition, and Consequences.* Available at: https://carnegiemoscow.org/commentary/81407 (accessed: March 21, 2022).

Voronenko A., Bai J. (2017). *Prospects for Russian-Chinese Cooperation in the Arctic.* Available at: http://sco-khv.org/ru/publication_209/ (accessed: May 1, 2022).

Xu G., Klintsev Y.V. (2020). The Polar Silk Road: Sino-Russian cooperation against the backdrop of international order restructuring in the Arctic. *East Asia: Facts and Analysis*, 2, 36–50 DOI: 10.24411/2686-7702-2020-10010 (in Russian).

Yang J., Zhao L. (2019). Opportunities and challenges of jointly building of the Polar Silk Road: China's perspective. *Outlines of Global Transformations: Politics, Economics, Law*, 12(5), 130–144.

Zagorsky A.V. (2011). *The Arctic: A Zone of Peace and Cooperation.* Moscow: IMEMO RAN.

Zagorsky A.V. (2016). Russia and China in the Arctic: Real or imaginary disagreements? *World Economy and International Relations*, 2(60), 63–71 (in Russian).

Zhao L. (2018). Sustainable development cooperation in the Arctic: Challenges and approaches for China and Russia. *China International Studies*, 4, 49–67.

Zhuravel V.P. (2018). The place of Russia and Western Europe in China's White Paper on the Arctic. *Scientific and Analytical Vestnik of the Institute of Europe of RAS*, 1, 211–217 (in Russian).

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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 Oblast[1].

The following tables and graphs show the dynamics of several parameters of social well-being and socio-political sentiment of the region's population according to the results of the latest "wave" of the monitoring (June 2022) and for the period from August 2021 to June 2022 (the last six 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), 2011 (the last year of Dmitry Medvedev's presidency), and 2012 (the first year of Vladimir Putin's third presidential term).

We also provide yearly dynamics of the data for 2018–2021[2]

During the period from April to June 2022, the level of approval of the RF President's work increased by 2 p.p. (from 56 to 58%); in general, for the period from February to June – by 10 p.p. (from 48 to 58%).

The share of Vologda Oblast residents who positively assess the work of the Chairman of the RF Government also increased by 2 p.p. (from 44 to 46%); from February to June – by 8 p.p. (from 38 to 46%).

The share of positive assessments of the work of the Vologda Oblast Governor over the past two months increased by 3 p.p. (from 38 to 41%); from February to June – by 7 p.p. (from 34 to 41%).

Over the last six surveys (from August 2021 to June 2022), the level of support for the work of the head of state increased by 6 p.p. (from 52 to 58%); the Chairman of the RF Government – by 3 p.p. (from 43 to 46%), the Vologda Oblast Governor – by 2 p.p. (from 39 to 41%)[3].

[1] The surveys are held six times a year in Vologda, Cherepovets, and in eight districts of the oblast (Babayevsky District, Velikoustyugsky District, Vozhegodsky District, Gryazovetsky District, Kirillovsky District, Nikolsky District, Tarnogsky District and Sheksninsky District). The method of the survey is a questionnaire poll by place of residence of respondents. The volume of a sample population is 1,500 people 18 years of age and older. The sample is purposeful and quoted. The representativeness of the sample is ensured by the observance of the proportions between the urban and rural population, the proportions between the inhabitants of settlements of various types (rural communities, small and medium-sized cities), age and sex structure of the Oblast's adult population. Sampling error does not exceed 3%.

More information on the results of VolRC RAS surveys is available at http://www.vscc.ac.ru/.

[2] In 2020, four "waves" of the monitoring were conducted. Surveys in April and June 2020 were not conducted due to quarantine restrictions during the spread of COVID-19.

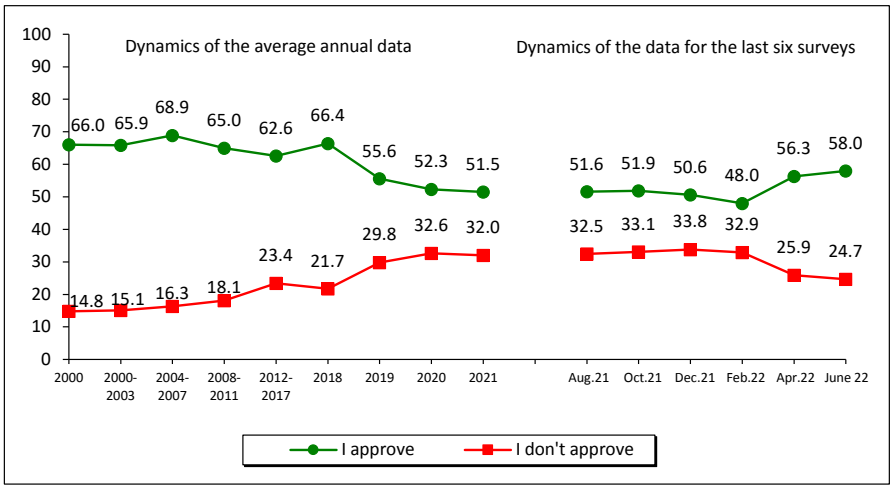
[3] Hereinafter, the results of a comparative analysis of the data from the survey conducted in June 2022 and the results of the monitoring "wave" conducted in August 2021 are given in the frame.

How do you assess the current performance of..? (% of respondents)

Answer option	Dynamics of the average annual data								Dynamics of the data for the last 6 surveys						Dynamics (+/–), June 2022 to	
	2000	2007	2011	2012	2018	2019	2020	2021	Aug. 2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2022	Aug. 2021	Apr. 2022
RF President																
I approve	66.0	75.3	58.7	51.7	66.4	55.6	52.3	51.5	51.6	51.9	50.6	48.0	56.3	58.0	+6	+2
I don't approve	14.8	11.5	25.5	32.6	21.7	29.8	32.6	32.0	32.5	33.1	33.8	32.9	25.9	24.7	-8	-1
Chairman of the RF Government																
I approve	-*	-*	59.3	49.6	48.0	41.1	38.7	39.9	42.7	39.7	38.3	37.6	43.6	45.5	+3	+2
I don't approve	-	-	24.7	33.3	31.6	38.4	40.4	37.6	36.0	38.3	38.9	37.7	32.5	31.4	-5	-1
Vologda Oblast Governor																
I approve	56.1	55.8	45.7	41.9	38.4	35.7	35.0	36.7	38.6	37.5	35.9	33.9	38.2	41.2	+3	+3
I don't approve	19.3	22.2	30.5	33.3	37.6	40.2	42.5	40.5	38.5	40.7	41.9	41.6	37.3	34.3	-4	-3

The wording of the question: "How do you assess the current work of ...?" According to the survey technique, sampling error does not exceed 3%, so hereinafter changes with a difference of 2 p.p. are not taken into account or are considered insignificant; they are highlighted in blue in the tables. Positive changes are highlighted in green, negative changes are highlighted in red.
*Included in the survey since 2008.

How do you assess the current work of the RF President?
(% of respondents, VolRC RAS data)



Answer option	Dynamics (+ / –), June 2022 to: August 2021	April 2022
I approve	+6	+2
I don't approve	-8	+0

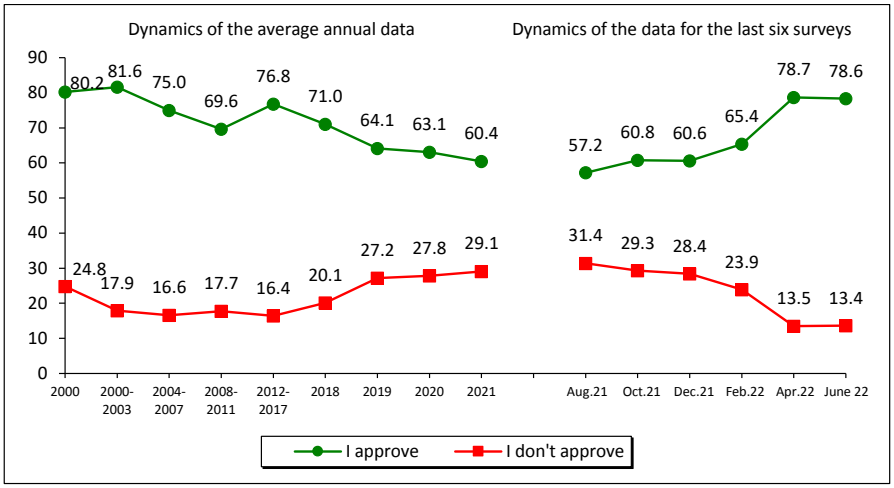
Hereinafter, all graphs show the average annual data for 2000, 2018, 2019, 2020, 2021, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017, corresponding to the presidential terms.

For reference:

According to VCIOM, the level of approval of the RF President's work from April to the beginning of June did not change and was equal to 78%. Compared to February 2022, there is a significant increase in the share of positive judgments (by 14 p.p., from 65 to 79%).

Positive changes were observed in early June 2022 compared to August 2021: the share of positive assessments of the work of the head of state increased by 21 p.p. (from 57 to 78%), the proportion of negative ones decreased by 18 p.p. (from 31 to 13%).

In general, do you approve or not approve of the work of the RF President?
(% of respondents; VCIOM data)



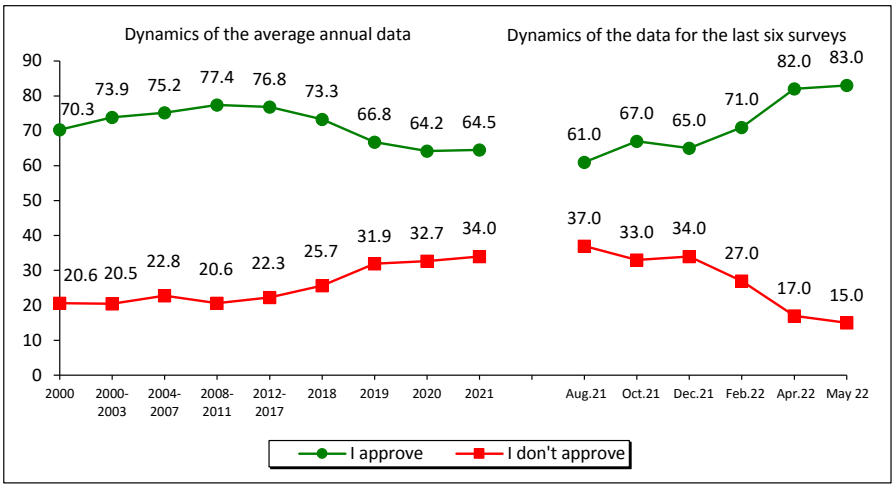
Dynamics (+ / –), June 2022 to		
Answer option	August 2021	April 2022
I approve	+22	0
I don't approve	-18	0

Question: "In general, do you approve or not approve of the work of the President of the Russian Federation?"
Source: VCIOM. Available at: https://wciom.ru/
Latest data – as of June 19, 2022.

According to Levada-Center*, the share of positive assessments of the RF President's work in April – May 2022 was 82%, the share of negative assessments decreased by 2 p.p. (from 17 to 15%).

Compared to June 2021, the level of support for the head of state increased by 22 p.p. (from 61 to 83%); the proportion of negative judgements decreased by 22 p.p. (from 37 to 15%).

In general, do you approve or not approve of the work of Vladimir Putin as President of Russia?
(% of respondents; Levada-Center data)*



Dynamics (+ / –), May 2022 to		
Answer option	August 2021	April 2022
I approve	+22	+1
I don't approve	-22	-2

Question: "In general, do you approve or not approve of the work of Vladimir Putin as President of Russia?"
Source: Levada-Center*. Available at: https://www.levada.ru

* Included in the register of foreign agents.

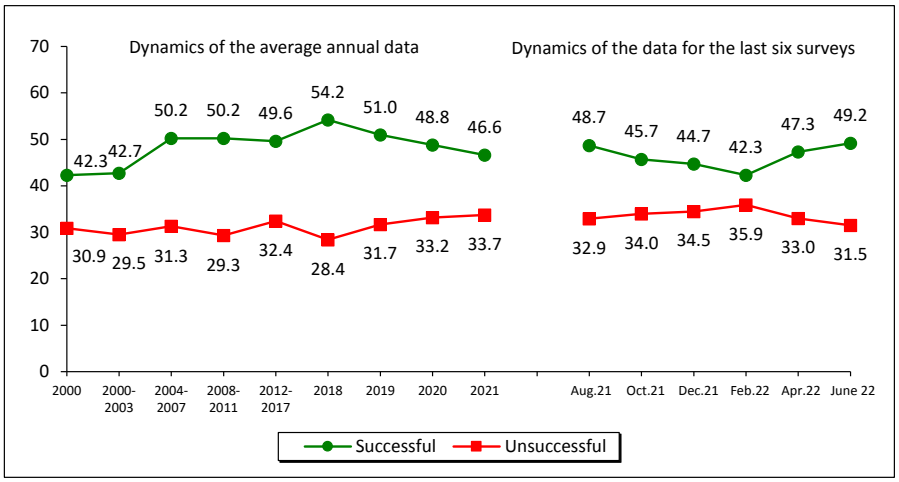
In your opinion, how successful is the RF President in coping with challenging issues? (% of respondents; VolRC RAS data)

Over the past two months, the share of those who consider the RF President's work to strengthen Russia's international positions to be successful increased slightly (by 2 p.p., from 47 to 49%). The proportion of those who hold the opposite point of view decreased by 2 p.p. (from 33 to 31%).

From February to June 2022, the share of positive assessments increased by 7 p.p. (from 42 to 49%); the proportion of negative ones decreased by 5 p.p. (from 36 to 31%).

Compared to June 2021, there were no significant changes in the assessments of the RF President's success in addressing the problem of strengthening Russia's international position.

Strengthening Russia's international position



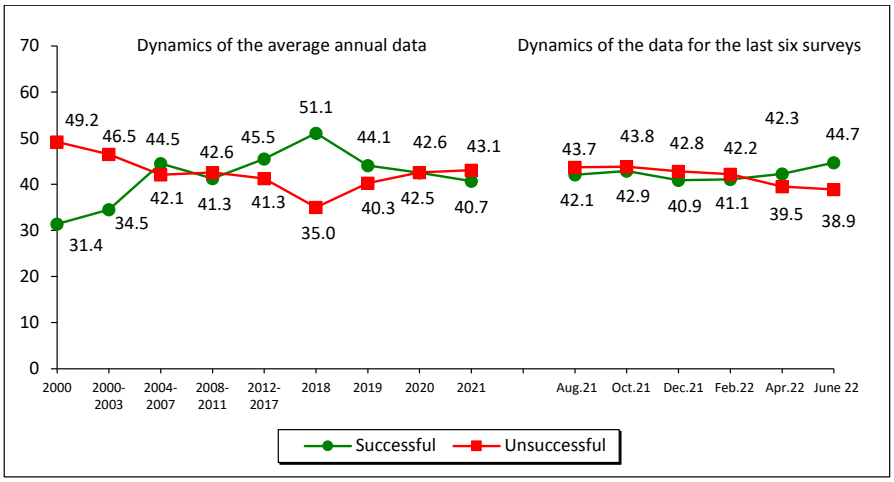
Answer option	Dynamics (+ / –), June 2022 to August 2021	Dynamics (+ / –), June 2022 to April 2022
Successful	+1	+2
Unsuccessful	-1	-2

In April – June 2022, the share of Vologda Oblast residents who positively assess the President's work in the field of imposing order in the country increased by 41–42%. The proportion of negative judgements did not change significantly (39–40%).

From February to June 2022, the share of positive assessments increased by 4 p.p. (from 41 to 45%); the proportion of negative ones decreased by 3 p.p. (from 42 to 39%)

Positive changes are also noted when comparing the results of the survey conducted in June 2022 with the results of the "wave" of the monitoring implemented in August 2021: the proportion of positive assessments increased by 3 p.p. (from 42 to 45%); the share of negative ones decreased by 5 p.p. (from 44 to 39%).

Imposing order in the country



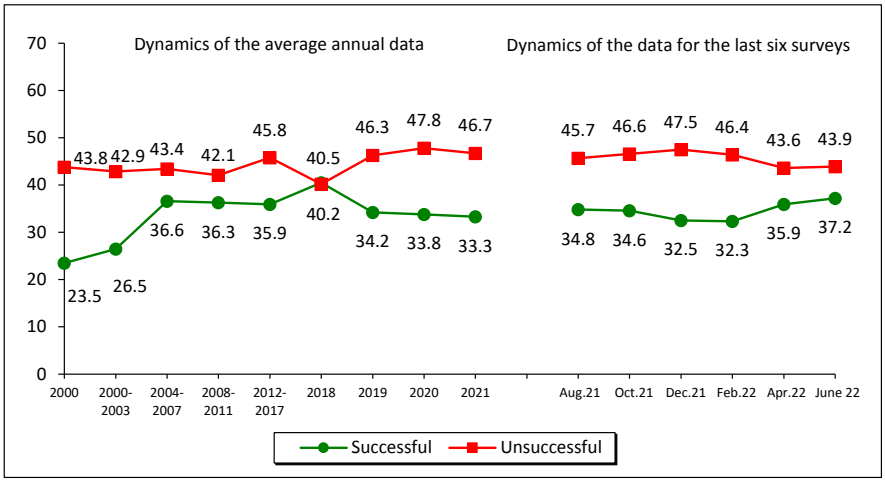
Dynamics (+ / –), June 2022 to		
Answer option	August 2021	April 2022
Successful	+3	+2
Unsuccessful	-5	-1

Over the past two months, there were no significant changes in the dynamics of people's assessments of the RF President's success in protecting democracy and strengthening citizens' freedoms: the share of positive judgments is 36–37%, negative – 44%.

From February to June 2022, the share of positive assessments increased by 5 p.p. (from 32 to 37%), negative – decreased by 2 p.p. (from 46 to 44%).

Over the last six surveys (from August 2021 to June 2022), there were no significant changes in the estimates of the population.

Protecting democracy and strengthening citizens' freedoms



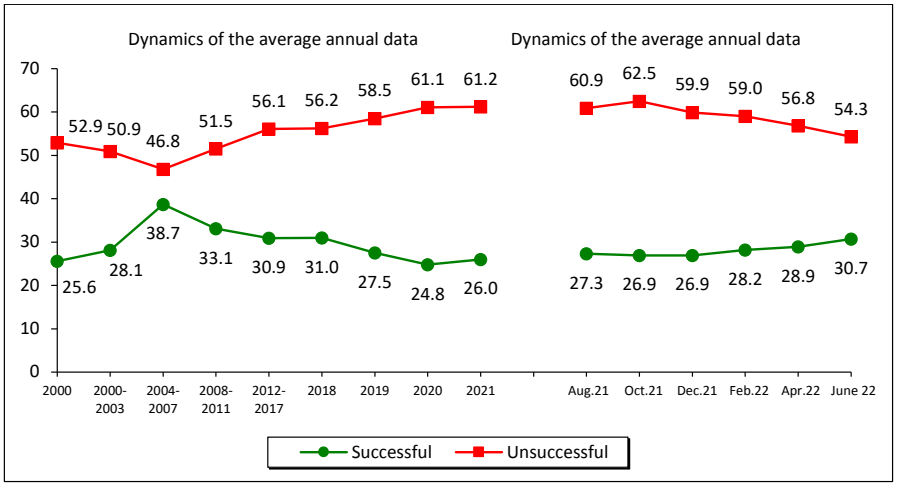
Dynamics (+ / –), June 2022 to		
Answer option	August 2021	April 2022
Successful	+2	+1
Unsuccessful	-2	0

From April to June 2022, the share of Vologda Oblast residents who believe that the RF President is successfully coping with the problem of economic recovery and growth of the welfare of citizens increased slightly (by 2 p.p., from 29 to 31%). The proportion of those who hold the opposite opinion decreased by 3 p.p. (from 57 to 54%).

From February to June 2022, mainly positive changes were noted: the share of positive judgments increased by 3 p.p. (from 28 to 31%); the proportion of negative ones decreased by 5 p.p. (from 59 to 54%).

Over the last six surveys (from August 2021 to June 2022), the proportion of positive judgments increased by 4 p.p. (from 27 to 31%), the share of negative ones decreased by 7 p.p. (from 61 to 54%).

Economic recovery and increase in citizens' welfare



Answer option	Dynamics (+ / –), June 2022 to August 2021	Dynamics (+ / –), June 2022 to April 2022
Successful	+3	+2
Unsuccessful	-7	-3

The structure of political preferences of Vologda Oblast residents did not change over the past two months: the share of people whose interests are expressed by the United Russia party is 34–35%, the KPRF – 10–11%, the LDPR – 8%, the Just Russia – 5%, the New People – 1%.

Support for United Russia increased slightly from February to June 2022 (by 4 p.p., from 31 to 35%).

Compared to August 2021, the share of supporters of the United Russia party increased by 3 p.p. (from 32 to 35%); the proportion of those who support the rest of the parties did not change significantly.

Which party expresses your interests? (% of respondents; VolRC RAS data)

Party	Dynamics of the average annual data												Dynamics of the data for the last 6 surveys						Dynamics (+/–), June 2022 to	
	2000	2007	2011	Election to the RF State Duma 2011, fact	2012	2016	Election to the RF State Duma 2016, fact	2018	2019	2020	Election to the RF State Duma 2020, fact	2021	Aug. 2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2022	Aug. 2021	Apr. 2022
United Russia	18.5	30.2	31.1	33.4	29.1	35.4	38.0	37.9	33.8	31.5	49.8	31.7	31.7	32.7	31.9	31.1	34.2	34.9	+3	+1
KPRF	11.5	7.0	10.3	16.8	10.6	8.3	14.2	9.2	8.8	8.4	18.9	9.3	9.3	11.1	10.5	9.5	11.2	10.2	+1	-1
LDPR	4.8	7.5	7.8	15.4	7.8	10.4	21.9	9.6	9.1	9.5	7.6	9.9	9.9	11.2	9.9	9.4	7.7	7.8	-2	0
Just Russia – Patriots for the Truth	-	7.8	5.6	27.2	6.6	4.2	10.8	2.9	3.4	4.7	7.5	4.7	5.3	6.3	6.0	5.7	4.5	4.8	-1	0
New People*	–	–	–	–	–	–	–	–	–	–	5.3	2.3	–	–	2.3	1.6	1.3	1.6	-	0
Other	0.9	1.8	1.9	–	2.1	0.3	–	0.7	0.3	0.5	–	0.2	0.2	0.5	0.2	0.7	0.3	0.1	0	0
None	29.6	17.8	29.4	–	31.3	29.4	–	28.5	33.7	34.2	–	33.9	34.1	31.7	29.6	32.4	30.8	30.7	-3	0
I find it difficult to answer	20.3	21.2	13.2	–	11.7	12.0	–	11.2	11.0	11.1	–	10.0	9.6	6.6	9.7	9.6	10.0	9.9	0	0

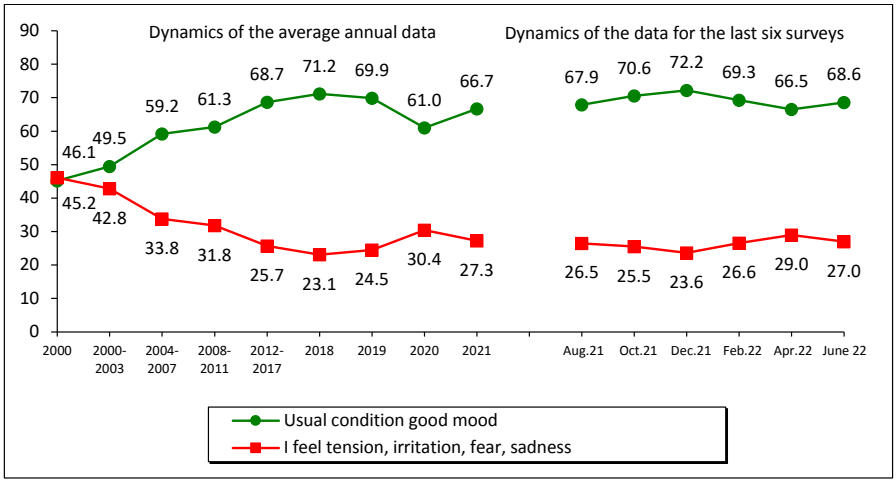
* The New People party was elected to the State Duma of the Russian Federation for the first time following the results of the election held on September 17–19, 2021.

Estimation of social condition (% of respondents; VolRC RAS data)

In June 2022, the proportion of the region's residents who characterize their daily emotional state as "normal, good" increased slightly (by 2 p.p., from 67 to 69%); the proportion of people who feel "tension, irritation, fear, sadness" decreased by 2 p.p. (from 29 to 27%).

Compared with August 2021 (as well as with February 2022), there were no significant changes in the estimates of social mood.

Social mood

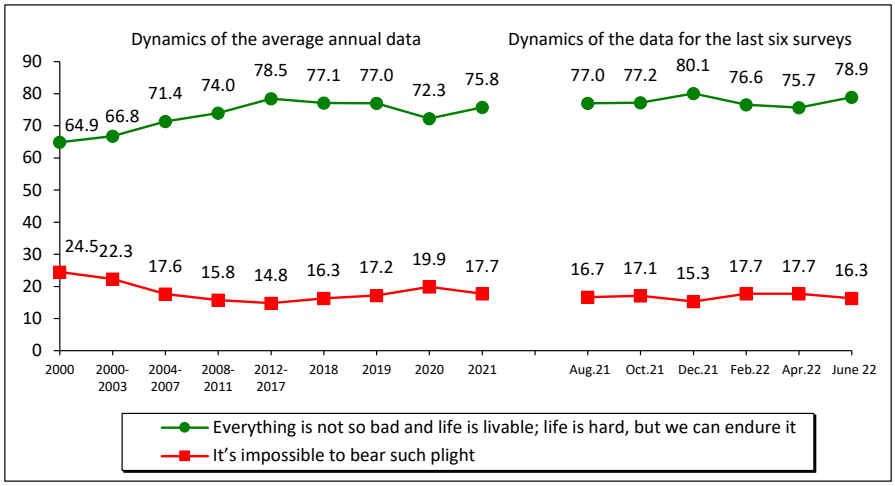


Answer option	Dynamics (+ / –), June 2022 to August 2021	Dynamics (+ / –), June 2022 to April 2022
Usual condition good mood	+1	+2
I feel tension, irritation, fear, sadness	0	-2

There are also some positive changes in the dynamics of the stock of patience indicator. Over the past two months, the share of people who believe that "everything is not so bad and life is livable; life is hard, but we can endure it" increased by 3 p.p. (from 76 to 79%). The proportion of those who hold the opposite point of view decreased by 2 p.p. (from 18 to 16%).

Compared with August 2021 (as well as with February 2022), there is a slight increase in the share of positive assessments (by 2 p.p., from 77 to 79%).

Stock of patience

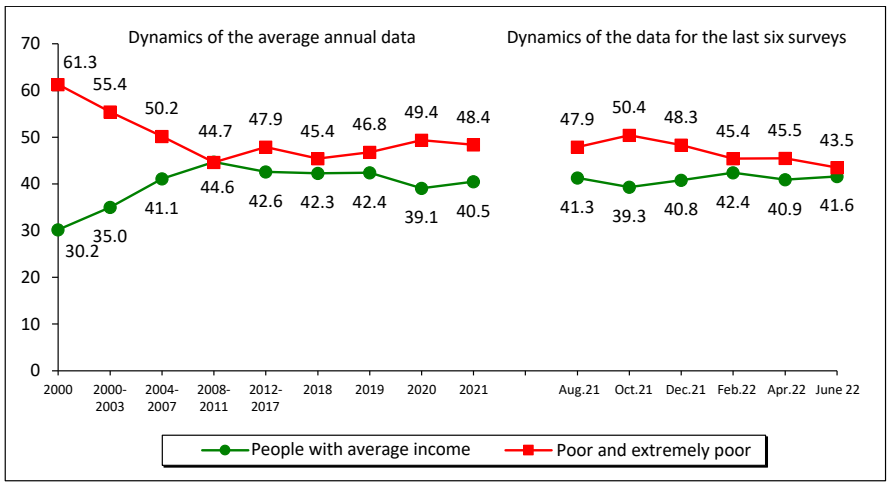


Answer option	Dynamics (+ / –), June 2022 to August 2021	Dynamics (+ / –), June 2022 to April 2022
Everything is not so bad and life is livable; life is hard, but we can endure it	+2	+3
It's impossible to bear such plight	0	-1

The proportion of the region's residents subjectively classifying themselves as "poor and extremely poor" decreased by 2 p.p. over the past two months (from 46 to 44%), which is close to the level of the beginning of the year (45%).

Over the last six surveys (from August 2021 to June 2022), the share of "poor and extremely poor" residents of the region has decreased by 4 p.p. (from 48 to 44%); the proportion of "middle-income" people did not change significantly (41–42%).

Social self-identification



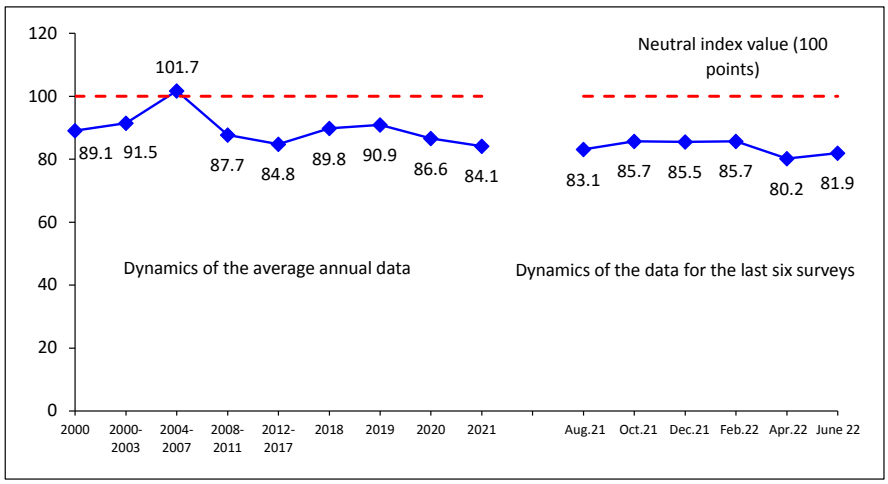
Answer option	Dynamics (+ / –), June 2022 to August 2021	Dynamics (+ / –), June 2022 to April 2022
People with average income	0	+1
Poor and extremely poor	-4	-2

Question: "Which category do you belong to, in your opinion?"

From April to June 2022, the Consumer Sentiment Index increased slightly (by 2 points, from 80 to 82 points), which indicates an improvement in people's forecasts regarding the future of the Russian economy and their personal financial situation.

However, the CSI still remains significantly lower than in February 2022 (by 4 points, 82 points against 86) and slightly lower than in August 2021 (by 1 point, 82 points against 83).

Consumer Sentiment Index
(CSI, points; data of VolRC RAS for the Vologda Oblast)

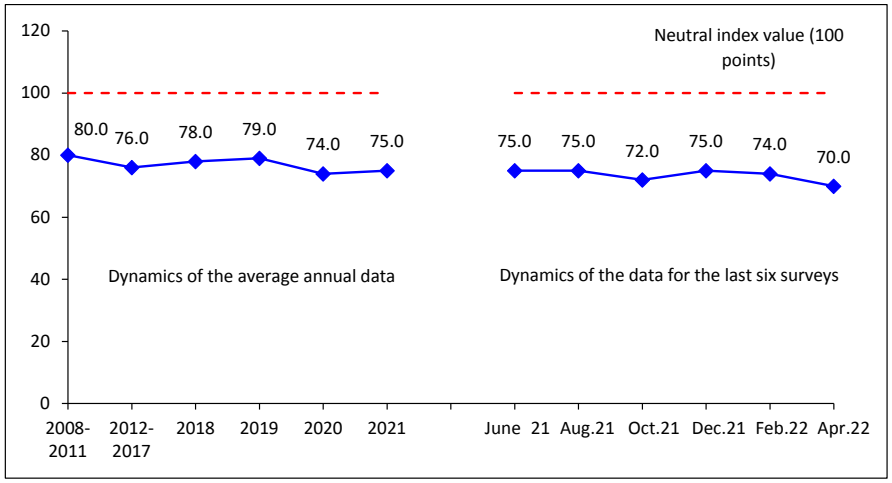


CSI	Dynamics (+ / –), June 2022 to August 2021	Dynamics (+ / –), June 2022 to April 2022
Index value, points	-1	+2

For reference:

According to the latest data from Levada-Center (as of February 2022), the Consumer Sentiment Index nationwide amounted to 70 points, which is lower than in February 2022 (74 points) and in June 2021 (75 points).*

Consumer Sentiment Index (CSI; Levada-Center data* for Russia)



Dynamics (+ / –), April 2022 to		
CSI	June 2021	February 2022.
Index value, points	-5	-4

The index is calculated since 2008.

Latest data are as of April 2022.

Source: Levada-Center*. Available at: https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/

We observe ambiguous changes in the dynamics of social mood in the context of the main socio-demographic groups over the past two months.

In 5 out of 14 groups, there is an increase in the proportion of people who characterize their daily emotional state as "normal, good". The share of positive assessments increased especially significantly among people over 55 years old (by 10 p.p., from 55 to 65%).

At the same time, the opposite changes are observed in 5 out of 14 socio-demographic groups: the share of those who experience predominantly positive emotions decreased especially significantly among people under the age of 30 (by 5 p.p., from 82 to 77%), as well as those who, according to subjective estimates of their own income, belong to the top 20% (by 6 p.p., from 82 to 76%).

We should note that in comparison with February 2022, there are no significant changes in the estimates of social mood in most of the groups, with the exception of the richest (according to self-estimates of income) citizens, among whom the share of positive judgments decreased significantly (by 6 p.p., from 82% in February 2022 to 76% in June 2022).

Compared with August 2021, we should note the increase in the proportion of people experiencing predominantly positive emotions among people over 55 years old (by 7 p.p., from 58 to 65%), as well as among those who, according to self-estimates of income, belong to the group of the bottom 20% (by 3 p.p., from 55 to 58%).

The deterioration of social mood over the past six surveys is noted primarily among people under the age of 30 (the share of positive assessments decreased by 5 p.p., from 82 to 77%), as well as in the group of the 20% of the most affluent residents of the region (by 11 p.p., from 87 to 76%).

* Included in the register of foreign agents.

Social mood in different social groups (answer option "Wonderful mood, normal, stable condition", % of respondents; VolRC RAS data)

Population group	Dynamics of the average annual data								Dynamics of the data for the last 6 surveys						Dynamics (+/–), June 2022 to	
	2000	2007	2011	2012	2018	2019	2020	2021	Aug. 2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2022	Aug. 2021	Apr. 2022
Sex																
Men	50.1	65.9	64.5	69.1	72.8	70.1	60.8	65.7	65.6	70.0	71.5	65.5	68.3	67.4	+2	-1
Women	43.3	61.7	62.0	65.8	69.8	69.6	61.2	67.4	69.8	70.9	72.8	72.3	65.1	69.7	0	+5
Age																
Under 30	59.1	71.3	70.0	72.3	80.0	81.1	67.6	73.5	82.3	75.3	81.9	75.3	81.8	77.3	-5	-5
30–55	44.2	64.8	62.5	67.9	72.6	71.2	61.8	69.5	71.4	70.8	75.1	70.7	71.1	68.8	-3	-2
Over 55	37.4	54.8	58.3	62.1	65.2	63.3	57.4	60.5	58.1	68.3	65.2	65.3	55.2	65.3	+7	+10
Education																
Secondary and incomplete secondary	41.7	58.4	57.4	57.2	64.8	63.2	56.1	62.1	63.2	64.1	69.7	68.7	63.0	65.8	+3	+3
Secondary vocational	46.4	64.6	63.6	66.7	72.2	72.7	63.5	66.7	68.5	70.4	70.1	68.3	69.8	70.5	+2	+1
Higher and incomplete higher	53.3	68.6	68.3	77.0	76.8	73.4	63.3	71.5	73.0	77.1	77.6	71.5	66.9	69.7	-3	+3
Income groups																
Bottom 20%	28.4	51.6	45.3	51.5	57.3	53.2	43.4	54.6	55.0	60.4	64.0	60.5	61.5	58.4	+3	-3
Middle 60%	45.5	62.9	65.3	68.7	71.9	71.4	62.6	67.3	68.9	70.9	71.1	68.8	64.2	70.3	+1	+6
Top 20%	64.6	74.9	75.3	81.1	82.9	81.8	75.6	79.9	86.7	84.2	85.3	81.5	81.9	75.7	-11	-6
Territories																
Vologda	49.2	63.1	67.1	73.6	71.0	68.6	60.9	60.3	59.7	64.0	65.7	63.2	60.2	61.0	+1	+1
Cherepovets	50.8	68.1	71.2	76.2	75.8	71.2	60.4	71.0	72.3	75.2	75.1	72.6	70.1	72.8	+1	+3
Districts	42.2	61.6	57.1	59.8	68.7	69.8	61.4	67.8	70.1	71.5	74.2	70.8	68.1	70.6	+1	+3
Oblast	46.2	63.6	63.1	67.3	71.2	69.9	61.0	66.6	67.9	70.5	72.2	69.3	66.5	68.7	+1	+2

RESUME

Starting from February 24, 2022, when Russian President Vladimir Putin announced the beginning of a special military operation on the territory of Ukraine[4], trends in public opinion on a wide range of issues reflecting people's opinions about the work of the authorities, the dynamics of their own financial situation and social well-being cannot be analyzed outside the context of both the special operation itself and its socio-economic, political and socio-cultural consequences.

Thus, in this issue of the Public Opinion Monitoring regarding the state of the Russian society, we focus on the changes in social attitudes that occurred in the period from February to June 2022.

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

According to the results of three "waves" of surveys carried out during this period (February, April, June 2022), we see that internal and, above all, external threats facing the country in the first half of 2022 had a positive, consolidating impact on the state of the Russian society. From February to June 2022:

✓ **there has been an increase in people's support for the work of the head of state (by 10 p.p.) and (no less important) other key representatives of federal and regional authorities (the Chairman of the RF Government (by 8 p.p.), the Vologda Oblast Governor (by 7 p.p.));**

✓ **after the first months of quite natural anxiety about the situation inside the country and the nature of the situation in the international political arena (as experts noted, "the very beginning, as well as the economic and social consequences, of the special operation seemed to paralyze society"), indicators of social well-being began to gradually recover (social mood +2 percentage points by April 2022, stock of patience + 3 p.p.);**

✓ **decisions adopted by the RF President and the RF Government and aimed at improving people's financial situation[5] and the morale of society[6], were reflected in a decrease in the share of people subjectively classifying themselves as "poor and extremely poor" (-2 p.p.), and, most importantly, in the growth of the consumer sentiment index (+2 p.p. by April 2022), which allows us (so far with some caution) to talk about an increase in people's optimistic forecasts regarding the future of the country, their own future and that of their families.**

Dynamics of the share of positive assessments
on key indicators of the public opinion monitoring (% of respondents)

Indicators of the public opinion monitoring	February 2022	April 2022	June 2022	Dynamics (+/–), June 2022 to	
				Feb. 2022	Apr. 2022
Assessment of the activities of the authorities					
RF President	48.0	56.3	58.0	+10	+2
Chairman of the RF Government	37.6	43.6	45.5	+8	+2
Vologda Oblast Governor	33.9	38.2	41.2	+7	+3
President's efforts to solve Russia's key problems					
Strengthening Russia's international position	42.3	47.3	49.2	+7	+2
Imposing order in the country	41.1	42.3	44.7	+4	+2
Protecting democracy and strengthening citizens' freedoms	32.3	35.9	37.2	+5	+1
Economic recovery and increase in citizens' welfare	28.2	28.9	30.7	+3	+2
Assessment of social condition					
Social mood	69.3	66.5	68.6	-1	+2
Stock of patience	76.6	75.7	78.9	+2	+3
Assessment of financial situation					
Share of the poor and extremely poor	45.4	45.5	43.5	-2	-2
Consumer Sentiment Index	85.7	80.2	81.9	-4	+2

[5] Such as an increase in the subsistence level, the minimum wage and pensions of unemployed pensioners by 10%; cash payments for those who have been awarded the Order of "Parental Glory" and the honorary title "Mother-Heroine", etc.

[6] Such as the creation of the movement of children and youth "Big Change", Russia's withdrawal from the Bologna education system, the revival of the Soviet honorary title "Mother-Heroine", etc.

Of course, it is still difficult to talk about any significant positive changes in the dynamics of public sentiment. It is impossible to ignore the fact that more than half of the population (54%) consider that the President is "unsuccessful" in ensuring the recovery of the economy and the growth of the welfare of citizens; that the share of "poor and extremely poor" residents of the region still exceeds the proportion of those who subjectively classify themselves as "middle-class" people (44% vs 42%), and the Consumer Sentiment Index has long remained at a level below 100 points (which indicates the predominance of pessimistic forecasts in the assessments of residents of the region regarding the future of the Russian economy and their own financial situation).

Nevertheless, the results of the monitoring conducted at the regional level and confirmed by the dynamics of the results of federal sociological surveys (VCOM, Levada-Center*) confirm the conclusions of experts that "the sanctions against Russia have not brought the desired results"[7].

Currently, the situation continues to be alarming: sanctions pressure on Russia from the countries of the Collective West (NATO and the European Union) persists, military action on the territory of Ukraine continues; we agree with many experts who note that in the coming months the level of support for the RF President and the state "will directly depend on the rapid success in the military campaign and effective economic policy of the government"[8].

In these conditions, the task of increasing the pace of socio-economic support for various segments of society, strengthening its morale and forming a clear idea in society about the prospects for the future of the country, its citizens and future generations of Russians remains extremely urgent on the part of the state.

Materials were prepared by M.V. Morev, I.M. Bakhvalova

[7] * Included in the register of foreign agents.

Opinion of economist V. Koltashov (source: Western experts could not calculate the consequences of sanctions against the Russian Federation. *Rossiiskaya gazeta*. June 12, 2022. Available at: https://rg.ru/2022/06/12/ekonomist-koltashov-zapadnye-eksperty-ne-smogli-proschitat-posledstviia-sankcij-protiv-rf.html).

[8] A divided society has lost the ability to protest. Nezavisimaya gazeta. April 3, 2022. Available at: https://www.ng.ru/editorial/2022-04-03/2_8407_editorial.html

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There should be not more than eight words or word combinations. Key words should reflect the content of the manuscript to the fullest extent. The number of words within a phrase should not exceed three.

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[1] Information about the modified Harvard standard is given in the book: Kirillova O.V. *Redaktsionnaya podgotovka nauchnykh zhurnalov po mezhdunarodnym standartam: rekomendatsii eksperta BD Scopus* [Editorial Preparation of Scientific Journals according to International Standards: Recommendations of a Scopus Expert]. Moscow, 2013. Part 1. 90 p.

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