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ECONOMIC AND SOCIAL CHANGES: FACTS, TRENDS, FORECAST

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

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

Founder: Vologda Research Center of the Russian Academy of Sciences

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

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

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

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

MAIN RESEARCH DIRECTIONS

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

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

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

INTERNATIONAL TIES AND PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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EDITORIAL

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The Rubicon Has Been Crossed: February 24, 2022, Russia Entered a New Stage in Its Development in the 21st Century

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

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

Abstract. February 24, 2022, after the recognition of the independence of the Donetsk People's Republic and the Luhansk People's Republic (February 22, 2022), Russian President Vladimir Putin announced the beginning of a special military operation on the territory of Ukraine. The head of state noted in his address to Russians that the purpose of the operation was "to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime. To this end, we will seek to demilitarize and denazify Ukraine, as well as bring to trial those who perpetrated numerous bloody crimes against civilians, including against citizens of the Russian Federation". The RF President's decision announced the beginning of a new stage in Russia's development in the 21st century and launched large-scale and irreversible changes concerning not only our country, but also the whole world. The global historical confrontation between Russia and the US-led NATO countries (between Russia and

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the Collective West) has entered an active phase, accompanied by a sharp aggravation of international political relations, sanctions policy, and armed clashes. We (relying, as usual, on expert opinions, official statistics and sociological surveys) express our own point of view on the events taking place in the world and in Russia, analyze their nature, causes, and implications.

Key words: special military operation, President of the Russian Federation, Ukraine, Collective West, new stage of development.

Russia has begun to fight for its future, for its place in the 21st century and for its own vision of the future of the 21st century.
V. Mozhegov[1]

February 2022, Russian President Vladimir Putin adopted decisions that entailed large-scale implications both for our country and for the whole world. It is no exaggeration to say that the recognition of the independence of the Donetsk People's Republic and the Lugansk People's Republic[2] (February 21, 2022), as well as the beginning of a special military operation on the territory of Ukraine (February 24) opened a new page in the multi-century history of the confrontation between Russia and the Collective West. As the President noted, **"a collision with these forces is inevitable; it is only a matter of time".**

The forced nature of the special operation (which the head of state has repeatedly emphasized in his public speeches) was due to deep reasons related to the history of the confrontation between Russia and the West, which escalated dramatically in late 2021 – early 2022 due to the following:

- ✓ fomenting anti-Russian hysteria in the world media around the allegedly imminent invasion of Ukraine by the Russian armed forces (which, in particular, allowed the Americans to literally "pour" weapons into Ukraine[3]);
- ✓ the U.S. ignoring Russia's key demands on the drafts of the treaty on security guarantees and

"... 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.**

... The showdown between Russia and these forces cannot be avoided. It is only a matter of time... Russia cannot feel safe, develop, and exist while facing a permanent threat from the territory of today's Ukraine.... They did not leave us any other option for defending Russia and our people, other than the one we are forced to use today... I reiterate: we are acting to defend ourselves from the threats created for us and from a worse peril than what is happening now"[4].

[1] Mozhegov V. Russia's special operation put an end to the end of history. *Vzglyad*. April 15, 2022. Available at: https://vz.ru/opinions/2022/4/15/1153019.html

[2] Presidential Decree on recognizing the Donetsk People's Republic. Available at: http://publication.pravo.gov.ru/Document/View/0001202202220002; Presidential Decree on recognizing the Lugansk People's Republic. Available at: http://publication.pravo.gov.ru/Document/View/0001202202220001

[3] According to some reports, this process has been going on since April 2021, but by the end of the year it became completely open; several shipments a day were delivered to the territory of Ukraine. Available at: https://www.5-tv.ru/news/382710/opublikovany-dokazatelstva-cto-ssa-nakacivali-oruziem-ukrainu-v2021-godu/

[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

the agreement on measures to ensure the security of Russia and NATO member states[5];

✓ an actual threat of the formation of a nuclear potential on the territory of Ukraine (as a result of which, according to the RF President, "the situation in the world and in Europe will drastically change, especially for us, for Russia"[6]);

✓ the threat of Ukraine's joining NATO, and therefore, the threat of deployment of the Alliance's armed forces on its territory, which would be "**a direct threat to Russia's security"[7];**

✓ finally, new shelling of the Lugansk and Donetsk people's republics by the armed forces of Ukraine, the intensity of which is indicated by the fact that on February 18, 2022, the leadership of the DPR and the LPR had to announce the evacuation of part of the civilian population (women, children, the elderly, about 700 thousand people in total[8]) to the territory of the Russian Federation.

Consequently, as Vladimir Putin noted in his address to Russians on February 24, 2022, announcing the start of a special operation in Ukraine, **"they did not leave us any other option for defending Russia and our people, other than the one we are forced to use today".**

After the start of the special operation, the purpose of which, as the President pointed out, is to demilitarize and denazify Ukraine and also "to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime", there developed a large-scale (not only military, but also economic, political, ideological) confrontation between Russia and the Collective West, **the global consequences of which for our country are comparable to such historical events as the Revolution in 1917, the victory in the Great Patriotic War in 1945 and the collapse of the USSR in 1991.**

> "In these circumstances, we have to take bold and immediate action. The people's republics of Donbass have asked Russia for help. In this context, in accordance with Article 51 (Chapter VII) of the UN Charter, with permission of Russia's Federation Council, and in execution of the treaties of friendship and mutual assistance with the Donetsk People's Republic and the Lugansk People's Republic, ratified by the Federal Assembly on February 22, I made a decision to carry out a special military operation. **The purpose of this operation is to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime. To this end, we will seek to demilitarize and denazify Ukraine, as well as bring to trial those who perpetrated numerous bloody crimes against civilians, including against citizens of the Russian Federation"**[9].

The global crisis observed today has several deeply-rooted foundations, each of which indicates its **logical emergence and inevitability**. According to Ambassador Extraordinary and Plenipotentiary of Russia V.V. Popov, such grounds include, for example, the centuries-old historical confrontation between the Russian and Anglo-Saxon civilizations. Many foreign experts have been talking about the crisis of capitalism for a long time and now raise the question of "what will replace this system" rather than "how to reform it"[10].

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[5] On Russian draft documents on ensuring legal guarantees of security by the United States and NATO. Official website of the RF Ministry of Foreign Affairs. Available at: https://www.mid.ru/ru/foreign_policy/news/1790809/

[6] 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

[7] Ibidem.

[8] Aggravation in the Donbass: What happened on February 18, 2022. Available at: https://officelife.media/news/31222-obostrenie-na-nbsp-donbasse-chto-proizoshlo-18-nbsp-fevralya-2022-goda/

[9] 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

[10] See, for example: 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.

V.V. Popov: **"...we are talking about the largest watershed in the history of the 21st century – about the confrontation between the Russian (sometimes called the Eurasian or the Orthodox civilization) and the Western civilizations.** The outcome of this conflict situation largely depends on our success in Ukraine... the success of our military operation in Ukraine **will inspire most of the world community** to boldly defend their independence, the right to determine their own policies and destiny"[11].

I. Wallerstein: **"Capitalism is a system, and ... all systems have lives; they are never eternal...** The question before the world today is not in what way governments can reform the capitalist system... **The question therefore has become what will replace this system"**[12].

Excerpt from a report of CIA Director W. Casey to the U.S.President R. Reagan (1981): **"Now the situation is favorable for dealing a serious blow to the Soviets,** for plunging their economy into complete chaos, and then taking control over and influence the further development of events in society and the state... **we have a historic chance – and we must not miss it"**[14].

A. Fursov: "Gorbachev's surrender, in fact, the surrender of the socialist camp and the USSR, which took place on December 2–3, 1989 in Malta, is the final act of a rather **long process of interaction between part of the Western and part of the Soviet elite"**[15].

K. Semin: "...one of the most important factors that determined the destruction of the Soviet Union, and we refer to this factor constantly when discussing the reasons, is **the successful sabotage and psychological war of our main enemy, aimed against the Soviet Union"**[16].

It is difficult to disagree with these points of view. However, in our opinion, the roots of today's tense global situation lie, among other things, in the specifics of the history of modern Russia, in its progressive development since 2000, when Vladimir Putin assumed office as President.

In fact, this whole story (from 2000 to the present) is proof that "the largest geopolitical catastrophe of the 20th century"[13] **– the collapse of the Soviet Union that was purposefully planned by the Americans** (as many experts like A. Fursov, K. Semin, etc., point out) **and that drew a line under the results of the Cold War of 1946–1991, despite the magnitude of its implications for Russia, did not turn out to be an irreversible process.**

And, of course, this process (Russia's return to the global geo-political arena, the restoration of the national identity that was seemingly lost in the 1990s) is directly related to the personality and role of Russian President Vladimir Putin, who even at the time of his first inauguration said that **he was taking on "a huge responsibility", because "in Russia the head of state has always been and will always be the person who is responsible for everything in the country..."**[17].

[11] Popov V.V. Confrontation of Russian and Western civilizations. Russian International Affairs Council. Available at: https://russiancouncil.ru/analytics-and-comments/columns/riacdigest/protivostoyanie-rossiyskoy-i-zapadnoy-tsivilizatsiy/?sphrase_id=90100562 (V.V. Popov – Ambassador Extraordinary and Plenipotentiary of Russia, Candidate of Sciences (History), analyst at the Institute for International Studies and the Center for Middle Eastern Studies of MGIMO University, member of the RIAC).

[12] 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.

[13] Address of the President of the Russian Federation, April 25, 2005. Official website of the RF President. Available at: http://www.kremlin.ru/acts/bank/36354

[14] Shironin V.S. KGB – TsRU. *Sekretnye pruzhiny perestroiki* [KGB – CIA. The Secret Springs of Perestroika]. Moscow: Yaguar, 1997. Available at: https://booksonline.com.ua/view.php?book=32756&page=21

V.S. Shironin (1939–2001) – one-star general, head of a KGB analytical center, deputy head of Soviet counterintelligence, senior consultant to the heads of the state security department.

[15] The lot of those who have no ideology is a beggars' banquet on the sidelines of History. Official website of A. Fursov. December 2, 2014. Available at: http://andreyfursov.ru/news/udel_tekh_u_kogo_net_ideologii_piknik_na_obochine_istorii/2014-12-02-384

[16] The causes of the collapse of the USSR. K. Semin and E. Spitsyn. March 17. 2017. Available at: https://aftershock.news/?q=node/499037&full

[17] Vladimir Putin's inaugural speech on May 7, 2000. Available at: https://www.mn.ru/blogs/blog_reference/80928

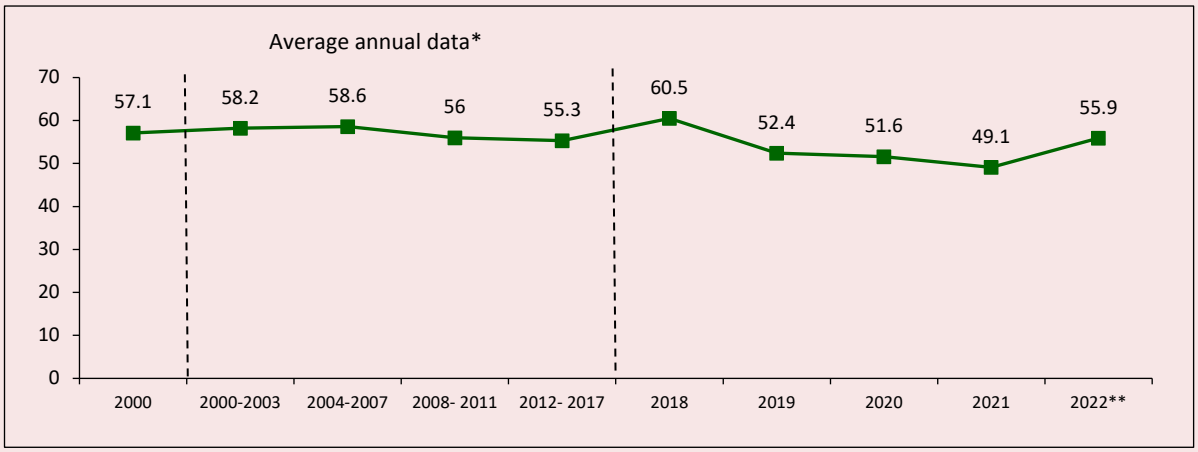
In the following decades, the President repeatedly confirmed the fact that he was personally responsible for the state of affairs in Russia and for the life of the country as a whole. This idea is not only expressed in his public speeches[18], but it is also contained in the key strategic documents on national development[19]. In fact, he built the entire system of public administration in such a way that a particular person is the main "arbiter" in it"[20].

At the same time, Vladimir Putin personally enjoys the highest level of people's trust compared to all major state and non-governmental institutions *(Figure)*, and this trust did not arise from nowhere, but is rather a reflection of public support for his work and the strategic guidelines for Russia's development that he expresses.

In general, over the period from 2000 to 2022, the level of people's trust in any of the main governmental and non-governmental institutions in the country has not decreased, and most of them (13 out of 21) have witnessed a noticeable increase in this kind of trust (5 p.p. or more; *Tab. 1*). This clearly characterizes the attitude of people toward the entire system of public administration created by the President. Therefore, we can say that the whole history of the development of Russia under Vladimir Putin is **the history of realization of his vision of the country's future, the vision supported by society, the vision which he outlined in his first program article "Russia at the turn of the Millennium" (1999): a state based on three pillars: "the Russian idea. A strong state. An efficient economy"**[21].

The path that the President embarked on in 2000 was originally designed for a long period, and the perseverance that the head of state has shown in achieving his goals over the years, in a sense, testifies to the passionate nature of his personality. Passion, as the author of this theory L. Gumilyov wrote, is

Dynamics of the level of trust in the RF President (% of respondents)



* Average annual data for the presidential terms: 2000–2003 – Vladimir Putin's first presidency; 2004–2007 – Vladimir Putin's second presidency; 2008–2011 – Dmitry Medvedev's presidency; 2012–2017 – Vladimir Putin's third presidency.
** Data as of April 2022.

Source: VolRC RAS public opinion monitoring.

[18] See, for example: 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

[19] See, for example: National Security Strategy 2015 (Article 108). Official website of the RF President. Available at: http://kremlin.ru/acts/bank/40391/page/1

[20] Putin's arbitration. *Nezavisimaya gazeta*. November 17, 2016. Available at: https://www.ng.ru/editorial/2016-11-17/2_6861_red.html

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

Table 1. Dynamics of the level of trust in governmental and no-governmental institutions, % of respondents

Answer option*	Year	Average annual data				Year					Dynamics (+/–), p.p.
	2000	2000–2003	2004–2007	2008–2011	2012–2017	2018	2019	2020	2021	2022**	2022 to 2000
Church	42.3	42.6	44.3	47.8	44.7	50.0	46.5	45.5	46.6	47.5	+5
Prosecutor's Office	30.9	28.9	31.9	36.8	39.5	47.1	43.6	43.1	44.6	47.3	+16
RF Government	42.7	39.3	39.3	51.7	45.5	47.3	41.0	41.0	40.1	45.2	+3
Court	31.6	30.9	33.9	37.4	39.1	45.3	39.4	38.1	42.1	44.7	+13
Federal Security Service	34.2	32.6	33.4	37.5	38.5	45.2	41.0	42.7	43.9	44.3	+10
Police	27.2	26.0	27.0	33.6	37.2	44.4	40.7	41.6	43.9	44.3	+17
Army	37.0	33.8	27.8	35.0	39.6	47.2	40.8	38.5	43.0	43.5	+7
Oblast Administration	31.3	28.6	35.3	40.3	36.6	35.4	33.5	34.2	35.6	37.5	+6
Local self-government	no data	no data	29.5	35.9	32.9	34.4	31.6	30.3	32.3	35.4	+6
Scientific organizations	no data	no data	no data	no data	no data	32.8	30.3	30.3	36.1	34.8	+2
Federation Council	28.3	27.9	31.7	39.3	37.4	37.4	32.2	31.9	30.3	33.4	+5
State Duma	23.0	22.5	27.6	35.3	33.1	33.8	28.6	27.7	29.0	32.5	+10
RF Civic Chamber	no data	no data	no data	27.3	31.2	31.0	27.4	27.8	28.3	31.5	+4
Media	30.2	29.1	29.1	30.5	28.0	29.8	26.7	26.9	29.5	30.7	+1
Civic Chamber of the Vologda Oblast	no data	no data	no data	25.3	28.1	28.3	25.6	25.9	27.6	30.2	+5
Trade unions	28.4	26.0	27.6	31.0	27.4	33.3	29.7	28.4	31.8	29.9	+2
Non-governmental organizations	no data	no data	11.1	27.5	25.5	28.1	24.9	24.7	28.5	28.6	+18
Directors, CEOs	19.6	20.1	23.8	24.5	23.0	25.1	20.5	21.2	24.4	23.9	+4
Banking and entrepreneurial circles	12.4	13.9	20.5	22.2	19.4	20.7	17.6	18.9	22.8	22.5	+10
Political parties, movements	20.4	12.9	17.2	23.1	19.5	22.3	19.7	18.7	20.0	20.4	0

* Answer options "RF Civic Chamber" and "Civic Chamber of the Vologda Oblast" were included in the list in 2010, answer options "Non-governmental organizations" and "Local self-government" – in 2006, answer option "Scientific organizations" – in 2018.
**Data as of April 2022.
Source: VoIRC RAS public opinion monitoring. Ranked according to the data as of 2022.

"the driving force… of history", and passionarity, as a personality trait, is **"the ability to endure overstrain in order to achieve a set goal"**.

Each step along this path was implemented consistently and methodically, taking into account the external political conditions and the internal condition of Russian society and the state. For example, Vladimir Putin's speech at the Munich Conference in 2007 did not happen "all of a sudden", but precisely when Russia gained sufficient strength to publicly express and, if necessary, defend its position in the international arena, that is, after the economic recovery of 2004–2007 *(Tab. 2)*; after the Presidential administration formulated the idea of "sovereign democracy" as "our Russian model", opposed to the Western model of "managed democracy"[23]; after the strengthening of

> "Passionarity is the ability to endure overstrain in order to achieve a set goal; an irresistible inner desire (conscious or more often unconscious) for activities aimed at achieving the goal… This goal seems to be more valuable to a passionate individual than even their own life…"[22]

[22] Gumilyov L.N. (2001). *Etnogenez i biosfera Zemli* [Ethnogenesis and the Biosphere of the Earth]. Moscow. P. 269.
[23] We are building a sovereign democracy. *Rossiyskaya gazeta*. June 29, 2006. Available at: https://rg.ru/2006/06/29/kreml.html

Table 2. Average annual growth rates of the main socio-economic indicators (cost indicators in comparable prices), % to the previous year

Indicator	1991–1995	1996–2000	2001–2005	2006–2008
Average annual number of people employed in the economy	-2.7	-0.5	0.7	0.8
Actual final consumption of households		0.1	8.7	10.5
People's real monetary incomes	-8.0	-2.1	11.6	10.2
Real accrued wages	-18.2	-3.8	12.6	14.3
Real size of the assigned pensions (1993–2001– including compensation)	-12.5	-5.4	11.3	9.1
Gross domestic product		1.6	6.2	7.1
Final consumption costs	no data	0.5	7.6	9.6
Fixed assets in the economy	1.2	0.0	1.3	3.0
Commissioning of fixed assets	-20.5	-1.5	12.3	12.0
Industrial production*	-13.0	1.0	5.6	4.9
Agricultural products	-7.7	-1.3	3.1	5.9
Commissioning of the total area of residential buildings	-12.1	-8.2	7.0	15.3
Retail trade turnover	-1.8	1.0	11.0	14.5
Investments in fixed assets	-22.1	-8.6	9.2	17.4
Foreign trade turnover	no data	-1.1	19.8	27.4

* The data are given according to the production index calculated by types of economic activity "Mining", "Manufacturing", "Production and distribution of electricity, gas and water". Adjusted for informal activity.
Source: Average annual growth rates of the main socio-economic indicators. Russian Statistical Yearbook – 2009. Rosstat. Available at: https://gks.ru/bgd/regl/b09_13/IssWWW.exe/Stg/html1/01-03.htm

civil society in the country (in particular through the establishment of the Civic Chamber of the Russian Federation in 2005 and the subsequent process of organizing its representative offices in all regions of the country).

During his second presidential term (2004–2007) Vladimir Putin, even despite the opinion of the majority of Russians who would like to see him as head of state in 2008 (according to sociological surveys, this point of view was shared by 60% of Russia's population[24]), did not initiate amendments to the Constitution of the Russian Federation, thus proving himself as a person who respects and is not going to violate the legislation in force in the country.

The period from 2008 to 2011, when Dmitry Medvedev was the head of state (a man who, as experts note, "did not like to take responsibility for difficult decisions ..., did not play a strategic role in the government system", "whose period of prime ministership witnessed the longest drop in household incomes"[25]); when the country was going through the global financial crisis of 2008 and when the Collective West managed to organize mass protests in Bolotnaya Square by means of the "fifth column" (in fact, the same trial that the Ukrainian statehood could not withstand and which was later "tested" on the territories of Belarus and Kazakhstan), was perhaps the most "vulnerable" for the country. However, after the Russian society supported Vladimir Putin in the presidential election on March 4, 2012[26], there began the second stage of Russia's movement toward achieving national sovereignty.

[24] According to a Romir Monitoring survey conducted in 2005, 65% of Russians said that they cannot name any worthy candidate for the post of President of the Russian Federation in 2008; 28% of Russians supported the idea of changing the Constitution of the Russian Federation so that Vladimir Putin could run for president for a third term (source: Russians want to see Vladimir Putin as President in 2008. RBK. May 8, 2005. Available at: https://www.rbc.ru/politics/08/09/2005/5703bb289a7947afa08c8771)

[25] Dmitry Medvedev's time: Indecision, dependence, stabilization. *Vedomosti*. January 16, 2020. Available at: https://www.vedomosti.ru/society/articles/2020/01/16/820713-vremya-medvedeva

[26] Sixty four percent (45.6 million people) voted for Vladimir Putin in the 2012 presidential election.

During this period, under the personal control of the head of state (which was proclaimed in the 2015 National Security Strategy[27]) an active process of rebuilding the Russian army has begun; as a result, "a real breakthrough has been achieved in the field of creating new weapons, pioneering developments that no one in the world has... a serious breakthrough that provides Russia with security and does not allow it to be drawn into an arms race"[28].

The real "fruits" of this breakthrough, allowing Russia "to have a defense capability that would guarantee its security in the long term"[29], were demonstrated by the President during his Address to the Federal Assembly of the Russian Federation in 2018.

> "During all these years since the unilateral U.S.withdrawal from the ABM Treaty [December 13, 2001], we have been working intensively on advanced equipment and arms, which allowed us to make a breakthrough in developing new models of strategic weapons[30].

Thus, over the past decades, there was an ongoing process of forming the Russian armed forces: a modern army with advanced weapons and real combat experience[31], the army capable, if necessary, of ensuring protection of Russia's sovereignty.

Another key condition for the implementation of national development benchmarks outlined by Vladimir Putin in 1999 was to prepare the Russian society to the possibility (which has become reality) of escalation of the conflict with the Collective West. To this end, the President continued to take concrete steps aimed at strengthening traditional moral values, civil society and national identity.

On May 6, 2011, at an interregional conference of the United Russia party, Vladimir Putin put forward an initiative to create the All-Russian People's Front (ONF), a "broad social movement"[32], through which, among other things, "the United Russia party was renewed"[33]. June 11–12, 2013, the founding congress of the ONF was held, at which Vladimir Putin was elected leader of the ONF.

In 2013, delivering his peech at the international Valdai Forum, the RF President made "**the first large-scale attempt to formulate a new political ideology for Russia after the collapse of the Soviet Union**, as well as to critically consider the issue of values that should form the basis of a new Russian identity, the Eurasian world and international relations"[34]. At the same time, as experts noted, Vladimir Putin himself acted as a "critic of the entire modern model of the development of Western civilization"[35].

Insert 1 contains excerpts from Vladimir Putin's Valdai speech. We consider this extremely important, because what the President talked about in 2013, that is, almost 10 years ago, against the background of the events taking place in 2022, has not lost its relevance, but, on the contrary, gained it.

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[27] Article 108. "The state policy of the Russian Federation in the field of national security is implemented through coordinated actions of all elements of the system of its provision **under the leadership of the President of the Russian Federation** and with the coordinating role of the Security Council of the Russian Federation".

[28] Opinion of political scientist V. Shapovalov. Available at: https://news.rambler.ru/other/44139899-glavnye-resheniya-putina-za-chetvertyy-prezidentskiy-srok/

[29] Address of the President to the Federal Assembly of the Russian Federation, March 1, 2018. Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/56957

[30] Ibidem.

[31] Since 2015, at the official request of Syrian President Bashar al-Assad, the Russian armed forces have been participating in military operations on the territory of the Syrian Arab Republic on the side of government troops.

[32] Vladimir Putin's speech at the founding congress of the ONF on June 12, 2011. Official website of the RF President. Available at: http://kremlin.ru/events/president/news/18328

[33] Transcript of Vladimir Putin's speech at the United Russia Congress. *Rossiyskaya gazeta*. September 24, 2011. Available at: https://rg.ru/2011/09/24/putin-stenogramma.html

[34] Makhmudov R. Valdai speech of Vladimir Putin: Critical analysis. *Informatsionnyi portal*. Available at: http://www.12news.uz/news/2013/09/30/валдайская-речь-владимира-путина/

[35] Akopov P.E. Valdai after Munich. *Vzglyad*. September 20, 2013. Available at: http://vz.ru/politics/2013/9/20/651345.html

Insert 1

Excerpts from Russian President Vladimir Putin's speech at the Valdai Forum on September 19, 2013

1. For us (and I am talking about Russians and Russia), questions about who we are and who we want to be are increasingly prominent in our society... It is evident that it is impossible to move forward without spiritual, cultural and national self-determination. Without this we will not be able to withstand internal and external challenges, nor we will succeed in global competitions...

2. After 1991 there was the illusion that a new national ideology, a development ideology, would simply appear by itself. The state, authorities, intellectual and political classes virtually rejected engaging in this work... the lack of a national idea stemming from a national identity profited the quasi-colonial element of the elite – those determined to steal and remove capital, and who did not link their future to that of the country, the place where they earned their money...

3. Russia's sovereignty, independence and territorial integrity are unconditional. These are red lines no one is allowed to cross...

4. Practice has shown that a new national idea does not simply appear, nor does it develop according to market rules. A spontaneously constructed state and society does not work, and neither does mechanically copying other countries' experiences. Such primitive borrowing and attempts to civilize Russia from abroad were not accepted by an absolute majority of our people. This is because the desire for independence and sovereignty in spiritual, ideological and foreign policy spheres is an integral part of our national character. Incidentally, such approaches have often failed in other nations too. **The time when ready-made lifestyle models could be installed in foreign states like computer programs has passed.**

Insert 1 (continuing)

5. Atlantic countries are actually rejecting their roots, including the Christian values that constitute the basis of Western civilization. They are denying moral principles and all traditional identities: national, cultural, religious and even sexual. They are implementing policies that equate large families with same-sex partnerships, belief in God with the belief in Satan... **I am convinced that this opens a direct path to degradation and primitivism, resulting in a profound demographic and moral crisis.**

What else but the loss of the ability to self-reproduce could act as the greatest testimony of the moral crisis facing a human society?

6. Russia – as philosopher Konstantin Leontyev vividly put it – has always evolved in "blossoming complexity" as a state-civilization, reinforced by the Russian people, Russian language, Russian culture, Russian Orthodox Church and the country's other traditional religions. It is precisely the state-civilization model that has shaped our state polity. It has always sought to flexibly accommodate the ethnic and religious specificity of particular territories, ensuring diversity in unity. Christianity, Islam, Buddhism, Judaism and other religions are an integral part of Russia's identity, its historical heritage and the present-day lives of its citizens.

7. In order to maintain the nation's unity, people must develop a civic identity on the basis of shared values, a patriotic consciousness, civic responsibility and solidarity, respect for the law, and a sense of responsibility for their homeland's fate, without losing touch with their ethnic or religious roots.

8. The years after 1991 are often referred to as the post-Soviet era. We have lived through and overcome that turbulent, dramatic period. Russia has passed through these trials and tribulations and is returning to itself, to its own history, just as it did at other points in its history. After consolidating our national identity, strengthening our roots, and remaining open and receptive to the best ideas and practices of the East and the West, we must and will move forward.

Source: Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/19243

One of the key steps taken by the head of state to strengthen the national identity of Russian society was the accession of Crimea and Sevastopol to the Russian Federation, which occurred after the residents of these territories had rejected the results of a coup d'etat taking place in Kiev in February 2014 and held an all-Crimean referendum (March 16, 2014), in which 96.77% of Crimean citizens (1.2 million people) and 95.6% of Sevastopol residents (262 thousand people) had spoken in favor of reunification with Russia[36].

> "The President's foreign policy position, reunification with Crimea, attitude toward the situation in Donbass, categorical rejection of any revolutionary scenarios of a change of power within the country have formed **a new social organism, which today is commonly called "the Crimean Consensus" or "the Putin Consensus".** The unity of this consensus is constantly being strengthened as a result of public reflection and an expanded understanding of the essence of the geopolitical and historical situation"[37].

Political scientist D.E. Kulikov notes that the Crimean Spring of 2014 formed a "new social organism in Russia... the Crimean or the Putin Consensus", actually dividing the socio-political life of the country into "before" and "after".

The further viability and development of this consensus largely depended on the ability of the head of state to continue the line of nation-oriented development of the country, that is, on the possibility of prolonging the term of his presidential powers that were to end (according to the Constitution of the Russian Federation) in 2024. Therefore, the next important step of the President was to initiate amendments to the Constitution of the Russian Federation, which he announced in his Address to the Federal Assembly on January 15, 2020.

Socially and patriotically oriented amendments to the RF Constitution actually "constitutionalized the welfare state"[38] in Russia and also contributed to the strengthening of the state structure, in particular by introducing a new concept of "public power" and "zeroing out" Vladimir Putin's presidential terms. This legally gives him an opportunity to run for the president two more times, that is, potentially to lead the country until 2036.

It is important to note that according to the results of the all-Russian vote on amendments to the RF Constitution (June 25 – July 1, 2020), the President's initiative was supported by the overwhelming majority of voters (78%, or almost 58 million people), which is even more than the support Vladimir Putin gained at the 2018 presidential election (77% or 56 million people).

In order to strengthen the internal, spiritual and moral state of the Russian society, the President adopted many important decisions:

✓ intensifying the work to eliminate the possibility of the "fifth column's" de-stabilizing the political and social situation in the country"[39];

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[36] The history of the reunification of Crimea with Russia. TASS. March 15, 2019. https://tass.ru/info/6222164?utm_source=yandex.ru&utm_medium=organic&utm_campaign=yandex.ru&utm_referrer=yandex.ru

[37] Kulikov D.E. Crimean consensus: Political meaning and significance. *RIA-novosti*. March 24, 2015. Available at: https://ria.ru/20150324/1054181774.html

[38] Skorobogatyi P. Putin is creating a "deep state" in Russia (materials of an interview with A. Zudin, political scientist, lecturer at MGIMO University). Ekspert, 2020, March 23, no. 13, p. 44.

[39] In particular, in 2021, all the headquarters of Alexei Navalny* were included in the "List of organizations for which there is information about their involvement in extremist activities or terrorism", and almost a year later the President signed Federal Law 157-FZ dated June 4, 2021 "On amendments to Article 4 of the Federal Law "On basic guarantees of electoral rights and the right to participate in a referendum of citizens of the Russian Federation" and Article 4 of the Federal Law "On elections of deputies of the State Duma of the Federal Assembly of the Russian Federation", according to which their activities (and on the grounds that do not contradict Russian legislation) was actually terminated.

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

✓ revising the 2021 National Security Strategy (experts noted that "for the first time, the system of national values or moral and spiritual values was prominently marked in it"[40]);

✓ December 2021, a draft presidential decree "On the approval of the foundations of state policy for the preservation and strengthening of traditional Russian spiritual and moral values" was developed; it is **"an inter-sectoral strategic planning document in the field of national security of the Russian Federation**, defining a system of goals, objectives and tools for the implementation of the strategic national priority "Protection of traditional Russian spiritual and moral values, culture and historical memory" in the part relating to the protection of traditional Russian spiritual and moral values"[41].

All these consistent decisions and initiatives coming directly from the President have "slowly but surely" prompted public consciousness to realize that "Russia will never become part of the Western world, because we are the religious and civilizational antipode of the Anglo-Saxon unity"[42]. And this, in our opinion, was an important task implemented by the President to strengthen Russian statehood and achieve full national sovereignty.

Thus, we see that Vladimir Putin's actions to achieve the national development benchmarks he outlined in 1999 were systematic and consistent. Importantly, throughout this period, the Russian society supported the President: it is evidenced not only by the results of the presidential and parliamentary elections held during this period (as well as the all-Russian vote on amendments to the Constitution), but also by regular public opinion polls *(Insert 2)*.

Russia's gradual movement toward achieving full national sovereignty, the strengthening of its geopolitical status and role in the international space could in no way suit the Collective West represented by the United States and NATO members[43]. Therefore, they have intensified systematic work to curb the development of our country. In fact, in this way a hybrid war against Russia was unleashed, which some experts named "Cold War 2.0".

The preface to the 2015 U.S. National Military Strategy[44] states that the main threats to the U.S. are "revisionist states that are challenging international norms" and violent extremist organizations. **The countries of concern to the U.S. military leadership, according to the strategy, include Russia, China, Iran and North Korea**[45].

The 2018 U.S. National Defense Strategy **names four countries as the main violators of world peace and threats to American security: China, Russia, North Korea and Iran**[46].

[40] Opinion of A. Podberezkin, director of the Center for Military and Political Studies at MGIMO University (source: Experts assessed the changes in the national security strategy signed by Putin. RBK. July 3, 2021. Available at: https://www.rbc.ru/politics/03/07/2021/60e0a1c79a7947a36edadc3d

[41] Fundamentals of state policy for the preservation and strengthening of traditional Russian spiritual and moral values. Digital platform "Strategiya 24". February 9, 2022. Available at: https://strategy24.ru/rf/culture/projects/osnovy-gosudarstvennoy-politiki-po-sokhraneniyu-i-ukrepleniyu-traditsionnykh-rossiyskikh-dukhovnonravstvennykh-tsennostey

[42] Odintsov A.V. 30 years of reforms: How capitalism is destroying Russia. Sulakshin Center. December 25, 2020. Available at: https://rusrand.ru/analytics/30-let-reform-kak-kapitalizm-unichtojaet-rossiyu

[43] Currently, NATO consists of 30 countries: USA, UK, Germany, France, Italy, Spain, Canada, Belgium, Denmark, Iceland, Norway, the Netherlands, Luxembourg, Portugal, Greece, Turkey, Hungary, Poland, Czech Republic, Bulgaria, Latvia, Lithuania, Romania, Slovakia, Slovenia, Estonia, Albania, Croatia, Montenegro, North Macedonia (source: official website of NATO. Available at: https://www.nato.int/cps/ru/natohq/topics_52044.htm)

[44] The National Military Strategy of the United States of America 2015. URL: http://www.jcs.mil/Portals/36/Documents/Publications/2015_National_Military_Strategy.pdf

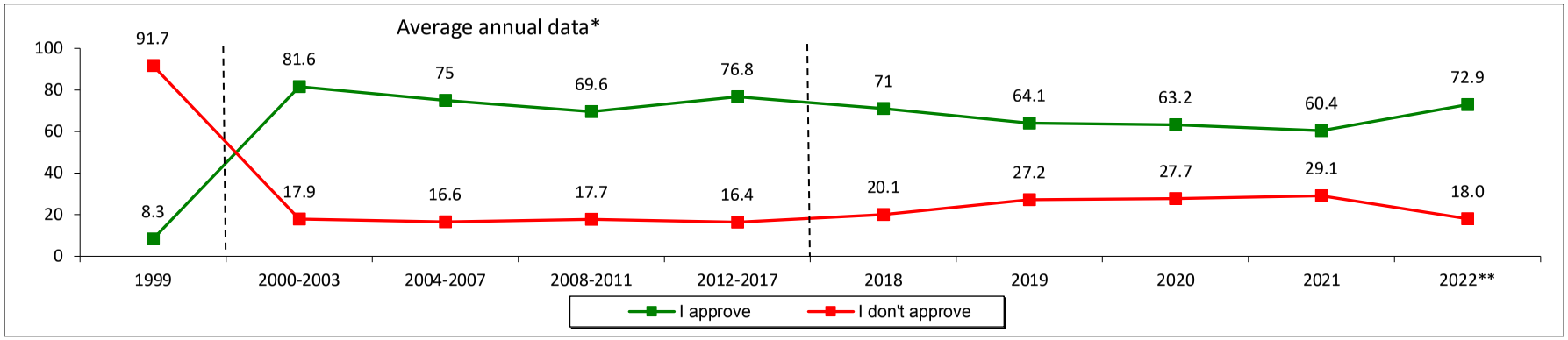
[45] The United States included Russia in the top five threats to national security. RBK. January 19, 2018. Available at: https://www.rbc.ru/politics/19/01/2018/5a61ccc09a7947061eb2ed36

[46] National Defense Strategy Will Enhance Deterrence. U.S. Department of Defense. January 19, 2018. Available at: https://www.defense.gov/News/Article/Article/1419045/dod-official-national-defense-strategy-will-rebuild-dominance-enhance-deterrence/

Insert 2

Dynamics of assessments of the RF President's work

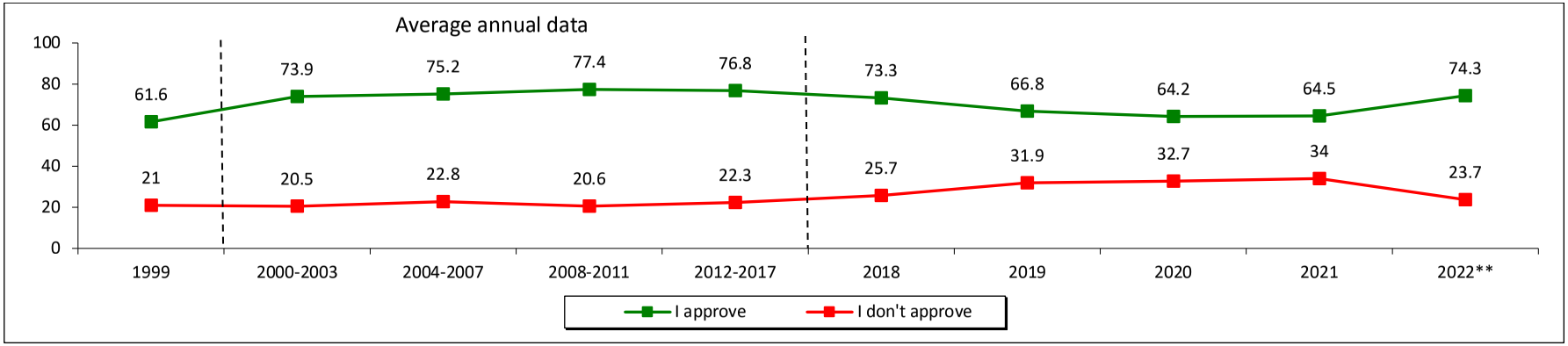
VCIOM data (% of respondents)



* Average annual data for the presidential terms: 2000–2003 – Vladimir Putin's first presidency, 2004–2007 – Vladimir Putin's second presidency, 2008–2011 – Dmitry Medvedev's presidency, 2012–2017 – Vladimir Putin's third presidency

** Data for 2022 are the average for the period from January to April 10, 2022.

Levada-Center data* (% of respondents)



* included in the list of foreign agents.

** Data for 2022 are the average for January – March 2022.

According to regular polls conducted by VCIOM and Levada-Center (included in the list of foreign agents), during all of Vladimir Putin's presidential terms, the majority of Russians (more than 60%) gave a positive assessment of his activities. The proportion of negative judgments did not exceed 30–34%.

The set of measures within the framework of the U.S. foreign policy aimed at curbing Russia's development is openly specified in official U.S. strategic documents (in particular, the 2015 U.S. National Military Strategy and the 2018 U.S. National Defense Strategy) and is quite wide and diverse.

It included tactical (dictated by the current geopolitical situation and the internal political situation in our country) and strategic (designed for a long-term perspective) measures of influence, and not only political, but also economic, informational, military... According to Russian experts, "China will remain an economic rival, **Russia – an enemy**" to the United States[47]. **"At the same time … the ideological confrontation with our country is very important to Washington. Russia has become the very "other" state that American propaganda endows with the most negative features.** As for China, it represents a serious competitor in the economic sphere, but China is too far away for political opposition and is poorly known to Americans"[48].

In fact, the "Ukraine" project and what we see today in the global political arena is part of the plan of the Collective West to "eliminate Russia as a real and potential subject of strategic action and turn our country into a political object, a tool for the ruling elites of the West"[49]. On the territory of Ukraine purposefully, through the education system filled with NATO textbooks that distort the truth and form anti-Russian sentiments[50], for many years, a whole generation of people has been brought up who not only disown everything Russian, but hate it fiercely and aggressively.

This, of course, is not the whole generation and not even the majority of Ukrainians, but an ideologically, politically and financially "processed" group that turned out to be sufficiently numerous and powerful to carry out a coup in 2014 with the support of the Collective West and subsequently seize power, continuing to eliminate (in every sense of the word) any dissent, including among the peaceful citizens of their own people.

Thus, an "anti-Russia" state was being created (and has actually been created) on the territory of Ukraine; this state is (as the RF President noted) placed "completely under full external control" of the United States and its allies *(Inserts 3, 4)*. Sooner or later this project would have been launched, and it happened after the possibilities of a diplomatic settlement of strained relations between Russia and the United States were actually exhausted, as shown by the results of negotiations to ensure legal security guarantees by the United States and NATO.

In his addresses on February 21 and 24, Russian President Vladimir Putin explained the essence of the current political situation to Russians and the whole world in a logical and convincing way, noting: "If we look at the sequence of events and the incoming reports, **the showdown between Russia and these forces cannot be avoided. It is only a matter of time"[51].**

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[47] Opinion of national security specialist Professor D. Yonchev (source: U.S.election results: Russia is an enemy, China is a rival, Europe is a competitor. Information Site Inosmi.info. November 7, 2020. Available at: http://www.inosmi.info/itogi-vyborov-v-ssha-rossiya--vrag-kitay--sopernik-evropa--konkurent-bnr.html)

[48] Polonsky I. Who is the main enemy of the United States: China or Russia? *Voennoe obozrenie*. October 11, 2018. Available at: https://topwar.ru/148186-kto-glavnyj-vrag-ssha-kitaj-ili-rossija.html

[49] Ovchinskii V., Larina E. Cold War 2.0. *Izborskii Klub*. November 11, 2014. Available at: https://izborsk-club.ru/4224

[50] Nikita Mikhalkov's program "Besogon". Episode 203 "Where is it all coming from?". Official website "Besogon TV". Available at: https://besogontv.ru/videos/otkuda-rastut-nogi/

[51] 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

Insert 3

Address of the RF President to the citizens of Russia on February 21, 2022

1. … Ukraine is not just a neighboring country for us. It is an inalienable part of our own history, culture and spiritual space…

2. ... the Ukrainian authorities – I would like to emphasize this – began by building their statehood **on the negation of everything that united us, trying to distort the mentality and historical memory of millions of people, of entire generations living in Ukraine… A role in this was played by external forces, which used a ramified network of NGOs and special services to nurture their clients in Ukraine and to bring their representatives to the seats of authority…**

3. If Ukraine acquires weapons of mass destruction, the situation in the world and in Europe will drastically change, especially for us, for Russia.

4. Kiev has long proclaimed a strategic course on joining NATO. Indeed, each country is entitled to pick its own security system... There would be no problem with that, if it were not for one "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.

5. ...They will never think twice before coming up with or just fabricating a pretext for yet another sanction attack **regardless of the developments in Ukraine. Their one and only goal is to hold back the development of Russia.**

6. 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...

Source: Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67828

Insert 4

Address of the RF President to the citizens of Russia on February 24, 2022

1. Anything that does not suit the dominant state, the powers that be, is denounced as archaic, obsolete and useless. At the same time, everything it regards as useful is presented as the ultimate truth and forced on others regardless of the cost, abusively and by any means available... **This has to do with the entire system of international relations... This array includes promises not to expand NATO eastwards even by an inch...**

2. ... The attempts to use us in their own interests never ceased until quite recently: they sought to destroy our **traditional values** and force on us their false values that **would erode us, our people from within**, the attitudes they have been aggressively imposing on their countries, attitudes that **are directly leading to degradation and degeneration, because they are contrary to human nature.** This is not going to happen. No one has ever succeeded in doing this, nor will they succeed now.

6. ... In territories adjacent to Russia, which I have to note is our historical land, a hostile "anti-Russia" is taking shape... **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. It is the red line which we have spoken about on numerous occasions. They have crossed it.**

7. If we look at the sequence of events and the incoming reports, **the showdown between Russia and these forces cannot be avoided. It is only a matter of time...**

8. They did not leave us any other option for defending Russia and our people, other than the one we are forced to use today... I made a decision to carry out a special military operation. **The purpose of this operation is to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime. To this end, we will seek to demilitarize and denazify Ukraine, as well as bring to trial those who perpetrated numerous bloody crimes against civilians, including against citizens of the Russian Federation... I reiterate: we are acting to defend ourselves from the threats created for us and from a worse peril than what is happening now.**

Source: Official website of the RF President. Available at: http://www.kremlin.ru/events/president/news/67828

Thus, the open, acute, armed phase of the global confrontation between Russia and the Collective West, which began in February 2022, was caused not only by such historical processes as the growing crisis of capitalism, the transition from a unipolar to a multipolar model of the world order and the centuries-old "mental" confrontation between Russian and English-Saxon civilizations, but also the natural logic of restoring Russia's sovereign status in the international political arena.

All these reasons, in fact, are interrelated and complement each other. February 2022, on the territory of Ukraine, they converged at one point, at one time and in one place, launching a large-scale process of global change for the whole world and for each country individually.

"February 2022 put an end to this scenario [the scenario of the Great Reset by K. Schwab]: **globalization is over, postmodernism is over, time has resumed its pace, history has begun again.** We can also say this: on February 24, 2022, Russia began fighting for its future, for its place in the 21st century and for its vision of the future of the 21st century. **And this future is very different from how Schwab, Soros and the U.S. Democratic Party see it.** That is why Russia is being watched so closely all over the world, which is by no means limited to the West and its media, which are in the hands of a handful of international oligarchs. **Russia returns the future to the world. This is the main essence of what is happening today"**[52].

Inevitably, the international processes that began after February 24, 2022, lead to irreversible changes within our country. This is especially important in the context of deep internal contradictions and "stagnant" problems, which largely arose as a result of the activities of the "fifth" and, especially, the "sixth" columns, which continued to exist throughout the post-Soviet period.

Until now, according to experts, "we have measured our success on a different scale, on the scale of profitability of the business. It was believed that if it is profitable for business, then it is profitable for the country"[53]. However, now the situation is such that all these aspects will depend on how "independent of foreign influence" they are: "The time has come when we have to start creating everything for ourselves to the maximum"[54]. Trust between the authorities, society and business is becoming "a necessary condition that can ensure the successful solution of the most complex problems that public administration bodies have to address, first of all, in the field of economics"[55].

March 16, 2022, Vladimir Putin said that Russia had launched a process of **"natural and necessary self-detoxification of society"**, which "would strengthen our country, our solidarity and cohesion and our readiness to respond to any challenge"[56]. Many representatives of cultural and business elites, who do not see the opportunity to link their personal lives with that of Russia, have left the country[57]. Conditions are

[52] Mozhegov V. Russia's special operation put an end to the end of history. *Vzglyad*. April 15, 2022. Available at: https://vz.ru/opinions/2022/4/15/1153019.html

[53] Vedeneeva N. Scientists announced scientific mobilization: RAS President spoke about countering the sanctions (an interview with the President of the Russian Academy of Sciences A. Sergeev). *Moskovskii komsomolets*. March 20, 2022.

[54] Ibidem.

[55] Kavetskii A. Trust is a product of reputation. Is it possible to renew the interaction between the government and society? *Nezavisimaya gazeta*. March 24, 2022. Available at: https://www.ng.ru/ideas/2022-03-23/7_8398_reputation.html

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

[57] Among them: businesspeople and entrepreneurs (M. Fridman, A. Panov, M. Prokhorov), politicians (A. Chubais, A. Dvorkovich), celebrities (I. Urgant, Ch. Khamatova, A. Pugacheva, M. Galkin, R. Litvinova, T. Bekmambetov), media representatives (L. Gildeeva, G. Pyanykh, T. Lazareva, A. Vasilyev), etc.

being created for the forced and mobilization-related reformatting of the basic principles of public administration, including management of the economy, social development, the education system and upbringing of new generations of Russians, culture, etc., that is, for what has often been declared over the past 20 years, but has not been actually implemented.

"There are good opportunities for our counteroffensive in the global hybrid war... The Western world today is on the verge of a catastrophe, which it has come close to because of the suicidal anti-Russian sanctions for Europe and the war unleashed by British and American special services in Ukraine. **We just need to stand our ground...**

If we take advantage of the positive results of the American aggression for Russia, then instead of Washington's planned drop in economic activity by 10% of GDP this year, we can get 10% of its growth. But to do this, it is necessary to rebuild the entire system that manages the development of the Russian economy based on the principles of the new world economic order. In particular, monetary policy should become part of strategic planning; the banking system should work on investing in achieving the goals of socio-economic development planned by the state"[58].

However, in order to take advantage of these conditions, today, as S.Yu Glazyev notes, "we need to stand our ground". First of all, it is Russia that has to stand its ground, and, together with Russia, all the states that share the idea of a multipolar world as the inevitable future of world civilization.

We are talking, apparently, about years, and this is a relatively short time for history and for the potential fundamental changes that the current situation may lead to. But this is quite a significant period for a specific country and specific people.

According to experts, the very beginning of the special operation, its economic and social implications "seemed to paralyze society"[59]; "today many people in Russia are confused"[60]. **However, despite this, the level of support for the head of state and for his decision to launch a special military operation, is growing in Russian society**. Thus, according to VCIOM, for the period from February to April 2022, the level of approval of the RF President's activities has increased by 14 p.p. (from 65 to 79%); according to Levada-Center* (for the period from February to March 2022) – by 12 p.p. (from 71 to 83%; *Insert 5*). The share of Russians supporting the President's decision to launch a special operation, from February 25 to March 24, according to VCIOM, increased by 11 p.p. (from 65 to 76%); according to the Public Opinion Foundation (from February 27 to March 20) – by 8 p.p. (from 65 to 73%; *Insert 6*).

[58] Glazyev S.Yu. To win and build a new world economic order. *Zavtra*. April 15, 2022. Available at: https://zavtra.ru/blogs/lyubopitnij_tekst_glaz_eva

[59] 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

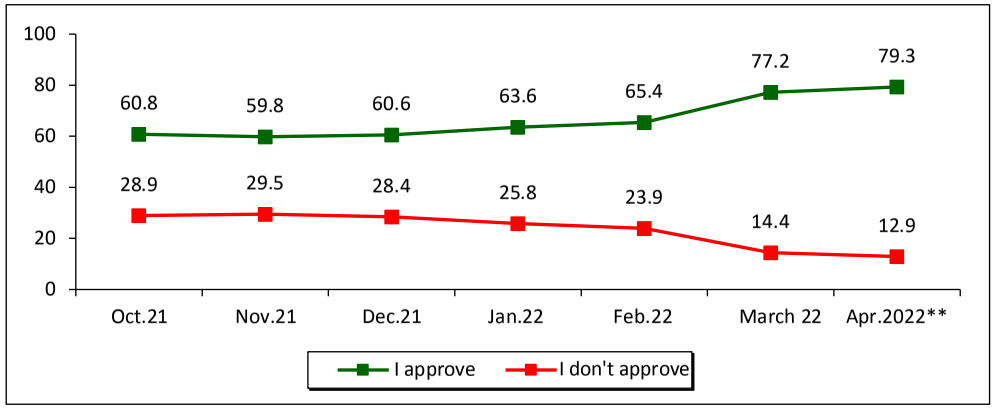
[60] Mozhegov V. Russia's special operation put an end to the end of history. *Vzglyad*. April 15, 2022. Available at: https://vz.ru/opinions/2022/4/15/1153019.html

* Included in the list of foreign agents.

Insert 5

Assessment of the RF President's activities during the beginning of the special military operation (% of respondents)

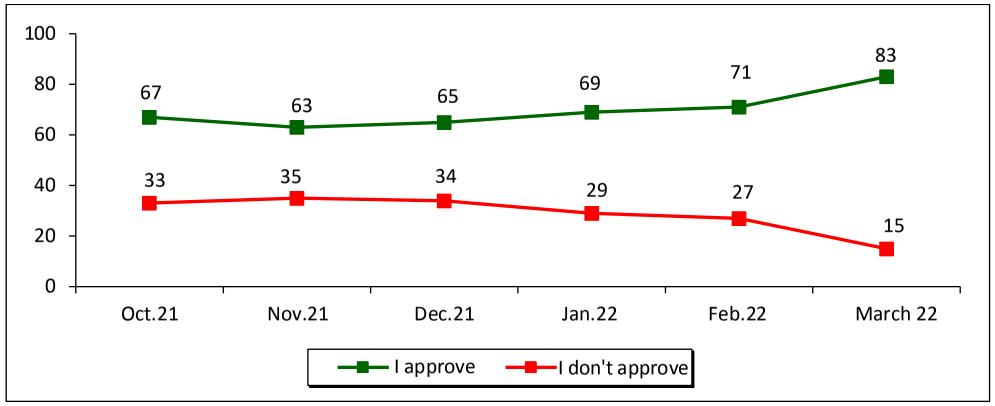
Assessment of the RF President's activities (VCIOM data)



The last three months of 2021 (for comparison) and the first four months of 2022 are presented. Data for April 2022 represent the average for two surveys (April 3, April 10).
Source: VCIOM. Ratings. Activities of government institutions. Available at: https://wciom.ru/ratings/dejatelnost-gosudarstvennykh-institutov/

According to VCIOM, until February 2022 (when the President announced the beginning of a special military operation on the territory of Ukraine), the share of positive assessments of the activities of the head of state was 60–64%. From February to April 2022, the share of positive assessments increased by 14 p.p. (from 65 to 79%).

Assessment of the RF President's activities (Levada-Center data*)



The last three months of 2021 (for comparison) and the first three months of 2022 are presented.
Source: Levada-Center*. Indicators. Available at: https://www.levada.ru/indikatory/

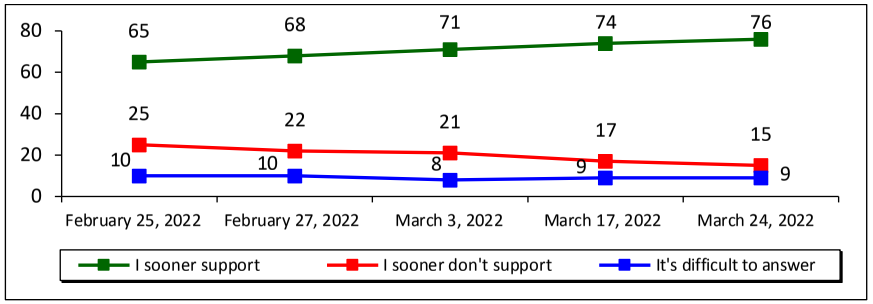
According to Levada-Center*, from October 2021 to January 2022, the level of approval of the activities of the head of state has not changed significantly and amounted to 67–69%.

From February to March 2022, the share of Russians who positively assess the President's activities increased by 12 p.p. (from 71 to 83%).

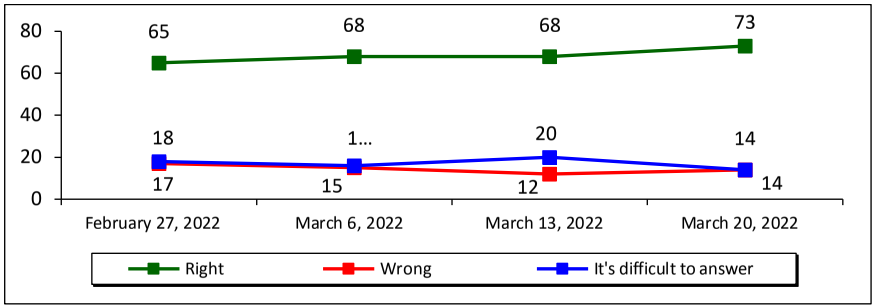
* Included in the list of foreign agents.

Insert 6

Russians' attitude toward the special operation on the territory of Ukraine (% of respondents)



"Do you support or do you not support the decision to conduct a special military operation of Russia in Ukraine?"
Source: VCIOM data. Available at: https://wciom.ru/analyticali reviews/analiticheskiii obzor/cpecialnajai voennajai operacijai monitoringi 20220330



"At the end of February, the military operation in Ukraine began. Do you think the decision to conduct the military operation was right or wrong?"
Source: FOM data. Available at: https://fom.ru/Politika/14706

Attitude to the special operation in the context of the main socio-demographic groups (VCIOM)

Population group		I sooner support it					I sooner don't support it					It's difficult to answer				
		Feb. 25	Feb. 27	March 17	March 24	Dynamics (+/–), March 24 to Feb.25	Feb. 25	Feb. 27	March 17	March 24	Dynamics (+/–), March 24 to Feb.25	Feb. 25	Feb. 27	March 17	March 24	Dynamics (+/–), March 24 to Feb.25
Sex	Men	68.7	71.6	74.9	79.1	+10	25.1	22.1	18.2	12.7	-12	6.2	6.2	6.9	8.2	+2
	Women	62.3	65.5	74.2	73.3	+11	25.8	22.2	16.9	17.4	-8	11.8	12.3	8.9	9.2	-3
Age	Under 30	37.4	40.7	48.9	52.4	+15	47.1	47.3	35.8	31.3	-16	15.6	12.0	15.2	16.3	+1
	30–55	62.4	64.4	73.3	75.5	+13	28.6	24.7	17.7	15.2	-13	9.0	10.9	9.0	9.3	0
	Over 55	80.4	84.4	85.7	85.5	+5	12.5	8.8	10.2	9.5	-3	7.1	6.7	4.1	5.0	-2
Education	Secondary and lower	69.5	61.4	80.3	71.4	+2	20.6	26.3	15.7	16.7	-4	9.9	12.3	4.0	12.0	+2
	Secondary vocational	71.9	73.1	76.7	82.6	+11	19.4	17.5	14.5	11.0	-8	8.7	9.4	8.8	6.5	-2
	Incomplete higher, higher and postgraduate	58.5	68.8	70.0	72.1	+14	32.2	23.0	20.5	18.5	-14	9.3	8.2	9.5	9.4	0
Financial situation of the family	Good	70.0	75.0	80.4	84.4	+14	24.5	15.1	13.9	8.7	-16	5.6	9.9	5.7	6.9	1
	Average	66.2	69.7	76.6	76.4	+10	24.7	20.9	15.5	15.7	-9	9.1	9.4	8.0	7.9	-1
	Poor	55.8	58.7	62.7	68.4	+13	29.8	31.9	27.1	19.9	-10	14.4	9.4	10.2	11.8	-3

The share of Russians who support the RF President's decision to launch a special military operation on the territory of Ukraine for the period from February 25 to March 24 increased, according to VCIOM, by 11 p.p. (from 65 to 76%), according to the Public Opinion Foundation – by 8 p.p. (from 65 to 73% for the period from February 27 to March 20, 2022). Moreover, a significant increase in support (by 10 p.p. and above) is observed in almost all major socio-demographic groups (VCIOM).

Nevertheless, many experts are concerned about the "split within the elites, where a special operation is just an excuse for internal squabbles in the government apparatus"[61], while in the current conditions, "intra-elite conflicts should go behind the scenes"[62] and "every word of a public person in power is a weapon more terrible than the Kalibr cruise missile"[63].

We should note that experts' concerns are not without reason. Careless statements of Presidential Aide Vladimir Medinsky, (during the negotiations in Istanbul[64]) and Presidential Press Secretary Dmitry Peskov (in an interview to the French channel LCI[65]), which caused a wide public response, the participation of oligarch and businessman Roman Abramovich in the negotiation process, and a number of other facts **indicate that "too much depends on the task of "self-purification" of Russian society"**[66].

Thus, the experts' concerns are justified and not without reason. Comprehensive and active mobilization changes (in the system of public administration, in the economy, politics, culture) require **powerful ideological support from the state.** Effectiveness and strategic foresight are required from management decision makers at all levels of public administration. After all, there is always a risk of "getting carried away" by patriotic populism and repeating the mistakes of the Soviet management system, which never found an effective response to the realization of needs growing from below. There also exists the risk to repeat the mistakes of the very recent past, when, on the whole, the correct and necessary decisions made by the President ultimately remained unrealized.

However, in any case, today Russia has no other way but to achieve complete victory. Russian Foreign Minister Sergey Lavrov noted: "There is a life-and-death battle for Russia's right to be on the political

> S. Lavrov: "It's not about Ukraine at all; it's about aggression against everything Russian – interests, religion, culture, language, security and so on. And now, of course, the reaction of the West to our actions is so completely frenzied, I would say, if you'll pardon the word; it shows that, indeed, this is a life-and-death battle for Russia's right to be on the political map of the world with full respect for its legitimate interests"[67].

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[61] "He is not a dove of peace": Political scientists called the attacks on Peskov a "split of the elites" (opinion of K. Kalachev, head of the Political Expert Group. Source: https://rtvi.com/news/on-ne-golubmira-politologi-nazvali-raskolom-elit-napadki-na-peskova/).

[62] Ibidem.

[63] Ibidem (an opinion of A. Turchak, First Vice-Speaker of the Federation Council, Secretary of the General Council of the United Russia party).

[64] "Tuesday [March 29] Medinsky retold the essence of the negotiations held in Istanbul in such a way that listeners and viewers concluded: Russia is losing ground. Firstly, it reduces activity in the Kiev and Chernihiv directions, and secondly, it seems to be going to discuss, and even at the level of the presidents of the two countries, the issues of Crimea and Donbass" (source: Prikhodko N. Vladimir Medinsky learned a lesson: Crimea remains with Russia. *Nezavisimaya gazet*a. March 30, 2022. Available at: https://www.ng.ru/cis/2022-03-30/1_8404_ukraine.html)..

[65] "April 6, the presidential press secretary gave an interview to the French news channel LCI. In particular, he spoke about the withdrawal of the Russian Armed Forces from positions in the north of Ukraine, specifically focusing on the role of Vladimir Putin in making this decision: "We decided to take such a step as a gesture of goodwill to create favorable conditions for negotiations. We can make serious decisions during the negotiations, so President Putin has ordered our troops to withdraw from the region." Respectfully calling Zelensky "president of Ukraine", Peskov emphasized: "Through negotiations we want to put an end to the military operation"... Peskov called fugitive actor Urgant a "great patriot"; he said that the attack on the oil depot in Belgorod "does not contribute to negotiations"; Peskov calls upon Ukraine to do something and declares that the withdrawal of troops from Kiev is a gesture of goodwill. Yesterday he said one thing, today he says another. It seems that Peskov always leaves the opportunity to disavow any previously expressed political position; **but what is acceptable in peacetime is now simply disorienting society and** state institutions. If Peskov spoke on his own behalf, who would care. But he speaks on behalf of the top leadership of Russia ..." (Source: Ivanov A. Is Peskov really press secretary of the Russian President? *Zavtra*. April 8, 2022. Available at: https://zavtra.ru/events/a_peskov_tochno_press-sekretar_prezidenta_rossii)

[66] Doctor of Sciences (Politics) S. Obukhov. KPRF website. Available at: https://kprf.ru/roscrisis/209510.html

[67] *Rossiyskaya 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

map of the world". The Rubicon – a line after which the launched processes become irreversible and lead to irreversible consequences – has been crossed by Russia and the whole world.

* * *

In conclusion, we note that in our ideological views we have always adhered and continue to adhere to statist positions. Our brief analysis of the processes and RF President's specific decisions which precede the start of the special operation, in our opinion, convincingly proves, on the one hand, the regularity and inevitability of the global crisis that has arisen, on the other hand the ability of Russia and the President personally to overcome such difficulties for the purposes of national development, converting Western restraint measures in new opportunities for economic growth and mechanisms for consolidation of Russian society.

Information about the Authors

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

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

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Competition, Collaboration, and Life Satisfaction
Part 1. The Seven of European Leaders

Victor M.
POLTEROVICH
Central Economics and Mathematics Institute, Russian Academy of Sciences
Moscow School of Economics, Lomonosov Moscow State University
Moscow, Russian Federation
e-mail: polterov@cemi.rssi.ru
ORCID: 0000-0001-6092-6823; ResearcherID: B-2258-2017

Abstract. The first part of this paper demonstrates that a group of seven European countries is significantly ahead of other Western states, including the United States, in the development of economic and political institutions. The Seven are Denmark, Norway, Sweden, Finland, Iceland, Switzerland, and the Netherlands. They rank first in the life satisfaction index (happiness index) and are leaders in the integral index of quality of life, civic culture, and institutional effectiveness which is formed by aggregating ten most important indicators. These include healthy life expectancy at birth, the corruption perception index, the democracy index, the human development index, the Gini index and a number of others. When this index is used to cluster the set of developed countries, the Seven appears to be the leading cluster. This result suggests that the achievement of high values of the proposed index contributes to the country's advancement to the leading positions in life satisfaction. An analysis of the dynamics of institutional indicators showed that the U.S. lagging behind the Seven has been increasing over time. In recent years, the U.S. has been among the flawed democracies, the levels of generalized trust of U.S. citizens as well as trust in political institutions and in the government are decreasing, the U.S. advantages in terms of global competitiveness and per capita GDP are diminishing. The second part of the paper will consider what qualitative features of socio-economic and political mechanisms provide leadership, and how our findings can be used to develop catch-up strategies.

Key words: happiness index, Nordic exceptionalism, U.S. lagging behind, collaboration, clustering, nearest neighbor method.

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Introduction

Western political systems and the welfare state mechanisms are in a deep crisis. Many experts confirm this. For instance, in a book published in 2019, Nobel laureates Abhijit Banerjee and Esther Duflo note that in many countries "... the public conversation between the left and the right has turned more and more into a high-decibel slanging match. ... In the United States ... split-ticket voting is at its lowest on record. Sixty-one percent of Democrats say they view Republicans as racists, sexists, or bigots. ... A third of all Americans would be disappointed if a close family member married someone from the other side." "There is a clear feeling that civilization..., based on democracy and debate, is under threat", "...We seem to be back to the Dickensian world of Hard Times, with haves facing off against the increasingly alienated have-nots, with no resolution in sight" (Banerjee, Duflo, 2019, pp. 1, 2, 3).

The works (Polterovich, 2015; Polterovich, 2018b; Polterovich, 2021a) demonstrate that the root of the problem lies in the exhaustion of opportunities and, moreover, degradation of institutions of political and economic competition. Having replaced the estate political systems and the guild economy of the late Middle Ages, competition between political parties and between manufacturers allowed a wider stratum of citizens to participate in the governance process and create an economy of technological progress. There emerged an opportunity to increase economic potential by creating new technology and administration methods; thus, the role of war as a radical type of competition between states has dramatically declined. However, in the course of development, the inherent flaws in economic and political competitive mechanisms are becoming more and more pronounced; first of all, these include high transaction costs of competitive interactions and the built-in mechanism providing for a negative selection of political leaders, as a result of which the victory in political competition turns out to be poorly related to managerial abilities of the winner. In this regard, the mechanisms of competition and power are being gradually replaced with mechanisms of collaboration in the economic and political spheres. However, this transformation is going on very slowly and it proves unable to prevent crisis phenomena. The paper (Polterovich, 2021a) demonstrates that some Western states are trying to deal with the crisis by implementing reforms to mitigate competition and enhance the role of collaboration. In this article, the thesis will be developed in more detail. Namely, we will show that seven European countries are leaders in this process and that the results of the strategy they have chosen allow to count on overcoming the crisis.

The Seven of European leaders include Denmark, Norway, Sweden, Finland, Iceland, Switzerland and the Netherlands. They rank first in the happiness index, an integral yardstick of the social, economic and political state of society, indicating citizens' life satisfaction. Their leadership in this and many other cultural and institutional indicators is primarily due to the fact that they are significantly ahead of other Western states in the above-mentioned process of establishing collaboration mechanisms. In this regard, the situation for the United States is the opposite. The country, which until recently demonstrated the seemingly unshakable advantages of competition institutions, is now experiencing a crisis in its most obvious and severe form, gradually losing economic and institutional leadership.

The Scandinavian countries (Denmark, Norway and Sweden) have high-quality institutions, a high level of social security and low inequality; all this was noted long ago and has provided the grounds for the emergence of the concept of Scandinavian exceptionalism. Elaborating on this concept, many authors have also considered Finland (see, for example, (Pratt, 2008), which contains references to earlier works). In modern studies, the term "Nordic

exceptionalism" or "Nordic model" is used more often, and along with the Scandinavian countries, not only Finland, but also Iceland is considered (see, in particular, (Iqbal, Todi, 2015; Martela et al., 2020)). The article (Martela et al., 2020) provides an overview of relevant studies. It emphasizes the connection between life satisfaction[1] and a high quality of institutions and civic culture.

The paper (Helliwell et al., 2019, p. 23) highlights factors closely related to the level of happiness. Along with per capita GDP, the authors point out indicators such as social support, healthy life expectancy at birth, freedom to make life choices, generosity, and perceptions of corruption. The results of the panel regression of the happiness index on these six variables demonstrate their significance and the ability to "explain" a significant part of the variance. At the same time, however, the question remains as to whether the Nordic countries are "first among equals" or indeed "exceptions".

Comparing the 15 richest countries by a number of indicators, the authors of the work (Martela et al., 2020, p. 134) find that the idea of Nordic exceptionalism is not entirely accurate: the Netherlands and Switzerland are very close to the Nordic states. However, the article does not pay attention to the two countries.

In the present paper, we use this observation and investigate the idea of exceptionalism of the Seven of European leaders. To this end, in the next section, an integral LCI-10 index will be formed, reflecting the quality of life, civic culture, and institutional effectiveness. This index will be used to cluster developed countries. It will be demonstrated that the Seven states not only occupy leading positions in this index, but also form a separate cluster. A slightly weaker result is obtained when the number of aggregated indicators is expanded, although in this case the Seven remains in the leading positions.

Life satisfaction: The Seven of European leaders

Since 2012, the annual World Happiness Report has been published under the auspices of the UN (see, in particular, (Helliwell et al., 2019, 2020, 2021a)). In these reports, a group of researchers analyze the results of Gallup polls, in which respondents from different countries (about 150 in recent surveys) are asked the following question: "Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"[2].

Countries are usually ranked by the average results of answers over the previous three years (the average level of happiness varies from 8.9 to 2.6). With such a ranking the Seven occupied leading positions in recent years.

The work of Helliwell, Huang, Wang, Norton (Helliwell et al., 2021b) presents the results of regressions of the happiness index on six significant factors, which together explain the variation of the dependent variable for 149 countries quite well. We are talking about the following indicators: GDP per capita in terms of Purchasing Power Parity, healthy life expectancy at birth, social support, freedom to make life choices, perceptions of corruption, and generosity. Social support is measured as the proportion of respondents who answered in the affirmative to the Gallup World Poll question "If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?" This indicator characterizes social relations of small radius, which may play less significant role in well-organized systems. Thus, an individual may need less help from relatives and friends if official organizations providing such assistance are available. Perhaps this is the reason

[1] An overview of alternative approaches to measuring the level of happiness and the works of Russian authors on this topic is contained in (Shmatova, Morev, 2015).

[2] See: https://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx

why, according to the data used by the authors, Sweden ranked 25th in terms of social support. A similar disadvantage is typical of the generosity indicator, which is measured by the results of responses to the question "Have you donated money to a charity in the past month?" In addition, we should note that generosity in these countries is realized in the form of state aid to poor countries. It is no coincidence that the Seven does not rank high according to this indicator: Iceland – 6th, the Netherlands – 11th, Norway – 23rd, Sweden – 26th, Switzerland – 27th, Denmark – 34th, Finland – 91st. Meanwhile, according to the level of official development assistance as a percentage of gross national income, five countries of the Seven are in the top ten, Finland ranks 11th, and Iceland – 14th[3].

The indicator of the freedom to make life choices, also measured by the Gallup World Poll, depends on citizens' ideas about freedom. Otherwise it is difficult to explain the fact that the United Arab Emirates turned out ahead of the Seven with the exception of Norway, and the United States ranked 64th (Martela et al., 2020, p. 135).

In order to demonstrate the "exceptionalism" of the Seven, we choose a different set of indicators to reflect more comprehensively the quality of institutions and the level of countries' development. The indicators are as follows: healthy life expectancy at birth, the corruption perception index, the democracy index, the human development index, the Gini index, the generalized trust index, trust in government, government effectiveness, GDP (PPP) per capita, the rule of law.

Let us compare the Seven with other developed countries. According to the IMF, there are 40 countries[4] among them, but only 36 were ranked by the happiness index. The corresponding list in ascending order of rank is given in column 2 of *Table 1*. Further, we consider that the country's rank on the happiness index coincides with its number on this list. Similarly, countries are rearranged according to the ten indicators listed above: in each case, the countries are arranged, according to the corresponding index, from the top one ranked 1st, to the bottom one ranked 36th. A special situation arises if two or more countries were assigned the same rank during the initial ranking, so that when

Table 1. The Seven of European leaders among developed countries

1	2	3	4	5	6	7	8	9	10	11	12	13
Happiness index[1)]	Country	Healthy life expectancy at birth[2)]	Corruption perception index[3)]	Democracy index[4)]	Human development index[5)]	Gini index[6)]	Generalized trust[7)]	Trust in government[8)]	Government effectiveness[9)]	GDP (PPP) per capita[10)]	Rule of law[11)]	Integral index LCI-10[12)] (average of ranks 3–12)
1	Finland	19	4.5	6	11.5	8	4	4	3	16	1	7.7
2	Denmark	19	1.5	7	10	7	3	7	5	8	5	7.25
3	Switzerland	4	4.5	12	2.5	14	7	1	2	4	6	5.7
4	Iceland	9	17.5	2	4.5	4	10	14	16	10	9	9.6
5	The Netherlands	14.5	8	9.5	8.5	11	5	5	6	9	11	8.75
6	Norway	14.5	7	1	1	6	1	2	4	5	2	4.35
7	Sweden	10.5	4.5	3	7	10	2	8	8	13	8	7.4
8	Luxembourg	12	9.5	13	22.5	20	22	6	7	1	10	12.3
9	New Zealand	27	1.5	4	14.5	21.5	6	10	14	18	3	11.95

[3] See: https://www.oecd.org/dac/financing-sustainable-development/development-finance-data/ODA-2020-detailed-summary.pdf

[4] See: https://www.imf.org/en/Publications/WEO/weo-database/2021/October/select-countries?grp=110&sg=All-countries/Advanced-economies

End of Table 1

1	2	3	4	5	6	7	8	9	10	11	12	13
Happiness index[1)]	Country	Healthy life expectancy at birth[2)]	Corruption perception index[3)]	Democracy index[4)]	Human development index[5)]	Gini index[6)]	Generalized trust[7)]	Trust in government[8)]	Government effectiveness[9)]	GDP (PPP) per capita[10)]	Rule of law[11)]	Integral index LCI-10[12)] (average of ranks 3–12)
10	Austria	22.5	15.5	16	17	9	16	11	9	11	7	13.50
11	Australia	22.5	12.5	9.5	8.5	21.5	9	21	12	14	13	14.35
12	Israel	5.5	28	23.5	19.5	28	27	25	26	25	28	23.55
13	Germany	22.5	9.5	14	6	12	15	9	20	12	15	13.50
14	Canada	16	12.5	5	16	15	8	13	11	17	12	12.55
15	Irish	17	20	8	2.5	13	13	15	17	3	17	12.55
16	UK	28	12.5	15	13	31	14	28	19	21	18	19.95
17	Czech Republic	30	32	27	26	2	23	29	30	26	27	25.2
18	USA	34	22	21	17	32	12	17	22	6	21	20.4
19	Belgium	26	15.5	30	14.5	5	17	32	25	15	20	20.0
20	France	7.5	21	20	25	16	26	23	23	20	22	20.35
21	Malta	13	34	26	27	-	30	-	28	23	31	26.5
22	Taiwan	-	23	11	-	-	20	-	15	-	23	18.4
23	Spain	7.5	24	18	24	24	19	26	31	30	32	23.55
24	Italy	10.5	33	25	28.5	23	21	27	36	24	36	26.40
25	Slovenia	25	28	29	21	3	32	19	24	29	26	23.6
26	Singapore	2	4.5	35	11.5	29	33	3	1	2	4	12.50
27	Slovakia	31	36	34	35	1	31	30	34	33	33	29.8
28	Lithuania	32	28	33	32	30	24	16	27	28	29	27.9
29	Cyprus	5.5	30	28	31	-	35	-	32	27	34	27.81
30	Estonia	29	17.5	23.5	28.5	17	25	18	21	31	19	22.95
31	Latvia	33	31	32	33	26	29	31	33	34	30	31.2
32	Japan	1	19	17	19.5	25	11	22	13	22	16	16.55
33	Portugal	19	25.5	22	34	19	34	12	29	32	24	25.05
34	South Korea	3	25.5	19	22.5	27	18	20	18	19	25	19.7
35	Greece	22.5	35	31	30	18	28	24	35	35	35	28.0
36	Hong Kong	-	12.5	36	4.5	-	-	-	10	7	14	14.0

Sources:
[1)] Data for 2018–2020. Helliwel et al., 2021a, p. 20.
[2)] Data for 2019. Available at: https://apps.who.int/gho/data/view.main.SDG2016LEXv?lang=en
[3)] Data for 2020. Available at: https://images.transparencycdn.org/images/CPI2020_Report_EN_0802-WEB-1_2021-02-08-103053.pdf
[4)] Data for 2020. Democracy Index 2020. In sickness and in health? (2021). The Economist Intelligence Unit Limited.
[5)] Data for 2019. Available at: http://hdr.undp.org/sites/default/files/hdr2020.pdf, p. 343.
[6)] Data for 2020. Available at: https://data.oecd.org/inequality/income-inequality.htm
New Zealand – for 2018. Available at: https://knoema.com/atlas/New-Zealand/topics/Poverty/Income-Inequality/GINI-index
Singapore – for 2020. Available at: https://www.statista.com/statistics/951976/singapore-gini-coefficient-after-tax/
New Zealand and Singapore were added to the OECD data on 39 countries. 41 countries were ranked.
[7)] Ranked by averaged WVS survey data from the early 1980s to 2009 (Svendsen, Svendsen, 2015, p. 95).
Data on Costa Rica. Available at: https://socialcapitalgateway.org/sites/socialcapitalgateway.org/files/data/paper/2012/09/07/pc.pdf, p.18.
[8)] OECD data, 2017–2020. Available at: https://data.oecd.org/gga/trust-in-government.htm
On Singapore. Available at: https://www.straitstimes.com/singapore/politics/singaporeans-have-high-level-of-confidence-in-government-but-politically
Singapore was added to the OECD data on 42 countries. 43 countries were ranked.
[9)] World Bank data for 2020. Available at: https://www.theglobaleconomy.com/rankings/wb_government_effectiveness/
[10)] World Bank data for 2020. Available at: https://www.theglobaleconomy.com/rankings/gdp_per_capita_ppp/
The data on Japan were taken as of 2019.
[11)] Available at: https://www.theglobaleconomy.com/rankings/wb_ruleoflaw/
[12)] The integral index of quality of life, civic culture and institutional effectiveness; calculated as an average of ten indicators (3–12).

Table 2. Clustering the set of developed countries, 10 and 12 factors*

1	2	3	4	5	6	7	8	9
Rank according to the LCI-10	Happiness index, rank	Country	Integral index LCI-10	Distance to the "nearest" country with a smaller LCI-10	Social support index[1], rank	Human freedom index[2], rank	Integral index LCI-12[3] (average of the ranks: 4 with a weight of 10; 6 and 7)	Distance to the "nearest" country with a smaller LCI-12
		Cluster 1.10					**Cluster 1.12**	
1	6	Norway	4.35		9	5.5	4.83	-
2	3	Switzerland	5.70	1.35	8	9.5	6.21	1.38
3	2	Denmark	7.25	1.55	4	9.5	7.17	0.96
4	7	Sweden	7.40	0.15	18	1	7.75	0.12
5	1	Finland	7.70	0.30	11	3.5	7.63	0.46
6	5	The Netherlands	8.75	1.05	19	2	9.04	1.29
7	4	Iceland	9.60	0.85	1	13	9.17	0.13
		Cluster 2.10						
8	9	New Zealand	11.95	**2.35**	3	3.5	10.50	1.33
9	8	Luxembourg	12.30	0.35	12	5.5	11.71	1.21
10	26	Singapore	12.50	0.20	-	36	-	-
11-12	14	Canada	12.55	0.05	7	11	11.96	0.25
11-12	15	Ireland	12.55	0.00	2	19	12.21	0.25
13-14	10	Austria	13.50	0.95	15	7.5	13.13	0.92
13-14	13	Germany	13.50	0.00	16	7.5	13.21	0.08
15	36	Hong Kong	14.00	0.50	-	27.5	-	-
16	11	Australia	14.35	0.35	6	12	13.46	0.25
		Cluster 3.10					**Cluster 2.12**	
17	32	Japan	16.55	**2.20**	20	27.5	17.75	**4.29**
18	22	Taiwan	18.40	1.85	-	17	-	-
19	34	South Korea	19.70	1.30	31	22	20.83	0.5
20	16	UK	19.95	0.25	5	20	18.71	0.96
21	19	Belgium	20.00	0.05	13	14	18.92	0.21
22	20	France	20.35	0.35	17	29.5	20.83	0.00
23	18	USA	20.40	0.05	14	26	20.33	1.41
		Cluster 4.10						
24	30	Estonia	22.95	**2.55**	25	15.5	22.5	1.67
25-26	23	Spain	23.55	0.60	10	29.5	22.92	0.42
25-26	12	Israel	23.55	0.00	24	35	24.54	0.12
27	25	Slovenia	23.60	0.05	22	23	23.42	0.50
28	33	Portugal	25.05	1.45	27	15.5	24.42	1.00
29	17	Czech	25.20	0.15	26	18	24.67	0.13
30	24	Italy	26.40	1.20	23	31	26.50	1.83
31	21	Malta	26.50	0.10	-	24	-	-
32	29	Cyprus	27.80	1.30	-	33	-	-
33	28	Lithuania	27.90	0.10	28	25	27.67	1.17
34	35	Greece	28.00	0.10	30	34	28.67	1.00
35	27	Slovakia	29.80	1.80	21	32	29.25	0.58
36	31	Latvia	31.20	1.4	29	21	30.17	0.92

* The dash indicates the absence of relevant data on the country.

Sources:

[1] Social Support Index. Available at: https://data.oecd.org/healthrisk/lack-of-social-support.htm

OECD (2021), Lack of social support (indicator). DOI: 10.1787/0cfbe26f-en (Accessed 07 October 2021).

[2] Human Freedom Index 2021. Available at: https://worldpopulationreview.com/country-rankings/freedom-index-by-country

[3] The integral index of quality of life, civic culture and institutional effectiveness; calculated as an average of twelve indicators: 3–12 (Tab. 1) and 5, 6 (Tab. 2). Obviously, LCI-12 = [10 LCI-10 + (rank 5) + (rank 6)]/12

compiling the list each of them can be located in one of two or more places following each other. In this case, each country is assigned a rank equal to the sum of the numbers of the corresponding places divided by their number. For example, according to the initial data, Finland, Switzerland, Sweden and Singapore had the same corruption perception index and ranked from 3rd to 6th on our list. After the rearrangement, each of these countries scores 4.5 (see column 4 of Table 1). Columns 3–12 of Table 1 contain the scores obtained in this way from the initial data.

We note that the initial ranks depend on the number of countries that were ranked according to one or another index. Rearrangement allows us to get rid of this dependence.

Column 13 of Table 1 shows the average rank of each country for all ten indicators. We call this indicator, designated as the LCI-10, the integral index of quality of life, civic culture and institutional effectiveness. This index is used to cluster the group of countries under consideration *(Table 2)*.

The calculation uses the simplest clustering method – the nearest neighbor method (also called the single linkage method)[5].

We take the modulus of the difference between the corresponding values of the LCI-10 as a measure of the distance between countries. We say that a subset of countries S (which does not coincide with their entire set and contains at least two countries) forms a cluster in a weak sense if two conditions are met: a) S contains all such and only such countries whose nearest neighbors belong to S; b). the distance between any two countries from S is less than at least one of the distances from these countries to any country not belonging to S. A subset of S is called a cluster in a strong sense, or simply a cluster if it is a cluster in a weak sense and the following condition is met: the distance from each country within S to its nearest neighbor is less than the distance from any country within S to any country outside S.

It can be easily verified that the nearest neighbor method generates clusters in a strong sense.

In the situation under consideration, the graph of connections between vertices (countries) can be represented as a weighted chain where the weights of the edges are equal to the corresponding distances.

The vertices of this chain are arranged in ascending order of LCI-10 values (see columns 1, 3 and 4 of Table 2), and the weights of the edges connecting them are equal to the differences between the corresponding values (see column 5 of Table 2). For example, the weight of the first Norway – Switzerland edge in the chain is 5.70 – 4.35 = 1.35; the weight of the Iceland – New Zealand edge is defined similarly: 11.95 – 9.60 = 2.35, etc. The distance between any two countries is equal to the sum of the weights of the edges connecting them. For example, the distance between Australia and the UK is calculated using the data from column 5 as follows: 2.20 + 1.85 + 1.30 + 0.25 = 5.60.

If an LCI-10 value is the same for several countries, as is the case, for example, for Austria and Germany, then they are located at the same vertex, and their order in column 3 is chosen at random.

Obviously, under the accepted assumptions, the Seven forms a cluster. In the situation under consideration, clustering can be conducted by sequentially removing the edges with the maximum weight. According to the data in column 5, the USA – Estonia edge has the maximum weight. When the edge is removed, our set of countries splits into two clusters: cluster 4.10 and all other countries. Then, removing the Iceland – New Zealand and Australia–Japan edges, we split the set of developed countries into four clusters. If we assess the level of development by the values of the LCI-10, then the Seven turns out to be the leading

[5] See: http://www.aiportal.ru/articles/autoclassification/single-link.html

cluster in this regard[6]. While each country from the first cluster shows higher life satisfaction than any country from the other clusters. It is also easy to check that the average life satisfaction in the second cluster is higher than in the third, and in the third it is higher than in the fourth.

The fact that the Seven forms a separate cluster, where each of the countries surpasses representatives of other clusters not only in life satisfaction, but also in the integral index, can be considered a serious argument in favor of its "exceptionalism": The Seven is significantly ahead of all other states, including the United States, in terms of development. We emphasize that neither the three Scandinavian countries nor the five Nordic states form a cluster.

The results we have obtained suggest that the feeling of life satisfaction is associated with the level of the LCI-10. It would be interesting to check for a causal relationship between indicators included in LCI-10 and the level of happiness by interviewing respondents.

Certainly, the conclusions may depend on the clustering method and, in particular, on the selected set of parameters that form an integral index. If, for example, the indicators of social support and personal freedom, rejected earlier for substantive reasons, are added to the ten parameters used, then the picture changes: the Seven ceases to be a cluster. When dividing the set of countries by means of a new integrated index LCI-12 into two clusters, the Seven is part of the first cluster along with seven more countries (see columns 6–9 of Table 2). Nevertheless, it remains at the top of the list and forms a cluster in a weak sense, which can be easily checked. While the United States turns out in the second cluster.

On the dynamics of the main indicators: the Seven and the USA

According to the LCI-10 the United States ranks 23rd, even lower than according to the happiness index. We should note that over the recent decades a typical trend has developed: the U.S. has been lagging increasingly behind a number of countries, and many other countries are now catching up with the U.S.

According to the report "Corruption Perceptions Index 2020"[7], in 2020 the United States reached its lowest position on the CPI since 2012. The authors relate this to the challenges of allocating and distributing the COVID-19 relief package. The high scores of Denmark, Finland, Sweden and Switzerland are emphasized. Of the seven European leaders, only Iceland has gone beyond the top ten on the CPI; still it is also significantly ahead of the United States.

The Democracy Index is calculated by the Economist Intelligence Unit, the research and analysis division of the Economist Group (UK), on the basis of expert assessments and opinion polls in 167 countries. The 60 indicators obtained in this way are aggregated to identify five indicators, each of which characterizes one of the fundamental categories of the democratic mechanism: electoral process and pluralism, the functioning of government, political participation, political culture, and civil liberties. These indicators are evaluated on a ten-point scale, and the Democracy Index is their arithmetic mean. Based on its scores each country is classified as one of four types of regime: "full democracy", "flawed democracy", "hybrid regime" or "authoritarian regime"[8]. Data for 2006–2020 have been published[9]. During this

[6] The algorithm used does not contain a stopping rule. It is important for us that the Seven forms a cluster at some step.

[7] Corruption Perceptions Index 2020 (2021). Transparency International. Berlin. 30 p. Available at: https://images.transparencycdn.org/images/CPI2020_Report_EN_0802-WEB-1_2021-02-08-103053.pdf

[8] See: https://countryeconomy.com/hdi?year=2006/

[9] Democracy Index 2012. Democracy at a standstill (2013). The Economist Intelligence Unit Limited 2013. Pp. 1–40. Available at: https://civitanaorg.files.wordpress.com/2014/05/democracy-index-2012.pdf; Democracy Index 2020. In sickness and in health? (2021). The Economist Intelligence Unit Limited. Pp. 1–70. An updated version of the index has been published recently (Democracy Index (2021). Gumanitarnyi portal: Issledovaniya. Tsentr gumanitarnykh tekhnologii, 2006–2021 (revised March 10, 2021). Available at: https://gtmarket.ru/ratings/democracy-index).

period, the index values decreased for almost all countries initially classified as full democracies. Norway is one of the few exceptions. In addition, four other countries within the Seven retained the index values above nine; the indices of the remaining two states – the Netherlands and Switzerland – are very close to nine. While the U.S. score on the Democracy Index was falling monotonously from 8.22 and turned out below 8 in 2016. Thus, the United States has moved to the flawed democracy category. It lags behind the majority of full democracies in terms of the quality of governance and the level of political culture[10].

The Human Development Index (HDI) is an aggregate of four indicators: life expectancy at birth, mean of years of schooling for adults aged 25 years and more, expected years of schooling for children of school entering age, and gross national income per capita[11].

In 1990, the United States ranked 7th on the HDI and were ahead of the Netherlands, Denmark and Finland[12]. In 2005, they ranked 12th, surpassing only Denmark within the Seven[13]. In 2019, the United States moved to the 17th place, while the Seven countries took places no lower than 12th (see Table 1). In terms of HDI growth rate for 1990–2017, the United States is behind the vast majority of countries. Among the countries included in the top 100 in 2017, the HDI was growing at a lower rate only in Ukraine[14].

As follows from Table 1, income inequality in the United States is significantly higher than in the Seven countries. In fact, this is true in relation to all European states, and the same can be said about wealth inequality. Compared with 1980, inequality in the United States has grown much more dramatically than in Western Europe (Alvaredo et al., 2018; Polterovich, 2021a).

Social mobility is among the factors that significantly affect inequality. It is natural to assume that mobility is higher when the levels of income groups to which children and their parents belong are less correlated. The work (Jäntti et al., 2006) shows that in the United States the correlation is significantly higher than in the UK, where it greatly exceeds the correlation observed in Denmark, Finland, Norway and Sweden. Thus, the son of a poor father is more likely to remain poor in the United States than in the Nordic countries. The authors note that their study dispels the myth of American exceptionalism regarding social mobility.

A similar conclusion also follows from the findings (Alesina et al., 2018, p. 532). According to the authors, if a child's parents belong to the lower income quantile, then the probability that the child will remain in the same quantile is 26.7% for Sweden, which is less than for Italy (27.3), France (29.2), the UK (30.3), the U.S. (33.1). The figures confirm that mobility is lower in the U.S., and in Sweden it is higher than in the leading European countries. The article shows that Europeans consider social mobility as being a lot worse than it is in reality, and U.S. citizens tend to believe that social mobility in their country is significantly higher than it actually is.

Institutional features are closely related to cultural ones. A remarkable example of this relationship is the difference between Americans and Norwegians, experimentally discovered in the work (Almäs et al., 2016). Norwegians, unlike Americans, show a much more negative attitude toward high inequality, while there are no differences in their attitude toward effectiveness.

[10] Democracy Index 2020. In sickness and in health? (2021). The Economist Intelligence Unit Limited. Pp. 1–70. Tables 3, 12.

[11] See: http://hdr.undp.org/en/content/human-development-index-hdi

[12] See: http://hdr.undp.org/sites/default/files/reports/220/hdr_1991_en_complete_nostats.pdf, p. 15.

[13] See: http://hdr.undp.org/sites/default/files/reports/268/hdr_20072008_en_complete.pdf, p. 229.

[14] Human Development Indices and Indicators. 2018 Statistical Update (2018). The United Nations Development Programme, New York. 112 p. Pp. 26–29. Available at: http://hdr.undp.org/sites/default/files/2018_human_development_statistical_update.pdf.

We can assume that when performing some kind of work, Norwegian citizens are more likely to feel responsibility that is not associated with financial incentives. It is an essential prerequisite for effective collaboration.

The share of respondents who believe that "most people can be trusted" is taken as an indicator of generalized trust. The data in Table 1 reflect the findings of surveys conducted from the early 1980s to 2009. The work (Min, 2020) contains relatively new data on a slightly different indicator – a synthetic indicator of social trust. It characterizes the respondents' trust in both their near and far circle, in particular to family members and to people met for the first time. The ranking looks different here, but all the seven European leaders are in the top ten, the UK, New Zealand and Australia rank 7th, 8th and 9th, and the United States ranks 17th.

A sufficiently high level of citizens' generalized trust is the most important prerequisite for the effectiveness of collaboration mechanisms. A high level of citizens' trust in the government is of equal importance. Only in this case it becomes possible, while combating the crisis, to transform command hierarchies into advisory or collaborative ones (Polterovich, 2021b).

We should note that over the recent decades the level of generalized trust in the United States has been declining considerably. Thus, the share of respondents who believed that most people can be trusted was about 45% in 1972, and a little more than 30% in 2014. The level of US citizens' trust in the government decreased from 30% in 1996 to 19% in 2015. In 1958, it was above 70% (Ortiz-Ospina, Roser, 2016).

It is interesting to trace the dynamics of another indicator, the World Competitiveness Ranking (WCR), for the Seven and the United States. The WCR has been calculated since 1989 at the Institute for Management Development (Switzerland) and represents an aggregate of 334 indicators obtained on the basis of statistics and surveys. These indicators, according to the authors, somehow affect the country's ability to implement long-term economic growth. As we see in *Table 3*, over the past five years, all the Seven countries, with the exception of Iceland, have improved their rating. Five of them were in the top ten in 2021, and Finland ranked 11th. The U.S. ranked no lower than 4th in 2017–2019; and it moved downward to the 10th place in 2020 and 2021.

Table 3. World competitiveness ranking dynamics

#	Country/year	2017	2018	2019	2020	2021
1	Denmark	7	6	8	2	3
2	Norway	11	8	11	7	6
3	Sweden	9	9	9	6	2
4	Finland	15	16	15	13	11
5	Iceland	20	24	20	21	21
6	Switzerland	2	5	4	3	1
7	The Netherlands	5	4	6	4	4
8	New Zealand	16	23	21	22	20
9	UK	19	20	23	19	18
10	Austria	25	18	19	16	19
11	Canada	12	10	13	8	14
12	Australia	21	19	18	18	22
13	Germany	13	15	17	17	15
14	USA	4	1	3	10	10
15	Singapore	3	3	1	1	5

Source: https://www.imd.org/centers/world-competitiveness-center/rankings/world-competitiveness/

The advantages of the Seven in relation to the United States, reflected in the level and dynamics of the above indices, have affected the dynamics of per capita GDP *(Tab. 4)*. Today Norway and Switzerland are ahead of the U.S. in terms of this key economic indicator, and other members of the Seven are confidently catching up with the U.S.

The Rule of Law Index is calculated by the World Bank on the basis of statistical data, population and expert surveys[15]. It reflects the scale of violence and organized crime, property rights protection, enforceability of contracts, confidence in the police force and judicial system, etc. According to this index, the United States is significantly behind not only the Seven, but also New Zealand, Canada, Austria, Germany (see column 12 of Table 1).

Conclusion

The fact that the United States is gradually losing its position as the most advanced socio-economic system has been noted by many authors, in particular supporters of the theory of Nordic exceptionalism. We have shown that this theory is not entirely accurate: at present, Switzerland and the Netherlands are also in the group of leaders along with the Nordic countries. Our results demonstrate that the Seven is far ahead of the United States not only in terms of the happiness index, but also in terms of the set of major indicators of civic culture, economic and political institutions. The question arises as to what qualitative features of socio-economic and political mechanisms ensure this leadership.

The process of the U.S. losing its leadership is not over yet. First, by now only Norway and Switzerland are ahead of the United States in terms of per capita GDP. Second, the United States is still ahead of Europe in terms of creating new technology, as evidenced by the data on the number of patent applications. According to statistics for 2010–2020, Asia's share in the total number of applications is growing, the share of North America and Europe is decreasing, while the decline for North America is slower than for Europe[16]. Third,

Table 4. GDP (PPP) per capita, % of the U.S. level

#	Country/year	C1	C2	C2/C1
1	Denmark	78.3	92.9	1.19
2	Norway	92.1	105.1	1.14
3	Sweden	80.1	85.4	1.07
4	Finland	72.5	79.5	1.10
5	Iceland	85.2	90.7	1.06
6	Switzerland	100.9	112.7	1.12
7	The Netherlands	85.7	92.3	1.08
8	New Zealand	59.2	69.1	1.17
9	UK	71.9	73.3	1.02
10	Austria	80.8	89.2	1.10
11	Canada	80.6	77.7	0.96
12	Australia	78.2	82.4	1.05
13	Germany	76.8	85.9	1.12
14	USA	100	100	1.00

C1 – GDP (PPP) per capita, % of the U.S. level, average for 1998–2000.
C2 – GDP (PPP) per capita, % of the U.S. level, average for 2018–2020.
C2/C1 – growth of the average ratio of GDP (PPP) per capita to the U.S. level for 20 years.
Calculated according to: https://stats.oecd.org/index.aspx?DataSetCode=PDB_LV#\

[15] See: http://info.worldbank.org/governance/wgi/pdf/rl.pdf. A different methodology is used by the World Justice Project, but Iceland and Switzerland are not included in the corresponding list of countries.

[16] See: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2021.pdf, p. 15.

the dollar still remains the world's main reserve currency. Its share in the reserves of central banks is decreasing, but yet again at the expense of Asian countries.

Will the United States continue to lose its positions or will it be able to reclaim them? This issue has become particularly relevant in connection with the recent events in Ukraine that resulted, in particular, in an unprecedented consolidation of European countries around the United States. The solution to this issue is connected with the question regarding the extent of qualitative differences in the socio-economic and political mechanisms that caused the superiority of the Seven over the United States in terms of institutional indicators. And if the extent is significant, then what are the chances that these mechanisms could be borrowed by other Western, primarily European, countries? The second part of the work will be devoted to finding the answer. In particular, we will show that the Seven countries have become leaders thanks to collaborative advantages – more mature mechanisms of collaboration in the economic, social and political spheres, and that a number of other European states follow their example. We will also consider how our findings can be used to develop catch-up strategies.

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Information about the Author

Victor M. Polterovich – Doctor of Sciences (Economics), Professor, RAS Academician, head of scientific field, Central Economics and Mathematics Institute, Russian Academy of Sciences (47, Nakhimovsky Avenue, Moscow, 117418, Russian Federation; e-mail: polterov@cemi.rssi.ru), deputy director, Moscow School of Economics, Lomonosov Moscow State University (1, Leninskie Gory, building 61, Moscow, 119234, Russian Federation)

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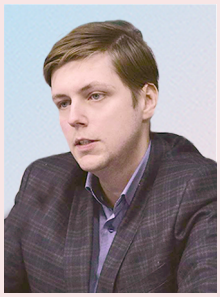
Protectionism in Russia: New Trends in the Context of the Import of Institutions

Ruslan S. GRINBERG
Institute of Economics, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: grinberg@inecon.ru
ResearcherID: H-8175-2016



Oleg O. KOMOLOV
Plekhanov Russian University of Economics
Financial University under the Government of the Russian Federation
Institute of Economics, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: oleg_komolov@mail.ru
ORCID: 0000-0001-6944-7925; Researcher ID: D-8347-2018

Abstract. The article examines the institutional aspect of state regulation of foreign economic activity in Russia. Theoretical basis of the research is the concept of "educational protectionism" by F. List, which involves the cultivation of "young industries" under the shelter of protective customs tariffs until they become competitive in domestic and foreign markets; as well as the theory of "delinking" by S. Amin, who considers protectionism as a method for the countries, which are on the periphery of the world economy, to exit the relations of unequal exchange with industrialized countries: national economic policy should be aimed at meeting the needs of domestic development, rather than promoting international competitiveness (food security, full employment, minimum wage, etc.). Such measures were a stable element of the socio-economic model of the USSR and acted as a source of capital accumulation for the development of industry and the military-industrial complex. We come to the conclusion that the mindless borrowing (transplantation) of institutions of free trade and protectionism in Russia in the

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1990s, which was not accompanied by the formulation and implementation of state strategic plans for the development of the Russian economy, led to the formation of a "mutant" economic model. On the one hand, the complete abandonment of the policy of state monopoly on foreign trade led to the flooding of the domestic market with imported goods and, as a consequence, massive ruin of domestic manufacturing enterprises. On the other hand, the purpose of the fragmentary application of protectionist policy instruments was not so much to support national producers as to create a comfortable environment for the distribution of state property among a narrow group of people close to the authorities, as well as favoring monopoly capital in a number of sectors of the domestic economy.

Key words: protectionism, institutions, free-trade, Russia, agriculture.

Introduction

Understanding the role of protectionism in the modern economy is impossible without taking into account the institutional environment in which the state implements such practices. Thus, during the market reforms of the 1990s, post-Soviet Russia imported the institutions of state regulation of the economy through their transplantation[1]. An attempt to directly borrow foreign elements from the external environment – the capitalist countries of the Western world, due to privatization and economic freedom of business entities, the policy of "austerity", easing the tax burden on capital, liberalization of currency regulation, the rejection of the monopoly on foreign trade, etc., came into conflict with the traditions of the planned economy. As a result, this symbiosis created the "Frankenstein monster" – socio-economic relations in which the institution of state regulation served the function of redistributing public property and protecting the interests of a narrow group of persons close to the government from external competition. In this context, protectionism will not produce the traditionally expected results, such as developing a competitive national manufacturer, economic growth and full employment, because their work was initially driven by other goals. Thus, the purpose of the study is to consider the development features of protectionism in modern Russia in the context of the institutional environment formed under the influence of atrophy and rebirth of liberal institutions, as well as the dysfunction of institutional macrostructure, when the freedom of entrepreneurship turned into all-powerful monopoly capital, privatization has led to mass bankruptcies of enterprises, the policy of non-interference of the state resulted in the abandonment of a large part of social obligations.

Protectionism according to F. List and S. Amin

The Dictionary of Economics defines protectionism as an economic policy of the state, which manifests itself "in the purposeful protection of the country's domestic market from the introduction of foreign goods into it. This policy aims to encourage the development of the national economy and protect it from foreign competition by imposing high duties on goods imported into the country or banning the importation"[2]. Thus, protectionism is a phenomenon typical of the market model of the economy. In economic theory, the authors of different economic schools have developed the ideas of protectionism. The most famous are the works of F. List, who formulated the theory of "educational protectionism". It implies the cultivation of "young industries" imposing protective customs tariffs until they become competitive on internal and external markets. Trade restrictions should not be applied

[1] On the problem of the transplantation of institutions in the case of the post-Soviet countries see (Grinberg, Komolov, 2020).

[2] Raizberg B.A., Lozovskii L.Sh., Starodubtseva E.B. (2021). *Modern Dictionary of Economics.* 6th ed. Moscow: INFRA-M.

to the purchase of equipment and technology. The costs of protectionism have to be borne by consumers, that List called "tuition fees". They will be overcompensated for by future economic growth. Protective or "nurturing" duties, according to List, should be temporary and abolished as national industry reaches the stage where it can compete openly with foreign manufacturers. "The customs system, as a means of promoting the economic development of the nation through the regulation of foreign trade, must constantly bear in mind the principle of the industrial education of the nation", List wrote in the preface to *The National System of Political Economy* (List, 2017). At the same time, F. List was an opponent of "prohibitive duties" and believed that they could be resorted to only in exceptional cases, such as in times of war.

S. Amin's works contain similar ideas, but as applied to the analysis of the core-periphery relations of the modern economy. His research focuses on the problem of economic dependence: the countries of the periphery of the world economy specialize in a few export-oriented, labor-intensive industries with low value added (mining, agriculture, low value-added manufacturing). High-value-added industries are predominantly located in the center. The redistribution of peripheral surplus value in favor of the core takes place through underpayment of labor in the periphery, control of prices by the core countries and securing high-tech technologies through the patent system, as well as losses of some peripheral countries due to devaluation of national currencies, net capital outflows and interest payments on foreign debt.

S. Amin argued that it is impossible to free countries that exist under the rules of the global capitalist system from economic dependence. The only condition for their catch-up development is "delinking" from the established relations of the international division of labor. (Amin, 1990). Separation does not mean autarky. The basic idea of this theory is that peripheral states should redistribute resources and surplus product in accordance with the contribution of workers in each industry to total output. This would, for example, lead to an increase in the price of agricultural products and the welfare of the rural population. The economic policy of the state should be aimed at meeting the needs of domestic development rather than promoting international competitiveness (food security, full employment, minimum wage, etc.). Amin admits that it is impossible to achieve complete separation from economic dependence, but even partial progress on this path can be considered a success for the country (Amin, 1996).

In the practice of state regulation of foreign economic activity protectionist measures can be a response to dumping by foreign producers. There are three forms of dumping:

1) occasional dumping, i.e. occasional sale of goods on foreign markets at a price below cost. This can happen, for example, in a situation of overproduction and the need at all costs to sell the goods produced on any terms. This form of dumping is not dangerous and does not require a government response (Maslov, 2019);

2) deliberate dumping – a conscious attempt to force a competitor out of the national market by selling goods at an artificially low price. The subsequent monopolization of the market makes it possible to more than compensate for the losses incurred;

3) sustainable dumping, based on the principle of third-degree price discrimination and posing the greatest danger. To deal with this phenomenon, the state is required to implement a well thought-out strategy that, on the one hand, will not deprive the consumer of access to imported goods sold at an affordable price, and on the other hand, will help to create sufficient conditions for the development and strengthening of a national competitor to the importer.

The most common protectionist measure in foreign trade is the customs tariff, i.e., the rate of duty levied on goods when they cross the customs border (Feenstra, 1992). This tool has a number of advantages: it allows limiting the entry of imported goods on the market in those industries that require support, usually new, underdeveloped industries that are not able to enter into open competition with the importer; it provides budget revenues; it serves as an argument in political confrontation between states in the international arena. However, the application of the customs tariff is effective only when the entire customs policy is part of a well-designed strategy for the development of the national economy, which considers inter-industry proportions and is aimed at achieving clearly defined goals of economic development. Otherwise, the sporadic, haphazard application of the customs tariff as a protectionist measure could lead to negative consequences. These include trade wars between countries, limited access of the population and companies to quality imported goods and advanced technologies, and reduced competitiveness of national producers due to the lack of competitive incentives for growth and development.

Formation of protectionism in modern Russia. Contradictions of the transition period

The economy of modern Russia has developed on the basis of the industrial and institutional foundation inherited from the Soviet period. In the Soviet Union, foreign economic activity was part of the planned economic system. In the absence of economic independence of enterprises, the customs policy of the Soviet state did not function as a regulator of foreign trade operations, so it would be incorrect to apply the term "protectionism" to the policy. Its role was auxiliary and limited mainly to fiscal function: customs duties acted as a source of replenishment of the state budget. In addition, the state monopoly on foreign trade made it possible to stabilize the economy, first, by ensuring the planned sale of goods by Soviet enterprises abroad (using, among other things, political instruments to secure foreign markets), and second, by filling the lack of domestic goods at the expense of import supplies (Gruzinov, 1978). Lenin considered the introduction of a state monopoly on foreign trade in 1918 as one of the main commanding heights of the Soviet state to overcome the economic ruin in the country in the context of a hostile external environment: this was the only way to protect the young republic from the invasion of foreign capital and successfully solve the problems of socialist construction; "without such monopolization we cannot get away from foreign capital by paying tribute" (Lenin, 1974). The principle of foreign trade monopoly assumed the implementation of foreign economic activities in accordance with the national plan. The proportions of foreign trade turnover became part of a single national economic plan, subordinated to its goals and objectives. The government centrally determined the nomenclature of imported goods needed by the country and formed a fund of export goods for sale abroad as normal conditions for foreign trade were restored (Yakub, 2018).

The period of market transformation in Russia coincided with the development of the neoliberal stage in the history of capitalism. The institutions of regulated capitalism in the Western world were replaced by the principles of market self-regulation. They are reflected in the provisions of the Washington Consensus – the type of macroeconomic policy recommended by the World Bank and the IMF, based on privatization, stabilization and liberalization. The latter meant a significant reduction in or abandonment of state regulation of the financial market (interest rates set by the market, abandonment of reduced rates for preferred borrowers); the removal of barriers to the inflow of foreign direct investment and ensuring direct competition between local producers and

foreign ones; deregulation that facilitates the creation of new enterprises and eases antimonopoly policies; trade liberalization by replacing quotas with tariffs and the gradual reduction of the tariffs themselves.

During the R. Reagan and G. Bush presidencies, the USA considerably restricted protectionism, reduced trade quotas, supported the GATT (WTO) principles of abandoning economic barriers to the movement of goods and production factors. The United States also initiated the North American Free Trade Area, NAFTA, which included Canada and Mexico. The creation of the integration association was an attempt by the U.S. to expand markets for domestically produced goods. The general movement of the world economy toward globalization was a response to the "stagflation" crisis of the 1970s: the shift of production to regions with low wages and the simultaneous growth of imports by developed countries from newly industrialized economies reduced the costs of American and European manufacturers, which ensured high rates of economic growth over the next two decades.

The center of the market reforms of the 1990s in Russia was the privatization of state property. This process has also affected the state policy of regulating foreign economic relations. In general, the prevailing ideology of market fundamentalism at the time assumed that the removal of the state from the economy was a sufficient condition for prosperity: the natural mechanisms of market competition would run themselves. All the government has to do is to limit monopolization through rather lenient antitrust legislation.

The abolition of the state monopoly on foreign trade was one of the key decisions aimed at integrating Russia into the international division of labor through the internationalization of the national economy. The country's competitive advantages – its rich scientific potential, educated population, natural resources, and diversified industry – were expected to actively attract foreign investment (Dzarasov, Novozhenov, 2009). However, this did not happen, partly because the Russian ruling class itself was not fully interested in such a development. Unlike the former Soviet republics of Central and Eastern Europe, which chose the path of unconditional submission and openness to the Western world (quick accession to the WTO and the EU), the Russian authorities were unwilling to share attractive assets with the outside world (Evenett, Vines, 2012). On the contrary, the 1990s were marked by a revival of protectionism, but in an ugly, distorted form, aimed at protecting property from external encroachment, rather than at developing the national producer. Conditions for attracting foreign direct investment to privatization were enshrined in the Foreign Investment Law, dated July 4, 1991, and the Civil Code. Foreign investors were subject to "national treatment", which equalized the status of foreign companies with Russian ones. The Law "On privatization of state and municipal enterprises in the Russian Federation", dated July 3, 1991, did not regulate the acquisition of state property by foreigners. Clarifications appeared only in the text of the State Privatization Program of State and Municipal Property, dated December 24, 1993. The document contained several restrictions on the participation of foreigners in privatization:

1) to privatize organizations of trade, transport, public catering, consumer services, as well as small construction and industrial enterprises (with up to 200 employees), the foreign investor needed to obtain permission from local authorities;

2) in case there were no other bidders, the sale of property to a foreign resident was possible only after a special evaluation of the company's property by the Russian Ministry of Finance;

3) The Federal Counterintelligence Service was given the right to apply to the Government of the Russian Federation with a request to refuse the acquisition of assets by foreigners in a number of

sectors: defense, transport, communications, oil and gas, mining of strategic materials and precious metals and stones;

4) foreign capital was not allowed to acquire assets located in closed territorial entities[3].

These barriers cannot be called insurmountable. On the contrary, the conditions for allowing foreigners to buy Russian assets have been softened in comparison with the first version of the program adopted by the Supreme Soviet in 1992. However, despite this, the participation of foreign capital in privatization was insignificant, especially in comparison to other former socialist countries. Thus, between 1992 and 1994, non-residents bought back only 10% of privatized assets (Suleimanov, 2003). The main reason was the unwillingness of the organizers of the privatization process to share property with external buyers. The specific, voucher-based form of privatization chosen by the authorities severely limited the participation of foreign capital. The close relationship between government and business has become a source of protectionism of a special kind, where the role of the state is reduced to protecting the national buyer from foreign competition.

In December 1993, *Nezavisimaya Gazeta* published an article with the headline "Rejection of Protectionism"[4]. In this article, the author argues that against the backdrop of the formal movement toward internationalization of the Russian economy, in fact the state prevents the entry of foreign players into the market through currency controls, import duties and taxes. As a result, there remains a high degree of monopolization in the economy, which should be overcome by attracting foreign investors to the market. However, such appeals went unheeded, and the tandem of state and business continued to strengthen. As a result of this synthesis, a specific business environment emerged in Russia, which has carried its features through the decades. These include the following:

1) The rent-seeking behavior of big business. The source of wealth for most Russian billionaires has been the appropriation of superprofits from natural rents and trade in a completely free, undeveloped and undemanding internal market (Dzarasov, 2010). And if in the retail trade foreign capital began to gradually penetrate in the form of large retail networks, the extraction of raw material rent was and remains the privilege of national capital, as well as the state.

2) Excess profits as a prerequisite for investment. Protectionism and lack of competition, as well as the absence of property rights guarantees and insignificant reputational risks, have left room only for investment strategies that imply quick, mostly speculative profits. This problem is inextricably linked to the offshorization of the Russian economy: capital flight becomes a tool to protect the profits from redistribution by non-market methods.

3) Non-market methods of competition: administrative support of regional business by local authorities for a fee; the policy of vertically integrated companies overpricing their products; monopolism in certain industries and regions, caused by the features of the production process, the state of the distribution of productive forces (for example, in the production of assemblies and units for mechanical engineering) (Apokin, 2011).

4) Low quality of management personnel, cronyism, lack of entrepreneurial initiative. It manifests itself, in particular, in the fact that Russian business was unable to achieve success in foreign markets, including those with a favorable business climate, low levels of corruption and a stable legal system.

[3] "On the State Program of Privatization of State and Municipal Enterprises in the Russian Federation": Presidential Decree 2284, dated December 24, 1993 (amended and supplemented). Available at: https://base.garant.ru/10101974/

[4] Teperman V. Rejection of protectionism. *Nezavisimaya Gazeta*, 1993, December 15, no. 240(664), p. 4.

5) Low wages, social inequality and property stratification. The proportion of wages in the cost of Russian goods and services in Russia is 20–25%, the EU – 50–60%, the U.S. – 75–80% (Aksenova, 2016).

Low efficiency of protectionism in Russia as a sign of institutional dysfunction

The mentioned features of Russian business are the result of a specific policy pursued by the state in the post-Soviet period. The new Russian protectionism did not fulfill the "educational" functions according to F. List: it did not create favorable conditions for the development of production (on the contrary, the low level of personal income, high taxes, the devalued ruble made direct investment unattractive), but it shielded big business from external competition. This situation is due to the dysfunction of the institutions of state regulation of the market economy. As O.S. Sukharev notes, dysfunction is a functional disorder, violation, non-execution (partial execution) of the institutional macrostructure functions. Distortedly functioning institutions ensure the stability of such a state, and overcoming the accumulated contradictions becomes possible only with appropriate modifications of institutions (Sukharev, 2021). In Russia, the functional disorder of the transplanted institutions of liberalism has taken the form of their atrophy and degeneration. According to V.M. Polterovich, the transplant turned out to be unclaimed, because its use became incompatible with the cultural traditions and institutional structure of the recipient. In this case, the atrophying institution becomes a source of more serious dysfunction: destructive possibilities of its application, suppressed by features of the institutional environment of the recipient, become more active (Polterovich, 2008). Thus, the problems of the USSR economy, where the state at least managed the economy in accordance with strategic plans, have not been overcome: greenhouse conditions for big business, lack of competition, as well as the unwillingness and probably inability of the Russian state to formulate and implement strategic plans for the development of the economy in general and priority industries in particular have led to contradictory results.

As an example, consider the situation in Russian agriculture. The use of protectionist measures in this industry is traditionally explained by unfavorable climatic conditions, the consequence of which is increased energy intensity, low yields and low labor productivity. Another argument in favor of the protection of national producers by tariff measures is an appeal to the practice of the USA and European countries. However, the mechanical borrowing of protectionist practices in foreign trade has led to ambiguous results. On the one hand, the volume of agricultural production as well as exports increased several times between 2000 and 2010 (Epshtein, 2017). On the other hand, the export-oriented nature of production, along with the undervalued ruble exchange rate, which the government maintains through the accumulation of excessive international reserves, leads to an increase in product inflation. As a result of such protectionism, it becomes more profitable for producers to export their goods and sell them for foreign currency rather than to sell them on the domestic market. Rapidly rising food prices contribute to a further decline in the real incomes of the population and force the president and the government to resort to methods of manual control in order to curb the rise in prices of socially important goods[5]. In such a situation, the state's influence on the volume of exports of Russian agricultural products would be a reasonable protectionist practice. Restrictions on the export of grain and other crops would reduce domestic market prices. At the same time, it would mean limiting foreign exchange earnings of exporters and, as a consequence, reducing the net outflow

[5] Putin commented on rising food prices. *RIA*. June 6, 2021. Available at: https://ria.ru/20210630/produkty-1739200839.html (accessed: July 18, 2021).

of capital – another channel of non-equivalent exchange in the global economy according to S. Amin.

Also, the side effects of domestic protectionism in the agro-industrial complex are the dominance of intermediaries and the monopolistic power of companies involved in the processing of raw materials. Thus, a certain percentage is added to the original producer price during transportation, packaging and storage. For example, the price of carrots increases by 195%, potatoes – 160%, buckwheat – 135%, milk – 91%, cabbage – 73%, beef – 51%, and meat – 40%.[6]. The absence of foreign competitors, coupled with ineffective antimonopoly policy, allows businesses to make high profits without sufficient capital investment (for example, the degree of depreciation of fixed assets in agriculture in Russia in 2020 was 40.5%). As a result, in pre-sanctioned times the trade margins exceeded the protective tariffs by several times, which loses its protective function: overpriced products limited domestic demand and to an even greater extent redistributed goods in favor of the foreign buyer *(Table)*.

Low consumption undermines labor reproduction and makes the industry more dependent on external markets (Afanasyev et al., 2015). In addition, this situation is influenced by such a traditional protectionist measure as the devaluation of the ruble. The cheap ruble policy pursued by the Central Bank and the Ministry of Finance does not allow Russian companies to import machinery, equipment, machine tools and other elements of fixed capital necessary to replenish depreciation and upgrade the material base of production. In the context of an ever-increasing rate of fixed assets depreciation, the Russian economy is in a steadily positive net export position. In pre-pandemic 2019, the trade balance was 105 billion US dollars (Tolkachev, Brzhezinskii, 2018). This circumstance indicates that in the context of devaluation Russian enterprises find themselves unable to meet their needs for imported equipment, as they are forced to bear excessive costs in rubles when buying foreign currency on the domestic market. However, one should note that the low efficiency of the protectionism in Russia in the context of weak economic growth in the period from

Trade margins and import duties on certain food products on the eve of the import substitution policy, 2013

	Excess of retail prices over production prices, %	Rates of import duties, %
Carrots (kg)	131	15
Milk (l)	122	15
Pork (kg)	93	0–65
Cabbage (kg)	93	15
Beef (kg)	92	0–15
Potatoes (kg)	79	0–15
Flour (kg)	62	10
Sunflower oil (l)	51	15
Buckwheat (kg)	41	0
Chicken egg (10 eggs)	36	0
Tomatoes (kg)	18	15

Source: own compilation according to (Tsedilin, 2014).

[6] The difference between the prices of producers and retailers is up to 195%. *Izvestiya*. February 11, 2015. Available at: https://iz.ru/news/582914 (accessed: July 12, 2021).

2014 to 2020 forces the government to reconsider the role of the state in international economic relations, in particular the WTO, the expediency of membership in which is increasingly questioned by representatives of the highest authorities of the Russian Federation (Obolenskii, 2018). In recent years, the vector of Russian protectionism is forced to turn toward the protection of national producers in order to increase their competitiveness. Despite the fact that the level of protection of the domestic market during WTO membership has slightly decreased, since 2016, Russia is noticeably ahead of many developed countries in the degree of tariff protectionism. According to V.P. Obolenskii, "the average arithmetic rate of import duty under the most favored nation treatment (7.6%) is about twice as high as in the USA, Japan and Canada, one and a half times higher than in the EU" (Obolenskii, 2018). The government, despite budgetary difficulties, finds ways to partially compensate for the losses of domestic producers. These include a recycling fee on wheeled vehicles, anti-dumping duties on light commercial vehicles from the EU, a ban on imports of pork, as well as increased duties on household appliances and some commodity groups of the AIC. However, such steps are still insufficient and reflect only the natural desire of the Russian state to follow the global trend toward a stronger protectionism.

Conclusion

In this study we examine contradictions of protectionism in Russia through the prism of the problem of institutions import in the period from the 1990s to the present. The novelty of the study, therefore, lies in the application of the political and economic method based on an analyzing the development of productive relations of the specific model of capitalism established in the territory of the post-Soviet space. We can argue that the mechanical borrowing (transplantation) of protectionist institutions in Russia in the 1990s, not accompanied by the formulation and implementation of strategic plans for the development of the Russian economy, led to the formation of a "mutant" economic model. On the one hand, the complete abandonment of the policy of state monopoly on foreign trade contributed to the flooding of the domestic market with imported goods and, as a consequence, the mass ruin of domestic manufacturing enterprises. On the other hand, the purpose of the fragmented application of protectionism instruments was not so much to support domestic producers as to create a comfortable environment for the distribution of state property among a narrow group of persons close to the government, as well as to favor monopoly capital in a number of sectors of the domestic economy. Russian protectionism does not fulfill the "educational" functions formulated by F. List, and also following S. Amin's ideas does not allow Russia to ensure self-sufficiency of its economy, to overcome its dependence on the outside world and its peripheral state. These circumstances create significant barriers to the development of national production and the implementation of the import substitution program, formulated by the government. Trends of deglobalization, typical of the current stage of the world economy development, require the state to reconsider the fundamental principles of protectionism. The study results show that the purpose of state policy should be expanding consumer demand and redirecting the flow of products from the external to the domestic market. In the context of worsening global confrontation of national economies such strategy becomes the key to the successful concentration of resources on the development of priority sectors of the domestic economy, which form the basis of the modern, sixth technological mode.

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Information about the Authors

Ruslan S. Grinberg – Doctor of Sciences (Economics), RAS Corresponding Member, Scientific Director, Institute of Economics, Russian Academy of Sciences (32, Nakhimovsky Avenue, Moscow, 117218, Russian Federation; e-mail: grinberg@inecon.ru)

Oleg O. Komolov – Candidate of Sciences (Economics), Associate Professor, Plekhanov Russian University of Economics (36, Stremyanny Lane, Moscow, 117997, Russian Federation), Financial University under the Government of the Russian Federation (49, Leningradsky Avenue, Moscow, 125993, Russian Federation), Senior Researcher Institute of Economics, Russian Academy of Sciences (32, Nakhimovsky Avenue, Moscow, 117218, Russian Federation; e-mail: oleg_komolov@mail.ru)

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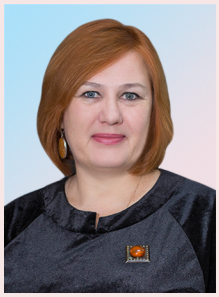
Demographic Education in Modern Russia: Mismatch between the Needs and Opportunities

Tamara K.
ROSTOVSKAYA
Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
e-mail: rostovskaya.tamara@mail.ru
ORCID: 0000-0002-1629-7780; ResearcherID: F-5579-2018



Aleksandra A.
SHABUNOVA
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: aas@vscc.ac.ru
ORCID: 0000-0002-3467-0921; ResearcherID: E-5968-2012

Leysan A.
DAVLETSHINA
Plekhanov Russian University of Economics
Moscow, Russian Federation
e-mail: davletshina.la@rea.ru
ORCID: 0000-0002-1497-1751; ResearcherID: AAF-1194-2021

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Abstract. Negative trends in major demographic processes, aggravated by the impact of the COVID-19 pandemic, require not only an active demographic policy, but also thoughtful and well-grounded management decisions. This raises the requirements for the qualifications of employees in the field of science, education and management personnel in terms of their understanding of complex and multifactor demographic processes. Consequently, the need for training and retraining of demographers is also increasing. The purpose of the work is to assess the current state of demographic education in Russia and the possibilities of its development. The article presents an overview of foreign and national educational and scientific practice in the field of demographic education. We find that the "Demography" field is included in the enlarged group "3. Social sciences, business and law"; therefore, most educational institutions implement educational programs in the "Sociology" field; more often these are master's degree programs. Scientific institutions focus on collaborating with educational institutions and pursue an educational and scientific trajectory (for example, the USA); they can also work autonomously by responding to the needs of the state and society (France, Germany). We also review Russian practice of implementing the educational process under the program "Demography". We find out that only three universities conduct educational activities under this program. However, the scientific and educational potential for training demographers, taking into account "non-core" universities and academic research organizations, is available in the capital and in the regions. Nevertheless, the presence of laboratories specializing in demographic research proves the relevance of demographic knowledge in various regions of Russia. The analysis of departments' teaching staff confirms their high educational and scientific potential. An overview of the work of scientific institutions and departments at universities indicates that vigorous scientific and research activity in the "Demography" field is being conducted in Russia. The analysis shows that in modern Russia, the issues of standardization of this area of work and education have not yet been fully worked out. We substantiate a system of successive stages for development of an educational standard in the "Demography" field and approval of the "Demographer" professional standard.

Key words: demographer, labor market, education, system approach, professional standard, educational standard, multilevel education system, domestic experience, foreign experience.

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Introduction

It is impossible to imagine the existence of any state without the population living on its territory. The current geopolitical and socio-economic situation, geographical features and environmental parameters, wars and revolutions, as well as cultural, religious conditions and circumstances – all this determines the demographic situation.

Knowing the patterns of changes in the number and structure of the population and understanding demographic situation parameters are essential conditions for strategic planning and ensuring national security.

In Russia, considerable attention is paid to the issues of preservation of the people at the level of federal legislation. Presidential Decree 606 "On measures to implement the demographic policy of the Russian Federation", dated May 17, 2012, which defines the main priorities and directions

of the country's demographic policy for the medium term may be named as one of the main documents in this area in the history of the new Russia[1]. The decree outlines very ambitious targets, including "increasing the total fertility rate to 1.753 by 2018" and "raising life expectancy in the Russian Federation to 74 years by 2018". Taking into account the demographic situation that had developed in Russia by the beginning of the 21st century, it was impossible to ensure the full achievement of the listed targets *and to maintain the result*.

The decree on Russia's national development goals up to 2030 signed by the RF President on July 21, 2020 contains the national goal of "preserving the population; people's health and well-being". Its targets are very ambitious, for example: "... raising life expectancy to 78 years; bringing down poverty rate twofold compared to 2017; raising the proportion of citizens systematically engaged in physical culture and sports to 70%"[2]. One of the main goals in this document is designated as "ensuring sustainable population growth in the Russian Federation", including natural and migration movement parameters.

Presidential Decree 400, dated July 2, 2021 "On the National Security Strategy of the Russian Federation" contains the section "Preservation of the people of Russia and development of human potential". The document refers to the state policy in the field of preservation of the people of Russia through "sustainable natural population growth and improvement of the quality of life". Among the tasks that make it possible to achieve the goal, the following are presented: "increasing the birth rate, forming motivation for having many children; increasing life expectancy, reducing population mortality and the level of disability, prevention of occupational diseases"[3].

In two strategic documents devoted to the development and preservation of Russia, adopted a year apart, close attention is paid to the issues of preservation of the people. At the same time, there is a certain discrepancy: the national development goals are about sustainable population growth, and the National Security Strategy is about sustainable natural population growth. It seems that the former is more likely to be achieved in the near future, while the latter, which involves increasing the birth rate and reducing mortality, requires a lot of effort and time.

Demographic development indicators as indicators of government performance are also included in many documents: Federal Law 172-FZ, dated June 28, 2014 "On strategic planning in the Russian Federation"[4], the forecast of socio-economic development of the Russian Federation for the period up to 2036, prepared by the Ministry of Economic Development of Russia in 2018[5], the forecast of socio-economic development of the Russian Federation for 2022 and for the planning period of 2023 and 2024, prepared by the Ministry of Economic Development of Russia in 2021[6], Order 191n of the Ministry of Labor, dated March 31, 2021

[1] On measures to implement the demographic policy of the Russian Federation: Presidential Decree 606, dated May 17, 2012. Available at: http://publication.pravo.gov.ru/Document/View/0001201205070019 (accessed: December 24, 2021).

[2] Decree on Russia's national development goals up to 2030, dated July 21, 2020. Available at: http://www.kremlin.ru/events/president/news/63728 (accessed: December 24, 2021).

[3] On the National Security Strategy of the Russian Federation: Presidential Decree 400, dated July 2, 2021. Available at: https://www.consultant.ru/document/cons_doc_LAW_389271/ (accessed: December 24, 2021).

[4] On strategic planning in the Russian Federation: Federal Law 172-FZ, dated June 28, 2014. Available at: https://docs.cntd.ru/document/420204138#7DE0K6 (accessed: December 24, 2021).

[5] Forecast of socio-economic development of the Russian Federation for the period up to 2036. Available at: https://cheladmin.ru/sites/default/files/n/page/25381/upload/dolgosrochnyyprognozrf.pdf (accessed: December 24, 2021).

[6] Forecast of socio-economic development of the Russian Federation for 2022 and for the planning period of 2023 and 2024. Available at: https://www.garant.ru/products/ipo/prime/doc/402874898/ (accessed: December 24, 2021).

"On approving a methodology for determining the demand of constituent entities of the Russian Federation, economic sectors and major employers for skilled personnel for the medium and long term"[7].

National projects aimed at the preservation of the people deserve special attention. Since 2007, they have been the key instruments of demographic policy, defining its goals, resources and methods.

A brief overview of strategic documents at the national level allows us to draw three important conclusions: first, at the national level, the preservation of the population is recognized as the major national security factor; second, Russia pays due attention to the formation of legislative frameworks in the field of demographic policy, but the targets of strategic documents are not always coordinated. Third, when forming demographic policy and adopting strategic documents for development of the country, it is extremely important to take into account the specifics and patterns of demographic development, to know and understand the needs of territories in order to achieve a demographic optimum and form a favorable demographic situation (an increase in the birth rate, a decrease in mortality, attracting workforce, etc.). This knowledge makes it possible to build an adequate and viable strategy, include viable and relevant parameters in it and obtain results, including those aimed at preserving the people.

However, a natural question arises: where does our country train specialists who are able to build a competent demographic strategy, analyze current demographic parameters, understand the essence of the personnel needs of regional labor markets and the degree of differentiation of territories along the course of demographic processes, and who know how to build predictive models and are able to interpret them? Are there enough such specialists in Russia?

Our article is devoted to the problem of training demographers in a difficult demographic situation. The main purpose of the work is to assess the state of demographic education in Russia and the possibilities of its development. To achieve the goal, we will analyze educational and scientific activity in the world and Russia within the "Demography" field, assess the personnel potential, outline the stages of development and implementation of the educational standard in the "Demography" field initiated by the expected approval of the professional standard "Demographer".

Literature review

Personnel training in the field of demographic development in higher education institutions has not been given due attention in the scientific literature. A significant number of works deal with the development of the education system in an actively globalizing world community and the coming information age. Researchers draw attention to the need to take into account changes in the content of socialization and forms of communication when building the educational process and point out the importance of increasing communicative competence in the formation of human potential. At the same time, prospects are assessed and futurological forecasts of the development of the education system in the conditions of the information technology era are presented (Egorychev, Rostov, 2021; Yarnykh et al., 2021). It is proved that in the modern conditions of the innovative economy there is a need for a new system of continuing education, which does not so much disseminate and replicate knowledge, as opens access to it to a variety of social groups. As a result, education becomes a tool of social transformation (Golenkova, Goliusova, 2016).

[7] On approving a methodology for determining the demand of constituent entities of the Russian Federation, economic sectors and major employers for skilled personnel for the medium and long term: Order 191n of the Ministry of Labor, dated March 31, 2021. Available at: https://docs.cntd.ru/document/603934331#6500IL (accessed: December 24, 2021).

Foreign studies consider new trends in the development of the education system, the demographic situation and their interrelation. Researchers substantiate why education should be considered as a value in all social and individual interactions, especially in a situation of economic change, globalization and demographic transition (Rajović, Bulatović, 2017; Marszowski et al., 2020), and emphasize that an integrated systems approach to addressing sustainability problems is possible with the help of network science tools (Tran et al., 2018; Weber et al., 2021). Attention is also paid to approaches in the management of educational institutions and the organization of the educational process in the field of higher education. Such studies are particularly relevant during the difficult period of the coronavirus pandemic (Fletcher et al., 2021; Ashour, 2021; Beal Krause, 2021).

Much attention in scientific works is paid to a systems approach to building the educational process in higher education institutions in connection with the needs of society and the transition to a competence-based approach (Golenkova et al., 2018). Researchers emphasize that in the modern world, the decisive role in the development of society belongs not only and not so much to knowledge, but people who possess it, are able to apply it in practice to specific tasks, and the number and quality of skilled specialists (Konstantinovsky, Popova, 2016). It is important that educational programs should take into account global and regional problems, requirements of the labor market, specifics and capabilities of the educational institution, and individual characteristics of a future specialist (Romanova et al., 2016). Modern research shows that consumers of educational services are sensitive to global trends in the modernization of production; the demand for workforce is increasing for professions that have a low risk of automation and require high-skilled workers; this once again proves the high demand for quality education (Ramos et al., 2021). This is what determines the need for objective procedures for independent assessment of qualifications that meet the needs of all stakeholders (Kicherova et al., 2021).

In various countries, approaches to the content of curricula and organization of the educational process in higher education have been formed or are at the stage of formation based on priorities and goals: state investment policy (Wang et al., 2021), foreign direct investment (Alshubiri, 2021), systems approach (Serrano-Aguilera et al., 2021) taking into account the Sustainable Development Goals (SDGs) (Serrano-Aguilera et al., 2021), inclusivity (Zabeli, Kaçaniku, 2021; Buitrago et al., 2021), competence-based approach (Brauer, 2021).

At the same time, the problem of insufficient comprehensive training of specialists in the field of demographic development, as we have already mentioned, is covered extremely poorly in scientific literature. However, the scientific community admits the existence of issues such as the lack of professionals in the field of fundamental and applied demographic research, as well as managers who understand the laws and patterns of demographic processes.

Addressing this problem, Mikhail Denisenko, while still deputy director of the Institute of Demography of the Higher School of Economics, noted in his interview: "... there should be not two demographic centers in a country like Russia, but at least five or six ... with about 200 demographic professionals. And now their number is several times less than necessary. Given the age composition of scientists, it may turn out that in 5–10 years demographers will have to be added to the Red List of Threatened Species..."[8].

The demand for demographic education is also indicated by the results of the interactive survey "Who needs and who does not need demography?" published in # 317-318 of the *Demoskop Weekly*.

[8] Denisenko M. Profession: Demographer. Available at: https://ecsocman.hse.ru/

The survey was conducted in an interactive mode by representatives of the student pool of the publication. The authors note that many participants of the survey talk about the desire and importance of studying the subject "Demography" more deeply and complain about its absence on the lists of subjects studied at universities[9].

At the same time, a significant part of school graduates and applicants have difficulties in understanding the practical application of demographic education, and not only in Russia. For example, on the website of Charles University in the Czech Republic, in order to attract students, it is written: "...Demography affects events that concern everyone". It is important for future students to know that demographers can successfully solve marketing tasks (for example, segmentation and forecast of market development) in the insurance sector and in pension funds, as well as in analytical and personnel services at large enterprises. Knowledge about trends in the development of population in the country, regions and large and small cities is in demand in politics, business, and in the work of scientific and non-governmental organizations.

Summarizing the thoughts and hypotheses presented in scientific works, taking into account the target indicators and indicators presented in strategic documents, we emphasize the following. First, the modern labor market is characterized by rapid obsolescence of knowledge, the need for its expansion and updating. Second, it is important to create a unified system of lifelong learning for personnel in various industries, based on a systems approach. Third, in Russia, there is a need to train qualified specialists who are able to adequately and reasonably assess current demographic parameters, build an up-to-date demographic policy, and develop methods and approaches to its implementation.

[9] Who needs demography? Available at: http://www.demoscope.ru/weekly/2008/0323/student01.php

Materials and methods

The methodology of our research is based on a systems approach (Mikeshina, 2005), in which the educational system is considered as a set of interrelated subsystems. A systems approach, as the most constructive one, allows us to comprehensively consider the process of formation of demographic education in Russia from the standpoint of the order and sequence of its development stages (Il'yasov et al., 2017).

To understand the current state of demographic education, we used a retrospective analysis, collection and synthesis of information about curricula and disciplines presented on the websites of Russian and foreign universities.

The development and subsequent approval of the professional standard "Demographer" was the initial stage in satisfying the existing demand for demographers. Based on the canons of the systems approach, the article presents the order and content of the subsequent stages necessary for the formation of an educational standard in the "Demography" field.

First of all, it is necessary to identify and formulate a problematic situation, to analyze it. The need for competent demographers is substantiated in the introductory part of our article; it is due to the presence of inconsistencies in the state demographic policy and strategic documents of the country, the setting of impossible tasks, the absence/non-inclusion of primary indicators of demographic development of territories. The analysis of the current situation regarding higher education in Russia and abroad will be carried out below (in the "Results" section).

At the next stage, it is necessary to determine the circle of interested participants. Their involvement will help solve the problem under consideration, and will also take into account the interests of each of the parties represented.

At the third stage, the goals and interests of all project participants are formulated and determined.

Such an approach will allow designing the best model in a problem-containing system (Karamzina, Sil'nova, 2021).

The fourth stage includes the formation of evaluation criteria and the content of the educational standard being developed in the "Demography" field.

At the fifth stage, the educational standard being developed in the "Demography" field undergoes coordination and approval by the relevant authorities.

The final, sixth, stage includes the implementation of the adopted decision, namely, enrollment of students in educational programs in the "Demography" field.

The adoption of the professional standard "Demographer" substantiated by the need for specialists in this industry, presents the educational and scientific community with the possibility of opening and implementing basic educational programs in the "Demography" field. To address this issue, it is necessary to conduct a systems analysis in two aspects:

– first, to study global experience in the implementation of educational and research programs in the "Demography" field; to this end, we reviewed the activities of 60 educational organizations of foreign countries implementing training and research in the field of demography; 14 educational programs available in the public domain were analyzed in detail;

– second, to evaluate the implementation of educational programs in the "Demography" field in Russia and the range of demographic disciplines taught at the departments of Russian universities, as well as the personnel potential of the teaching staff.

The first aspect will determine the degree of relevance of this area of training in the world, taking into account the needs of demographic policy of foreign countries (Syupova, 2018), the second aspect will help assess the degree of readiness of the educational system of Russia for the training of demographers.

Research findings

World experience in the implementation of educational and research programs in the "Demography" field. In the International Standard Classification of Education developed and adopted by the UNESCO Institute for Statistics (2011), the "Demography" field is included in broad group 3 "Social sciences, business and law", field of education 31 "Social and behavioral science" along with economics, political science, sociology, psychology, etc.[10]

We should mention that the formation of demography as a science took place in the 17th century in Great Britain. Since then, demography as a branch of scientific, educational and practical activity has undergone significant changes and transformations. It flourished at the junction of the 19th – 20th century, when, as a result of a scientific and technological breakthrough, on the one hand, the standard of living improved, which led to a decrease in mortality and an increase in fertility; on the other hand, many wars and revolutions reduced the population in various territories. Despite some similarity in the course of demographic processes in this time period, each country had its own features, which also contributed to the growth of attention to demographic analysis. Among the leading foreign demographic institutions today, the following can be noted.

France. French Institute for Demographic Studies (INED)[11]. A public research organization specialized in population studies. It is a partner of the academic and research communities at the national and international levels. Founded in 1945, it became a state scientific and technical institution (EPST) in 1986. The main objectives of the Institute are to study the population of France and foreign countries, to widely disseminate the knowledge

[10] International Standard Classification of Education ISCED 2011. Available at: http://uis.unesco.org/sites/default/files/documents/isced-2011-ru.pdf (accessed: December 24, 2021).

[11] Available at: https://www.ined.fr/fr/ (accessed: December 26, 2021).

gained, and to support education in the field of demographic research and through research.

Germany. Max Planck Institute for Demographic Research (MPIDR)[12]. Studies the structure and dynamics of the population. Founded in 1948. The Institute's staff investigate issues of political importance, such as demographic changes, aging, fertility and labor redistribution (including age characteristics), as well as digitally processing historical demographic data and searching for new data sources, including for assessing migration flows.

USA. Association of Population Centers (APC)[13]. Founded in 1991. It is an independent group of universities and research groups whose mission is to promote joint demographic research and data exchange, to conduct fundamental demographic research for decision makers in the field of public policy, to provide opportunities for education and training in the field of demographic research, to promote the expansion of funding opportunities for population research and support the principles of objective and thorough evaluation of grant applications and scientific reliability of results. In 2021, the APC consisted of 27 research centers and laboratories of leading US universities from 10 US states.

While studying the information about the activities of the world educational community, we reviewed more than 60 universities. The information and analytical base is limited by the completeness of the data presented on the websites of higher educational institutions. The most complete information was obtained on 14 educational programs, most of them are master's degree programs[14] (almost 2/3 of the total number), the smallest part is represented by bachelor's degree programs[15].

Having analyzed the activities of educational institutions we see that the training of demographers in the world is most common at the master's degree level, most often within the framework of the "Sociology" field. This distribution is predetermined by the fact that, according to ISCED, the "Demography" field belongs to the enlarged group 3 "Social sciences, business and law".

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[12] Available at: https://www.demogr.mpg.de/en (accessed: December 26, 2021).

[13] Available at: https://www.popcenters.org/ (accessed: December 26, 2021).

[14] University of Oxford, MPhil in Sociology and Demography program. Available at: https://www.ox.ac.uk/admissions/graduate/courses/mphil-sociology-demography (accessed: December 26, 2021); London School of Hygiene and Tropical Medicine, MSc Demography & Health program. Available at: https://www.lshtm.ac.uk/study/courses/masters-degrees/demography-health (accessed: December 26, 2021); University of Groningen, MSc in Population Studies program. Available at: https://www.rug.nl/masters/population-studies/ (accessed: December 26, 2021); University of Groningen, DDM Social Demography program. Available at: https://www.rug.nl/masters/ddm-social-demography (accessed: December 26, 2021); University of Groningen, DDM Demography and Social Inequality program. Available at: https://www.rug.nl/masters/ddm-demography-and-social-inequality/ (accessed: December 26, 2021); Tilburg University, Sociology and Population Studies (Double degree) program. Available at: https://www.tilburguniversity.edu/education/masters-programmes/sociology-and-population-studies (accessed: December 26, 2021); University of Waikato, Human Development program (Bachelor of Arts, Bachelor of Social Studies). Available at: https://www.waikato.ac.nz/study/subjects/human-development (accessed: December 26, 2021).

University of Waikato, Population Studies program (Bachelor of Arts, Bachelor of Social Studies). Available at: https://www.waikato.ac.nz/study/subjects/population-studies (accessed: December 26, 2021); University of Waikato, Population Studies and Demography program (Master of Social Sciences, Master of Philosophy, Doctor of Philosophy). Available at: https://www.waikato.ac.nz/study/subjects/demography (accessed: December 26, 2021); University of Texas at San Antonio, Applied Demography (PhD) program. Available at: https://graduateschool.utsa.edu/programs/applied-demography-ph.d/ (accessed: December 26, 2021).

[15] University of Waikato, Human Development program (Bachelor of Arts, Bachelor of Social Studies). Available at: https://www.waikato.ac.nz/study/subjects/human-development (accessed: December 26, 2021); University of Waikato, Population Studies program (Bachelor of Arts, Bachelor of Social Studies). Available at: https://www.waikato.ac.nz/study/subjects/population-studies (accessed: December 26, 2021); Portland State University, Applied Social Demography graduate certificate program. Available at: https://www.pdx.edu/academics/programs/graduate/applied-social-demography (accessed: December 26, 2021).

Thus, specialists in the field of demography and population are trained in various educational institutions (in terms of territories, rating, etc.); in the country context, demographic policy affects the main demographic processes – fertility and mortality, takes into account the increasing role of migration, is aimed at regulating population size and structure, but also takes into account the specifics of the country, its socio-economic and cultural features, different ways to achieve demographic optimum. In order to support educational institutions (USA) or independently from them (France, Germany), academic research institutes study the current demographic parameters of a particular country and countries of the world as a whole, conduct scientific and popularization activities and other research.

The study and evaluation of the implementation of educational programs in the "Demography" field in Russia show that, although there is a need for specialists in the field of demography in the country, training is conducted in only three universities and only in master's degree programs.

Analyzing the current situation, one should not forget about the development of demography as a science in Russian history. M.V. Lomonosov was one of the first to draw attention to the problems of preserving and multiplying the people[16]. The heyday of demography occurred during the USSR and is associated with such names as V.A. Borisov, D.I. Valentey, A.Ya. Kvasha, O.A. Kvitkin, S.A. Novoselsky, V.V. Paevsky, S.G. Strumilin, B.Ts. Urlanis and other scientists who made a significant contribution to the development and formation of national demographic thought.

Previously, demographic education was implemented at Lomonosov Moscow State University and Moscow Economic and Statistical Institute.

Since 2009, demographers have been trained at the Higher School of Economics in the master's program "Demography" in the "Sociology" field, a little later the second program was opened for the "Economics" field[17]. Since 2015, the HSE has opened an English-language master's degree program "Population and development" in the "State and municipal administration" field[18]. Both master's degree programs belong to Vishnevsky Institute of Demography and are implemented at the department of demography.

Since 2018, the Graduate School of Modern Social Sciences of Lomonosov Moscow State University at the department of demography has opened and successfully implemented the master's degree program "Social demography" at the sociology section[19]. Since 2019, the master's degree program "Management of demographic processes" has been opened at the management section[20].

The Department of Demographic and Migration Policy at MGIMO, which is affiliated to the Faculty of Management and Politics, implements the master's degree program "Human resource management" focused on training specialists in the field of human resource management with an emphasis on methods of demographic and migration research, as well as analysis of the best international practices in the field of human development[21].

Thus, in 2021, specialists in the "Demography" field were trained only in three universities that are in the top of various domestic and foreign ratings and have certain freedoms and opportunities to choose the trajectory of work and development.

[16] Lomonosov M.V. *O sokhranenii russkogo naroda* [About the Preservation of the Russian People]. Available at: https://rusinst.su/docs/books/M.V.Lomonosov-O_sohranenii_russkogo_naroda.pdf

[17] HSE, Master's program in Demography, Sociology field. Available at: https://www.hse.ru/ma/demography/ (accessed: December 26, 2021).

[18] HSE, Master's program in Population and Development, State and Municipal Administration field. Available at: https://www.hse.ru/ma/pd/ (accessed: December 26, 2021).

[19] Lomonosov Moscow State University, Master's program "Social demography". Available at: https://www.demography-msu.ru/ (accessed: December 26, 2021).

[20] Ibidem.

[21] MGIMO, Master's degree program "Human resource management". Available at: https://sgp.mgimo.ru/master/hr (accessed: December 26, 2021).

To assess the possibility of opening and implementing educational programs in the "Demography" field, we consider the departments where disciplines of this orientation are taught in a number of leading Russian universities *(Tab. 1)*.

The greatest number of lecturers work at the department of demography at Vishnevsky Institute of Demography, Higher School of Economics – 40% of the total number of teaching staff. We should note that there are no doctors of sciences at the HSE department, most of them are candidates of sciences (economics, sociology, geography, etc.) and four employees without an academic degree (two of whom have more than 10 years of experience, two – less than 5 years).

According to the number of employees (with an equal number of teaching staff), the Institute is followed by the department of population at the faculty of economics of Lomonosov Moscow State University and the department of demographic and migration policy at the faculty of management and policy of MGIMO – each of them has nine employees. Their number of academic degree holders is somewhat similar, but there is a slight difference: the department of population has more doctors of sciences (more by one person), and the department of demographic and migration policy has more candidates of sciences (more by one person as well). There is one employee without an academic degree at each department.

This is followed by the department of demography of the Higher School of Modern Social Sciences of Lomonosov Moscow State University. Of the eight employees, three are doctors of sciences, four are candidates and one is without a degree (deputy head for academic affairs).

Table 1. Personnel potential of the departments of demography and population in Russian universities

University, department	Teaching staff, people	Doctors of sciences		Candidates of sciences		Without an academic degree	
		People	% of the whole teaching staff	People	% of the whole teaching staff	People	% of the whole teaching staff
HSE, Vishnevsky Institute of Demography, department of demography[1)]	20	0	0.0	16	80.0	4	20.0
Lomonosov Moscow State University, faculty of economics, department of population[2)]	9	3	33.3	5	55.6	1	11.1
MGIMO, faculty of management and politics, department of demographic and migration policy[3)]	9	2	22.2	6	66.7	1	11.1
Lomonosov Moscow State University, Higher School of Modern Social Sciences, department of demography[4)]	8	3	37.5	4	50.0	1	12.5
Lomonosov Moscow State University, faculty of sociology, department of family sociology and demography[5)]	4	2	50.0	2	50.0	0	0.0
TOTAL	**50**	**10**	**20.0**	**33**	**66.0**	**7**	**14.0**

[1)] HSE, Vishnevsky Institute of Demography, department of demography. Available at: https://www.hse.ru/demo/kdemo/ (accessed: December 26, 2021).
[2)] Lomonosov Moscow State University, faculty of economics, department of population. Available at: https://demography.econ.msu.ru/ (accessed: December 26, 2021).
[3)] MGIMO, faculty of management and politics, department of demographic and migration policy. Available at: https://mgimo.ru/study/faculty/sgp/kdmp/ (accessed: December 26, 2021).
[4)] Lomonosov Moscow State University, Higher School of Modern Social Sciences, department of demography. Available at: https://www.demography-msu.ru/ (accessed: December 26, 2021).
[5)] Lomonosov Moscow State University, faculty of sociology, department of family sociology and demography. Available at: https://www.socio.msu.ru/index.php/ (accessed: December 26, 2021).

The most compact is the department of family sociology and demography at the faculty of sociology, Lomonosov Moscow State University. Of the four employees, two are doctors of sciences and two are candidates of sciences.

In addition to the data on the number of employees with an academic degree and the level of academic degrees among the staff of demographic departments, we considered the age composition of employees, and their scientific and pedagogical experience.

Information about the scientific and pedagogical experience of the teaching staff is not presented on the websites of the department of population at the faculty of economics of Lomonosov Moscow State University and the department of demographic and migration policy at the faculty of management and policy of MGIMO, therefore they are excluded from further analysis.

The scientific and pedagogical experience of the teaching staff of the departments is divided into four groups based on the following criteria:

- 1–5 years of experience: young specialists, assistants or lecturers of departments who are studying or have recently completed postgraduate studies and are admitted to teaching; this is the potential and the future of the departments, provided that they receive proper training and mentoring;
- 5–10 years of experience: young candidates of sciences or young lecturers preparing to defend their thesis; specialists who have studied a wide range of scientific and practical material, gaining experience in both pedagogical and scientific activities;
- 10–20 years of experience: the driving force of departments, as a rule, candidates of sciences or "young" doctors of sciences, they have significant experience in teaching and research activities;
- 20 years of experience or more: department "elders" with extensive professional and life experience, they establish scientific schools and directions, and are mentors to the younger generation.

The information is based on open data available at the websites of the departments *(Tab. 2)*.

Based on the criteria of scientific and pedagogical experience presented in Table 2 and the quantity and quality of academic degrees, the department of family sociology and demography at the faculty of sociology of Lomonosov Moscow State University can be called a mentor department. Two thirds of the staff of the department have more than 20 years of experience, one lecturer – 10–20 years of experience. The situation is similar at the department of demography of the Higher School of Modern Social Sciences of Lomonosov Moscow State University – 75%, or 6 out of 8 employees have more than 20 years of experience, one employee 5–10 years, one employee – 10–20 years.

The department of demography at Vishnevsky Institute of Demography of the Higher School of Economics has a succession of generations, while lacking doctors of sciences: there are at least two or three lecturers in each of the allocated work experience intervals.

Table 2. Scientific and pedagogical experience of the teaching staff at Russian universities

University, department	Teaching staff, people	Scientific and pedagogical experience, years			
		1–5	5–10	10–20	20 and more
HSE, Vishnevsky Institute of Demography, department of demography	**20**	3	2	7	8
Lomonosov Moscow State University, Higher School of Modern Social Sciences, department of demography	**8**	0	1	1	6
Lomonosov Moscow State University, faculty of sociology, department of family sociology and demography	**4**	0	0	1	3
TOTAL	**32**	**3**	**3**	**9**	**17**

The analysis of the disciplines taught at the departments gives an understanding of the current areas of work, as well as, together with information about the teaching staff of the departments of demography, an opportunity to assess the potential of the departments from the position of opening new educational programs in the "Demography" field. The data on the disciplines taught and broken down by level of training are presented in *Table 3*.

The largest number of disciplines is observed at the department of demographic and migration policy of the MGIMO faculty of management and politics (35), of which most are at the bachelor's degree level (19 disciplines, or 54.3%). The department of demography at the Higher School of Modern Social Sciences of Lomonosov Moscow State University is the next in terms of the number of demographic disciplines; it implements most of the disciplines at the master's degree level (27, 81.8%). The department of demography at Vishnevsky Institute of Demography, Higher School of Economics implements 29 disciplines, most of which are at the master's degree level 18, or 62.1%). Such a distribution in the three universities is quite natural and, first of all, reflects the educational programs implemented at the core educational department.

The department of family sociology and demography at the faculty of sociology and the department of population at the faculty of economics of Lomonosov Moscow State University, whose employees provide for the needs of their own faculty and teach inter-faculty disciplines, are represented by a wide number of disciplines (17 and 15, respectively).

In addition to educational activities, scientific and popularization work is carried out at each of the departments under consideration, or there are branch laboratories and centers there. The most significant areas include research-to-practice conferences, research projects supported by various foundations (RFBR, RSF, Ministry of Science and Higher Education of Russia, etc.), public lectures, science festivals, international cooperation, joint activities with the academic community and employers.

In addition to the numerical characteristics of the departments, it is necessary to understand who is in charge of them, which scientific schools and directions are developing at each department, because these parameters form the future of any scientific direction.

Table 3. Disciplines broken down by level of training at the departments of demography and population in Russian universities

University, department	Number of disciplines, units	Bachelor's degree level		Master's degree level	
		Units	% of the number of all disciplines	Units	% of the number of all disciplines
HSE, Vishnevsky Institute of Demography, department of demography	**29**	11	37.9	18	62.1
Lomonosov Moscow State University, faculty of economics, department of population	**15**	4	26.7	11	73.3
MGIMO, faculty of management and politics, department of demographic and migration policy	**35**	19	54.3	16	45.7
Lomonosov Moscow State University, Higher School of Modern Social Sciences, department of demography	**33**	6	18.2	27	81.8
Lomonosov Moscow State University, faculty of sociology, department of family sociology and demography	**17**	10	58.8	7	41.2
TOTAL	**129**	**50**	**38.8**	**79**	**61.2**

The research laboratory for population economics and demography[22], which includes three sectors (sector of population reproduction and demographic policy; sector of regional demography, settlement and migration; sector of historical and demographic and bibliographic research), has been successfully functioning at the faculty of economics of Lomonosov Moscow State University since the 1960s. The laboratory has 16 employees who are both full-time employees and internal part-timers.

Vishnevsky Institute of Demography of the Higher School of Economics is a scientific and educational institution. Its goals are to conduct fundamental scientific research, improve its methodology and train scientific personnel. In addition to the department of demography, Vishnevsky Institute of Demography includes the following departments: scientific and educational laboratory for socio-demographic policy; editorial office of the mass media – electronic journal *Demograficheskoe obozrenie*; demographic research center[23]. In 2017, an international laboratory for population and health research was established, which develops new and improves existing methods for studying public health, conducting scientific research on this basis in the field of population health and mortality[24].

The department of demographic and migration policy headed by a leading demographer, RAS Corresponding Member S.V. Ryazantsev, makes a huge contribution to strengthening the positive image of MGIMO in the media through the speeches of its employees on the problems of demographic and migration policy. In addition to the educational process and scientific activities, the department deals with practical issues of improving Russia's demographic and migration policy through broad implementation of scientific research findings in the activities of Russian agencies and international organizations. Scientists of the department provide consulting services to Russian government agencies and international organizations.

A laboratory for demography and migration studies has been opened on the basis of the Institute of Social Analysis and Forecasting of RANEPA[25]. Its research focuses on analyzing current trends in the reproduction of the Russian population, effects of social and demographic policy and working out recommendations for their improvement.

On the basis of the Ural Federal University in 2014, the scientific laboratory "International center for demographic research"[26] was opened, the main purpose of which is to develop new promising areas at the university with the involvement of foreign scientists, organize and implement historical and demographic research.

Ammosov North-Eastern Federal University has a laboratory for population economics and demography[27]. The laboratory focuses on studying population reproduction processes, demographic potential, family and household, population migration, economic and demographic factors in the regional labor market balance, the development of regional demographic forecasts.

[22] Lomonosov Moscow State University, research laboratory for population economics and demography. Available at: https://www.econ.msu.ru/departments/cps/ (accessed: December 26, 2021).

[23] HSE, Vishnevsky Institute of Demography. Available at: https://www.hse.ru/demography/ (accessed: December 26, 2021).

[24] HSE, international laboratory for population and health research. Available at: https://demogr.hse.ru/ (accessed: December 26, 2021).

[25] RANEPA, laboratory for demography and migration studies. Available at: https://www.ranepa.ru/social/ob-institute/laboratoriya-issledovanij-demografii-i-migratsii/ (accessed: December 26, 2021).

[26] Ural Federal University, scientific laboratory "International center for demographic research". Available at: https://idun.urfu.ru/ru/sotrudniki/ (accessed: December 26, 2021).

[27] Ammosov North-Eastern Federal University, laboratory for population economics and demography. Available at: https://www.s-vfu.ru/universitet/rukovodstvo-i-struktura/instituty/niires/demography/ (accessed: December 26, 2021).

In addition to the review, we should note that in a number of Russian universities, certain demographic disciplines are also taught, scientific work involving students is carried out, research is carried out, teaching staff of departments make reports and publish articles on topical issues of preservation of the people. Among the most active regions are the Republic of Bashkortostan, the Vologda, Volgograd, Ivanovo, Nizhny Novgorod, Novosibirsk, Sverdlovsk oblasts, Stavropol Krai, the Republic of Tatarstan, etc. In a number of regions there are academic organizations that conduct educational activities in addition to research. Thus, Vologda Research Center of the Russian Academy of Sciences, within the framework of master's and bachelor's degree programs in the field of economics, implements the course "Economic demography" taught by the staff of the department for standard of living and lifestyle studies. The "Demographic crash course" is also included in advanced training courses for teachers and government representatives.

Speaking about the work carried out at the national level in the "Demography" field, it is necessary to point out the Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (IDR FCTAS RAS), which occupies a special place[28]. It was founded on the basis of the Center for Social Demography at the Institute of Socio-Political Research – Branch of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences by Order 55 of June 1, 2020. A renowned scientist, demographer, RAS Corresponding Member S.V. Ryazantsev is head of IDR FCTAS RAS; he has his own scientific school in the field of demographic and migration development. The main areas of work of IDR FCTAS RAS are as follows: development and systematization of the theoretical and practical provisions of the national demographic school, improving the quality of scientific research and the validity of the results of its activities; implementation of the results of demographic research in the practical activities of federal and regional authorities of the Russian Federation; popularization of the results of demographic research in the media and increasing the public importance of demographic science in Russia; development and improvement of the demographic education system in the Russian Federation, organization of advanced training courses and scientific and practical seminars on key problems of demographic development of the country. The educational and scientific organizations of Russia and foreign partner countries of the Institute include nine domestic educational institutions and ten foreign educational and scientific organizations[29].

After reviewing the educational institutions of Russia implementing educational programs in the "Demography" field (in various areas of training), we can conclude that the scientific and educational potential for training demographers is available not only in the universities of capital cities, but also in the regions. However, we cannot but note a significant "lag" in RF constituent entities – the absence of specialized departments. Nevertheless, the presence of laboratories specializing in demographic research proves the relevance of knowledge in this field in various regions of Russia.

Upon the initiative of IDR FCTAS RAS, in 2021 a professional standard (PS) "Demographer"[30]

[28] Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (IDR FCTAS RAS). Available at: https://idrras.ru (accessed: December 26, 2021).

[29] Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (IDR FCTAS RAS). Available at: https://idrras.ru/presentation/ (accessed: December 26, 2021).

[30] On the approval of the professional standard "Demographer": draft Order of the Ministry of Labor of Russia (as of November 24, 2021); prepared by the Ministry of Labor of Russia, project ID 01/02/11-21/00122735. Available at: https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=PNPA&n=78220#EvcynsSpXzyfQKAJ (accessed: December 26, 2021).

was developed and is at the stage of approval; the standard presents the type of professional activity according to ISCO-08: "Development of measures aimed at regulating quantitative and qualitative parameters of demographic development for managerial decision-making" (code 3. Social services) (Rostovskaya, Zolotareva, 2021). The professional standard acts as a vector defining an enlarged group of specialties (EGS), within which the educational standard will be developed[31].

Based on the needs of the labor market and society for qualified specialists in the field of demography, IDR FCTAS RAS has set a goal for 2022 to develop Generation 3++ Federal State Educational Standards (FGOS VO 3++) at the bachelor's degree and master's degree levels within the framework of EGS 39.00.00 "Sociology and social work". To achieve this goal, it is planned to solve the following tasks:

- form a working group including leading Russian demographers, representatives of the academic community and educational institutions, potential employers, representatives of executive and legislative authorities;
- prepare and approve the schedule of work on the development of FGOS VO 3++ in the "Demography" field within the framework of EGS 39.00.00 "Sociology and social work" at the bachelor's and master's degree levels of training;
- develop primary projects of FGOS VO 3++ in the "Demography" field within the framework of EGS 39.00.00 "Sociology and social work" at the bachelor's and master's degree levels of training;
- conduct professional and public discussion of primary projects of FGOS VO 3++ in the "Demography" field within the framework of EGS 39.00.00 "Sociology and social work" at the bachelor's and master's degree levels of training;
- revise the projects of FGOS VO 3++ based on the results of professional and public discussion;
- submit the developed draft standards to the relevant authorized bodies for consideration and approval.

The main goal of the professional standard "Demographer" is "to solve problems aimed at analyzing and forecasting the demographic situation at the micro- and macro level, taking into account the demographic factor in social and economic development; to develop socio-demographic policy of the state, region, industry, organization, aimed at regulating quantitative and qualitative parameters of the population (socio-demographic groups, households, workers, labor collectives); to study demographic dynamics factors and solutions to applied demographic problems (for macroeconomic regulation, insurance, logistics, marketing, placement of services and productive forces, political research)" (Rostovskaya, Zolotareva, 2021). This formulation fully and broadly reveals the types of professional activities of a demographer in various sectors and activities at the federal, regional or municipal level.

The generalized labor functions contained in the PS "Demographer" are aimed at three levels of training: bachelor – master – postgraduate, with the possibility of implementing additional professional education programs at each level. This approach makes it possible to implement a system of lifelong learning in the field of demography.

While working on FGOS VO 3++ in the "Demography" field within the framework of EGS 39.00.00 "Sociology and social work" and at the bachelor's degree and master's degree levels of training, the following aspects will be determined: areas of professional activity and (or) the spheres of professional activity of the graduate; types of professional activity tasks that graduates are ready to solve; universal and general professional competencies formed by the graduate in the learning process; requirements for the conditions to

[31] Rules for the development, approval of Federal State Educational Standards and amendments to them: Resolution 434, dated April 12, 2019. Available at: https://docs.cntd.ru/document/554229840 (accessed: December 26, 2021).

implement educational programs, including systems requirements, requirements for logistical and educational support, requirements for personnel and financial conditions for the implementation of programs.

Discussion and conclusion

Having reviewed the current Russian regulatory and legal documents, including in the field of demographic policy, national development goals and national security strategies, we see that due attention is paid to the formation of legislation on population issues and the preservation of the people. The only alarming fact is that the tasks set are not always up-to-date or feasible, and the indicators used do not always reflect the actual key parameters of the demographic optimum.

The solution to this problem in 2021 was the development and approval of the professional standard "Demographer" (Rostovskaya, Zolotareva, 2021), which will form a new model of human resources potential in the field of demography, identify opportunities for training highly skilled demographers, and within the framework of management activities will make it possible to meet the need for demographic expertise and consulting. The draft standard is in the public domain[32].

Having reviewed Russian and foreign scientific works devoted to education, human and personnel development, and the situation regarding specialists in the labor market, we see that a modern in-demand specialist in the labor market is someone who, in addition to quality education, has an updated, multi-level and relevant knowledge base that meets the needs of society, sectors and types of activity. For demographers, these requirements are also relevant and applicable.

In order to assess the potential of the Russian educational community and the situation in the world as a whole, we have analyzed the activities of educational and scientific organizations in the "Demography" field. As a result, we revealed that globally, educational institutions and research institutions work autonomously and in collaboration.

In Russia, only three universities conduct educational activities in the framework of the programs related to demography (since there is no separate educational direction today, such programs are included in other directions). There are five departments of demography and population in three universities. Metropolitan and regional educational institutions have relevant educational potential: there are laboratories or research centers conducting research on topical issues of demography there; also there are universities whose lecturers teach certain demographic disciplines, conduct research, publish articles and deliver reports.

In order to create and approve educational standards in the "Demography" field within the framework of EGS 39.00.00 "Sociology and social work" at the bachelor's and master's degree levels of training, a number of works were carried out by FCTAS RAS on an initiative basis. Among them: development of a schedule of activities for 2022; creation of a working group; definition of the area and scope of professional activity of the graduate; definition of the types of tasks of professional activity that graduates are ready to solve. At each stage, the principle of a systems approach in the training of a demographer specialist will be preserved, based on the criteria and parameters laid down in the professional standard "Demographer".

[32] On the approval of the professional standard "Demographer": draft Order of the Ministry of Labor of Russia (as of November 24, 2021); prepared by the Ministry of Labor of Russia, project ID 01/02/11-21/00122735. Available at: https://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=PNPA&n=78220#EvcynsSpXzyfQKAJ (accessed: December 24, 2021).

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Information about the Authors

Tamara K. Rostovskaya – Doctor of Sciences (Sociology), Professor, deputy director for science, Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (6, building 1, Fotieva Street, Moscow, 119333, Russian Federation); e-mail: rostovskaya.tamara@mail.ru)

Aleksandra A. Shabunova – Doctor of Sciences (Economics), Associate Professor, director, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: aas@vscc.ac.ru)

Leysan A. Davletshina – Candidate of Sciences (Economics), associate professor of department, Plekhanov Russian University of Economics (36, Stremyanny Lane, Moscow, 117997, Russian Federation; e-mail: davletshina.la@rea.ru)

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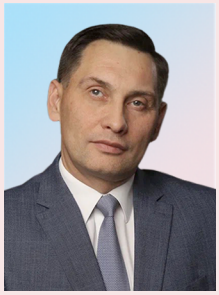
Expanding Methodological Approaches to Assessing the Quality of Socio-Economic Development Strategies for Large Cities

Evgenii B.
SHULEPOV
Vologda Oblast Legislative Assembly
Vologda, Russian Federation
e-mail: op.r35@edinros.ru
ORCID: 0000-0001-6731-1653



Konstantin A.
ZADUMKIN
Vologda City Branch of the Union of Industrialists and Entrepreneurs of the Vologda Oblast
Vologda, Russian Federation
e-mail: zk00@mail.ru
ORCID: 0000-0001-5313-0835

Anna A.
SHCHERBAKOVA
Vologda State University
Vologda, Russian Federation
e-mail: annascherbakova@mail.ru
ORCID: 0000-0002-3733-1909

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Abstract. We substantiate areas of improving the tools designed to assess the quality of socio-economic development strategies for large cities. In particular, we developed and tested a methodology for assessing the quality of socio-economic development strategies for large cities based on the principles of strategic planning and social corporatism. At the first stage, it involves analyzing the dynamics of key indicators of socio-economic development in large cities, reflecting the growth rates of the number of city residents ("Citizens" indicator, provides a comprehensive assessment of the dynamics of development and targets of the urban community); the number of registered enterprises and organizations in the city ("Business" indicator, provides a comprehensive assessment of the dynamics of development and targets of the entrepreneurial community); the volume of housing construction ("Municipality" indicator, provides a comprehensive assessment of the effectiveness of municipal management through land use, interaction with residents and construction companies), as well as the faith of people and investors in the city and its future. At the second stage, we assess the use of five main mechanisms of social corporatism in the development strategies of large cities via contextual analysis: project management, urban sociology, territorial public self-government, municipal-private partnership, participatory budgeting. At each stage, we arrange large cities into groups in accordance with the criteria under consideration. At the final stage, we design a "Strategy – Development" matrix and put forward proposals for finalizing the strategies of large cities, taking into account their features. The approbation of the methodology has shown the heterogeneity of the quality of strategic planning and the dynamics of socio-economic development in Russia's large cities. This may indicate that they are all at different stages of development of social corporatism. Therefore, it is necessary to use different approaches, tools and directions when developing city strategies, taking into account their characteristics and potential.

Key words: quality assessment, strategy, development, large city, project management, urban sociology.

Introduction to the issues

Today, the "growth poles" of the Russian economy are the largest cities. However, according to some authors, large cities can also become such poles, as they concentrate significant economic, management and intellectual potential (Douay, 2008). They are characterized by deep markets, well-developed infrastructure, and qualified personnel (Yamshchikov et al., 2017; L'vov et al., 2005; Nikonova et al., 2008). A composite indicator of such concentration can be the ability of cities to generate innovation and revenues for budgets at all levels (Bogomolova, 2016; Ignatyevskiy, Sovetova, 2020).

Today, large cities with significant economic potential do not take full advantage of the development opportunities that have arisen in recent years, including due to the weak design of their strategies (Schlingmann, Nordström, 2015; Jacobs, 1961). This is confirmed by the experts of the Center for Strategic Research, who point to the following reasons for the low efficiency of strategic documents in terms of their development: insufficient elaboration of strategies, vagueness of authority and responsibility, declarativity of documents and others.

The main goal of successful socio-economic development of any city is to make the city a comfortable "home" for its residents, a promising platform for business development, a favorable and interesting place for tourists. The basic idea is simple – in a city where it is good, comfortable, cozy, safe, quiet and interesting, people are happy. One appreciates and loves such a city, is proud of it, cares about it, and strives to ensure its prosperity.

One doesn't want to leave such a city; one wants to live there, create a family, and have children. And this requires comfortable parks and embankments, modern kindergartens, schools, and sports facilities; landscaped yards, streets and sidewalks; reliable heat, gas, water and electricity supply systems; quality garbage and snow removal; convenient and safe public transportation; developed communication systems and many other subsystems, without which it is impossible to live comfortably in a modern city. A consequence of the positive changes in a city, an indicator that life there is becoming better and more comfortable, that it is developing in the right direction, is just the growth of population. It takes common goals, ideas, a common attractive future, and involvement in a big construction project. The quality of life in one city can be strikingly different. This is the root of animosity and contradictions, so it is necessary to strive to ensure equal accessibility of urban services.

Urban life is distinguished by the level of freedom, that is, the life scenarios that a person can implement (Jacobs, 1970; Jacobs, 1984). The main resource of the city is human capital – a set of competencies of people to meet the needs of the city. Traditionally, cities compete for people and resources. However, the concept of social corporatism[1] (Shulepov, 2014; Shulepov et al., 2020a) suggests complementing competition with diverse cooperation between cities, people and companies, and the introduction and dissemination of best practices.

Literature review

Currently, there are numerous methodologies for assessing the level of urban development. Most of them are based on statistical data, expert estimates, and sociological surveys of residents and representatives of the business community. The most famous are the Economist's "Global Liveability Ranking"; Mercer's "Quality of living survey"; Domofond.ru rating of Russian cities; urban environment quality index[2]; methodology for assessing the quality of the urban environment of the Ministry of Regional Development of the Russian Federation[3]; surveys (for example, employees of the Financial University under the Government of the Russian Federation conducted a survey in cities with a population of more than 250 thousand people in order to study satisfaction with the quality of life); the methodology of the Institute for Urban Development Foundation; the methodology of the International Center for Social and Economic Research "Leontief Centre" (Kolchinskaya, 2013; Zhikharevich et al., 2017; author's methods of N.V. Shcherbakova, 2009, E.L. Chekaukova[4], I.V. Manaeva et al.,2020).

Most methodologies are labor-intensive and include the assessment of dozens of different particular socio-economic indicators, which are further summarized in an integral indicator, on the basis of which cities are ranked. But for strategic planning, the use of these techniques is not quite appropriate, since this approach violates the most important condition – concentration on the essential.

Russia has more than 30 years of strategic planning practice[5]. During this period, strategic planning has become a widespread and mandatory tool, strategies have been actively developed and adopted at the federal, regional and municipal

[1] In the author's interpretation, social corporatism at the municipal level is a system of institutions and mechanisms for coordination of interests, goals and actions of the partnership participants (authorities, residents and business community), based on equal and mutually beneficial cooperation in order to develop and implement a strategy for socio-economic development of the city.

[2] Information system "Index of the quality of the urban environment". Available at: индекс-городов.рф.

[3] "On approval of the methodology for assessing the quality of the urban living environment": Order of the Ministry of Regional Development of the Russian Federation no. 371, dated September 9, 2013.

[4] Cheklaukova E.L. (2009). Tools for assessing the city's socio-economic development strategy: Candidate of Sciences dissertation: 08.00.05. Irkutsk. P. 23.

[5] ICSER "Leontief Centre" was established in 1991.

levels. Federal Law 172 "On strategic planning in the Russian Federation", dated June 28, 2014, which regulates this sphere, was adopted. Scientific school under the guidance of B.S. Zhikharevich, Director of the Resource Centre for Strategic Planning of ICSER "Leontief Centre", carries out great work on the research of strategic planning practice at the municipal level.

We considered the main results of the study of strategies for Russian cities in 2014–2019, obtained by the research team of ICSER "Leontief Centre". The study group included 168 cities with a population of more than 100 thousand people. Federal cities of Moscow, Saint Petersburg and Sevastopol were not included. The paper (Zhikharevich, Pribyshin, 2019) presents the formalized analysis results of 82 socio-economic development strategies elaborated and adopted in cities with population more than 100,000 people over the five years since the introduction of the Federal Law "On strategic planning in the Russian Federation" (from the mid-2014 to the mid-2019). In the course of the study, we searched and formed an array of texts of official city strategies. During the study period, 75 of the 168 cities in the studied size group developed new strategies (45%). We characterized each text with the help of the content codifier questionnaire. For each strategy we obtained the characteristics of continuity, balance, ambition, highlighted the declared and real priorities, flagship projects, assessed the scale of the planned transformations in the structure of the economy, recorded sectoral priorities. Separate attention is paid to the reflection of spatial development aspects in the strategies. The analysis of the usage frequency of marker words in the wording of the main objectives of cities' strategies and missions showed that the leading phrase is still "quality of life" – it is used in 69% of the main objectives. We have proved that the context analysis methodology of officially tested strategic planning documents of cities allows assessing the quality of municipal governance accurately enough. This method of research is the basis of the author's methodology for assessing the quality of socio-economic development strategies for large cities.

Materials and methods

Based on the above, we identify the scientific and practical problems that need to be solved:

1) there is no holistic methodological framework for assessing the quality of strategies for socio-economic development of cities;

2) with the active development of strategic management at the city level, the scientific community has not established a link between the content of the adopted strategic planning documents and the pace of socio-economic development of cities;

3) strategic planning documents adopted at the level of large cities do not take into account current trends in the development of social partnerships between the main stakeholders of the territories.

In this regard, the article aims to develop a new methodological approach to assessing the quality of strategies for socio-economic development of large cities and substantiate the potential possibility of its practical application. We consistently address the following scientific challenges:

– to develop an algorithm for assessing the quality of strategies for large cities;

– to analyze the dynamics of key indicators of socio-economic development of large cities in Russia;

– to assess the use of the five main mechanisms of social corporatism (the most tested and widespread in Russian practice) in the strategies for large cities of Russia on the basis of a contextual analysis;

– to build a "Strategy – Development" matrix and to form proposals for refining the strategies of cities, taking into account their characteristics. Today, the practice of strategic urban management is evolving rapidly, so it is necessary to eliminate the lag of strategic planning.

Scientific novelty lies in the development of a new methodological approach to assessing the quality of strategies for socio-economic development of large cities, taking into account modern mechanisms of social corporatism.

In our opinion, when developing a strategy, the number of target indicators should be minimal, but the most informative, and it is important to consider not their absolute value, but primarily the dynamics. Based on this premise, we have developed and tested our own methodology for assessing the quality of strategies for socio-economic development of large cities, based on the principles of strategic planning and social corporatism (Kolchinskaya, 2013), which involves three stages *(Fig. 1)*.

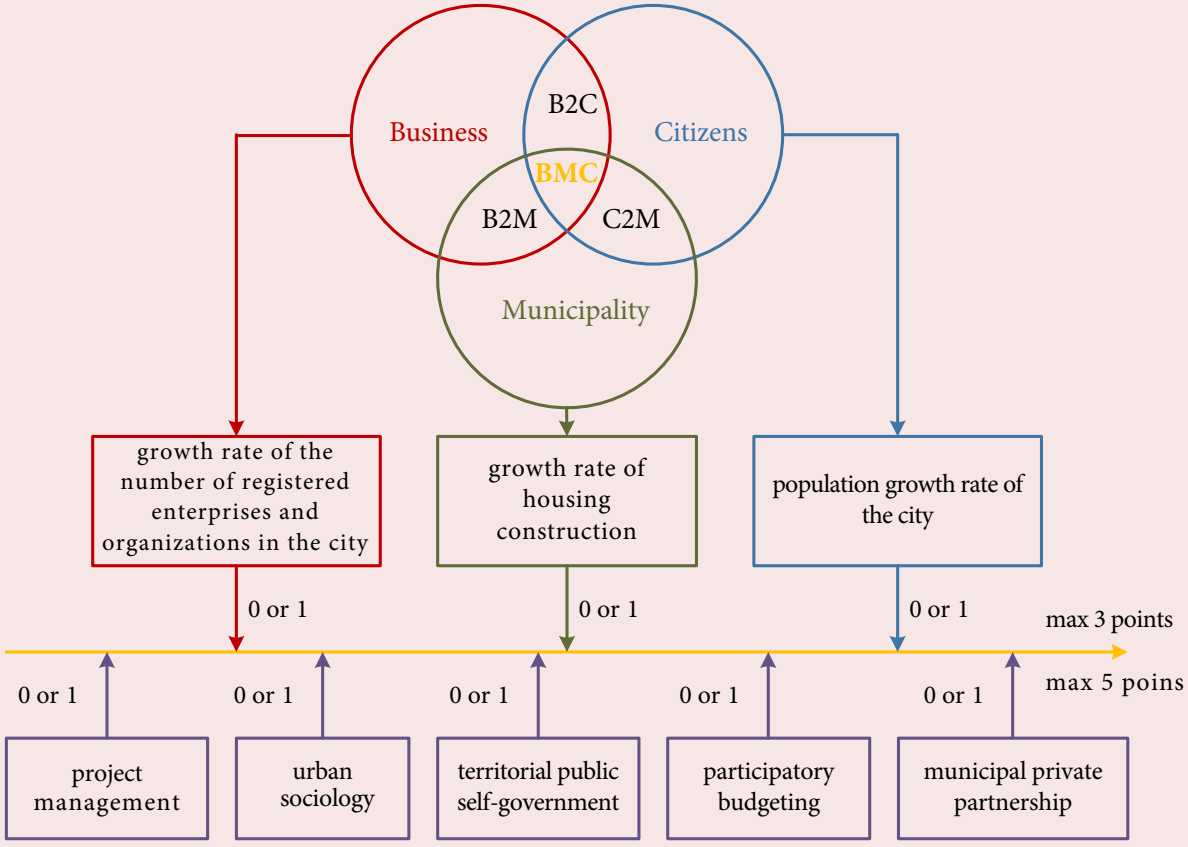
In the first stage, we analyze the following key indicators (a point is assigned in case of positive dynamics; the maximum rating is 3 points) according to the subsystems shown in Figure 1:

– the population growth rate of the city (comprehensively characterizes the dynamics of development and the targets of the urban community "Citizens");

– the growth rate of the number of registered enterprises and organizations in the city (comprehensively characterizes the dynamics of development and target settings of the business community "Business");

– the growth rate of housing construction (comprehensively characterizes the effectiveness of municipal management through land use, interaction with residents, construction companies "Municipality") – the faith of people and investors in the city and its future.

Figure 1. Algorithm for assessing the quality of development strategies for large cities



Source: own compilation.

According to these indicators, the large cities of Russia are divided into three groups:

– leaders (increase in the indicator studied by more than 10%);

– average performers (an increase of the indicator in the range from 0 to 10%);

– outsiders (decrease of the index for the analyzed period).

The gradation is chosen based on the following hypothesis: a decrease in the value of the indicator suggests that the city is degrading, there is no development; during the study period, on average, all cities under consideration develop within the values of the indicators from 0 to 10% (normal distribution), and the dynamics of the indicator over 10% is above the average for the sample and the experience of socio-economic development of such cities will be of interest.

To increase the objectivity of the study, we analyzed the dynamics of specific indicators of the number of enterprises and organizations per 1,000 inhabitants of a large city, and the commissioning of residential buildings (per 1,000 inhabitants of the city).

The second stage was a search for official documents of long-term socio-economic planning of all large cities in Russia. The Registry of strategic planning documents included in GAS "Upravlenie" (State automated information system "Upravlenie"), websites of city administrations and city legislative bodies, websites of legal reference systems, and regional databases of strategic documents are used for searches. The strategy is considered found and meets the search criteria if a local legal act defining the official status of the document can be found.

The methodology developed for the study is based on an assessment of the use of five basic mechanisms of social corporatism in the adopted texts of strategies[6]:

– project management (marker words: project, project activities) – a method of managing strategic tasks within projects and under time and resource limitations to achieve the stated results and goals (BMC sector);

– urban sociology – the study of the genesis, essence and general patterns of development and functioning of the city as an element of an integral system of socio-spatial and economic organization of society (BMC sector) (Savage, Warde, 1993);

– territorial public self-government (marker words: TPS) is a complex of formal and informal principles, norms, rules that condition and regulate the self-organization of city residents to independently carry out their own initiatives on issues of local importance (sector C2M)[7];

– municipal-private partnership (marker words: municipal private partnership, MPP, PPP) – a set of forms and mechanisms of medium- and long-term mutually beneficial cooperation between the municipality, on the one hand, and economic entities, on the other hand, to implement socially important projects on the territory of the municipality (B2M sector);

– participatory budgeting (marker words: participatory budgeting) is a form of direct participation of residents in the implementation of local self-government through initiatives for the purpose of spending part of the budget funds with the use of the mechanism of co-financing (C2M sector).

We conduct a contextual search for the main mechanisms of social corporatism based on the texts of the strategies. If the strategic documents contain the relevant mechanism, the city earns one point. The maximum score a city can get is 5 points. At the third stage, we build a "Strategy – Development" matrix and put forward recommendations for improving the socio-economic development

[6] We have chosen five main mechanisms of social corporatism out of the 39 examined (Shulepov et al., 2020a).

[7] "On the general principles of organization of local self-government in the Russian Federation": Federal Law no. 131-FZ dated October 6, 2003 (as amended on December 30, 2021).

strategies for cities, taking into account their characteristics.

Results of the methodology testing

Today there are 1,117 cities in Russia, including 62 large cities[8] (urban districts). They constitute the sample of this study because they have considerable potential and, at the same time, they are not characterized by the monopolistic position inherent in megacities.

One of the main indicators of the city's development is the number of its residents, which is considered in the dynamics. The growth of city residents is an increase in the number of citizens due to certain factors, depending on which there are natural population increase and positive migration balance. To identify demographic trends in a city, researchers usually consider fertility and mortality rates, the number of departures and arrivals. However, for strategic planning it is advisable and sufficient to consider the rate of change in the number of urban residents, as this indicator reflects both natural population increase (people stay in the city comfortable for life, leisure and work and expand their families) and migration growth (people are willing to move to a comfortable city for permanent residence). The market, ideas, business and money, diversity and development opportunities – all this increases with the growth of the number of inhabitants.

We consider the change in the population of large cities in Russia over the past 10 years. During this period, 48 large cities[9] in Russia (77.4%) saw an increase in the number of inhabitants (including urban and rural population), while 14 saw a decrease. In general, the population of large cities in Russia in the period from 2010 to 2019 increased from 26.1 to 28.0 million people (by 1.9 million people, or 7.3%). These facts indicate that the processes of urbanization in Russian large cities are quite active, but uneven. *Table 1* shows the results of the population size assessment in large Russian cities. Hereinafter, the leading cities according to the considered indicator (the first 10 large cities in the rating) and the outsider cities (the last 10) are presented.

Table 1. Population estimates for large cities of Russia (urban and rural population)

Cities-leaders	Change rate 2019 / 2010, %	Cities-outsiders	Change rate 2019 / 2010, %
Balashikha	245.8 (152.3 including Zheleznodorozhny)	Arkhangelsk	99.6
Podolsk	179.5 (137.4 including Klimovsk)	Ivanovo	99.1
Tyumen	132.8	Volzhsky	98.9
Sevastopol*	132.0	Oryol	97.4
Sochi	125.8	Vladikavkaz	97.3
Khimki	124.3	Tolyatti	97.2
Surgut	123.4	Bryansk	96.8
Yakutsk	118.4	Nizhny Tagil	96.3
Kaliningrad	113.4	Kurgan	93.9
Novorossiysk	113.4	Murmansk	93.7

Leaders (increase over 10%)	14 large cities	Average performers (increase from 0 to 10%)	36 large cities	Outsiders (decrease)	12 large cities

* Change rate 2019 / 2015, %.
Source: Database of indicators of municipalities of the Russian Federation. Available at: https://www.gks.ru/dbscripts/munst/ (accessed: November 16, 2021).

[8] According to the code "Urban planning. Urban and rural planning and development" of the Ministry of Construction of the Russian Federation, large cities include cities with a population of between 250,000 and 1 million people.

[9] Hereinafter, the term "city" also refers to urban districts.

The analysis revealed that the outflow of population comes mainly from the northern cities (Arkhangelsk, Murmansk) and those that have in close proximity the largest or more comfortable large cities (Tolyatti, Vladikavkaz, Volzhsky and others). The highest growth rates were shown by Moscow's satellite cities (Balashikha, Podolsk, Khimki), resort towns (Sochi, Novorossiysk, Kaliningrad, Sevastopol), "mining" cities (Surgut, Yakutsk). Balashikha has achieved the highest population growth compared to other large cities of Russia. Here we should give an explanation. In 2015, the city of Zheleznodorozhny with population of almost 152 thousand people joined Balashikha. Due to this, the population of Balashikha itself increased sharply from 260.7 thousand people in 2015 to 428.4 thousand people in 2016. Thus, the population growth in Balashikha over the past 10 years was 52.3% (including residents of Zheleznodorozhny). In 2015, the city of Klimovsk (56.2 thousand people) was included in the enlarged urban district of Podolsk. If we take into account the residents of Klimovsk, the dynamics of population growth in Podolsk is significant (an increase of 37.4%).

We assume that the population growth in large cities was mainly due to migration processes. This is confirmed by the results of a study of Russians' migration attitudes within the country, conducted by the Russian Public Opinion Research Center (VCIOM)[10]. Currently 25% of Russians, mostly between the ages of 25 and 34 (40%), are thinking about moving for permanent residence to another city of Russia. Among those expressing a desire to move to another locality in Russia, 61% would like to move to a city, and 34% would like to move to the countryside. The reasons why Russians want to move are: unemployment or remoteness of work (18%), a higher standard of living in another locality (15%), environmental reasons (13%), as well as a preference for a more favorable climate (12%). Some respondents would like to move because they do not like their city or are more attracted to another one (7%), while others would prefer to move for a better education (7%) or in an effort to broaden their own horizons and prospects (7%). Thus, potential migrants must see the prospects for the development of a large city, laid down in a qualitative strategy. An important factor is the consolidation in the city of active residents who can create impulses for its socio-economic development.

A quality urban business environment creates and combines conditions for the long-term development of the city, in which people and businesses are interested and profitable to invest time and money in the area. It is determined by safety, livability and design of the urban environment, ecology, logistics, availability and quality of human resources and specialized services, investment incentives, predictability and professionalism of local politics, social protection system, functional diversity, etc. The business environment is also greatly influenced by the city's long-term development goals, as outlined in the strategy. The results are expressed in the creation of new jobs, an increase in tax payments to the municipal budget, and the attraction of non-budgetary investments, which ultimately contributes to the improvement of the overall socio-economic situation in the city and the well-being of its residents.

In this regard, the second most important indicator of the development level of the city is the number of enterprises and organizations, as the dynamics of this criterion shows how favorable the business environment is formed in the city.

The data presented in *Table 2* show that 14 Russian large cities (22.6%) currently have a favorable environment for business development. The satellite cities of Moscow (Balashikha, Podolsk,

[10] The Russian Public Opinion Research Center's study of the migration attitudes of Russians within the country. Available at: https://wciom.ru/index.php?id=236&uid=9976 (accessed: November 16, 2021).

Table 2. Number of enterprises and organizations (according to state registration) in large cities of Russia

Cities-leaders	Change rate 2019 / 2010, %	Cities-outsiders	Change rate 2019 / 2010, %
Balashikha	156.4	Surgut	78.3
Grozny	129.0	Kirov	76.1
Smolensk	126.6	Yoshkar-Ola	75.5
Khimki	125.4	Volzhsky	74.9
Naberezhnye Chelny	117.2	Tver	72.3
Sevastopol*	116.0	Murmansk	60.9
Simferopol*	115.0	Irkutsk	51.5
Yakutsk	108.8	Ulan-Ude	49.1
Saransk	108.3	Makhachkala	41.8
Podolsk	107.6	Vladikavkaz	33.6

Leaders (increase over 10%)	7 large cities	Average performers (increase from 0 to 10%)	7 large cities	Outsiders (decrease)	48 large cities

* Change rate 2019 / 2015, %.

Source: Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2020; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2018; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2016; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2014; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2011.

Khimki) show great dynamics of growth. In 48 large cities out of 62, the number of registered enterprises and organizations was decreasing. For the whole sample, this indicator decreased by 14.1%[11] from 2010 to 2019, indicating insufficient efforts made by the authorities to create a comfortable business climate and promote entrepreneurship.

Significant decrease in the number of enterprises and organizations according to the state registration for the review period is observed in Ulan-Ude (50,9%), Makhachkala (58,2%), Vladikavkaz (66,4%).

The third indicator, the rate of development of the housing sector, illustrates what results can be achieved by systematically building a partnership of government, residents and businesses on the basis of urban strategy on a "win – win" principle. When residents understand and share the vision of the future of the city, notice positive dynamics in the development of infrastructure, and are confident that the government is open to dialogue and respects citizens, then they associate their future and the future of their children and grandchildren with the city and invest in the purchase (construction) of housing. Businesses, based on the growing demand for real estate, are beginning to develop manufacturing facilities and trade. Authorities and management as a result involve land resources in circulation, increase the capitalization of urban land (thereby increasing the affordability of housing), ensure the quality of housing through the approval of design and estimate documentation, get new jobs and objects of taxation. Consequently, tax deductions to budgets grow, which can be directed to the further development of infrastructure, landscaping and improving citizens' quality of life. Consistently ramping up this "flywheel" from year to year, it is possible to significantly increase the rate of socio-economic development of the city, even with limited resources, and vice versa, when in the most favorable conditions residents, business and government operate on the principle of "circular firing squad", the city will degrade, losing population and prospects.

Table 3 provides an assessment of the commissioning of residential buildings in large Russian cities. In 39 cities under review (62.9%) for 2010–2019 there is an increase in the rate of construction,

[11] The Covid-19 pandemic in Russia began on March 2, 2020.

Table 3. Assessment of the commissioning of residential buildings in large Russian cities

Cities-leaders	Change rate 2019 / 2010, %	Cities-outsiders	Change rate 2019 / 2010, %
Grozny	1 386.7	Vladivostok	68.8
Sevastopol*	541.8	Kostroma	66.3
Orenburg	298.7	Tomsk	56.7
Sterlitamak	291.4	Oryol	56.6
Simferopol*	268.2	Chita	53.2
Yoshkar-Ola	229.8	Belgorod	39.6
Nizhny Tagil	211.7	Ulan-Ude	38.9
Yakutsk	205.4	Astrakhan	35.6
Kaluga	205.4	Murmansk	25.6
Kurgan	205.3	Podolsk	10.8

Leaders (increase over 10%)	36 large cities	Average performers (increase from 0 to 10%)	3 large cities	Outsiders (decrease)	23 large cities

* Change rate 2019 / 2015, %.
Source: Database of indicators of municipalities of the Russian Federation. Available at: https://www.gks.ru/dbscripts/munst/ (accessed: November 16, 2021).

therefore, we can say that people are planning to spend their lives in these cities. However, in 23 cities (37.1% of the sample) the commissioning of residential buildings is declining, which is an unfavorable trend in strategic terms. Slight rates of increase are observed only in three Russian cities.

As a result of the analysis of the three indicators (Citizens – Business – Municipality), the directions of strategic planning efforts for different cities are clearly visible. For more substantiation of the conclusion made, it is advisable to consider the relative indicators that characterize the socio-economic development of cities from the perspective of strategic planning. *Table 4* shows the dynamics of changes in the number of enterprises and organizations per 1,000 residents of the city. Smolensk and Grozny retained their leading positions by a comparable indicator, while the three outsiders by the level of development of the business environment remained unchanged.

Table 4. Assessment of the number of enterprises and organizations, per 1,000 residents of a large city

Cities-leaders	Change rate 2019 / 2010, %	Cities-outsiders	Change rate 2019 / 2010, %
Smolensk	127.0	Tver	68.8
Grozny	114.8	Yoshkar-Ola	68.6
Simferopol*	114.4	Balashikha	68.3
Naberezhnye Chelny	112.8	Murmansk	65.0
Sterlitamak	106.2	Surgut	63.5
Cherepovets	103.5	Podolsk	61.0
Tolyatti	101.2	Irkutsk	48.7
Khimki	100.9	Ulan-Ude	45.5
Saransk	100.9	Makhachkala	40.1
Vologda	100.1	Vladikavkaz	34.5

Leaders (increase over 10%)	4 large cities	Average performers (increase over 10%)	6 large cities	Outsiders (decrease)	52 large cities

* Change rate 2019 / 2015, %
Source: Database of indicators of municipalities of the Russian Federation. Available at: https://www.gks.ru/dbscripts/munst/ (accessed: November 16, 2021); Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2020; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2018; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2016; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2014; Regions of Russia. The main socio-economic indicators of cities. Stat. Coll., *Rosstat*. Moscow, 2011.

Table 5 presents an assessment of the dynamics of changes in the commissioning of residential buildings in square meters per inhabitant of the city. According to this relative indicator, the main leader and outsider cities remained practically unchanged.

The following is a grouping of cities according to the dynamics of the most important indicators for strategic planning over 2010–2019 *(Tab. 6)*. The point estimate was taken as the basis. If there is a positive trend in the indicator over the analyzed period, the city is assigned one point. If the trend is the opposite, the city does not receive a point. Thus, we formed four groups of large cities:

– effectively developing or successful cities (3 points; 10 cities);

– cities that have some problems in their development, or "catching-up" cities (2 points; 26 cities);

– cities at risk (1 point; 21 cities);

– "dying" cities (0 points; 5 cities).

Table 5. Assessment of the commissioning of residential buildings per 1,000 residents of the city

Cities-leaders	Change rate 2019 / 2010, %	Cities-outsiders	Change rate 2019 / 2010, %
Grozny	1 233.9	Oryol	58.2
Sevastopol	410.5	Sochi	56.7
Sterlitamak	288.5	Tomsk	51.9
Orenburg	287.2	Balashikha	49.3
Simferopol	266.9	Chita	49.1
Nizhny Tagil	219.8	Ulan-Ude	36.0
Kurgan	218.8	Belgorod	35.9
Yoshkar-Ola	208.7	Astrakhan	35.0
Kaluga	200.3	Murmansk	27.3
Yaroslavl	195.6	Podolsk	6.1

Leaders (increase over 10%)	32 large cities	Average performers (increase over 10%)	7 large cities	Outsiders (decrease)	23 large cities

Source: Database of indicators of municipalities of the Russian Federation. Available at: https://www.gks.ru/dbscripts/munst/ (accessed: November 16, 2021).

Table 6. Ranking of large cities according to the dynamics of the most important indicators for strategic planning for 2010–2019

City	Commissioning of residential buildings	Population	Number of enterprises and organizations	Total score
Successful cities (3 points)				
Naberezhnye Chelny	1	1	1	3
Sevastopol	1	1	1	3
Simferopol	1	1	1	3
Yakutsk	1	1	1	3
Saransk	1	1	1	3
Grozny	1	1	1	3
Sterlitamak	1	1	1	3
Khimki	1	1	1	3
Balashikha	1	1	1	3
Cherepovets	1	1	1	3
"Catching-up" cities (2 points)				
Saratov	1	1	problem	2
Izhevsk	1	1	problem	2
Ulyanovsk	1	1	problem	2
Yaroslavl	1	1	problem	2
Orenburg	1	1	problem	2

End of Table 6

City	Commissioning of residential buildings	Population	Number of enterprises and organizations	Total score
Kemerovo	1	1	problem	2
Ryazan	1	1	problem	2
Cheboksary	1	1	problem	2
Kaliningrad	1	1	problem	2
Tula	1	1	problem	2
Tambov	1	1	problem	2
Petrozavodsk	1	1	problem	2
Tyumen	1	1	problem	2
Barnaul	1	1	problem	2
Penza	1	1	problem	2
Kaluga	1	1	problem	2
Vologda	problem	1	1	2
Kirov	1	1	problem	2
Belgorod	problem	1	1	2
Surgut	1	1	problem	2
Tver	1	1	problem	2
Podolsk	problem	1	1	2
Nizhnevartovsk	1	1	problem	2
Novorossiysk	1	1	problem	2
Yoshkar-Ola	1	1	problem	2
Magnitogorsk	1	1	problem	2
Cities at risk (1 point)				
Tolyatti	1	problem	problem	1
Lipetsk	1	problem	problem	1
Khabarovsk	problem	1	problem	1
Vladivostok	problem	1	problem	1
Makhachkala	problem	1	problem	1
Kursk	problem	1	problem	1
Kostroma	problem	1	problem	1
Stavropol	problem	1	problem	1
Sochi	problem	1	problem	1
Chita	problem	1	problem	1
Nizhny Tagil	1	problem	problem	1
Arkhangelsk	1	problem	problem	1
Smolensk	problem	problem	1	1
Irkutsk	problem	1	problem	1
Tomsk	problem	1	problem	1
Novokuznetsk	problem	1	problem	1
Astrakhan	problem	1	problem	1
Ulan-Ude	problem	1	problem	1
Vladimir	problem	1	problem	1
Kurgan	1	problem	problem	1
Vladikavkaz	1	problem	problem	1
"Dying" cities (0 points)				
Murmansk	problem	problem	problem	0
Bryansk	problem	problem	problem	0
Ivanovo	problem	problem	problem	0
Volzhsky	problem	problem	problem	0
Oryol	problem	problem	problem	0

Source: own compilation.

Thus, the analysis of socio-economic development of large cities in Russia showed that 10 of them, or only 16.1% for 2010–2019, can be attributed to effectively developing. "Catching up" cities represent also a significant proportion (42%). However, still critical is the percentage (33.9%) of cities that are in the risk zone and may become "dying" without the intensification of processes for their strategic development. According to our methodology, five cities can be classified as "dying" cities. All three of their most important indicators of socio-economic development for the period under analysis have downward trend.

At the second stage, we consider the formed base of strategic documents, which included 60 strategies for the development of large cities (96.8% of all cities in the study group). We have not found strategic documents for Vladikavkaz and Balashikha. In the context of social corporatism, this circumstance is indicative of the fact that the availability of the content of the strategy for the residents of the city and its business community is a necessary condition for the use of mechanisms of social corporatism.

The evaluation of strategic documents of large cities in Russia, based on the mechanisms of social corporatism, is as follows: 4 points – 6 strategies (10% of 60 strategies); 3 points – 15 strategies (25%); 2 points – 19 strategies (31.6%); 1 point – 16 strategies (26.7%); 0 points – 4 strategies (6.7%) *(Tab. 7)*. Below are the mechanisms of social corporatism, laid down in the strategic documents under study:

a) project management – 56 strategies (93.3% of 60 strategies);

b) urban sociology – 14 strategies (23.3%);

c) territorial public self-government – 20 strategies (33.3%);

d) municipal-private partnership – 29 strategies (48.3%);

e) participatory budgeting – 4 strategies (6.7%).

Table 7. Assessment of strategic documents of large cities in Russia in terms of the use of social corporatism mechanisms

City	Date of strategy adoption	Scores	The mechanisms of social corporatism, inherent in the strategy				
			Project management	Urban sociology	TPS	MPP	Participatory budgeting
Yaroslavl	June 3, 2010 (amended on November 7, 2016)	4	1	1	1	1	no
Cherepovets	November 29, 2016	4	1	1	1	1	no
Sochi	Project through to 2030	4	1	1	1	1	no
Kirov	November 24, 2010	4	1	no	1	1	1
Bryansk	Project through to 2030	4	1	no	1	1	1
Belgorod	January 30, 2007 (amended on February 27, 2018)	4	1	no	1	1	1
Chita	November 22, 2018	3	1	1	no	1	no
Ulyanovsk	September 8, 2015	3	1	no	1	1	no
Surgut	June 8, 2015	3	1	no	1	1	no
Smolensk	Project through to 2030	3	1	no	1	1	no
Penza	September 29, 2017	3	1	no	1	1	no
Novokuznetsk	December 25, 2018	3	1	1	no	1	no
Nizhny Tagil	January 31, 2019	3	1	no	1	1	no
Kurgan	December 24, 2014	3	1	1	no	1	no
Ivanovo	December 26, 2008 (amended on July 1, 2015)	3	1	1	1	no	no
Vladimir	Project through to 2030	3	1	1	1	no	no

Continuation of Table 7

City	Date of strategy adoption	Scores	The mechanisms of social corporatism, inherent in the strategy				
			Project management	Urban sociology	TPS	MPP	Participatory budgeting
Vladivostok	Project through to 2030	3	1	no	1	1	no
Arkhangelsk	13.02.2019	3	1	no	1	1	no
Orenburg	September 6, 2011	3	1	no	1	1	no
Murmansk	May 30, 2012	3	1	1	no	1	no
Oryol	October 3, 2011	3	1	1	no	no	1
Tula	Project through to 2030	2	1	no	no	1	no
Tomsk	June 27, 2006 (amended on July 07, 2020)	2	1	no	no	1	no
Tver	Project through to 2030	2	1	no	no	1	no
Sterlitamak	Project through to 2030	2	1	1	no	no	no
Sevastopol	June 24, 2016 (amended on October 25, 2017)	2	1	no	no	1	no
Saratov	February 16, 2017	2	1	no	1	no	no
Saransk	April 30, 2013 (amended on July 27, 2016, May 24, 2017)	2	1	no	no	1	no
Naberezhnye Chelny	April 07, 2016 (amended on October 07, 2019)	2	1	no	no	1	no
Magnitogorsk	October 27, 2018	2	1	no	no	1	no
Lipetsk	August 2, 2016	2	1	1	no	no	no
Kursk	November 19, 2019	2	1	no	no	1	no
Kaluga	February 2, 2018	2	1	no	1	no	no
Yoshkar-Ola	February 28, 2018	2	1	no	1	no	no
Izhevsk	April 14, 2016	2	1	1	no	no	no
Grozny	September 30, 2016	2	1	no	no	1	no
Vologda	May 30, 2019 (amended on June 27, 2019)	2	1	no	1	no	no
Astrakhan	December 29, 2011 (amended on June 27, 2017)	2	1	1	no	no	no
Yakutsk	February 6, 2019	2	1	no	no	1	no
Petrozavodsk	February 18, 2015	2	1	no	no	1	no
Cheboksary	October 27, 2009	1	1	no	no	no	no
Khimki	July 30, 2014	1	1	no	no	no	no
Khabarovsk	January 31, 2017	1	1	no	no	no	no
Ulan-Ude	December 20, 2018	1	1	no	no	no	no
Stavropol	July 21, 2017	1	1	no	no	no	no
Simferopol	Project through to 2030	1	1	no	no	no	no
Ryazan	March 26, 2009 (amended on April 22, 2010, July 18, 2013, October 29, 2015, January 28, 2016, April 26, 2016, February 22, 2017, April 27, 2017)	1	1	no	no	no	no
Podolsk	November 28, 2019	1	1	no	no	no	no
Makhachkala	December 27, 2012	1	1	no	no	no	no
Kostroma	November 28, 2019	1	1	no	no	no	no
Kemerovo	December 27, 2019	1	1	no	no	no	no
Kaliningrad	October 09, 2013	1	1	no	no	no	no

End of Table 7

City	Date of strategy adoption	Scores	The mechanisms of social corporatism, inherent in the strategy				
			Project management	Urban sociology	TPS	MPP	Participatory budgeting
Irkutsk	February 22, 2018	1	1	no	no	no	no
Barnaul	December 19, 2013 (amended on August 31, 2017)	1	1	no	no	no	no
Tyumen	Project through to 2030	1	1	no	no	no	no
Nizhnevartovsk	December 26, 2014	1	1	no	no	no	no
Tambov	April 23, 2012 (amended on April 28, 2015)	0	no	no	no	no	no
Tolyatti	January 25, 2019	0	no	no	no	no	no
Novorossiysk	July 16, 2019	0	no	no	no	no	no
Volzhsky	November 29, 2019	0	no	no	no	no	no
Vladikavkaz	–	0	We have not found any strategies for the development of these cities				
Balashikha	–	0					
Source: own compilation.							

Thus, none of the strategies reviewed received a maximum score of 5, indicating the need to improve the quality of strategic planning at the level of large cities.

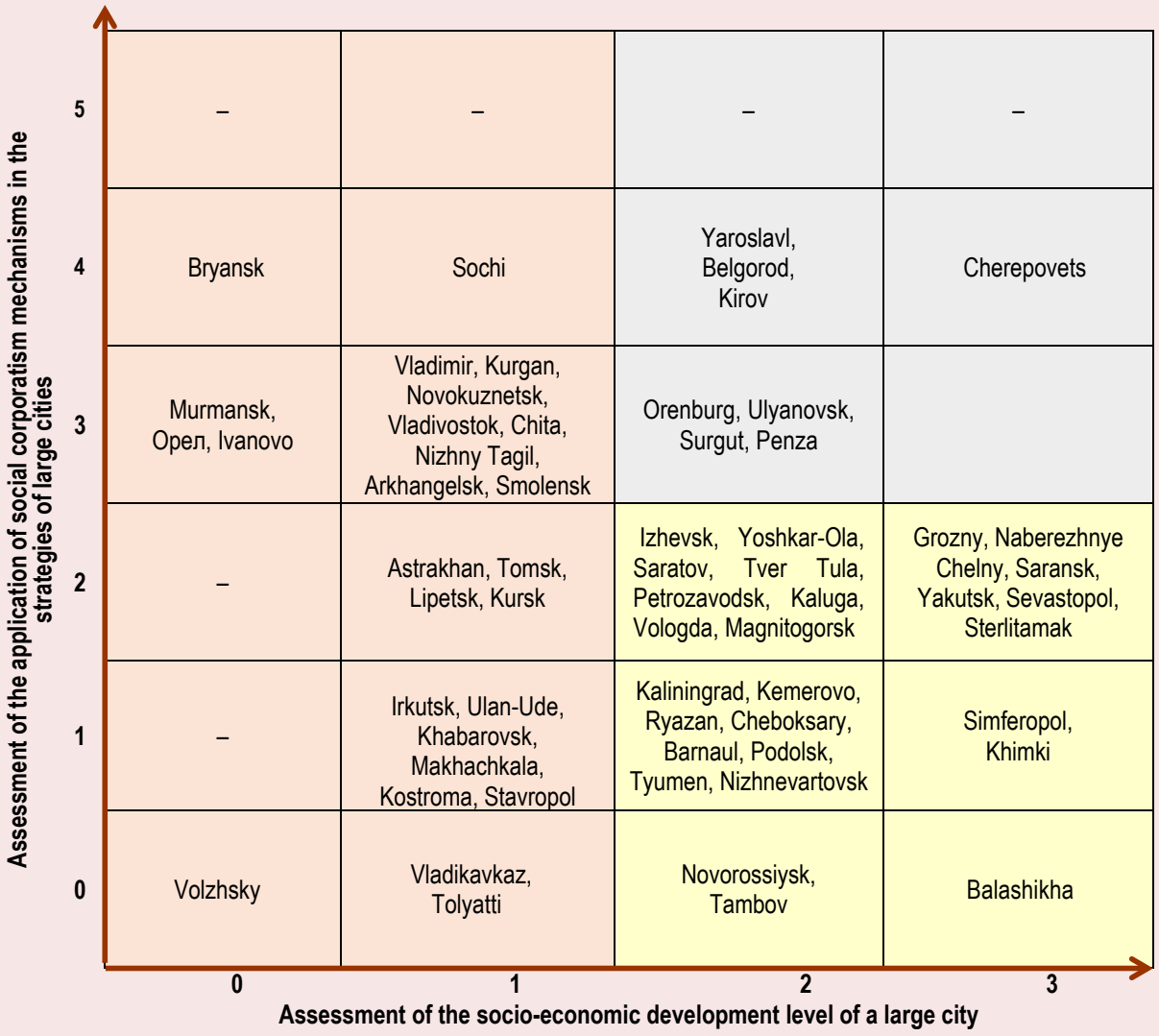
The most commonly used mechanism of social corporatism is project management[12]. Least frequently mentioned in the strategies of large cities is participatory budgeting. As noted earlier, the urban sociology is virtually not used (Stolbov, Starosta, 2017). In this regard, the data of sociological research are scattered, the municipal statistics do not allow getting correct feedback from residents and businesses, conducting a qualitative analysis of the processes occurring in the city and making effective management decisions. This area can and should become the key to the application of modern information technology in municipal government in the coming years, especially since the collection of primary data from residents and businesses from various sources and databases is constantly growing. Initiative budgeting is a fairly common practice, but it is not adequately reflected in strategic documents.

[12] Our results correlate with the conclusions of B.S. Zhikharevich (Zhikharevich, Pribyshin, 2019).

Next, we consider how the strategic documents of large Russian cities correlate the designations of the mechanisms of social corporatism with the level of socio-economic development of the city. The correlation between these two blocks has not been sufficiently investigated, since the development of the city also depends on other factors – natural and climatic characteristics, geographic location, and others. However, the visual representation of the results is quite interesting *(Fig. 2)*.

Thus, the formed matrix shows the heterogeneity of the quality of strategic planning and the dynamics of socio-economic development of large cities in Russia. This may indicate that they are all at different stages of the evolution of social corporatism. Consequently, it is necessary to use different approaches, tools and directions in the development of city strategies, taking into account their characteristics and potential. For example, cities characterized by a high level of socio-economic development and a relatively high level of social corporatism (green quadrant) are recommended in strategic planning documents to focus on the formation of their own identity through the development and implementation of

Figure 2. "Strategy – Development" Matrix for large cities of Russia



Source: own compilation.

jackpot projects[13]. Cities in the yellow quadrant should pay attention to improving the quality of strategic planning, the development of dialogue between government, business and society through the development and implementation of urban social projects. Cities in the red quadrants are characterized by negative dynamics of two or more key indicators of socio-economic development and are in the risk zone. They require the development of strategies that are essentially anti-crisis.

Discussion and conclusion

The strategy is the most important document of socio-economic development of a large city, so it must be developed on the principles of social corporatism, that is, in cooperation with the authorities, residents and businesses.

[13] The authors (Shulepov et al., 2020b) show how one (or a series of) successful projects dramatically change the living conditions and dynamics of development in a city for the better.

In science and practice, various methods are used to assess development strategies for large cities, using both quantitative and qualitative data. However, due to the extremely scarce information base of municipal statistics and urban sociology and a number of other factors, these tools do not provide an objective result, and therefore there is a need to improve tools for assessing the quality of strategies. In the article we attempted to solve this problem.

The developed methodology for assessing the quality of strategies for socio-economic development of large cities promotes a comprehensive approach, there is a comprehensive assessment at two levels: a) application of social corporatism mechanisms based on contextual analysis; b) socio-economic development of a large city based on a nominal set of indicators. The methodology proposed for use is not devoid of flaws, but with certain assumptions it allows solving the necessary problems and is up-to-date.

The formed matrix shows the heterogeneity of strategic planning quality and the dynamics of socio-economic development of large cities in Russia. This implies the use of different approaches, tools and directions in the development of city strategies, taking into account their characteristics and potential.

The quality of city strategies varies, but we can conclude that it generally characterizes the competence, intellectual level and openness of the city administration headed by the mayor. Currently, most strategies emphasize analysis and description of the current state of the city. There is a clear intention to develop all areas at the same time. Hence the voluminous and complex documents with a large number of indicators and the lack of emphasis on the main ones. At the same time, the ways to achieve the set goals are poorly defined. Often municipal authorities do not have the ability to influence the declared indicators at all.

The use of various forms of social corporatism in municipal strategic planning in many large cities is at an initial level, which raises the question of their development (what to do?) and testing (how to do?).

The methodological approach we have developed corresponds to global trends in the development of strategic planning focused on the Sustainable Development Goals[14].

This methodological approach for assessing the quality of socio-economic development strategies of large cities can be applied to different municipalities. However, in rural settlements the community of dacha residents is added to the groups considered.

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Information about the Authors

Evgenii B. Shulepov – Deputy, Vologda Oblast Legislative Assembly (1, Pushkinskaya Street, Vologda, 160000, Russian Federation; e-mail: op.r35@edinros.ru)

Konstantin A. Zadumkin – Candidate of Sciences (Economics), Associate Professor, executive director, Vologda City Branch of the Union of Industrialists and Entrepreneurs of the Vologda Oblast (15, Konev Street, Vologda, 160025, Russian Federation; e-mail: zk00@mail.ru)

Anna A. Shcherbakova – Candidate of Sciences (Economics), associate professor of department, Vologda State University (15, Lenin Street, Vologda, 160000, Russian Federation; e-mail: annascherbakova@mail.ru)

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Economic Growth and Environmental Pollution in the USA and Russia: Comparative Spatial-Econometric Analysis

Aleksei N.
KURBATSKIY
Moscow School of Economics, Lomonosov Moscow State University
Moscow, Russian Federation
e-mail: akurbatskiy@gmail.com
ORCID: 0000-0001-6478-8034; ResearcherID: K-4309-2013

Ekaterina I.
SHAKLEINA
Moscow School of Economics, Lomonosov Moscow State University
Moscow, Russian Federation
e-mail: kateshkln99@gmail.com
ORCID: 0000-0001-5872-6179

Abstract. One of the vital problems of the 21st century is environmental pollution, unfavorable both locally and globally. Contaminants released into the soil, air, and water runoff pollute drinking water which leads to an increase in the number of epidemic outbreaks. Moreover, pollutants affect local ecosystems. And when the ecosystem dynamics change, the balance of organisms that provide us with clean air is disrupted. The main cause of the pollution problem is economic growth. It encourages intensive energy use which leads to an increase in CO_2 emissions. It is important to understand how to reduce emissions while maintaining the pace of economic growth. To date, the emission-leading countries have fundamentally different economic structures, and therefore it seems necessary to conduct a comparative analysis of the economic growth impact on pollutant emissions for them. The paper considers the situation typical of the Russian regions and American states for the period from 2004 to 2018. We have used spatial

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econometric models to identify dependencies. The paper proves the existence of spatial correlation in the level of pollutant emissions in Russia's regions and American states. We have confirmed the hypothesis that the dependence of emissions on economic growth in Russia's regions has the form of an inverted U-shaped curve. The value of the GRP turning point, after reaching which the level of pollutant emissions will decrease, has shown that only in ten Russia's regions, with GRP growth, emissions are reduced, and most regions are on the increasing part of the curve. For the United States, the estimates obtained are not significant, which proves the paramount importance of the structure of the country's economy in the issue of the relationship between environmental pollution and economic growth.

Key words: pollutant emissions into the atmosphere, economic growth, Kuznets ecological curve, spatial econometrics, Moran's index.

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Introduction

Economic growth is one of the most important characteristics of social production in any economic system. After the industrial revolution, the countries of the world are striving to achieve ever higher rates of economic growth through the use of existing including non-renewable, natural resources (Jian et al., 2019). This leads to forest destruction, disappearance of rivers, sea pollution, decrease in drinking water quality, large-scale changes in land use, increase in greenhouse gas emissions, especially carbon dioxide (CO_2), which plays an important role in global warming and ozone layer destruction[1]. It is worth noting that the saturation of carbon dioxide in the Earth's atmosphere over the previous 150 years has increased from 280 to 400 ppm (particles per million), such a high level has not been observed over the previous 400 thousand years[2]. During the 20th century, the average global surface temperature increased by 0.6 °C, sea level rose by 10–20 cm, snow cover and ice extent decreased by 10% (Canas et al., 2003). Thus, at present, humanity faces two most important tasks – sustainable economic development and environmental conservation.

Economic progress, carried out through progressive economic development, is one of the factors in the country's development and represents economic growth, characterized by the following indicators: growth of gross domestic product and per capita income, growth of industrial production and labor productivity, changes in the social structure and the economy as a whole, the availability of sales markets and others (Zhuravleva et al., 2017). At the same time, carbon monoxide emissions into the atmosphere have an impact on economic growth. Accordingly, in order to achieve sustainable development, we should take into account the relationship between economic activity and environmental quality (Shikwambana et al., 2021).

The most widely used method of analyzing the relationship between economic growth and environmental pollution is the environmental Kuznets curve, an inverted U–shaped dependence of emissions on economic growth, considered in the work (Grossman, Krueger, 1991).

[1] Intergovernmental Panel on Climate Change (IPCC). AR5 synthesis report: Climate change 2014.

[2] Intergovernmental Panel on Climate Change (IPCC). AR5 synthesis report: Climate change 2015.

The environmental Kuznets curve (EKC) was presented in the World Development Report (1992) as a relationship between the concentration of sulfur dioxide in the environment and GDP per capita in 47 cities, located in 31 countries[3]. The EKC corresponds to an inverted U-shape of the relationship between income and concentration of sulfur dioxide.

The theory of the environmental Kuznets curve is based on the effect of the transition from agricultural to industrial production. As industrial production in urban areas becomes more intense, environmental pollution increases. With an increase in the income level, heavy industry is gradually being phased out in favor of more high-tech production. This transition should reduce environmental pollution. Thanks to high-tech and efficient production, emissions are reduced and the demand for a clean environment from consumers increases, and there is also a high political interest in the environment well-being (Dinda, 2004).

In the work, we will carry out a comparative analysis of the issue of the relationship between emissions and economic growth on the example of the USA and Russia. According to the World Bank, the United States and Russia occupy the leading places in terms of pollutant emissions per capita, ahead of China, the European Union and India[4]. The USA is one of the most developed economies in the world, Russia is an emerging market country, and therefore, the economic model of their GDP formation is different. However, at the same time, according to the level of pollutant emissions per capita, the countries are located in neighboring positions. Thus, due to the urgency of the environmental pollution problem for Russia and the USA, the purpose of the study is to conduct a comparative analysis of the relationship between emissions and economic growth on the regional data of Russia and the USA.

To achieve this purpose, we have solved the following research tasks: we have carried out a comparative analysis of environmental problems in Russia and the United States, estimated spatial correlation in terms of pollutant emissions on regional data for the United States and Russia, tested the hypotheses about the existence of the Environmental Kuznets Curve in the two countries at the regional level, identified factors of reducing the environmental burden, and noted development trends environmental politics in the USA and Russia.

Further, it is necessary to note the works that served as a starting point for our research.

Literature review

Quite a lot of books and articles have been devoted to the topic of the relationship between the pollution level and economic growth. For example, the hypothesis of this relationship was tested in 217 countries for the period from 1990 to 2014 (Kudryavtseva et al., 2017). The problem of carbon dioxide emissions is one of the most urgent, which is also reflected in the Kyoto Protocol (1997). That is why the level of carbon dioxide (CO_2) emissions was taken as a measure of environmental pollution. The researchers have confirmed the hypothesis of the existence of an inverted U-shaped dependence of economic growth on emissions. Thus, there is a critical turning point between the positive and negative nature of the economic growth dependence on the CO_2 emissions level. At the same time, the hypothesis is accepted for developing countries, for developed countries the dependence is linear negative. To test the hypothesis, we have used the following equation specification:

$$\mathrm{Ln}\, y_{it} = \alpha + \rho \times \mathrm{ln} y_{i,t-1} + x'_{it} \times \beta + y_1 \times CO_{2it} + y_2 \times CO_{2it}^2 + h_i + \varepsilon_{it}, \quad (1)$$

where y_{it} – GDP per capita,
x_{it} – matrix of regressors,
CO_{2it} – carbon dioxide emissions,
h_i – individual country effects.

[3] World Bank. World development report 1992: Development and the environment.

[4] Available at: https://data.worldbank.org/

It is also worth noting that the generalized moment method, proposed by (Arellano, Bond, 1991) and used to evaluate dynamic panel data models, was chosen as a method for econometric analysis. We should note that the method allows obtaining reliable and consistent estimates of the coefficients. Based on the results obtained, the authors of the article (Kudryavtseva et al., 2017) established the existence of relationship between the pollution level and economic growth.

There are works that investigate the hypothesis of the existence of the environmental Kuznets curve and its turning point on the data for Russia. For instance, the hypothesis was tested for the period from 1998 to 2013 in the work (Yang et al., 2017). The pollutant was the volume of greenhouse gas emissions. In this paper, the authors considered emissions from energy consumption, industrial production, agricultural production and inorganic emissions, and also estimated specific emissions from ferrous metallurgy, primary aluminum production and cement production. The presence of an inverted U-shaped relationship between GDP per capita and economy-related greenhouse gas emissions per capita has been verified. The EKC model, used in this study, looks like:

$$Y = \alpha + \beta X + \gamma X^2 + \varepsilon, \quad (2)$$

where Y – environmental change indicator, X – indicator of economic development (GDP per capita in USD in 2005), α, β, γ – X coefficients.

We have noted that from 1998 to 2008, the total volume of greenhouse gas emissions gradually increased from 2,230 to 2,605 million tons of CO_2, annually by 1.6%. The obtained results have confirmed the hypothesis of the environmental Kuznets curve. Based on the calculations, we assume that Russia will reach a turning point in 10 years with the stability of economic growth rate.

The problem of the relationship between carbon dioxide emissions and energy consumption, real income, international trade, level of education and urbanization was considered on the basis of Russian data from 1991 to 2016. An empirical dependence of the volume of CO_2 emissions on other factors is constructed (Ketenci, 2018). The paper confirmed the hypothesis of the environmental Kuznets curve, according to which environmental pollution decreases after reaching a certain income level.

We have used an autoregressive model with a distributed lag to assess short-term and long-term relationships. It is worth noting that this model allows analyzing the impact of shocks of independent variables on the dependent one using dynamic coefficients (analogy with the functions of impulsive response in VAR models). Based on the results obtained, we have concluded that real incomes, energy consumption, level of education and urbanization affect the carbon emissions level, and trade openness is an insignificant factor.

Also, the economic impact issue on the environment was considered in the work (Druzhinin et al., 2018). The authors have analyzed the relationship between emissions and economic development in the case of Russia and Finland for the period 1990–2017. At the same time, the SO_2 indicator was taken into account. The paper used a multiplicative function linking economic and environmental indicators:

$$E(t) = A(t) \times X_1^{\mu}(t) \times X_2^{-\eta}(t) \times X_3^{\nu}(t), \quad (3)$$

where $E(t)$ – environmental indicator under study (environmental impact – ratio of SO_2 emissions to GDP); $X_j(t)$ – factors, $A(t)$ – neutral environmental progress (it shows a decrease in the pollution rate due to factors, not included in the equation, primarily structural shifts); μ, η, ν – constant parameters (factorial elasticities); t – year.

It is worth noting that the indicators of the dynamics of investments in fixed assets, new construction, modernization, air protection, machinery and equipment and the share of industry in GDP were used as independent variables in

relation to the Russian Federation. As a result, we have revealed that an increase in the share of industry in GDP by 1% leads to an increase in the ratio of SO_2 emissions to GDP by 0.15%, an increase in cumulative investments in atmospheric air protection by 1% leads to a decrease in the ratio of SO_2 emissions to GDP by 0.15%, an increase in investments in machinery and equipment by 1% has an impact on reducing the ratio of SO_2 emissions to GDP by 0.32%.

As independent variables in the model for Finland, the indicators of the dynamics of industrial production, investment in the economy, air protection, machinery and equipment, and the share of industry in GDP in the pre-crisis (1996–2008) and post-crisis (2009–2015) periods are taken. We have found that an increase in the share of industry in GDP by 1% leads to an increase in the ratio of SO_2 emissions to GDP by 2.35%, an increase in cumulative investments in atmospheric air protection by 1% leads to a decrease in the ratio of SO_2 emissions to GDP by 0.39%, in the first period, an increase in investments in the economy by 1% led to a decrease in the ratio of emissions SO_2 and GDP by 1.08%, in the second period, an increase in investment in machinery and equipment by 1% contributed to a decrease in the ratio of SO_2 emissions to GDP by 1.07%.

The environmental impact on economic growth has recently attracted the researchers' attention. Environmental pollution has a negative impact on labor productivity. Accordingly, some works consider the following problems: the consequences of economic development for the environment and climate change impact on the development of certain economic sectors. For example, one of the articles studied the problem of the relationship between emissions of harmful substances from stationary sources and economic growth on the example of Russia and its regions for the period 2000–2011 (Druzhinin, Shkiperova, 2014). The authors have concluded that economic growth leads to an increase in greenhouse gas emissions, while modernization and structural shifts in the economy reduce them by 4.9% annually.

For the regions, calculations were carried out using linear and multiplicative functions. The results showed that the EKC hypothesis on greenhouse gas emissions and harmful substances coming from stationary sources is not confirmed for most Russia's regions. The authors conclude that most of the regions, according to the main indicators of environmental load, are far from the maximum position on the EKC and potential economic growth may be accompanied by increased environmental degradation.

Next, we will consider the problem of the relationship between pollutant emissions, energy consumption and economic development on the example of the BRICS countries for the period 1971–2005 (for Russia it is 1990–2005) (Pao, 2010). The article has revealed that in the long term there is a relationship between emissions, energy consumption and output for the BRICS countries. In the long term, the elasticity of energy consumption is statistically significant and is estimated higher for each of the four countries. This elasticity means that energy consumption is highly sensitive to changes in emissions. The results obtained confirm the hypothesis of the environmental Kuznets curve, according to which emissions increase along with the actual production volume, stabilize and then decrease. Consequently, after reaching a critical production level, an increase in output can lead to a reduction in emissions and a growth in demand for environmental quality. The authors have shown that energy consumption and real production complement each other, and environmental degradation has only an accidental impact on economic growth. Thus, the best environmental policy is to raise investments in energy supply, increase energy efficiency, and activate energy conservation policies to reduce unnecessary energy losses.

It is also worth noting that this problem has been investigated on the example of the United States of America taking into account energy consumption. For instance, the article (Soytas, et al., 2007) studied the impact of energy consumption and output on CO_2 emissions for the period from 1960 to 2004. We should emphasize that earlier studies mainly focused on verifying the existence of the Kuznets curve without taking into account energy consumption. The work (Motrenko, 2011) considered the Granger causality between income, energy consumption and CO_2 emissions including labor and gross fixed capital accumulation.

The researchers conclude that income is not the cause of CO_2 emissions in the USA in the long run, unlike energy consumption, so America should not reduce income to decrease emissions. It is worth emphasizing that an important aspect is the reduction of energy consumption. The authors note the absence of causal relationship between energy consumption and income and conclude that in the United States, reducing energy consumption can be considered as a serious environmental policy that does not harm long-term prospects for economic growth (Soytas et al., 2007).

The problem of the relationship between environmental pollution and economic growth in the case of Russian data taking into account three different types of pollutants (CO_2, SO_2, NO_2) was carried out in the work (Mihalishchev, Raskina, 2016). The research has reviewed the information database of 79 entities of the Russian Federation from 2000 to 2013, and tested the hypothesis of the EKC existence.

Attention was paid to the indicator characterizing the socio-economic situation, GRP per capita, indicators of nitrogen dioxide, sulfur dioxide, carbon oxides were considered as characteristics of the ecological level. In order to assess the impact of external factors and the variability of the economic environment, the Gini coefficient and the share of the contribution of the industry's added value to the total GRP are integrated into the model. As a result, the econometric model has the following form:

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{it}^2 + \beta_3 X_{it}^3 + \beta_4 GINI_{it} + \beta_5 STRUCT_{it} + \varepsilon_{it}, \quad (4)$$

where $i = 1, ..., N$ – regions,

$t = 1, ..., T$ – years, $GINI$ – Gini coefficient,

$STRUCT$ – vector of variables responsible for the GRP structure.

The results obtained through modeling allowed formulating the following conclusions:

– only a small part of Russia's entities is outside the area of the ascending Kuznets curve;

– reduction of emissions is accompanied by an increase in inequality (Gini coefficient)

– econometric insignificance of the unproductive GRP sector is fixed.

Summarizing, we can note that the socio-economic situation of Russia's entities is characterized by low stability in the long term and does not significantly contribute to reducing the environmental pressure exerted.

Thus, we understand that the work on the relationship between CO_2 emissions and economic growth is relatively controversial and contradictory. They do not consider the spatial autocorrelation of factors at the regional level including environmental pollution factors and regional incomes.

Most studies have used panel data to analyze the relationship between economic development and environmental pollution in relation to a group of developed and/or developing countries. But for a correct assessment, it is necessary to take into account spatial correlations, especially for large countries.

There are several works which use spatial-econometric models. So, in the article (Xu et al., 2018), the problem was investigated on the example of 30 provinces of China for the period 2000–2012. To test the EKC hypothesis, the following equation was used:

$$\ln CE_{it} = \alpha_0 + \alpha_1 \ln EG_{it} + \alpha_2 \ln EG_{it}^2 + \\ + \alpha_3 \ln PSI_{it} + \alpha_4 \ln UR_{it} + \varepsilon_{it}, \quad (5)$$

where CE – carbon emissions expressed in tons, UR – urbanization level, expressed as a percentage, EG – gross domestic product per capita, expressed in 100 000 Yuan/km^2, PSI – share of secondary industry, expressed as a percentage.

In the article, to analyze the relationship between economic growth and CO_2 emissions, the authors have used the following models:

• spatial autoregression model (SAR) of fixed effects:

$$\ln CE_{it} = \alpha_0 + \alpha_1 \ln EG_{it} + \alpha_2 \ln EG_{it}^2 + \\ + \alpha_3 \ln PSI_{it} + \alpha_4 \ln UR_{it} + \rho W \ln CE_{it} + \varepsilon_{it}, \quad (6)$$

where W – spatial matrix, ρ – spatial autocorrelation coefficient which reflects the magnitude and direction of spatial correlation;

• spatial error regression model (SER) of fixed effects:

$$\ln CE_{it} = \alpha_0 + \alpha_1 \ln EG_{it} + \alpha_2 \ln EG_{it}^2 + \\ + \alpha_3 \ln PSI_{it} + \alpha_4 \ln UR_{it} + \varepsilon_{it}, \quad (7)$$

$$\varepsilon_{it} = \lambda W \varepsilon_{it} + \gamma_{it},$$

where λ reflects the spatial dependence of the estimated region on neighboring,

ε_{it} – the remainder obeying the normal distribution.

Based on the results obtained, the researchers have showed that the EKC has an inverted U-shape of the relationship between CO_2 emissions and economic growth in China. Moreover, there is a significant spatial correlation between carbon emissions and economic growth, it means that carbon emissions in a province are influenced by emissions from neighboring provinces. The authors note that a 1% increase in carbon emissions in a neighboring province could lead to a 0.028% increase in carbon emissions in the local province. When economic growth reaches 279.91 million yuan per unit of GDP, the contradiction between economic growth and carbon emissions will be gradually eliminated. We should note that currently in China, only a few well-developed provinces or provincial-level cities, such as Tianjin, Beijing, Shanghai and Jiangsu, have reached this inflection point (Xu et al., 2018).

V. Ivanova in her article has carried out the analysis taking into account the spatial relationship of the Russian regions. The article examines the dependence of the environmental pollution level on the indicator characterizing the socio-economic situation in Russia's entities – the level of disposable income per capita (Ivanova, 2019).

An econometric model with a time trend and individual effects is used as the main equation:

$$Y = \alpha + \beta_1 \ln GRP + \\ + \beta_2 \ln GRP^2 + X'\delta + \gamma t + \varepsilon, \quad (8)$$

where Y – pollutant emissions into the atmospheric air from stationary sources in terms of per capita (kg),

lnGRP – gross regional product per capita (rub.), logarithm,

α – individual effects of regions,

X' – vectors-strings of explanatory variables,

δ – vector of coefficients,

t – temporary trend, $e \sim i.i.d.\ N(0, \sigma^2)$.

In order to quantify the closeness of the relationship between the values of indicator x for closely located regions, the global index of Moran's spatial autocorrelation I was used.

The obtained Moran's indices for logarithms of average per capita pollutant emissions into the atmosphere emanating from stationary sources are statistically significant. Hence, the dependent variable in the equation is spatially autocorrelated. The assumption was confirmed that the regions' pollution is due to their location relative to each other.

The work of V. Ivanova has considered two regression models:

• Spatial autoregressive model including the spatial lag of the dependent variable (hereafter – SAR):

$$Y = \alpha + \rho WY + \beta_1 \ln GRP + \beta_2 \ln GRP^2 + \\ + X'\delta + \gamma t + \varepsilon, \quad (9)$$

• Spatial error model (hereafter – SEM):

$$Y = \alpha + \beta_1 \ln GRP + \beta_2 \ln GRP^2 + \\ + X'\delta + \gamma t + \epsilon, \\ \epsilon = \lambda W\epsilon + \epsilon, \quad (10)$$

where W – matrix of spatial weights, X – matrix of control variables ρ and λ. The following control variables were used:

lnGini, lnElc– electricity consumption per capita (thousand kW/hr.),

lnGini, $\ln Gini^2$ – Gini coefficient (income concentration index),

Manf – share of manufacturing industries in the sectoral structure of gross value added,

Ming – share of mining in the industry structure of value added.

The SAR model based on the spatial Lagrange multiplier test turned out to be preferable.

The research results have confirmed the hypothesis of an inverted U-shaped relationship between environmental emissions and per capita GRP. The significance of the income tipping point demonstrates that most regions are characterized by an increase in the pollutant volume with an increase in income.

Accordingly, the problem of the relationship between economic growth and environmental pollution does exist. Economic development, which affects the depletion of natural resources, cannot be sustainable in the long term. S.N. Bobylev considers new economic models, related to environmental factors: the green economy, the low-carbon economy, the blue economy, the bioeconomy, etc. (Bobylev, 2019). The researcher also points out the long-term objectives of the Russian economy development: the transition to sustainable development, replacement of the export-raw material model with a model with clearly defined environmental priorities, as well as human capital development. The author believes that for the Russian economy development, it is necessary to adopt its own sustainable development strategy, in which a new economic model should take an important place; to develop a system of sustainable development goals with appropriate indicators for the long term taking into account international experience and agreements in which Russia participates.

Methodology and data

In the study, we have used panel data. To verify the existence of spatial dependence in the data, we have performed Moran's test. The value of the Moran's index is found by the formula:

$$I = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}\sum_{j=1}^{n} w_{ij}}, \quad (11)$$

where w_{ij} –spatial weights that are (i, j) elements of the spatial matrix W,

x_i and x_j – values of variables in regions i and j,

$\bar{x}$ – average value,

n – number of regions.

Spatial weights w_{ij} are a comparative characteristic of regions, with a higher value of the weighting coefficient, there is a greater similarity in the location of territories.

In the case of a positive Moran's index, the spatial dependence for variables is positive, otherwise it is negative, and at zero level it is absent (Zhukova et al., 2016).

Identification of weighting coefficients characterizing the level of spatial impact of indicators of other regions on the values of the region's indicator is one of the main factors of spatial data analysis. The weights are determined by a matrix, based

on adjacency or distance. Distances between regions are set as distances between centroids or regional centers (Ivanova, 2019). To construct the spatial matrix, we have used inverse geographical distances.

The study constructed a model with spatial lag and spatial structure in errors (SAC – Spatial Autoregressive Combined):

$$Y = \lambda \times (\mathrm{W} \times \mathrm{y})_{\mathrm{it}} + \mathrm{X}_{\mathrm{it}} \times \beta + \epsilon_{\mathrm{it}},$$
$$\epsilon_{\mathrm{it}} = p \times (\mathrm{W} \times \epsilon)_{\mathrm{it}} + u_{\mathrm{it}},\ u_{\mathrm{it}} \sim N(0, \sigma_u^2, \mathrm{I_n}), \quad (12)$$

where $Y = (y_1, \ldots y_{\mathrm{n}})^T$ – vector of dimension n×1 of values of the endogenous variable for each sampling unit,

λ – spatial autoregression coefficient,

n – number of sample items (territorial systems),

ρ – autoregression coefficient,

ϵ_{it} – error vector (n×1) assuming autocorrelation,

$\mathrm{W} = (\mathrm{w_{ij}})_{\mathrm{i=1,j=1}}^{\mathrm{n,n}}$ – spatial weighing matrix of size n×n, WY – spatial lag of the dependent variable,

$\mathrm{X} = (\mathrm{x_{ij}})_{\mathrm{i=1,j=1}}^{\mathrm{n,k}}$ – matrix of explanatory variables of size n×k, k – number of explanatory variables,

β – vector of dimension k×1 of the estimated parameters reflecting the influence of explanatory variables on the dependent variable,

$u_{\mathrm{it}} = (u_1, \ldots u_{\mathrm{n}})^T$ – vector n×1 of the model residuals, with respect to which it is assumed hereafter that they are equally and independently distributed with zero mean and variance σ^2, it means that $\varepsilon \sim \mathrm{N}(0,\sigma^2,\mathrm{I_n})$, $\mathrm{I_n}$ – a unit matrix of size n×n.

We have carried out calculations using the statistical package R.

The data for the study were taken from the websites of the United States Environmental Protection Agency[5], the U.S. Bureau of Economic Analysis[6] and the Federal State Statistics Service of Russia[7].

Research results and their analysis

Before building the models, we have analyzed the regions of Russia and the USA with the highest and lowest pollution levels.

In 2018, CO_2 emissions in Wyoming amounted to 110 tons per capita, which is the highest in the United States. According to the Energy Information Administration (EIA), the state is a major producer of coal, natural gas and crude oil. Also, one of the most polluted states is North Dakota. In 2018, its emissions amounted to 77 tons per capita. It is one of the ten largest coal-producing states in the United States and provides almost 4% of coal production in the country[8].

In Russia, the highest level of pollutant emissions was 1.6 tons per capita (Yamalo-Nenets Autonomous Okrug). According to the report "On the environmental situation in the Yamalo-Nenets Autonomous Okrug in 2017", the main pollution sources were oil and gas producing enterprises[9].

Thus, both in the US states and in Russia's regions, the main reason for the high emission level is the mining industry.

As for the regions with the lowest level of CO_2 emissions per capita, in 2018 in the United States, those were the states of Maryland and New York with indicators of 7.7 and 7.8 tons, respectively. According to the Energy Information Administration (EIA), New York City, with a population of almost 20 million people, has one of the lowest CO_2 emissions per capita – about 8 tons per capita. It is important to notice that the New York economy is focused on activities with low energy consumption (for example, financial markets)[10].

[5] United States Environmental Protection Agency. Available at: https://www.epa.gov/

[6] The Bureau of Economic Analysis (BEA). Available at: https://www.bea.gov/

[7] Available at: https://rosstat.gov.ru/

[8] Energy Information Administration (EIA). Available at: https://www.eia.gov

[9] On the environmental situation in the Yamalo-Nenets Autonomous Okrug in 2017: State Report. Salekhard, 2018.

[10] Energy Information Administration (EIA). Available at: https://www.eia.gov

Table 1. Moran's index and p-value for the dependent variable "pollutant emissions" in the USA and Russia (by year)

Year	US Inverse Distance Matrix		Russia's Inverse Distance Matrix	
	Moran's Index	P-value	Moran's Index	P-value
2004	-0.017	0.740	-0.011	0.802
2005	-0.016	0.66	-0.01	0.748
2006	-0.017	0.703	-0.011	0.771
2007	-0.016	0.675	-0.011	0.783
2008	-0.015	0.612	-0.009	0.649
2009	-0.013	0.455	-0.009	0.646
2010	-0.013	0.489	-0.007	0.505
2011	-0.013	0.49	-0.007	0.506
2012	-0.014	0.516	-0.008	0.587
2013	-0.012	0.439	-0.007	0.488
2014	-0.012	0.432	-0.007	0.463
2015	-0.014	0.518	-0.007	0.485
2016	-0.014	0.561	-0.007	0.492
2017	-0.014	0.561	-0.009	0.605
2018	-0.015	0.595	-0.010	0.731

Source: Own compilation according to data of Energy Information Administration (https://www.eia.gov), U.S. Bureau of Economic Analysis (https://www.bea.gov), and Federal State Statistics Service of Russia (https://rosstat.gov.ru/).

In Russia, the lowest value was observed in 2018 in the Republic of Ingushetia – 0.002 tons per capita. We have noted that most of the regions with low pollutant emissions are located in the south of Russia (North Caucasian Federal District) and are the least economically developed. Also, low rates were recorded in Moscow and Saint Petersburg. This is not surprising, since these cities have the highest population density: in Moscow, it is 4,925.9 people per 1 sq. km, and in Saint-Petersburg – 3,741.5 people per 1 sq. km.

The next step for analyzing the spatial dependence between regions on the pollutant emission level is to find the Moran's spatial autocorrelation index *(Tab.1)*.

We can see that in Russia and the USA there is a spatial correlation according to the dependent variable, which means that the pollutant emissions are significant (at a significance level of 0.1). Accordingly, the emission level in one region is closely related to the emission level in another, so spatial models for the environmental Kuznets curve are constructed further:

1) for the USA:

$$Y = \lambda \times \mathrm{W} \times \mathrm{y} + \\ + \beta_1 \times \ln\mathrm{GDP} + \beta_2 \times \ln\mathrm{GDP}^2 + \beta_3 \times (Min) + \\ + \beta_4 \times (Man) + \beta_5 \times \ln \mathrm{In} + \beta_6 \times \ln\mathrm{El} + \mathrm{u}, \quad (13)$$
$$\mathrm{u} = p\mathrm{Wu} + \varepsilon,$$

where Y – dependent variable (energy-related carbon dioxide emissions per capita (metric tons), W – matrix of spatial weights,

λ and p – spatial parameters.

We have used the following variables as explanatory variables:

lnGDP – real GDP by state per capita (in 2012 prices, million US dollars);

(*Min*) – share of mining in the sectoral structure of GDP by state;

(*Man*) – share of manufacturing industries in the structure of GDP by state;

lnIn – disposable income per capita (US dollars);

lnEl – energy consumption per capita (million BTU);

2) for Russia's regions:

$$Y = \lambda \times \mathrm{W} \times \mathrm{y} + \\ + \beta_1 \times \ln\mathrm{GRP} + \beta_2 \times \ln\mathrm{GRP}^2 + \beta_3 \times (Min) + \\ + \beta_4 \times (Man) + \beta_5 \times \ln\mathrm{In} + \beta_6 \times \ln\mathrm{El} + \mathrm{u}, \\ \mathrm{u} = pW\mathrm{u} + \varepsilon, \quad (14)$$

where Y – dependent variable (pollutant emissions into the atmospheric air from stationary sources per capita (t)), W – matrix of spatial weights, λ and p – spatial parameters. We have used the following variables as explanatory variables:

lnGRP – gross regional product per capita (in 2012 prices, million rubles);

(Min) – share of mineral extraction in the sectoral structure of GRP;

(Man) – share of manufacturing industries in the structure of GRP;

lnIn – average per capita monetary income (thousand rubles);

lnEl – electricity consumption per capita (thousand kWh).

It is worth noting that the dependent variables in the USA and Russia are different. For the US data, an indicator of CO_2 emissions, related to energy, was taken. They arise as a result of the consumption of fossil fuels in all sectors including residential, commercial, industrial, as well as during electricity consumption for production. We have taken the indicator "air pollutant emissions from stationary sources" as a dependent variable for analyzing regional data for Russia. It includes the following pollutants: sulfur dioxide, nitrogen oxides, carbon monoxide, hydrocarbons taking into account volatile organic compounds. The differences in the dependent variables, taken for analysis, are due to the fact that the methodologies for accounting for pollutant emissions in the USA and Russia differ.

Table 2 shows the results of the obtained models.

Spatial autoregression coefficients are significant in both models; therefore, there is an interdependence of the pollution levels of neighboring regions both in Russia and in the USA.

In the model, based on the data from Russia's regions, the coefficients for all variables except *Min* and *Man* are statistically significant. In the USA, the coefficients for the variables *Min, Man*, lnEl are statistically significant. The estimates in *Table 2* cannot be interpreted directly because the spatial regression specification should be taken into account for the coefficients obtained. If there are lags of a dependent variable or independent variables in the models, then the dependent variable in *i*-th region (state) is influenced not only by its regressors, but also by indicators of other regions (states).

Table 2. SAC-FE model estimates

	Coefficient		Standard error	
	USA	Russia	USA	Russia
Spatial coefficient	0.18	-0.56	-	
Spatial autoregression coefficient	**-0.66****	**1.18****	**(0.09)**	**(-0.35)**
Regressors				
Share of mining	0.00**	0.00	(0.00)	(0.00)
Share of manufacturing industries	0.01***	0.00	(0.00)	(0.00)
Ln (*Gross regional product*)	-0.69	-1.43***	(-2.71)	(-0.35)
(ln (*Gross regional product*))^2	-0.02	0.05***	(-0.12)	(-0.01)
Ln (*Average per capita income*)	0.11	0.21**	(-0.07)	(-0.06)
Ln (*Electricity consumption*)	0.85***	-0.46**	(-0.04)	(-0.14)

Note: *** – p < 0.001; **– p < 0.01; * – p < 0.05; . – p < 0.1.
Source: Own compilation according to data of Energy Information Administration (https://www.eia.gov), U.S. Bureau of Economic Analysis (https://www.bea.gov), and Federal State Statistics Service of Russia (https://rosstat.gov.ru/).

Direct and indirect effects are used for the correct interpretation of the coefficients. The direct effect is the influence of exogenous variables that relate to *i*-th state on the explained variable λ of *i*-th state. It is worth noting that in the simplest models, this is the coefficient β before the variable. If there are *X* and *Y* lags in the equations, then the direct effect is calculated as the average value of the diagonal elements of the matrix $(I - p \times W)^{-1}\text{-}\beta_i$, where *I* is a unit matrix of size *N* (number of states), and *W* is a matrix of weights (matrix of inverse distances). The indirect effect is the effect of independent variables that relate to *i*-th state on the dependent variable of *j*-th state. This effect is calculated as the average value of the non-diagonal elements of the matrix $(I - p \times W)^{-1}\text{-}\beta_i$.

The specificity of this model is that the right side of the equation includes the spatial lag of the endogenous variable ($\lambda \times W \times y$). Coefficients for independent variables cannot be interpreted directly; this requires direct and indirect effects which we have calculated at the next step.

According to *Table 3*, the coefficient for the variable "Share of mining" in both countries is significant. Accordingly, both in Russia and in the USA, this economic branch has an impact on pollutant emissions.

Indeed, the extractive industry makes a big contribution to the amount of pollutant emissions (Addison, 2018). When burning oil and gas, large amounts of CH_4 (methane), C_2H_6 (ethane), and CO_2 (carbon dioxide) are released into the atmosphere.

Also, in both countries, the coefficient for the variable "Share of manufacturing industries" is significant. Accordingly, manufacturing has a significant impact on emissions in both the US and Russia.

Moreover, this industry affects emissions not only in a particular state, but also in neighboring ones. For instance, a sharp increase in the cost of natural gas in one state may lead to the introduction of new energy-efficient technologies, which, in turn, will have an impact on reducing emissions and improving living standards. In the long term, this may affect production facilities, located in neighboring states. They can follow suit and also introduce more energy-efficient technologies to reduce energy consumption and decrease emissions. Accordingly, changes in the manufacturing industry in this state will affect emissions changes in others.

As for the region's GRP variable (or state GDP), this variable is not significant in the USA. We can assume that the lack of impact of this indicator on emissions is due to the fact that the main industries that influence carbon dioxide emissions (mining and manufacturing) do not make a significant contribution to the state's GDP. Thus, the hypothesis of the existence of the environmental Kuznets curve on the data of the US states has not been confirmed. It means that the

Table 3. Magnitude of direct and indirect effects

	Direct effect		Indirect effect	
	USA	Russia	USA	Russia
Share of mining	0.005*	0.03***	0.01	0.00
Share of manufacturing industries	0.01***	0.01*	0.01.	0.00
ln(Gross regional product)	-0.71	2.85***	-1.31	-0.35
$(ln(Gross\ regional\ product))_2$	**0.02**	**-0.11*** **	0.04	0.01
ln(Average per capita income)	0.11	-0.54***	0.2	0.07
ln(Electricity consumption)	0.88***	1.28***	1.62.	-0.16

Note: *** – p < 0.001; **– p < 0.01; * – p < 0.05; . – p < 0.1.
Source: Own compilation according to data of Energy Information Administration (https://www.eia.gov), U.S. Bureau of Economic Analysis (https://www.bea.gov), and Federal State Statistics Service of Russia (https://rosstat.gov.ru/).

level of carbon dioxide emissions does not depend on the state's economic growth. Consequently, changing the economic structure by reducing the share of manufacturing and extractive industries does not have a significant impact on the economic development rate, but at the same time entails a reduction in emissions in the United States.

However, for Russia, the GRP variable turned out to be significant. The results of the model's evaluation confirmed the presence of EKC, which means that there is an inverted U-shaped dependence of pollutant emissions on GRP in Russia's regions. Variable $(\ln GDP)^2$ is significant, therefore, the change in this indicator has an impact on the change in carbon dioxide emissions. Next, we have found GRP turning point, after which the pollutant emissions level will decrease. To calculate the turning point, the found values of the direct effects (lnGREP) and $(\ln GRP)^2$ were taken. The result was 581,602 (in 2012 prices, rubles).

Accordingly, in 10 regions out of 75, the average annual GRP per capita for the period 2004–2018 exceeds this value. Large indicator values are typical for Moscow and regions with a raw material export-oriented economy. Most of them are characterized by a high share of mining in the GRP structure. For example, in the Magadan Oblast in 2018, the share of the extractive industry in the GRP structure was 37%.

Thus, the value of the GRP turning point, obtained over a given period, cannot be considered easily achievable for many Russia's regions.

Accordingly, Russia's continued dependence on energy-intensive types of production not only poses a problem for the Russian economy in the future, but is also expected to exacerbate the consequences it faces as a result of climate change. Therefore, it is necessary to take measures to reduce greenhouse gas emissions and preserve the environment. Let us try to highlight the main measures.

First of all, it is necessary to revise the goal of reducing emissions by 2030. For instance, we can try to take into account the experience of the EU countries, which have committed to reduce air emissions by 55% by 2030. Also, in many countries there is a quota trading policy, which means that a limit on carbon dioxide emissions is set. A government agency sets a "limit" on the emissions that can be produced in its jurisdiction, and companies are given carbon emission quotas. These quotas can be used or sold to other companies. It is possible to raise the question of setting more stringent requirements for greenhouse gas emissions. So, for example, it is possible to make a decision on a carbon tax, and to introduce a fee for burning carbon-based fuels. It is worth noting that this tax is taken into account in the policies of many developed countries in order to reduce the use of fossil fuels, the burning of which harms the environment. The Government of the Russian Federation started discussing this issue at the end of 2021.

Second, it is important to gradually reduce emissions of coal-fired electricity. Instead, it is necessary to develop other sources of energy, such as solar, wind, tidal, geothermal. Investment from the state is essential part for the development of alternative sources.

Third, measures should be taken in the field of agriculture and forestry, which is to increase the amount of CO_2 absorption due to new forest plantations and to reduce N_2O emissions by reducing the amount of fertilizers used.

Fourth, it is necessary to increase the number of landfill gas capture plants for reducing emissions. Landfill gas is a renewable energy source. So that the gas does not dissipate in the atmosphere, it can be captured, processed and used.

Conclusion

Global warming is one of the most serious problems in the world today. It is believed that the cause of environmental problems is economic growth: an increase in production leads to emission growth.

The article assesses the impact of mining, manufacturing, monetary income per capita, electricity consumption on air pollution (pollutant emissions) in the two countries. There is no doubt that air pollution, even at the regional level, is also influenced by the policies of States including neighboring countries. The obvious difficulty lies in the fact that it is difficult for countries to agree on common approaches to solving the problem of environmental pollution, in particular air. The situation is aggravated by the difficult international situation, when many agreements are being revised, and countries are withdrawing from the treaties. The Paris Agreement is an example. It is impossible to ignore the positive fact that the current positions of the Presidents of the Russian Federation and the United States on this issue do not contradict each other in general.

As a result of the analysis, we have revealed that economic growth may not have an impact on the pollution level (for example, in the USA). As policy measures in the United States, we can consider the reduction of the manufacturing and extractive industries, since it will not affect the development rate of the US economy. It is also worth noting that the use of energy-efficient technologies and renewable energy sources will lead to a reduction in the pollutant emissions level.

In Russia's regions, we have obtained a U-shaped dependence of pollutant emissions on the region's GRP for the period from 2004 to 2018. But the calculated value of the GRP turning point, upon reaching which emissions of pollutants should begin decreasing, turned out to be quite high for Russia's entities, and only in 10 of them the emission level decreases when this value is reached. Thus, the confirmation of the hypothesis of the existence of the environmental Kuznets curve on Russian data is conditional. Regions with a high GRP level correspond to a high emission level, since they have a significant raw material base.

Consequently, the economic growth of Russia's regions cannot be defined as stable in the long term and contributing to reducing the pressure exerted on the environment. The main reason is the raw material dependence of the Russian economy. Decarbonization measures are quite obvious: the use of highly efficient, "clean" technologies in the extractive sector of the economy, energy-saving technologies in the manufacturing sector, as well as the implementation of economic diversification. Nevertheless, their intensive implementation remains an extremely difficult task.

In conclusion, we would like to note that the research results can help in modeling regional economic growth taking into account trends in environmental policy. The more accurate the estimates of the coefficients of the factors considered in the model are, the more concrete it is possible to formulate assumptions about the necessary regional policy measures and their impact on economic growth, as well as predict pollution levels. The approach to this issue in the United States is also useful for Russia, despite the fundamental differences in the economies of the two countries. The findings may be useful for a coordinated environmental policy at the federal and regional levels.

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Information about the Authors

Aleksei N. Kurbatskiy – Candidate of Sciences (Physics and Mathematics), Associate Professor, head of department, Moscow School of Economics, Lomonosov Moscow State University (1, Leninskie Gory, building 61, Moscow, 119234, Russian Federation; e-mail: akurbatskiy@gmail.com)

Ekaterina I. Shakleina – master's degree student, Moscow School of Economics, Lomonosov Moscow State University (1, Leninskie Gory, building 61, Moscow, 119234, Russian Federation; e-mail: kateshkln99@gmail.com)

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Methods for Analyzing Economic and Social Development of Smart Cities

Evgeny V.
POPOV
Institute of Economics, Ural Branch of the Russian Academy of Sciences
Yekaterinburg, Russian Federation
e-mail: epopov@mail.ru
ORCID: 0000-0002-5513-5020; ResearcherID: H-3358-2015

Konstantin A.
SEMYACHKOV
Institute of Economics, Ural Branch of the Russian Academy of Sciences
Yekaterinburg, Russian Federation
e-mail: k.semyachkov@mail.ru
ORCID: 0000-0003-0998-0183; ResearcherID: F-6974-2017

Abstract. The purpose of the study is to develop a typology of methods for analyzing economic and social development of smart cities. Having reviewed the works indexed in the global database Web of Science Core Collection we selected one and a half hundred articles on economic problems of smart cities development published in 2015–2021 and available in the public domain. We identify various methods for analyzing economic and social development of smart cities, differentiate them using the method of describing the objects under consideration (static and dynamic) and the method of model description (tables, diagrams, matrices, graphs). Static methods include methods for assessing ecosystem characteristics, input-output analysis, development diagrams, data ecosystems coordination analysis, assessment of the ecosystem for elderly residents. Dynamic methods include the Value Creation – Value Capturing matrices, stimulating management elements, "digital ecosystems – entrepreneurial ecosystems", graphs showing the life cycle of the smart city ecosystem, evolution of civil ecosystems, stage-by-stage digital transformation, dynamic opportunities for innovation and the quadruple helix.

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We show the applicability of methods for analyzing the development of smart cities for various territories. We present our own results of assessment of the development of smart cities in Moscow, Yekaterinburg, Oslo, Singapore based on the 7I-model (infrastructure, institutions, intranet, integration, interfaces, innovations, implementation). Theoretical significance of the results obtained consists in the development of a theory of ecosystem analysis related to assessing the formation of smart cities; practical significance of the results lies in the development of applied tools for strategic planning in the field of smart city project development.

Key words: smart cities, analysis methods, static methods, dynamic methods, tables, diagrams, matrices, graphs.

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Introduction

The development of digital technologies and their applications has led to the formation of a qualitatively new landscape of economic and social changes in the development of human society. Against this background, there was a rapid development of smart cities (Popov, Semyachkov, 2020). Smart cities mean urban settlements in which the use of digital technologies leads to significant economic and social development providing a significant increase in the citizens' well-being.

The exponential growth of relevant scientific publications, indexed in global databases, demonstrates the researchers' growing interest in the topic of analyzing the economic and social development of smart cities. At the same time, until now, the analysis methods of the development of such objects of the digital economy have not received a systematic presentation.

In this regard, the purpose of our research is to design a typology of the analysis methods of economic and social development of smart cities. The algorithm of such a study should include an assessment and criticism of previous works, issue formulation, solving the typologization issue of methods for analyzing the economic and social development of smart cities, discussion of the results obtained and demonstration of the applicability of the selected analysis methods.

It is advisable to evaluate previous studies on the economic and social development of smart cities within the framework of ecosystems of urban formations. By the early 2020s, it became clear that the network paradigm of economic relations does not describe the entire landscape of economic interactions. The introduction of digital technologies stimulated the development of economic activity taking into account not only partners, consumers, suppliers and competitors, but also the influence of public organizations, authorities and social media. The paradigm of ecosystem analysis of the economy began developing, the first works on which appeared at the end of the 20th century.

The ancestor of the term "ecosystem" in relation to the economy is considered to be J. Moore. He defined ecosystem as "an economic community supported by a basis of interacting organizations and individuals" (Moore, 1997). The analysis of urban ecosystems involves the assessment of all individuals and organizations interested in relations with these settlements.

Smart city ecosystems

During the formation of smart cities, the development of human-oriented sustainable ecosystem of the urban area takes place. This leads to a better world with improved human well-being, with better cities emphasizing the importance of education and science, promoting wisdom and common sense, rejecting violence. On this side, digital technologies provide successful basis for developing modern society (Bliss et al., 2021). On the other hand, urbanization of the second half of the 20th century contributed to the decline of cities as places of economic value creation. Suburbanization, first of residential buildings and then of industry, led to the devastation and, in some areas, destruction of urban life. In the first half of the 21st century, cities began reviving as innovation engines. This renaissance is an organic response to the digital technology adoption (Engel et al., 2018).

Smart cities are known as systems of material infrastructure, digital technology infrastructure and social infrastructure that exchange information flowing between its numerous subsystems. The built-in infrastructure of digital technologies in smart cities plays a crucial role in the functioning of the entire system. The most important derivative of digital technologies is new communication means, known as social network services, which provide smart cities with additional opportunities (Hajikhani, 2020). Social network services, in turn, contribute to the formation of digital social innovations that use the potential of digital technologies to jointly solve problems in a wide range of social needs (Certoma, 2020).

We should note that digital technologies and solutions, based on the principles of sustainable development, can make cities smarter representing a new technological portfolio for the biodiversity conservation and the provision of a range of ecosystem services, facilitating the necessary adaptation to climate change which cities should give priority to in order to ensure their sustainability (Colding et al., 2020). The results indicate a spatial interdependence between environmental and socio-economic processes in urban environments which provides a unique basis for planning strategies and policy intervention in the development of smart city ecosystems (Hazell, 2020). What is the structure of smart city ecosystems?

Since traditional organization models are of little use for smart cities, their structure is based on network, cross-border systems of activity with distributed innovation processes and adaptive policy formation. In this case, five key dimensions can be defined in the configuration fields of smart cities which are displayed in five organizational structures: actors, urban subsystems, activity levels, rules of activity of actors at various activity levels, institutional support for this activity (Pierce et al., 2017). It is necessary to develop active strategies for smart territories including strengthening smart clusters, creating a management ecosystem and providing integrated services that provide hybrid strategies for upstream and downstream design approach to planning for the development of smart cities (Yuan et al., 2020). With regard to smart cities, three key characteristics of growing business and the ability to occupy leading positions can be distinguished: joint creation through the integration of resources and the exchange of services is preferable to meet the market needs; the digital platform is critical for creating the necessary knowledge for the integration of resources and the exchange of services; intelligent services combine the city's ecosystem and the digital platform and create a result that solves a specific business problem. In other words, all three elements of a smart city – ecosystem, platform and intelligent services – create a single environment in which it is possible to develop business in a new emerging market (Pulkkinen et al., 2019).

Cities are becoming experimental sites for new forms of robotics and automation technologies, used in a wide variety of sectors in all areas of

economic and social life. Robotics and automation systems are superimposed on existing urban digital networks expanding the capabilities of infrastructure networks, as well as changing the everyday experience of the city and citizens (Macrorie et al., 2021). The Internet of Things, as a component of smart urbanism, is also used to solve the smart city issues. Internet of Things technologies reconfigure connections between users, suppliers and water and energy infrastructures which ensures reliability in economic activities (Chambers, Evans, 2020).

At the same time, citizens' trust in a smart city is fundamental for its transparency, residents' participation in management and entrepreneurial initiatives, and therefore for its economic growth. In this case, blockchain technology provides the most important level of trust in a smart city. The blockchain technology value for smart cities can be represented in three positions: network impact on trust in society, government authorities and manufacturing enterprises; empowering individuals and strengthening the economy; liquid and shared economy (Kundu, 2019).

Big data analytics and artificial intelligence, combined with blockchain technology and the Internet of Things, as well as other new technologies are revolutionizing urban governance. Thanks to the huge amounts of data, collected from citizens, digital devices and traditional information sources, urban areas for the first time in history have the ability to manage urban infrastructure in real time (Engin et al., 2020). How is the smart city ecosystem managed?

Fragmented management of smart city digitalization reduces the scale of economic activity and leads to incompatibility of interdisciplinary data which limits the planning sequence and open data benefits (Kitchin, Moore-Cherry, 2020). In this case, Big Data application strategies transform the activities of city governments so that they become more focused on meeting the citizens' needs (Lee, 2020).

Smart city ecosystem management relies on regulatory, supportive, and cognitive economic institutions. At the same time, in various smart cities (for example, Amsterdam, Hamburg and Nimbo), combination of strategic management and the dynamics of the use of these institutions differs on a spatial scale to take into account local features (Raven et al., 2019).

In smart cities, a transition to sustainable development is possible for the circular economy, based on the rational management concept, i.e. combination of cooperation and competition. In this case, it is necessary to support intelligent technologies that develop digital society (Hirvensalo et al., 2021). Smart city management can take place at the following levels (for example, Dublin): local authorities – steering committee – advisory network – smart city management group – local working groups (Coletta et al., 2019). But the most interesting topic of any research is the analysis of the development of smart cities. What are the prospects for such development?

Industry 4.0, also known the Fourth Industrial Revolution, leaves its mark on the territories' development, as it affects the production in companies and, as a result, on all economic activity. Industry 4.0 creates new markets and destabilizes the traditional way of doing business. As soon as it becomes a strategic approach to integrating advanced management systems with digital technologies that provide communication between people, wares and complex systems, we can expect significant development of smart city management systems (Storolli et al., 2019).

The sustainable development issue is also important in the context of the problems faced by modern cities. Three fundamental pillars of sustainable development: economic growth, environmental management and social integration are manifested in all economic sectors. They mainly affect cities, rapid urbanization process, and the development of infrastructure, energy and

transport. City authorities are planning and acting toward a more sustainable future characterized by investments in innovative, integrated technologies and services such as smart buildings, population mobility, controlled lighting and broadband (Derlukiewicz, Mempel-Sniezyk, 2018).

In 2016, the Government of Japan unveiled an initiative and a call to action to introduce a "super smart society", announced as Society 5.0. The stated goal of such a society is to meet the various needs of its members by providing goods and services to those who need them, when they are required and in the required quantity, which will allow citizens to lead active and comfortable life. In this case, the intellectual community should be defined as a human-oriented organization where technologies are used to provide citizens with information and services that they can use to justify their decisions. Such a perspective may be one of the directions for the development of smart cities (Iqbal, Olariu, 2021).

The determinants of the development of smart cities are internal factors, related to the citizens' involvement in digitalization projects, authorities' leadership and formation of the necessary infrastructure, as well as external factors, based on the political will of decision makers, the interest of various parties and the influence of the Fourth Industrial Revolution. In addition, it is necessary to have communication channels and public hearings (Myeong et al., 2018).

Urban "living laboratories" are used to develop new products, based on distributed knowledge as a driving force for sustainable innovation. In laboratories, innovative ideas converge in developing an experimental framework of various stakeholders that structures mechanisms and practices within dynamic collaborative ecosystems and defines boundary conditions for such open ecosystems (Robaeyst et al., 2021).

Evaluation of the previous studies demonstrates various analysis methods of smart city ecosystems. However, there is currently no systematization of these methods, whereas a systematic analysis of the development of smart cities requires a targeted approach to such assessments. Hence, there is a problem associated with the need to develop a typology of the methods for analyzing economic and social development of smart cities.

Research procedure

The research object is the smart city ecosystems. The subject of the study is economic and social relations in their development. The information base is the world database Web of Science Core Collection, in which one and a half hundred articles, published in 2015–2021 and in open access, were selected according to the keywords "Smart City Ecosystem" in the titles and annotations. The research method is logical hierarchical analysis.

After a critical analysis of the previous studies and formulation of the problem, we have identified various analysis methods of the economic and social development of smart cities for study. The differentiation of the selected methods was carried out by the method of describing the objects under consideration (static and dynamic) and by the method of model description (tables, diagrams, matrices, graphs). In this case, tabular and diagrammatic methods of description were attributed to static methods of analysis, and matrix and graphical modeling – to dynamic ones (Popov, 2020). As a result, we have obtained a typology of methods for analyzing the development of smart cities.

Typology of methods for analyzing the development of smart cities

The data obtained as a result of the study are summarized in a *Table*.

Application of methods for analyzing the development of smart cities

The results of the data analysis in the table demonstrate a wide range of possible methods for analyzing the development of smart cities and the geography of application of these methods.

Methods for analyzing the development of smart cities

Description method (modeling)	Name of the method	Method content
Static (tables)	Assessment of ecosystem characteristics	Assessment of the content of three ecosystem characteristics: marketing (user perspective is emphasized), strategic management (the reasonableness concept is used to attract stakeholders for decision-making purposes), technology (the use of artificial intelligence, the Internet of Things, machine learning with data analysis to provide smart services) (Ruohomaa et al., 2019)
	Input-output analysis	Analysis of the mutual correlation of costs and output in nine industries: agriculture, mining, traditional production, IT production, construction, energy, IT services, information services, traditional services, etc. (Jo et al., 2021)
Static (diagrams)	Development diagram	Expert assessment in four areas: development strategy, digital technologies (capacities, data, technological experiments), management (security, vertical and horizontal scales), stakeholders (funding, stakeholder values) (Hamalainen, 2020)
	Data ecosystem coordination analysis	Three coordination elements in smart city data ecosystems: openness (technological, organizational), dissemination (knowledge mobility, trust building), common vision (management tools, central coordination structures) (Gupta et al., 2020)
	Ecosystem assessment for age-related residents	Expert evaluation of eight city indicators: housing conditions, urban environment, transport, social engagement, social participation, information communications, health, employment (work) (Marston et al., 2020)
Dynamic (matrices)	"Value Creation – Value Capturing "	Four business models: "glass balls" (all is individually); "tetris" (values are created individually, but profitable models occupy part of the ecosystem); "janga" (ecosystem actors study each other with limited income potential for each); "puzzles" (synergy within the ecosystem for the greatest value for consumers) (Brock et al., 2019)
	Stimulating controls	Evaluation of stimulating controls (transformational leadership, cooperative strategies, goal setting) and hindering controls (lack of expectation management) at the initial stage of smart city formation; during the growth phase, stimulating elements (transactional leadership, creative strategies, performance measurement, promotion organization) and hindering elements (lack of leadership, lack of goal setting, lack of focus on communications) (Ooms et al., 2020)
	"Digital – entrepreneurial ecosystems"	Four digital entrepreneurial ecosystems: digital infrastructure management (infrastructure institutions); citizens› digital technologies (user institutions); digital entrepreneurship (digital infrastructure agents); digital market (user agents) (Gorelova et al., 2021)
Dynamic (graphics)	Ecosystem life cycle	Assessment of various phases of city development: integration of innovations, integration of functions, financial management, project management – City 1.0 – understanding of ecosystem evolution, development and adjustment, sustainable city, integration of innovations – City 2.0 – continuous improvement (Rochet, Correa, 2016)
	Evolution of civil ecosystems	The analysis of the evolution of innovative ecosystems (living laboratories and knowledge integrators) is carried out in the space of an "organizational field" that includes the private sector, scientific and educational sector, public sector and citizens (Claudel, 2018)
	Digital transformation stages	Assessment stages: vision and concepts – digital ecosystem of smart city area – dissemination (through hackathons) and events (Elberzhager et al., 2021)
	Dynamic innovation opportunities	Expert assessment of dynamic opportunities for ecosystem innovation: ecosystem sensing (screening capabilities, partner exploration), ecosystem utilization (value development proposals, ecosystem formation), ecosystem reconfiguration (creation of adaptive values, ecosystem resilience) (Linde et al., 2021)
	Quadruple helix	Development assessment of the four sides of a smart city: civil society, private business sector, public sector management, scientific and educational sector (Paskaleva et al., 2021)

The method of assessing ecosystem characteristics (Ruohomaa et al., 2019) was implemented in the study of small towns in Finland (Hamenlina, Riihimaki, Forsa). The research shows that a relatively small city can take significant steps in the development of smart city technologies by choosing a specific topic for organizing events on its territory. Examples of the implementation of smart city technologies highlighted the importance of public sector entities which play a key role in creating the foundations for fruitful work on the development of smart territory ecosystems.

The input-output analysis (Jo et. al., 2021) was applied to assess smart city ecosystems in Korea. For comparative analysis, data from the Bank of Korea from 1960 to 2015 were used. The study has found that smart industries such as smart buildings and smart transportation systems are anchor industries in Korean smart cities and positively correlate with three other industries: IT manufacturing, IT services and information services. The results of the analysis show that the traditional industrial structure of labor-intensive production has been transformed into developing high-tech industries. Smart industries such as IT manufacturing, IT services and information services have led to sustained national economic growth with greater added value than other industries. Consequently, intellectual industries become anchor industries that create value chains of new industries, acting as accelerators or incubators for their development.

In relation to the smart city of Helsinki, the capital of Finland, the method of the development diagram (Hamalainen, 2020) was applied; the main directions for the implementation of initiatives for the formation of smart territories were identified. Using the example of London, the capital of the United Kingdom, the study was carried out by the method of data coordination ecosystem analysis (Gupta et al., 2020). The problems faced in complex urban data environments by the authorities, involved in such ecosystems and coordinating data collection initiatives from the point of view of their organization, are identified. The need to apply flexible approaches in order to develop initiatives for the formation of smart territories is also shown on the example of London. For this purpose, the ecosystem assessment method for age-related residents was used (Marston et al., 2020).

The introduction of Philips Lighting digital technologies in the cities of the Netherlands served as a testing ground for the Value Creation – Value Capturing matrices (Brock et al., 2019). The research highlights various business models that allow existing organizations to enter the structure of smart cities. Stimulating and hindering control elements for the development of smart cities are also analyzed using the example of the Netherlands (Ooms et al., 2020). The authors have found that the use of specific control elements varies depending on the evolution stages of the smart city ecosystem. At the initial stage, the key ones management structures, aimed at strengthening internal relations. At this stage, elements such as trust and commitment to common goals are important. During the growth phase, the ecosystem focuses on establishing external relationships with other parties, such as competitors and suppliers. At this stage, the control elements, such as a collaborative creative strategy and a special organization for promotion, become important because they facilitate communication with the outside world.

The analysis of European cities on the six main components of smart cities: smart people, smart management, smart economy, smart housing environment, smart environment, smart transport – was carried out on the basis of the matrix "digital ecosystems – entrepreneurial ecosystems" (Gorelova et al., 2021). The research shows that digital entrepreneurial ecosystems are an integral part of any smart city.

Using the example of Washington, the US capital, Singapore and a number of French cities,

the applicability of the smart city ecosystem life cycle method for analyzing to assess its development is demonstrated (Rochet, Correa, 2016). Based on the life cycle, it is possible to determine the tasks that the integrator of the functions that make up the smart city should perform. The conducted research determined that the role of the integrator of functions should be played by public administration.

Amsterdam, Barcelona, Copenhagen acted as platforms for the application of the analysis of the evolution of civil innovation ecosystems (Claudel, 2018). The paper proves that the development of living laboratories and innovation integrators leads to the formation of information hubs, which act as a "niche" that promotes radical innovations and new processes. As these prototypes are increasingly deployed and adopted, there is a change in the innovation regime, creating a new culture of experimenters. For example, urban living laboratories can evolve into urban experimental platforms (Rehm et al., 2021).

The assessment of the digital transformation stages (Elberzhager et al., 2021) was carried out on the example of smart cities in Germany. In this case, we have to look for new ways to identify the needs and requirements for digital solutions, not yet knowing the citizens who will live in the new areas. Consequently, the assessment of the stages of digitalization is a possible strategy for the formation of a digital society. Note that such strategies can be formed on the basis of digital urban-scale counterparts (Nochta et al., 2021).

The analysis of dynamic opportunities for the innovation ecosystem (Elberzhager et al., 2021) was carried out in the study of smart cities in Sweden. Based on numerous interviews, three coordination mechanisms have been identified for organizing innovation in ecosystems: setting up partnerships in ecosystems, deploying value propositions, and managing ecosystem coordination.

To analyze the development of Manchester (UK), Eindhoven (the Netherlands) and Stavanger (Norway), the method of estimating the quadruple helix was used (Paskaleva et al., 2021). The study shows that the involvement of the quadruple helix stakeholders in the joint assessment of activities increases the ability of projects to ensure and measure the impact of digital technologies and applications which is important for cities and citizens.

We have previously proposed a method of phasing digital transformation of smart cities, developed a scheme of seven successive levels in the development of smart cities: engineering infrastructure (Infrastructure), institutes (Institutions), communication and communications systems (Intranet), data integration (Integration), interaction of users and technical systems (Interfaces), innovations (Innovations), application innovations in smart city components (Implementation) (Popov, Semyachkov, 2020). The superimposition of the 7I-model on the six main components of the smart city development made it possible to obtain a matrix of the smart city development indicators which makes it possible to compare different territories with each other (Popov, Semyachkov, 2021).

For example, *Figure 1* shows a comparison of the use of digital technologies in various cities studied.

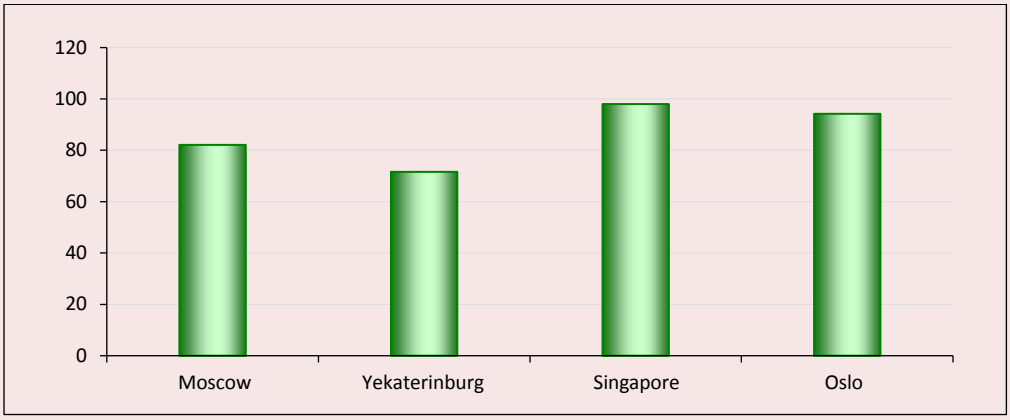
The data in Figure 1 demonstrate close development of various cities in the direction of the household's digitalization.

On the other hand, the data, presented in *Figure 2,* demonstrate a sharp difference in digital technologies for accounting for utility needs in cities that have the characteristics of a smart city.

Thus, the use of various methods for analyzing the economic and social development of smart cities allows creating a basis for making management decisions on the strategic formation of such territories.

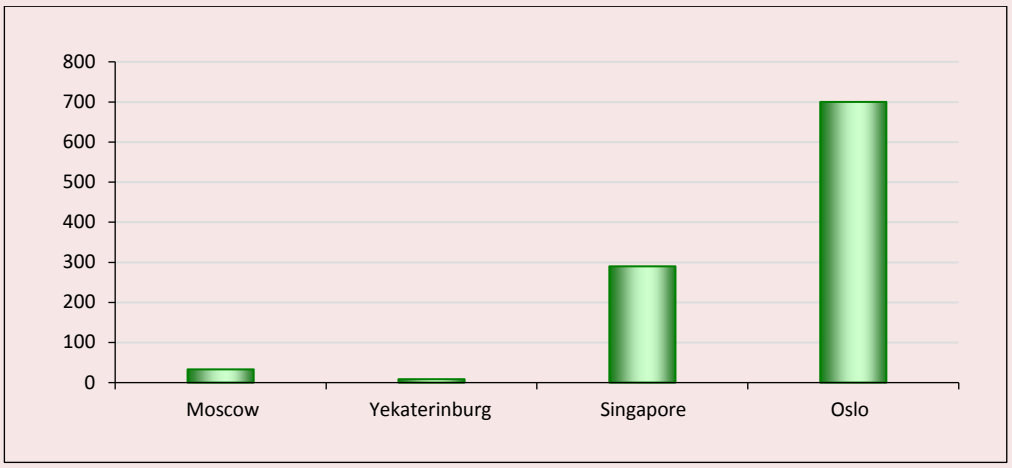
The scientific novelty of the conducted research lies in the typologization of methods for analyzing

Figure 1. Use of digital technologies in the household in Moscow, Yekaterinburg, Singapore, Oslo, %



Source: own compilation.

Figure 2. Number of smart metering devices per 1,000 households in Moscow, Yekaterinburg, Singapore, Oslo



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the economic and social development of smart cities which develops the theory of ecosystem analysis of territories' digitalization.

Conclusion

In the course of the research, conducted to develop a typology of the analysis methods of economic and social development of smart cities, we have obtained the following theoretical and practical results.

First, we have analyzed the results of the previous studies of the smart cities ecosystem, and formulated the problem associated with the need to develop a typology of methods for analyzing their economic and social development.

Second, based on the analysis of the works indexed in the world database Web of Science Core Collection we have selected one and a half hundred articles on the economic problems of the development of smart cities published in 2015–2021 and in the public domain.

Third, we have highlighted various methods for analyzing the economic and social development of

smart cities. The research carries out differentiation of the selected methods by the method of describing the objects under study (static and dynamic) and by the model description method (tables, diagrams, matrices, graphs). Static methods include methods for assessing ecosystem characteristics, input-output analysis, development diagrams, data ecosystem coordination analysis, ecosystem assessment for age-related residents; dynamic ones include the Value Creation – Value Capturing matrices, stimulating controls, "digital ecosystems – entrepreneurial ecosystems", as well as graphs of the life cycle of the smart city ecosystem, the evolution of civil ecosystems, digital transformation stages, dynamic innovation opportunities and the quadruple helix.

Fourth, we show the applicability of methods for analyzing the development of smart cities for various territories.

Fifth, for clarity, we have presented the author's results of the assessment of the development of smart cities in Moscow, Yekaterinburg, Oslo, Singapore based on the 7I-model (infrastructure, institutions, intranet, integration, interfaces, innovations, implementation).

The theoretical significance of the results obtained lies in the development of the theory of ecosystem analysis in relation to the assessment of the formation of smart cities; the practical significance consists in the development of applied tools for strategic planning in the field of smart city project development.

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Information about the Authors

Evgeny V. Popov – Doctor of Sciences (Economics), Professor, RAS Corresponding Member, Chief Researcher, Institute of Economics, Ural Branch of the Russian Academy of Sciences (29, Moskovskaya Street, Yekaterinburg, 620014, Russian Federation; e-mail: epopov@mail.ru)

Konstantin A. Semyachkov – Candidate of Sciences (Economics), Senior Researcher, Institute of Economics, Ural Branch of the Russian Academy of Sciences (29, Moskovskaya Street, Yekaterinburg, 620014, Russian Federation; e-mail: k.semyachkov@mail.ru)

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Development of the Information Society in the Russian Federation: Problems and Prospects

Vladimir S.
USKOV
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: v-uskov@mail.ru
ORCID: 0000-0001-5158-8551; ResearcherID: T-6713-2017

Abstract. The development of information technology and the informatization of society are putting forward new tasks that focus on obtaining major advantages in the use of information and communication technology, expanding the capabilities of users and effective use of the Internet and digital services. A characteristic feature of the modern stage of society's development is the digitalization of the economic and social spheres. Digital transformation has become an important factor in global economic growth: potential economic effects of the digital economy can significantly increase GDP, people's purchasing power, change the labor market and quality of life, and improve the business environment. The emergence of the concept of "digital economy" marked a new stage in the management of goods and services production based on the use of modern information technology. The development of the information society in Russia and the reduction of its lag behind the leading countries requires addressing the issues related to the development of intellectual, human, technological advantages; the formation of an adaptive regulatory framework for the introduction of digital technologies in all spheres of life. The purpose of the work is to comprehend the concept and the essence of the information society in its relationship with the phenomenon of the digital economy and to study trends, problems and prospects for development of the information society in the Russian Federation in the context of digitalization of the economy. We review theoretical concepts of the development of the information society, consider theoretical foundations of the essence of the information society in the context of digitalization of the economy, analyze the state of and trends in the development of the information society in the Russian Federation,

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and reveal problems and directions of its development. Scientific novelty and originality are as follows: we develop theoretical and methodological approaches to studying the essence of the information society in the conditions of digitalization of the economy and the corresponding conceptual apparatus; we define scientific and methodological foundations for a comprehensive assessment of the situation and trends in the development of the information society in the Russian Federation; we propose a range of practical measures and a list of indicators characterizing the development of the information society.

Key words: information society, digital economy, problems, state, trends, development directions.

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Introduction

The impact of information and communication technologies (ICT) on the socio-economic space is global, and the speed of their spread is high. They are widely used in various spheres of social and industrial activity. The scale of the informatization process determines the need to measure the impact of information processes and ICT on the national economy development.

The technological revolution of the late 20th century led to the transition from a "material" society to an "informational" one, where information is a priority production factor. This socio-economic transformation is reflected in the change in the production mode, GDP structure, emergence of new professions, development of information and communication infrastructure, globalization and digitalization of the economy, integration of services and technologies, as well as networks for the information transmission and processing.

All population groups and activity spheres are affected by informatization which is due to the information concentration in places of its accumulation and dissemination, as well as the possibility of its direct impact on society. Therefore, it is necessary to work out a number of measures for developing information and communication infrastructure that meets the needs of the economy and the information society.

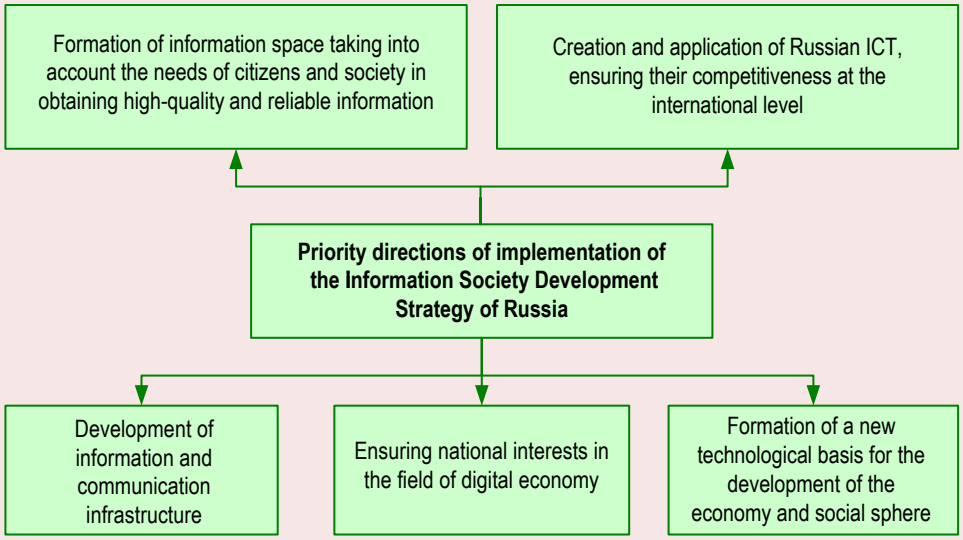
The ICT industry, as part of the material, industrial and social infrastructure, not only plays a direct role in solving all the tasks of forming the information society, but also has a specific stimulating effect in all economic and social spheres (Kuzovkova, 2017).

The Information Society Development Strategy in the Russian Federation for 2017–2030, approved by the Russian President, assigns information and communication technologies a major role in the development of Russia's external and internal policy, the information society formation, the digital economy creation and ensuring state interests and priorities within the economic digitalization *(Fig. 1)*.

In recent decades, ICTs have been of key importance in the process of developing the information society at the national and international levels and ensuring sustainable development standards. The importance of the industry is determined by the positive impact of the ICT use in the production of goods and services, as well as changes in the quality of production capacities and factors of production. Only when creating the information society it is possible to use the information resources and technologies effectively.

The purpose of the work is to comprehend the concept, the essence of the term of the information society in its relationship with the digital economy

Figure 1. Objectives of the Information Society Development Strategy in the Russian Federation for 2017–2030



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phenomenon, and to study trends, problems and prospects for the development of the information society in the Russian Federation in the economic digitalization. The following tasks are aimed at achieving it:

1) to summarize the theoretical concepts of the development of the information society;

2) to study the theoretical foundations of the information society essence in the economic digitalization;

3) to analyze the state and trends in the development of the information society in the Russian Federation;

4) to identify the problems and directions of the development of the information society in the Russian Federation in the context of the digital economy development.

Materials and methods of research

The research is based on the application of an interdisciplinary approach implying the use of a unified methodological framework in order to summarize the results in scientific, technological, industrial, socio-economic, institutional, administrative and managerial, political and legal and other areas to conduct a comprehensive analysis of the formation and development of the information society in the Russian Federation in the digital economy development.

We have carried out the analysis of the state and trends in the development of the information society in the Russian Federation with the help of an array of statistical information covering, first, indicators of innovative economic development, second, data characterizing Russia's socio-economic potential, and third, indicators of the information and communication technologies market.

The information base of the research is the work of Russian and foreign economists in the field of scientific, technological and innovative development, public administration; scientists dealing with the digital economy development, the problems of formation and implementation of the information society in their relationship with the socio-economic development issue.

The research is based on the principles of complexity, consistency, dialectics which allow gaining knowledge about the essence of the

information society and the ways of its formation. Its scientific novelty and originality consist in the development of theoretical and methodological approaches to the study of the essence of the information society in the economic digitalization and the corresponding conceptual apparatus; in the development of scientific and methodological foundations for a comprehensive assessment of the state, trends in the development of the information society in Russia; in the formation of a set of practical measures and a list of indicators characterizing Russian's information society development in the conditions of digitalization.

Research theoretical aspects

The information society concept began forming as a result of the development of the post-industrial doctrine which assigned information and knowledge a major role in the development of production and society.

In the late 1950s, D. Risman introduced the concept of "post-industrial society". The emergence of the post-industrial society theory is a complex result of the application of various assessment methods to the dynamics of social development. Already in the early 1960s, the post-industrialism concept became widespread, along with the understanding that social and political factors were gradually giving way to factors of technological development.

There are several approaches to the post-industrialism theory in the scientific literature. The first is based on the definition of D. Bell, who understands post-industrial society as a society whose economy has moved from mass production of goods to the production of services, organization of scientific research, the education development and life improvement (Bell, 2001). In this regard, the post-industrial society determines the appearance of advisers, consultants who act as experts in the political arena.

The second approach assumes a connection with the definition of a new state of civilization through the informatization development. In the 1960s, the concept of "information society" was introduced; this theory was widely spread in the works of R. Katz, I. Masuda, T. Stonier, M. Porat. Adherents of this approach note that the rapid development of the informatization processes leads to the information society as a result of a new qualitative development of post-industrial society. According to I. Masuda, the development of computer technology allows quickly moving from one technical solution to another which is better. The very speed of the spread of the information revolution is characterized by constant growth, and also exceeds the speed of technology development (Masuda, 1983a; Masuda, 1983b).

A significant contribution to the study of post-industrialism issues was made by the American political scientist Z. Brzezinski. He noted that under the influence of technology and electronics, the development of computers and communications in culture, psychology, society and economy, a post-industrial (technological) society is being formed.

In the early 1960s, the concept of "electronic society" (Marshall McLuhan) was proposed which led to the study of the development of modern culture characterized by the presence of electronic communication methods.

Among the studies of Russian scientists on the problem under consideration, we can note the works of V.L. Inozemtsev, A.I. Rakitov, and R.F. Abdeev.

According to V.L. Inozemtsev, the basis for the transition to post-industrial societies is not so much new technologies or knowledge, as the change of the person himself, the acquisition of a qualitatively new motivation. At the same time, the spread of post-industrial trends is extremely slow due to the unique property of the post-industrial type of society itself. For instance, having reached a certain development level, this society forms a relatively economically and socially neutral sector which is increasingly striving to interact with the rest of the elements of the social whole. V.L. Inozemtsev's works on the

development of post-industrial society as a social phenomenon are currently recognized by Western sociology (Inozemtsev, 2000).

A.I. Rakitov's studies of the development of the technological and information revolution note the main changes and innovations in culture, society and civilizations in general. In his opinion, the information society development includes several stages, the transition to which is carried out through technological (information) revolutions (Rakitov, 1998).

In the 1980s, R.F. Abdeev associated the main stages of the society's development with achievements in the field of informatics, information management, computerization, ecology (the concept of information civilization). In his opinion, the civilization development is influenced by the information revolution which leads to an increase in production efficiency, a reduction in employment in the economy. The creation of modern technologies is changing economic sectors and creating a favorable environment including for economic growth in developing countries.

The generalization of scientific papers on post-industrial development and research on social change, the society's development, allows identifying the main characteristics of post-industrial society. Among them are knowledge-intensive industries, the predominance of the service sector, the development of ICT infrastructure (integrated, distribution networks), information and knowledge that are determinants of social processes (Masuda, 1983a; Masuda, 1983b; Toffler, 1999; Webster, 2004).

According to the results of the analysis of theoretical and methodological approaches, the generally accepted definition of the concept of "post-industrial society" has not been developed in the scientific literature. Currently, when studying issues related to the information society development, the terms "new economy", "information economy", "Internet economy", "knowledge economy" and "digital economy" are encountered. The interpretations of these terms offered by scientists are diverse and very vague depending on the scientific direction in which the concept is being studied.

In our opinion, the information society is a society where the production, processing, storage and transmission of information increase the efficiency of socio-economic processes.

In turn, the informatization of social processes is understood as the improvement of social and economic conditions of society with the help of modern information and communication technologies. In the absence of a sufficient technological basis that allows the dissemination of organized knowledge without spatial restrictions with the least expenditure of time and labor, the growth and development of the information society will be insignificant.

Society, filled with information consumption and equipped with modern information technologies, developed infrastructure, can perform tasks at a completely different level, conduct economic activities for sustainable economic growth and development.

According to Yokoshiro Kogan, the information space is a set of databases with advanced technologies, methods of storage and use, information transmission systems operating on the basis of uniform principles and providing information interaction between institutions and citizens to meet their information requests. The above components and the economic component of the development of the information society form a phenomenon called the "digital economy" (Amagaev, 2017).

In scientific research, the digital economy is primarily an economy in which the main share of gross domestic product is formed through the production, processing, storage and dissemination of information with the participation of more than half of those employed in the economy in this activity. Within the framework of a practical

approach, the digital economy is a concept that considers the use of information resources for economic development. The scientific and methodological approach to the definition of this concept assumes to consider the digital economy from the standpoint of analyzing the laws of creation, storage and dissemination of technical information.

A.M. Tufetulov believes that the digital economy is a complex of inter-economic interactions that have a number of key elements that differ from other possible types of economies. Thus, at present we can say that the digital economy is going through the period of its formation (Tufetulov, 2007).

The main trend of effective development of the digital economy is the digitalization. It is the process that forms the basis of the digital economy and causes the restructuring of traditional formats for the presentation of information to digital, in order to ensure the growth of the efficiency of business processes and improve living standards by increasing the speed of interchange, accessibility and security of information, increasing the role of automation.

Digitalization determines the creation of digital platforms in the economic space that allow solving strategic issues in the field of education and science, medicine, transport, public administration, industry, etc., it means that the nature of public relations is being transformed.

In order to study the information society phenomenon, it is necessary to consider the criteria for the formation of analytical approaches to its definition. The generalization of the economic literature on this topic revealed that there are four criteria for the analysis of the information society: related to employment, spatial, economic and technological *(Tab. 1)*.

Thus, many approaches to the identification of elements of the information society are based on the acceptance of the fact that the emergence of new social and economic interactions in society is associated with significant quantitative changes in the production, processing, storage and dissemination of information.

Having considered various methods of interpretation of social and economic relations, created on the basis of information and digital technologies, we can conclude that at present detailed provisions on this issue have not been developed. Many studies pay attention to quantitative indicators of society's informatization, and we assume that soon, with sufficient growth, the digital economy will begin prevailing.

Research review in this field allows concluding that the transformations in modern society, caused by the global penetration of modern information technologies into many spheres of activity, appear

Table 1. Analytical approaches to the identification of the main elements of the concept of "information society"

Criteria	Characteristic	Researchers
Related to employment	Changes in socio-economic processes are a consequence of the employment of the majority in the field of production and dissemination of information. Data becomes the main resource, a significant increase in the workload in the field of their processing can be considered as a transition to an information society.	Bell D., Drucker P., Machhlup F. (Bell, 2001; Drucker, 1993; Machhlup, 1962)
Spatial	The global economic space is formed on the basis of the development of data transmission networks in different places. In turn, networks become the main feature of social development.	Barron I., Curnow R. (Barron, Curnow, 1979)
Economic	Takes into account the increasing value of the production, processing, storage and dissemination of information.	Lane N., Martin J. (Lane, 1999; Martin, 1978)
Technological	The presence of a large number of innovations in the field of ICT, which have become widespread in society	Fuchs C., Mulgan P., Urry J. (Fuchs, 2008; Irawan, 2014; Urry, 1999)
Source: own compilation.		

as an objective process due to the creation of increasingly advanced and efficient means of production and the formation of appropriate relationships. The processes of transformation of social development are so fundamental that, in addition to positive aspects, they bring with them serious problems, threats and risks to everyone who did not perceive and appreciate the new factors and conditions (Uskova et al., 2013). At the same time, the problems of the formation and becoming of the information society are multifaceted and affect all aspects of manifestation: technological, economic, social, institutional, etc.

The main research results

Currently, ICTs are being developed and disseminated in all sectors of the economy and spheres of public life acting as factors of economic development and improving living conditions. New ICTs make it possible to raise the educational level of society, develop its scientific potential, as well as increase the efficiency of using national and global resources. In order to form an information society, it is also important for the Russian Federation to develop and use modern information technologies.

In the Russian economic literature, business practice and everyday life there are different terms that characterize information products and services. In the Internet, periodicals and everyday speech, the concept of "information technology" (IT) is more often used, and in scientific and statistical literature, as well as in legislative acts – "information and communication technologies" (ICT). Within the framework of our research, both terms are used as synonyms, while from the perspective of the industry division of information goods and services, it is more correct to use the term ICT which makes it possible to identify differences between information and communication services, while the international and global term IT is more convenient when analyzing current trends.

According to the research of the EIU (Economist Intelligence Unit)[1], at present it can be stated that the development of the ICT sector in the countries will be different, since the leading states that were the first to introduce new technologies will have more opportunities for the sustainable development of the ICT sector in the future. It will be increasingly difficult for other countries to overcome the growing gap (Egorova, Torzhevsky, 2018).

In this regard, an analysis of the current state of development of the ICT sector and the digital economy in Russia is relevant *(Tab. 2)*. Despite the fact that the development of such ratings of countries by relevant international organizations cannot be fully considered accurate and reliable, it can nevertheless be considered as an external assessment in determining the place and role of countries in the world economy.

Thus, the ratings allow concluding that there is a significant difference between the country's available capabilities and their use in the economy. At the same time, Russia has the potential and readiness to actively develop information technologies.

The ICT market has started to develop actively only in recent decades. In 2018, its total global volume amounted to almost 4.0 trillion US dollars, and by 2023 it will increase by 1.5 times. Its share in the GDP of developed countries is about 6%, according to the forecast it will increase to 8% (Egorova, Torzhevsky, 2018). It is this growth that indicates the transition of countries to a new stage – active digitalization and the development of the information society (Makarov, 2003).

The dynamics of the global ICT market in the period 2007–2018 correlated quite well with the

[1] Realizing the benefits of ICT and economic growth in Europe: EIU review. 2018. Available at: http://emag.lis.ru/arc/infosoc/emag.nsf/BRA/c8b8769161ef8635c325716b0052794a

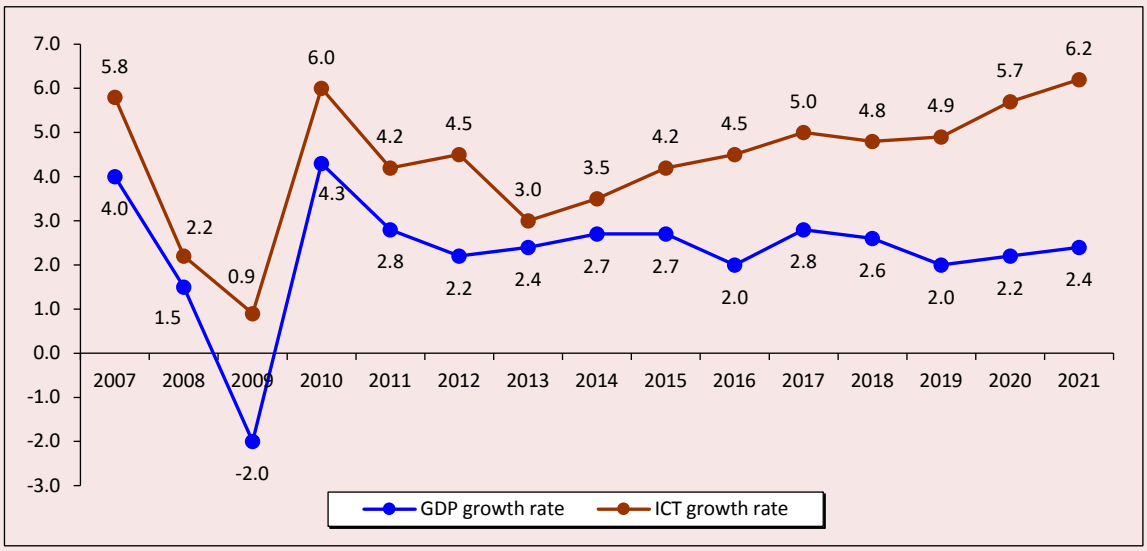
Table 2. Russia's position in international rankings on the digital economy development

Index, year	Leading countries of the rating	Russia's place in the rating	Total countries in the rating	Russia's "neighboring" countries
Inclusive Internet Index, 2020	Sweden, New Zeeland	**26**	100	Kuwait, Portugal, Taiwan
Global Networking Index, 2019	USA, Switzerland	**41**	79	Bahrain, Oman
Global Competitiveness Index, 2019	Singapore, USA	**43**	141	Slovakia, Cyprus
World Ranking of Digital Competitiveness, 2019	USA, Singapore	**38**	63	Czech Republic, Saudi Arabia
Network Society Readiness Index, 2019	Sweden, Singapore	**48**	121	Romania, Bulgaria
B2C E-Commerce Index, 2019	The Netherlands, Switzerland	**40**	152	Bulgaria, Greece
Global Innovation Index, 2019	Switzerland, Sweden	**46**	129	Montenegro, Ukraine
E-Government Development Index, 2018	Denmark, Австралия	**32**	193	Israel, Poland
Global Cybersecurity Index, 2018	United Kingdom, USA	**26**	175	Italy, China
EBRD Knowledge Economy Index, 2018	Estonia, Slovenia	**17**	38	Georgia, Kazakhstan
ICT Development Index, 2017	Island, Republic of Korea	**45**	175	Portugal, Slovakia
Digital Development Index, 2017	Norway, Sweden	**39**	60	Greece, Jordan
International Index of Digital Economy and Society, 2016	Denmark, Republic of Korea	**37**	45	Cyprus, Greece
According to: Abdrakhmanova G.I., Vishnevskii K.O., Gokhberg L.M. (2020). *Digital Economy Indicators: Statistical Collection*. Moscow: NIU VShE.				

growth of global GDP *(Fig. 2)*. However, since 2015, the market of information and communication technologies has almost twice outpaced GDP growth.

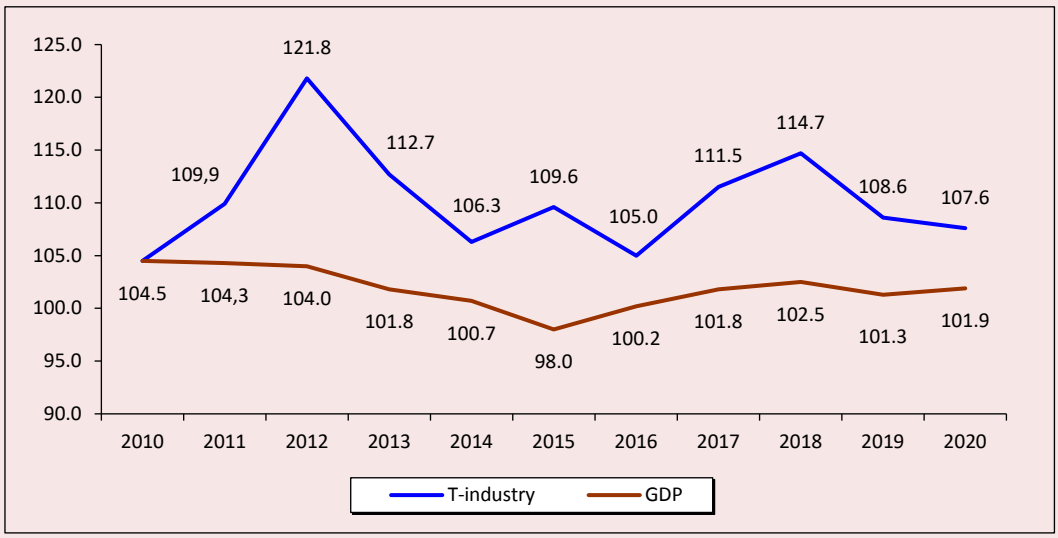
In the Russian Federation, the ICT market growth is associated with global trends and local features: the introduction of IT into production and management (primarily at the state level); the active

Figure 2. Dynamics of the global ICT market and GDP, %



Source: ICT global market. Tadviser. Available at: https://www.tadviser.ru/index.php/Статья:ИКТ_(мировой_рынок)

Figure 3. Physical volume indices of the gross value added of the ICT industry, % compared to the previous year; in constant prices



Source: Dynamics and prospects of IT-industry development. Available at: https:/ https://issek.hse.ru/news/371816718.html

development of the Internet services; the growth of the number of "smart devices" among users. In the near future, active ICT introduction is expected in all sectors of production and services.

In the Russian Federation, about 350 thousand people work in the IT-industry – this is 0.5% of those employed in Russia. Over the previous decade, the industry has been experiencing positive development dynamics: according to the calculations of the Institute of Statistical Studies and Economics of Knowledge of HSE, in general, over the period 2010–2019, its gross value added has more than doubled to 945 billion rubles. The highest growth in the last six years was observed in 2018 – almost 15%. In 2019, it decreased to 8.6% *(Fig. 3)*.

The share of the ICT industry in Russia in GDP for the period 2010–2018 also showed a steady positive trend (growth from 0.58 to 0.90%). If the gross value added of the IT-industry in Russia in 2014 was 374 billion rubles, then in 2019 it has already reached 822 billion rubles. And if the ICT share in the country's GDP was 0.9% by the end of last year, then by 2024 it should reach 1.5%. However, this is almost three times lower than in the leading countries (EU countries, UK, Japan)[2].

According to the Ministry of Digital Development, Communications and Mass Communications of the Russian Federation, the ICT-industry growth in Russia is proceeding rapidly[3]. According to the information of the unified register of Russian software, there are almost 4,000 software products in the country.

The Russian Federation plays a leading role in the creation of social networks, search engines, antivirus programs and systems. There are also software products for the industrial sector, such as image recognition tools, design systems (Adem, Compass), systems for managing production, human resources, enterprise assets (1C, Galaxy), blockchain (Waves) (Korovin, 2019).

[2] Abdrakhmanova G.I., Vishnevskii K.O., Gokhberg L.M. (2020). *Digital Economy Indicators: Statistical Collection*. Moscow: NIU VShE. 360 p.

[3] Strategy for the development of the information technology industry in Russia. Available at: https://www.tadviser.ru/index.php/

According to Russoft data, the supply of software products from Russia abroad amounts to more than 8.0 billion US dollars[4]. In addition, the Russian experience is reflected in the search for solutions in the most competitive parts of the global software market (big data, artificial intelligence, etc.). Several active and experimental projects are being implemented in Russia in the field of obtaining information from registries, electronic public services, electronic trading platforms, etc.

In order to improve citizens' living conditions, increase the country's competitiveness, develop all social spheres, modernize management systems through the ICT use, the state program of the Russian Federation "Information Society (2011–2020)" was adopted. Its first text was approved by RF Government Order no. 1815-r, dated October 20, 2010. The program is based on the plan of innovative development of social and economic processes of the Russian Federation in accordance with the Concept of long-term socio-economic development of the Russian Federation for the period through to 2020 (approved by the Government Order of the Russian Federation no. 1662-r, dated November 17, 2008 taking into account the program-target development principles of Russia's budget system.

In the period from 2014 to 2019, the state program of the Russian Federation "Information Society" was adjusted in connection with the adoption of a number of normative legal acts: "On national goals and strategic objectives of the development of the Russian Federation for the period through to 2024" (Presidential Decree 204, dated May 7, 2018); "On the Information Society Development Strategy in the Russian Federation for 2017–2030" (Presidential Decree 203, dated May 9, 2017); "On the approval of the Information Security Doctrine of the Russian Federation" (Presidential Decree 646, dated December 5, 2016); "The main directions of activity of the Government of the Russian Federation for the period through to 2024" (approved by the Chairman of the Government of the Russian Federation on September 29, 2018), etc.

According to these documents, the main priorities for the information society development in the Russian Federation are to improve living standards and well-being of the country's population, the availability of public services, the development of digital literacy, as well as increasing Russia's economic potential through the use of modern ICT.

In the latest edition of the state program "Information Society" (approved by RF Government Resolution 386-20, dated March 31, 2020), the tasks of the ICT development are aimed at ensuring state interests and priorities within the framework of the development of the information society, and economic digitalization.

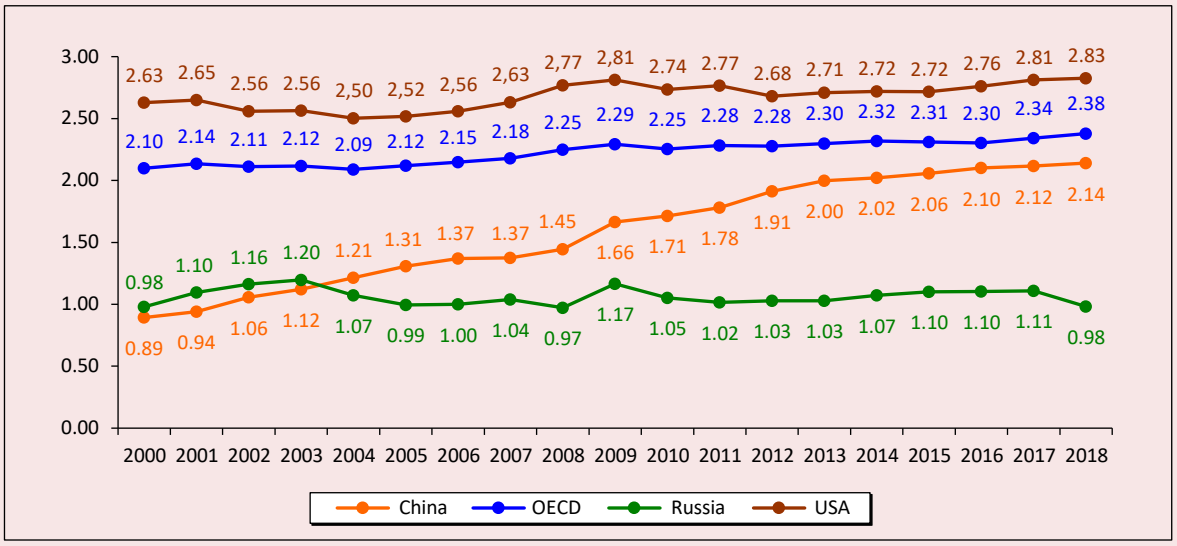
At the same time, digitalization processes require significant financial investments. It is necessary to purchase and maintain technical means, special software products, training and retraining of personnel.

According to the data, in the OECD countries, R&D expenditures for the period from 2000 to 2018 increased by 0.28% and amounted to 2.38% as a percentage of GDP *(Fig. 4)*. In the Russian Federation, this indicator stagnated during the period under review. In 2018, R&D expenditures amounted to 0.98% of GDP (2000 level) which is 2.5–3 times less than in the OECD countries and China.

Real R&D expenditures in the Russian Federation increased by 9% from 2007 to 2018, mainly due to the dynamics of R&D results in the higher education and science sector. During the period under review, R&D expenditures in the public sector increased by 29%, while in the enterprise sector, on the contrary, decreased by almost 6%.

[4] Export of the Russian software industry. Available at: https://russoft.org/wp-content/uploads/2018/10/RUSSOFT_Survey_14.1_rus.pdf

Figure 4. Share of R&D costs, % of GDP



Source: own compilation based on OECD data. Available at: https://stats.oecd.org/

An important problem is the statistical assessment of R&D and "end-to-end" technologies in the economy due to the lack of a commonly used description of their parameters, constant statistical accounting, and difficulties with attribution to the spheres of scientific and technological development. In addition, statistics mainly take into account only R&D carried out in state scientific institutes and universities, and a huge layer of work carried out by companies at their own expense is not reflected in official statistics. Statistical data on the volume of R&D and the number of patents on end-to-end digital technologies are summarized in the *Atlas of End-to-End Technologies of the Digital Economy of Russia (Tab. 3)*.

Based on the presented data, we emphasize that the most significant block of completed R&D is related to big data technologies (6800 units), having in value terms almost 120 billion rubles. This is followed by new production technologies (6,372 units) with the largest number of patents – 890 units. We should also note that over 58 billion rubles were spent on the development of artificial intelligence.

Table 3. R&D and patents on end-to-end digital technologies for 2011–2018

Name of technology	R&D number, units	R&D volume, million rubles	Number of patents, units
Big data	6800	119200	530
Artificial intelligence	4340	58770	585
Blockchain	675	11340	359
Quantum technologies	1270	7550	92
New production technologies	6372	63875	890
Industrial Internet	270	2444	141
Robotics	925	13520	302
Wireless communication	211	1470	226
Virtual and augmented reality	450	500	115
Source: *Atlas of End-to-End Technologies of the Digital Economy of Russia*. Moscow: Rosatom, 2019. Available at: http://digitalrosatom.ru/proektnyj-ofis-cifrovayaekonomika-rf-gk-rosatom-podgotovil-pilotnuyuversiyu-doklada-atlas-skvoznyx-texnologij-cifrovojekonomiki-rossii/			

Thus, the available state and departmental statistics allow speaking about a high level of IT-penetration into public life in Russia. For instance, almost 80% of the country's population uses cellular and mobile Internet services.

Number of Russian subscribers of fixed and mobile broadband Internet access (broadband) in 2017 amounted to 30.9 and 117.4 million units *(Fig. 5)*.

In addition, the volume of fixed traffic has also increased by 23%, mobile – by 84%. In 2017, the volume of information transmitted via broadband Internet access in the Russian Federation amounted to more than 40 thousand petabyte.

In recent years, the transition to the information society has been increasingly declared in the Russian Federation against the background of great success of private companies in introducing digital technologies, general digitalization of the market, the emergence of large infrastructure projects for digitalization, the development of high-speed mobile communications (Uskov, 2020a; Uskov, 2020b).

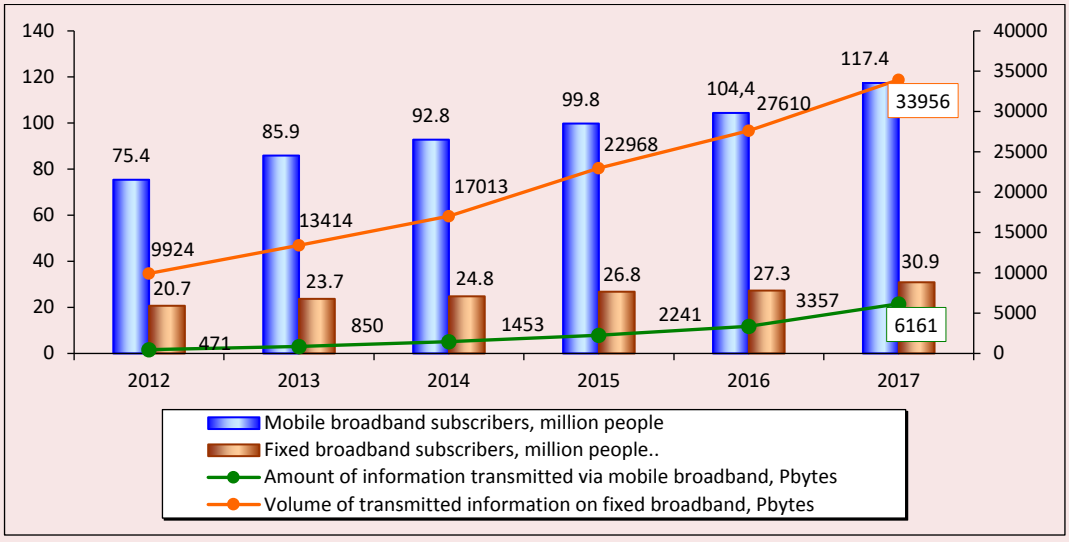
According to data from monitoring the development of the information society, from 2014 to 2020 in the Russian Federation, the share of students enrolled in bachelor's, specialty, and master's degree programs decreased from 3.6 to 2.8% of the total population *(Tab. 4)*.

Also during this period, the number of researchers who carried out research and development decreased to 49.6 per 10,000 employed in the economy. At the same time, there is an increase in industrial organizations that have implemented technological innovations, from 8.8 to 10.8%.

At the same time, during the period, the volume of investments in fixed assets for ICT equipment has increased by 33% (up to 729 billion rubles) which entails an increase in the availability of the Internet to both the population and organizations.

For Russia, rapid dynamics became possible thanks to the development of the ICT sector and e-government infrastructure including the modernization of the government website, as well as the active representation of the interests of the Russian Federation in the framework of

Figure 5. Use of mobile and fixed-line communication devices and technologies



Source: Abdrakhmanova G.I., Kovaleva G.G. *The ICT Sector in Russia*. Available at: https://issek.hse.ru/news/227732702html

Table 4. Key indicators of the development of the information society in the Russian Federation

Indicator	2014	2015	2016	2017	2018	2019	2020	2020 to 2014, %
Share of the employed population aged 25–64 with higher education in the total number of employed population of the corresponding age group, %	33.0	33.8	34.3	35.1	35.1	35.2	36.5	3.5
Proportion of students enrolled in educational programs of higher education – bachelor's degree, specialty, master's degree programs, in the total population, %	3.6	3.3	3.0	2.9	2.8	2.8	2.8	-0.8
Share of domestic research and development costs, % of GDP	1.07	1.10	1.10	1.11	1.0	1.04	1.1	0.0
Number of researchers, carried out research and development, per 10,000 employed in the economy, people	55.1	52.5	51.4	50.1	49.8	49.8	49.6	90.0
Share of industrial production and service sector organizations that implemented technological innovations in the total number of surveyed organizations, %	8.8	8.3	7.3	7.5	8.6	9.6	10.8	2.0
Share of fundamentally new technologies in the total number of advanced production technologies developed, %	11.6	12.5	12.5	13.6	13.6	11.6	13.4	1.8
Number of points of collective use (access) with access to the Internet, per 10,000 people, units	2.0	1.7	0.3	0.1	0.2	0.3	0.6	30.0
Number of subscribers of fixed broadband Internet access per 100 people, units.	17.0	18.3	18.6	21.0	21.7	22.2	23.0	135.3
Number of subscribers of mobile broadband Internet access per 100 people, units.	64.5	68.1	71.1	79.9	86.2	96.4	99.6	154.4
Volume of investments in fixed assets for equipment for information and communication technologies, in actual prices, billion rubles.	292.15	304.99	284.67	389.7	484.3	617.8	728.9	249.5
Source: Rosstat data.								

interaction with international organizations. The most significant breakthrough was the creation of a Single portal of public services — a key link of the "electronic government" of the country.

Considering the information security indicators of Russian enterprises, we can note that over the period 2014–2020, the share of organizations that used means to protect information transmitted over global networks decreased, in 2020 their share was slightly more than 75%. About 69% of organizations used electronic digital signature tools, 39% used encryption tools *(Tab. 5)*. Also, during this period, the proportion of the population that does not use the Internet for security reasons decreased by 1.8%.

However, the gap in digitalization indicators between the Russian Federation and the leading countries is still significant. Since 2014, the Digital Economy and Society Index (DESI) has been calculated in the countries of the European Union, currently it is calculated for other countries of the world. In 2017, the Russian Federation had a DESI index equal to 0.47 (in EU countries it is 0.54).

Table 5. Information security of enterprises and population

Indicator	2014	2015	2016	2017	2018	2019	2020	2020 to 2014, %
Share of the organizations that used means of protecting information transmitted over global networks in the total number of surveyed organizations, %	87.7	86.6	87.3	87.2	89.3	89.5	75.3	-12.4
of them used:								
- encryption tools, %	39.3	41.0	42.9	44.3	45.8	44.3	38.6	-0.7
- means of electronic digital signature, %	76.5	75.3	77.7	77.2	78.9	79.1	68.7	-7.8
Share of the population that does not use the Internet for security reasons in the total population, %	2.2	0.4	0.5	0.6	0.4	0.5	0.4	-1.8
Source: Rosstat data.								

The leaders in this indicator were Denmark (0.66), Finland (0.65) and Sweden (0.64).

The data of the Eurasian Economic Commission allow asserting that the significant potential of the digitalization in the Russian Federation (primarily the availability of digital platforms) is concentrated in the fields of information and communication technologies, Internet commerce, services and finance. There are certain difficulties with the development of digital platforms in the scientific field, medicine and the industrial sector.

Conclusion

The development of Russia's information society in the context of the economic digitalization is an important goal for the country in the near future. Back in 2018, the national program "Digital Economy of the Russian Federation" was adopted (approved by RF Government Order 1632-r, dated July 28, 2018), but it did not have the status (federal, state, interdepartmental), specific standards and sources of funding.

The scientific literature and public discussions have repeatedly noted in that this program only superficially touched on the main aspects of the economic and social digitalization (Ivanov, Malinetsky, 2017; Yakutin, 2017). This was largely influenced by the speed of its development, adoption and the hype that arose around the problem of the digital economy. As a result, without a specific focus, goals, objectives and priorities of the digitalization, the program has not shown its effectiveness and has not been developed.

The development of the national project (program) "Digital Economy of the Russian Federation", approved by Presidential Decree 204, dated May 7, 2018 "On national goals and strategic objectives of the development of the Russian Federation for the period through to 2024", was called upon to correct these shortcomings. The part of the decree concerning the digital economy declares the digitalization of the economic and social spheres of the state: industry, agriculture, construction, healthcare, education, etc. In fact, an opportunity has been opened to address the issue of ensuring communication and interaction between two important state issues – digitalization of the economy and society and import substitution in the ICT industry and other areas.

At the same time, the national program "Digital Economy of the Russian Federation" is not connected with other relevant documents of scientific, technological and innovative development: "Strategy of scientific and technological development of the Russian Federation", "Information society development strategy in the Russian Federation for 2017–2030" because a large number

of intellectual resources are needed for interaction in fundamental and applied research (Lenchuk, Vlaskin, 2018).

Thus, an important task is to determine technological priorities for solving issues related to the formation and development of the information society. The following digitalization areas come to the fore here: the development of the information and communication technologies, microelectronics, artificial intelligence and robotics. In addition, it is necessary to ensure the high status of the program exceeding the significance of similar projects in the areas of the digital economy development. The national program must be approved within the framework of the Presidential Decree or within the framework of the action of the Council for the Development of National Projects under the President of the Russian Federation.

If we approach this issue systematically, it is advisable to consider large-scale programs in the field of the digitalization as an integral part of the national program which solves certain tasks and against this background has priority over other projects financing. At the same time, the analysis of the passport of the national program "Digital Economy of the Russian Federation" suggests that it will be included in the programs "Information Society", "Economic development and innovative economy", etc. In this case, it is difficult to ensure the independence of its financing, since its implementation must be ensured through programs and projects that are part of it (Shevtsov, 2021). It is clear that such a decision will not contribute to the priority execution of the national program, but will lead to its financing as funds become available (on a residual basis).

Thus, first of all, it is necessary to create an independent project "Information system and resources of the digital economy", the main tasks of which will be the development of the digital environment, digitalization of various spheres of the national economy, society's informatization, solving issues of its functioning on the basis of information systems that ensure the creation and processing of large amounts of data.

In addition, a special status should be given to the national program "Digital Economy of the Russian Federation" which allows it to be implemented excluding the general requirements of RF Government Order 1288 "On the organization of project activities in the Government of the Russian Federation". It means that, in fact, it is required to ensure its transition from the existing structure of "Tasks – Results" to "Project – Goal – Task – Milestone – Event" which will contribute to better control over the program implementation.

Finally, it is necessary to ensure transparency of information on the implementation of the national program. Currently, there is very little information about this in the public domain, and therefore it takes a lot of time to search and analyze sources about the progress of the program. Information on the progress of the program is also not provided on the state portals (ANO "Digital Economy" and Digital Economy 2024).

The joint implementation of the above proposals will help to improve the formation and development of the information society and will contribute to the activation of innovative activities both in the field of public administration and in the field of the national economy.

When developing a strategy for the development of the information society in the country, it is important to determine priorities and focus of consideration from the point of view of industries and territories. The approach should be based on an understanding of their importance for maintaining national competitiveness, on the one hand, and the relative ease of implementing information technologies in this area, on the other. The focus of consideration determines what exactly should be worked with when implementing the strategy, what to influence, what to change. These are objects of attention and at the same time objects of change.

For example, the focus of consideration may be an organization as a whole or its component part (division), several related organizations (holding), an entire industry, a particular territorial entity (city, region).

When developing a strategy, it is necessary to focus on the objects of attention from certain positions or through a certain prism, for example, financial, personnel or, finally, digital. The combination of "the object of attention + the prism of consideration" generates the direction of the strategy development. If the whole region becomes the object of attention, and the prism of consideration is the "information society", we get a "regional strategy for the development of the information society". The focus of the strategy for the state organization can be set by top-level regulatory documents starting with the national projects and ending with the region's development strategy, and can be determined by industry specifics or regional specifics.

The main directions of the development and the focus of state support for the development of the information society are presented in *Table 6*.

ICTs make a significant contribution to the development of sectors of the national economy. They become part of the modern management system in most sectors of the economy, public administration, national defense, national security, etc.

There are several main areas in which information activities are related to computers and IT-technologies: production of new goods and services, scientific research, the development of information systems, education, publishing and workplace automation. Currently, a system of

Table 6. Directions of the development of the information society in Russia

no.	Problem	Decision directions
1.	Formation and development of the technical base of the information society	Ensuring the full functioning and high level of development of the following main components: information and communication infrastructure; ICT; scientific and industrial potential of information technologies; communication markets, information technologies, etc. Budget financing of thematic information systems of great social importance (healthcare, education, employment, etc.), as well as tax and customs service systems, information support of state bodies, law enforcement agencies, etc. Separate support for priority information technologies, transparent functioning of the sphere of state orders, public procurement; open and competitive selection of technologies for the implementation of the national informatization projects. Support from the budget of national scientific schools for the creation of domestic ICT, stimulating the development, production and implementation of ICT in various budget projects and informatization programs. Promotion of domestic software to the world market.
2.	Development of national security, leveling threats from the use of new information technologies	Development of a unified information security system in the context of an industry consortium of departmental systems that solve individual tasks of protecting information within their authority and in the interests of their sector. Monitoring of scientific, technological, social, economic and other changes abroad. International cooperation in the development and adoption of legal provisions, agreements to ensure information security in the process of information exchange; participation of the country in the development of international standards in the field of information security. Development of legal norms, measures of responsibility for hacking, unauthorized access to state and corporate information networks, violation of citizens' rights in the process of information exchange.
3.	Socio-economic and socio-cultural problems of transition to the information society	Ensuring the interests of population, organizations and the state in the information sphere. Unconditional legal equality of all participants in the process of information interaction, regardless of their political, social and economic status. Reducing the formalization of public relations, creating transparent tools for the democratic control of society over power (on property relations in society, on the income of the elite, etc.). Providing access to global information resources, global information networks.
According to: Shevtsov Yu. (2021). Russian realities complicate the digitalization of the economy. *Society and Economy*, 3, 111.		

providing public services in electronic form is being created in the country.

In the Russian Federation, in connection with the task of ensuring universal access to information and communication technologies, there is a need to strengthen the use of technologies created on the basis of advanced knowledge (nano- and biotechnology, artificial intelligence, alternative energy, etc.).

Modern Russian society is interested in obtaining information that will help improve the intellectual and cultural development of the country's citizens.

The main priorities in the development of state interests within the framework of the formation of the information society in the Russian Federation are: taking into account the needs of citizens and society in obtaining high-quality and reliable information in the context of the formation of the information space; the formation and development of ICT infrastructure, the creation and use of ICT, their promotion at the international level; the development of the national economy and society within the new technological fundamentals; ensuring national interests in the field of digital economy.

Thus, in order to develop the information society and reduce the gap between Russia and the leading countries, it is necessary to form and develop human and technological advantages, as well as create a regulatory framework for the development of information technologies in various social spheres. A comprehensive strategy of informatization of the economy and society providing for their comprehensive transformation, will lead to the development of competitiveness and the achievement of positive results in the world market.

The results of the study can be used to develop recommendations for the activation of state policy in terms of determining promising directions for the development of the information society; in the working out of programs, bills and other institutional foundations for the development of the national economic complex of the country based on the transition to the digital economy.

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Information about the Author

Vladimir S. Uskov – Candidate of Sciences (Economics), Senior Researcher, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: v-uskov@mail.ru)

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Issues of the Methodology for Assessing Social Well-Being in Contemporary Russia

Anton M.
MAKSIMOV
N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences
Arkhangelsk, Russian Federation
e-mail: amm15nov@yandex.ru
ORCID: 0000-0003-0959-2949; ResearcherID: AAO-7228-2021

Andrei G.
TUTYGIN
N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences
Arkhangelsk, Russian Federation
e-mail: andgt64@yandex.ru
ORCID: 0000-0001-9821-651X; ResearcherID: AAD-6430-2022

Kristina O.
MALININA
N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences
Arkhangelsk, Russian Federation
e-mail: malinina.ciom@gmail.com
ORCID: 0000-0003-3113-1241; ResearcherID: I-3917-2018

Lyudmila A.
CHIZHOVA
N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences
Arkhangelsk, Russian Federation
e-mail: chijova.mila@yandex.ru
ORCID: 0000-0003-0298-5248; ResearcherID: D-1867-2019

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Tat'yana A.
BLYNSKAYA
N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences
Arkhangelsk, Russian Federation
e-mail: t_blynskaya@mail.ru
ORCID: 0000-0002-9675-4688; ResearcherID: I-3946-2018

Abstract. The article provides a critical analysis and synthesis of modern concepts of social well-being, as well as decomposition and operationalization of this sociological concept, which allows solving the problem of measuring and assessing the quality of life of individuals and social groups in a more comprehensive way. We have shown differences in the understanding of social well-being as a socio-psychological construct based on an individual's subjective evaluation of the conditions and results of their life activities, and as an objective assessment of the social and economic status of the individual, their involvement in social networks, access to public goods. We also noted that when choosing a methodology for measuring social well-being, it is necessary to consider the economy of the society under consideration (developed or developing) and the existence conditions of the local community as a whole, not just individuals (the concept of community well-being). Based on a synthesis of existing approaches, methodologies, and sets of variables for the empirical study of social well-being, we propose our own version of the methodology for the comprehensive measurement of social well-being, which takes into account the specifics of social processes and relations in contemporary Russia. Within the framework of this methodology, we identify 11 basic factors affecting the level of social well-being, operationalized through more than 50 indicators. The sources of data for their measurement, along with state and corporate statistics, are mass sample and expert surveys. In the article we also raise the problem of calculating weighting coefficients for various factors contributing to social well-being, and proposed its solution on the basis of the ranking method as a special case of the expert evaluation method. The considered set of factors allows covering economic, social, political and legal, medical, socio-cultural and everyday components of life of individuals and local communities.

Key words: social well-being, quality of life, subjective well-being, factors contributing to social well-being, expert evaluation methods, ranking method.

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Introduction

Socio-economic development of any relatively autonomous geographically organized social system (region, federal district, etc.) can be represented in two planes – the plane of material and economic and the plane of social well-being. In the first case, the researcher is interested in the current state and dynamics of macroeconomic, demographic and logistical parameters reflecting the objective state of the production factors. In the second case, we are talking about indicators that assess the capabilities of a social system to meet the individuals' needs, integrated into it in accordance with generally

accepted (within the framework of this system) standards. At the same time, when quantifying various elements of people's life activity that determine their well-being, a researcher should refer not only to objectified indicators (for example, infant mortality, real per capita income or housing security), but also to indicators reflecting the assessment by people themselves of how satisfied they are with their own living conditions. How do these two approaches to understanding social well-being relate to each other? What are the conceptual grounds for including an intersubjective component in a comprehensive assessment of the quality of life? What important methodological problems of measuring social well-being need to be solved and what can these solutions be? The answers to these questions are the content of this article.

Before turning directly to the methodology of assessing social well-being in Russia, we will briefly consider the theoretical innovations and directions of scientific discussions in this area over the previous decade.

The concept of "social well-being" does not have a generally accepted strict definition; its content may vary depending on the disciplinary field and theoretical approach preferred by specific researchers. Nevertheless, we can argue that there is a consensus among scientists regarding the conceptual core of this term. For instance, at present, according to the results of the work of the Stiglitz–Sen–Fitoussi Commission, the point of view has become generally accepted that it is insufficient to use only econometric indicators for measuring social well-being, such as per capita GDP, national income or public health spending. The necessary parameters of social well-being are life expectancy, proportion of time allocated to leisure, security (physical and economic), environmental conditions, inequality and people's subjective assessments of their well-being (Stiglitz et al., 2009). The role of non-economic factors of social well-being becomes especially noticeable when comparing countries that differ greatly in per capita GDP and income. In the work, D. Altindag and J. Xu show that there is a difference in the influence of economic factors and factors related to the quality of political and legal institutions on social well-being for residents of developing countries and residents of countries with developed economies – for the former, the growth of social well-being correlates with the growth of per capita income, while the degree of corruption of the government, the democratic regime and guarantees of civil rights practically do not affect it; in developed countries, the opposite situation is observed (Altindag et al., 2017). F. Bacchini and his colleagues from the National Institute of Statistics (Italy) point out that the social well-being concept as a multidimensional phenomenon synthesizing socio-psychological (subjective well-being) and socio-economic (benefits and opportunities) approaches is widely recognized among specialists, discussions are mainly about the greater or lesser validity and analytical advantages of various aggregated indices of social well-being (Bacchini et al., 2020).

Among researchers, in particular those specializing in the study of social problems in the developing countries of Latin America, there is a point of view according to which social well-being should be considered in close relationship with the concepts of happiness and life satisfaction. At the same time, it is emphasized that the semantic content of the three concepts intersects, and all together they can be designated by the umbrella term "quality of life", and these three concepts measure the quality of life (Toscano, Molgaray, 2019, p. 574). Within the framework of this approach, the emphasis in measuring social well-being shifts from external objectified indicators toward variables that are subjective interpretation of their position by the subjects themselves (subjective well-being) (Toscano, Molgaray, 2019, pp. 580–583). Developing the subjective well-being concept, a number of foreign authors include life satisfaction and happiness in its structure as components

(Gulyás, 2016); some justify the need to introduce the category of "affective well-being" which involves identifying the relationship between the frequencies of negative and positive emotions experienced by individuals in everyday life (Fors, Kulin, 2016, pp. 326–328). These ideas are inherited by the concept of happiness as a cognitive-emotional phenomenon, proposed in the works of E. Diener and D. Myers (Myers, Diener, 1995; Diener, Suh, 1997; Myers, 2000). E. Diener and D. Myers, without completely denying the influence of material and financial factors on social well-being, emphasize the role of the cultural environment, the nature of universally valid values, religiosity degree, as well as social (kinship, friendship) ties, emotional the experiences of the individual and their ideas about the degree of achievement of personal life goals.

Generalizing works of Russian researchers express another view of the correlation of these concepts. For instance, according to D.A. Leont'ev, subjective well-being is the sum of positive and negative emotions and cognitive assessments of life in general at the current time, and the quality of life is "a predictor of subjective well-being that characterizes the measure of favorability of objective external conditions of an individual's life" (Leont'ev, 2020, p. 26). In other words, the mutual relation of two D.A. Leont'ev's concepts turns out to be "inverted" in comparison with the interpretation of Latin American researchers. At the same time, he emphasizes that the quality of life in his interpretation is still a weak factor in subjective well-being – the works of such foreign authors as D. Kahneman and A. Tversky, S. Lubomirski, U. Staudinger et al., show that the objective conditions of life affect him slightly and are mediated by personal parameters, partly innate, partly formed in the process of socialization under the influence of the immediate environment and cultural context (Leont'ev, 2020, p. 21). Thus, two conclusions follow from this: firstly, it is advisable to consider subjective well-being as a parameter related to "objective" indicators of social well-being non-linearly, therefore, when measuring social well-being, this parameter should not be used as a correlate of quality of life indicators (in the above meaning), but as an additional indicator necessary for constructing a generalized index of well-being; secondly, since subjective well-being is an expression of personal dispositions, its level is largely determined by the values and meanings generated by a particular culture. This means that the same values of quality of life indicators will be accompanied by completely different assessments of their own well-being by a representative of the middle class of a Western European state and, for example, by a Pashtun nomad from the southern regions of Afghanistan.

A.V. Kuchenkova is attracted by the concept of social well-being which is interpreted in two ways: either as a synonym for subjective well-being, or as an aggregation of indicators of subjective well-being and indicators reflecting the individuals' financial situation and the availability of public goods for them, i.e. what D.A. Leont'ev means by the concept of "quality of life" (Kuchenkova, 2016, pp. 120–122). In both cases, A.V. Kuchenkova rather records the practice of using another ambiguous category in the studies of Russian authors. In fact, social well-being (where it is not identified with subjective well-being) can only be considered as a terminological replacement for social well-being, and not its conceptual alternative.

A.S. Lysukho points out that in Russian research practice there is a tradition according to which "social well-being becomes a broad complex aggregating the conditions of human life. This complex includes both social and material conditions of life, expressed in the standard of living, and such components of the quality of life as the environmental situation, political climate, psychological background ..." (Lysukho, 2020, p. 9). At the same time, the results of empirical studies show that, firstly, all other things being equal, the assessment of well-being changes due to the change of life stages: marriage, childbirth, aging

(dependence is confirmed by the materials of the 6th wave (2012) of the European Social Research and primary data on workers of the 26th wave (2017) of the Russian Longitudinal Monitoring of the HSE); secondly, there is a gap between subjective and objectified assessments of well-being – respondents with similar income levels assess their life chances significantly differently under the influence of individual and personal differences and subjective ideas about desired goals and available opportunities (Lysukho, 2020, pp. 9–13).

M.F. Chernysh notes the key role of health status in the structure of factors determining subjective well-being, and not only medical assessments of individuals' health are significant, but also their self-assessment of their own health, as well as their assessment of the quality of health infrastructure (Chernysh, 2020).

A.V. Andreenkova, considering the post-Soviet period, convincingly proves that for different countries the complex of factors determining the self-assessment of the level of happiness is significantly different. Thus, she identifies two clusters: in the first (Baltic States, Moldova, Belarus, Georgia), differences in the level of happiness correlate with macro-social (socio-economic and political-institutional) indicators; in the second (Central Asian countries, Armenia and Azerbaijan), the cultural and normative system of society plays a much more significant role (Andreenkova, 2020, pp. 322–326). Thus, the results of the research confirm the idea that for different types of societies, the weighting coefficients of economic and institutional (objectified) and cultural-normative (intersubjective) indicators of social well-being will be different.

Within the framework of the popular concept of community well-being in the previous decade, the conceptual difference between the social well-being of individuals and the social well-being of entire local communities is substantiated[1]. At the same time, the authors of this concept emphasize the advantages of their approach, since it is through the category "community well-being" that social conditions of individuals' life are best revealed, which is especially important when solving problems of managing socio-economic development[2]. In addition, due to the individuals' involvement in complex networks of social interactions and the fact that each of them has a set of identities which form a stable sense of belonging to certain communities, the conditions of existence of the latter cannot but affect the well-being of specific people.

It is also important to emphasize the following: if one of the significant components of social well-being at the individual level is a subjective assessment of one's own well-being, then the inter-subjective component plays a more significant role for the needs of the study of the "social well-being of communities". Its meaning is that an individual can subjectively be satisfied, for example, with their living conditions, but at the same time their assesses the living conditions of most other people in the area of their residence as unsatisfactory, which is closer to objectively measurable parameters of quality of life[3].

Along with the classification of social well-being factors, dividing them into objective, intersubjective and subjective, its structure highlights components related to material well-being, social factors (interpersonal, intra-family, socio-professional relations), physical and mental health, environmental factors (the state of the environment, communal infrastructure, political and legal regime), subjective well-being (general life satisfaction)[4] (Morozova et al., 2013).

[1] Social Factors and Community Well-Being, 2016, pp. 14–15; Quality of Life in Communities of Latin Countries, 2017, pp. 6–8.

[2] Social Factors and Community Well-Being, 2016, pp. 16, 32; Quality of Life in Communities of Latin Countries, 2017, pp. 12.

[3] Social Factors and Community Well-Being, 2016, pp. 20–21, 32–33.

[4] Social Factors and Community Well-Being 2016, pp. 9–10.

S. White from the University of Bath (UK) reveals the multidimensional nature of social well-being in the context of various approaches to social policy. It builds a kind of coordinate system, where along one axis there are approaches that differ in the degree of "objectivity" of the parameters used to measure well-being (ranging from the econometric approach to the concept of subjective well-being), and along the other there are approaches that differ in the extent to which social well-being can be measured through people's self-assessment of their position (evaluative), and in which – through the diagnosis of the severity of social problems, which many of the respondents may not be perceived as such, but regardless of their opinion affect their health, habitat quality, safety, equality of opportunity, etc. (substantive). At the intersection of the axes, S. White has the concept of "comprehensive" well-being which seems to be the most relevant for the study of social well-being in its entirety and complexity. At the same time, the researcher focuses on the importance of approaches that 1) illuminate the problem through the prism of subjective life satisfaction and happiness, 2) prioritize the quality of social ties within various kinds of communities, 3) focus on policies aimed at improving citizens' living environment and expanding opportunities to achieve living standards[5]. In the context of the above mentioned, we can conclude that the position of S. White is close at the same time to the views of those authors who talk about the need to shift research attention from the analysis of the dynamics of macroeconomic indicators to the analysis of subjective well-being, and to the views of those who advocate the priority of studying community well-being, rather than the social well-being of isolated individuals.

Argentine researchers G. Tonon and L.R. de la Vega, in their model adapted for developing countries, offer a wide set of indicators for measuring the level of social well-being according to 17 components: education, health, employment, personal security, housing conditions, discrimination, environmental component, components related to cultural rights and gender equality, economic well-being, the quality of political institutions, life satisfaction and components related to relations within the community (community well-being)[6]. When describing the latter, G. Tonon focuses on the important role of such parameters as trust and mutual assistance between community members, their participation in the activities of local civic associations[7]. These parameters are standard indicators for measuring the so-called social capital (Putnam, 1995, pp. 66–67) which makes it possible to include it among the key factors in social well-being.

In the course of further searches for the optimal set of variables for constructing complex indices of social well-being, A. Michalos and P. Maureen Hatch (University of Northern British Columbia) have revealed that the results of measurements on a number of aggregated indicators, such as the Human Development Index (HDI), Sustainable Society Index (SSI), the World Happiness Index (WHI) and some others are well correlated with each other, and their combination allows building reliable ratings within the framework of cross-country studies of social well-being (Michalos, Hatch, 2020). Hence, we can conclude that the decomposition of these indices will allow identifying a common set of valid indicators of social well-being and calculate an aggregated indicator based on them.

The construction of universal indices of social well-being is useful for cross-country research, but a deeper understanding of the processes of social

[5] Cultures of Wellbeing: Method, Place, Policy, 2015, pp. 1–44.

[6] Indicators of Quality of Life in Latin America, 2016, pp. 7–15.

[7] *Ibidem*, p. 8.

development in a certain territory requires taking into account the local context, its specific problems and socio-cultural characteristics – collective ideas about well-being, dominant values and target attitudes of local residents[8]. In this regard, it is necessary to supplement and adjust the set of analyzed factors and indicators used for each specific case.

Methodology for measuring social well-being: factors and indicators

As we have already said, many specific methods of measuring social well-being are described in the scientific literature. At the heart of any such methodology is the definition of a set of factors that determine the overall well-being level (latent variables), and directly measurable indicators corresponding to them. Referring to the methods tested in international studies, in particular to the methodology of the UN (Human Development Index), WHO, OECD, determination of the sustainable development index and the comprehensive methodology of comparative research of Russian regions (Institute of Philosophy of RAS; N.I. Lapin, L.A. Belyaeva), we compared the sets of latent variables (well-being factors) used in them. The correspondences in these sets are shown in *Table 1*.

Table 1. Comparison of methods for measuring social well-being (social well-being factors)

Methodology / Factor	Human Development Index (HDI, UN)[1)]	WHOQOL (WHO)[2)]	The better life index (OECD)[3)]	Sustainable Development Goals (SDG Index)[4)]	Economist Intelligence Unit quality-of-life index[5)]	Institute of Philosophy of RAS[6)]
Health	+	+	+	+	+	+
Social relationships		+	+		+	
Material well-being	+	+	+		+	+
Employment			+	+	+	+
Access to education	+	+	+	+		+
Access to medical services		+		+		+
Safety of life		+	+	+	+	+
Civil rights and political freedoms			+	+	+	+
Cultural consumption and leisure		+	+			+
Environmental conditions		+	+	+		+
Climate conditions					+	
Subjective well-being			+			+

[1)] Human Development Report – 2019. UNDP. Available at: http://hdr.undp.org/sites/default/files/hdr2019.pdf (accessed: February 1, 2022).
[2)] The World Health Organization Quality of Life (WHOQOL). World Health Organization. Available at: http://www.who.int/mental_health/publications/whoqol/en/ (accessed: February 1, 2022).
[3)] OECD Better Life Index. URL: http://www.oecdbetterlifeindex.org
[4)] Sustainable Development Report – 2019. Available at: https://s3.amazonaws.com/sustainabledevelopment.report/2019/2019_sustainable_development_report.pdf (accessed: February 1, 2022).
[5)] The Economist Intelligence Unit's quality-of-life index. The World in 2005. Available at: http://www.economist.com/media/pdf/QUALITY_OF_LIFE.pdf (accessed: February 1, 2022).
[6)] Lapin N.I., Belyaeva L.A. (2010). *Program and Standard Tools "Socio-Cultural Portrait of the Russian Region" (Modification-2010)*. Moscow: MFRAN. Pp. 13–26. Available at: https://iphras.ru/uplfile/scult/titul.pdf (accessed: February 1, 2022).
Source: own compilation.

[8] Cultures of Wellbeing: Method, Place, Policy, 2015, pp. 29, 38.

Focusing on these correspondences, we have identified 11 key factors that determine the social well-being dynamics. Each factor was decomposed into a number of indicators to which empirically measurable indicators were selected. *Table 2* summarizes the final results of the operationalization of the factors that we have identified.

Table 2. Operationalization of social well-being factors

Factor	Indicator	Type of indicator*
Health	Self-assessment of physical condition	S
	Life expectancy	O
	Self-assessment of emotional state	S
Material well-being	Real disposable income (average)	O
	Self-assessment of purchasing power	S
	Employment rate	O
	Household income structure	O
	Housing area (sq. m.) per capita	O
	Assessment of housing conditions	S; I
Subjective well-being	Assessment of overall life satisfaction	S; I
	Assessment of changes in the quality of life compared to the previous year	S; I
	Forecast of changes in the quality of life for the coming year	S; I
	Level of confidence in the future	S
Social capital	Index of trust in the immediate social environment	S
	Index of trust in voluntary associations	I
	Index of trust in local self-government and territorial self-government	I
	Attitude to receiving a bribe using employment status**	S; I
	Attitude to tax evasion**	S; I
	Attitude to receiving state benefits by a person who does not have the right to them**	S; I
	Attitude to free passage on public transport**	S; I
	Share of participants of public associations from the total population	O
Environment	Environmental assessment	O***
Social security	Share of population with incomes below minimum wage	O
	Assessment of the availability of medical services	O
	Assessment of the quality of medical services	S; I
	Assessment of accessibility of preschool education institutions	O
	Assessment of quality of preschool education institutions	S; I
	Ratio of average pension to average salary	O
Legal security	Victimization level	O
	Corruption perception index	I
	Share of population that has experienced abuse by police	O
	Share of population that has experienced abuse by officials	O
	Protection from discrimination based on nationality or race	S; I
	Protection from discrimination based on religious beliefs	S; I
	Protection from discrimination based on political beliefs	S; I
	Protection from discrimination based on gender and/or age	S; I

End of Table 2

Factor	Indicator	Type of indicator*
Culture and leisure sphere	Territorial accessibility of sports facilities	O
	Financial accessibility of sports facilities	O
	Assessment of sufficiency of recreational facilities	S
	Assessment of sufficiency of leisure facilities for youth and adults	S
	Visit frequency of cultural institutions and related events	O
	Number of cultural institutions per 1,000 people	O
Education	Share of population with higher education	O
	Average and expected duration of training	O
	Assessment of quality of secondary (full) education	S; I
	Assessment of quality of vocational education	S; I
Landscaping of the residence area	Assessment of quality of work of urban/rural utilities	S
	Assessment of landscaping of house and yard territories	S
	Assessment of quality of work of management companies/housing cooperative	S
	Assessment of the state of regional road network	O
	Satisfaction with the work of public urban transport	S; I
	Satisfaction with the work of public intercity transport	S; I
	Assessment of sufficiency of service and retail establishments in the residence area	S
Association with the residence area	Share of people identifying themselves with local/regional community	S
	Degree of desirability of personal emigration	S
	Degree of desirability of emigration for minor children/grandchildren	S

* Each indicator is classified according to the principle of dividing them into objectified (O), subjective (S) and intersubjective (I). The latter are those whose values are determined based on the dominant system of norms and values in society, political culture, ideas about standards of quality of life and consumption. In some cases, it is impossible to distinguish analytically between the subjective and intersubjective nature of the indicator, therefore both codes (S; I) are indicated.
** These indicators show the adherence to the norms of civil cooperation which is considered as one of the key components of social capital within the framework of the Eurobarometer in Russia project.
*** Based on expert assessment.
Source: own compilation.

The proposed operationalization and empirical indicators require some comment. It will be presented below.

Health. In the most detailed form, this factor is presented in the methodology of the study of the quality of life of the World Health Organization, where the state of physical and mental health is separately assessed. This methodology assumes a sufficiently large number of indicators which is important for WHO tasks, but redundant for the sociological study of population well-being. Therefore, we have limited ourselves to two main indicators – self-assessment of physical condition and self-assessment of emotional state supplementing them with the indicator "life expectancy". The choice of the latter is due to the fact that it is used in the calculation of the UN Human Development Index.

Material well-being acts as the main component for measuring social well-being in the works of many domestic economists[9]. M.Y. Malkina directly interprets social well-being as "the availability of necessary resources for productive life", as well as the degree of "provision of people with vital goods, means of existence" (Malkina, 2017, p. 49).

[9] Comprehensive methodology for diagnosing individual's well-being and residence area, 2017, p. 162.

The following formula is proposed to measure population's income:

$$\mathrm{RDI}_{\mathrm{rel}}^{i} = \frac{\mathrm{RDI}_i}{\mathrm{MW}_i}, \quad (1)$$

where RDI_i (in rubles) – real disposable (per capita) income of population living in the *i*-th territory, $\mathrm{RDI}_{\mathrm{rel}}^{i}$ (in rubles) – minimum wage (in average) for population in the *i*-th territory, – relative values showing how many minimum wages on average can be covered by the average per capita income. Real disposable income as an indicator based on government statistics is supplemented by an indicator for assessing the purchasing power of citizens' incomes, measured on the basis of sample survey data. It assumes a verbal-numerical gradation based on the Harrington scale.

The employment rate is an indicator that is well provided statistically, but in reality does not always adequately reflect the state of the labor market because it does not take into account informal employment. It is not uncommon for a person's main (official) type of activity to generate income comparable to his additional earnings. In this regard, we propose to supplement the employment coefficient with data from sample surveys of households on the structure of their income and the share of labor income in it.

We propose to carry out the assessment of housing conditions, an alternative to the statistical indicator of the number of square meters per person by means of selective surveys with ranking of responses on a verbal-numerical scale.

Subjective well-being reflects an integral assessment by individuals of their objective economic, legal and cultural situation in the context of their own hierarchy of basic (terminal) values and life goals. Two indicators are proposed to measure subjective well-being. The first, "life satisfaction", reflects an individual's assessment of the completeness of achieving their priority life goals. The second, "social optimism", is designed to reflect an individual's medium-term assessment of the favorable living conditions in a particular territory in terms of achieving their priority life goals. N.I. Lapin and L.A. Belyaeva propose and justify the method of calculating this indicator (Lapin, Belyaeva, 2010).

Social capital. The concept of social capital is operationalized through a set of empirical indicators which include the level of trust, norms of civil cooperation and participation in voluntary associations[10]. Taking this approach as a basis, we have specified the indicators by which the components of social capital should be measured. The level of trust is measured through the indices of social trust – trust in the immediate social environment (relatives, friends, work colleagues, housemates) and trust in people in general. Along with social trust, institutional trust should also be taken into account. We propose a measurement based on two indices (the index of trust in voluntary associations and the index of trust in local self-government), since they reflect individuals' willingness to build horizontal ties, self-organization and consolidation in the face of common problems of local significance. The methodology for measuring adherence to the norms of civil cooperation is based on the developments of the RANEPA Center for Sociological Research within the framework of the project "Eurobarometer in Russia". To measure participation level in voluntary associations, we propose to estimate the number of active members of various types of non-governmental associations relative to the total population of the surveyed territory. Since the available statistical data on this issue are scattered

[10] Socio-cultural factors of innovative development and successful implementation of reforms, 2017.

and incomplete, representative surveys of the population and expert surveys are becoming a more reliable source of data.

Social security in the narrow sense of the word depends, first of all, on the degree of functionality of health and social security institutions. Along with indicators reflecting the state of these institutions, we propose to consider the level of poverty as an indicator of social security, since poverty is a phenomenon caused not only by the situation in the economy as such, but also by the state of the support system for poor citizens. Measuring the level of absolute poverty based on comparing average per capita or median income with the poverty threshold (minimum wage) has at least two disadvantages: 1) the poverty indicator strongly depends on the method of calculating incomes of citizens and households; 2) the border separating the poor from all other members of society is rigidly tied to such income level that allows only the satisfaction of "primary" needs. At the same time, today the idea of a minimum acceptable standard of living is not limited only to protection from malnutrition and homelessness. Consequently, the incomes that individuals have may be perceived by many of them as insufficient to maintain generally accepted standards of consumption, which means that they will define their position as poverty, even if its measurement on the scale of absolute poverty does not allow them to be officially recognized as poor. In this regard, we propose as an alternative to measure the level of poverty based on the assessment of individuals' purchasing power and economic deprivation degree.

The choice of pensions from the entire list of state and corporate compensatory payments, insurance payments and payments within the framework of direct financial assistance is due to their universality (from the moment of occurrence of an insured event) and payment regularity. The indicator reflecting the effect of replacing lost labor income with a pension is calculated using the formula:

$$\frac{P_{av}}{S_{av}} \times 100\% , \qquad (2)$$

where P_{av} – average monthly labor pension at the end of the *i*-th year, S_{av} – average monthly salary at the end of the *i*-th year.

We propose to measure indicators of the availability of medical services and their quality by means of rank scales in the course of mass and expert surveys. Indicators of accessibility and quality of work of preschool education institutions are included in indicators of social security due to the fact that shifting the function of children's socialization from parents to specialized organizations allows parents to free up time for economic activity without which it would be difficult for households to maintain the usual standards of quality of life.

Legal protection. As indicators for assessing the crime rate, along with the number of registered crimes, we use victimization coefficient recorded in sample surveys of the population. Victimization surveys, despite some of their flaws related to the sensitive nature of the questions, are a more valid tool for determining crime level, especially in terms of the most latent crimes, than criminal statistics data (Verkeev et al., 2019). Corruption is proposed to be assessed primarily through the corruption perception index, the calculation method of which has been tested in cross-country comparative studies, and discrimination risks – through indicators tested in the practice of Russian scientific research (Romashkina et al., 2015, pp. 58–59).

Cultural and leisure infrastructure as a social well-being factor is distinguished in a number of methods of its measurement (see Tab.1). A specific set of indicators may vary depending on the methodology. We limited ourselves to three indicators. We have chosen the indicator "leisure conditions" due to its being frequently mentioned in methodological developments on measuring the quality of life. We have chosen the indicator of accessibility of sports facilities and institutions as it reflects the external conditions for maintaining physical health through physical activity. Finally, we have chosen the indicator "cultural consumption" for two reasons: 1) as a marker of the real education level, not related to the presence of an educational certificate, but expressing the presence of knowledge, skills and motivation formed by education for the consumption of cultural works; 2) as a marker of the development of cultural infrastructure in a particular region / locality which, as a rule, correlates with high economic indicators of the region.

Education level and its accessibility figure in most generally accepted methods of measuring social well-being including the UN methodology for calculating the human development index. At the same time, the quality of the education system has a direct impact on economic dynamics that generates through the human capital. As a result, education both directly and indirectly affects social well-being level which makes it one of the key factors in the framework of the methodology proposed by the authors.

To assess *landscaping of residence area*, indicators that register individuals' assessment of satisfaction with their needs for relevant public goods (transport, utility networks, etc.) and service infrastructure are more valid than objectified indicators of departmental statistics that do not fully take into account requests from the population and qualitative characteristics of the comfort of the urban environment.

Association with residence area. Involvement in the life of a regional or local community, shared identity with it is one of the significant socio-psychological factors of social well-being of both individuals and communities as a whole. In addition, this factor is important from the point of view of population conservation and further development of territories. Along with the degree of formation of territorial identities recorded in mass surveys, the severity of emigration attitudes is the most important indirect indicator of individuals' alienation from local communities and/or dissatisfaction with the birth place.

Methodological problems of calculating weight coefficients of social well-being factors

The factors discussed above obviously have different significance in terms of their impact on the social well-being of a certain territory. Its evaluation involves assigning numerical values to factors. When factors are reduced to quantitative indicators, this is not a problem. However, in other cases, there is a need to turn to expert methods – an extensive set of branched procedures, the use of which is an independent task.

The degree of influence of factors can be assessed in various ways – from direct statistical calculation of weight coefficients, econometric or simulation modeling to methods of system analysis. Among the latter, the most well-known are the methods of direct placement, ranking and analysis of hierarchies. The first two have become widespread due to their simplicity, the latter due to the technological nature of the procedures used in it. Empirical evidence has shown that all three of these approaches are highly correlated (Korobov, 2005).

The possibility of conducting a simulation procedure is not excluded which in many cases gives quite acceptable results. In one of the similar studies, the deviations obtained by simulations gave a spread from 3 to 32% with an average error statistically insignificantly different from zero. However, the correlation coefficients obtained by experimental and model methods differed from each other by almost two times. This suggests the need to consider also the limiting situation when factors form a strict hierarchy – ranks are not combined, and in the matrix of paired comparisons of the hierarchy analysis method, each factor is strictly greater (or strictly less) than the previous one in its value. This often happens, for example, when all experts think about the same, the task is clearly formalized; the criteria for assessing the situation are clear, experts of approximately equal qualifications and hold similar positions on this issue. Then the totality of experts can, in principle, be replaced by a "collective" expert as the results of all will be close.

In connection with the above, the question of which method to use in a specific practical situation depends on the characteristics and quality of the empirical material obtained. We should note that in our works we often turned to the method of hierarchy analysis proposed by the American mathematician T. Saaty (Saaty, 2009) and its various modifications. A number of studies have been devoted to discussing the advantages and disadvantages of this group of methods (Tatarova, 2002; Litvak, 2004; Tutygin, Korobov, 2010; Tomashevskii, 2014).

Returning to the question of choosing one of the methods, we note that their proximity can be even higher if the ranking of the studied factors is made more accurate. Weight coefficients w_i of the factors ($i = 1, \ldots, n$) are calculated by the formula:

$$w_i = \frac{2 \cdot (n + 1 - \overline{r_{ik}})}{n \cdot (n + 1)}, \qquad (3)$$

where $\overline{r_{ik}}$ – average value of the ratings of the ranks of the i-th factor set by experts, k – ordinal numbers of experts. This means that the weight coefficients obtained by ranking will be evenly distributed within the interval, while those obtained by hierarchy analysis and especially by direct placement can take a larger number of values within the same interval. This is especially true for a small number of factors, when estimates become rougher due to an increase in the degree of discreteness. It is possible to reduce the effect of discreteness by dividing gradations into additional categories. The easiest way is to introduce three more gradations, which greatly facilitates the work of the expert, since it allows making decisions and giving estimates on the principle of "middle", "more", "less". This is what they do when the state of the object allows them to do it (Kochurov et al., 2018).

Also, this approach helps to achieve more adequate estimates if the researcher wants to get close, but not equal values of weight coefficients. Direct placement allows doing this without problems (however, if the number of factors n does not exceed 6–7), the method of analyzing hierarchies, in general, too, and when ranking, difficulties arise due to discreteness resulting from the need to assign estimates to different ranks. This problem is of a general methodological nature and applies to all types of verbal-numerical scales (Tutygin et al., 2020).

In the course of the conducted research, we have found that the ranking method for calculating weight coefficients is not inferior in accuracy to the hierarchy analysis method, but at the same time it is free from inherent disadvantages. It is also much easier to use and allows for the formation of a sequence of factors. This makes it possible to widely apply ranking to solve an extensive set of problems, especially at the preliminary research stages, where greater accuracy is not required, and qualitative assess-

ments are decisive. It follows from the above that the ranking method is in a certain sense a compromise, combining simplicity of implementation and logical validity of the results.

Let us apply this methodology for assessing the significance of factors (see Tab. 2) in relation to a specific entity of the Russian Federation.

The ranking was conducted by a group of eight qualified experts – representatives of academic and university communities specializing in the study of socio-political, socio-economic and economic-ecological processes in the Arkhangelsk Oblast[11]. The ranking results are presented in *Table 3*.

We should note that in Table 3, for factors 7–10, the ranks are not divided among themselves, so the ranking should be adjusted by calculating and then clarifying weight coefficients. The initial values of weight coefficients averaged by a group of experts are given in *Table 4*.

Table 3. Ranking of social well-being factors

Factor	Expert's no.								Σ	r_{ik}	Rank
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*			
Health	1	1	1	1	1	1	3	1	10	1.25	1
Material well-being	4	2	6	2	2	3	1	2	22	2.75	2
Subjective well-being	2	9	9	4	11	2	2	8	47	5.88	7
Social capital	3	8	10	10	9	7	9	9	65	8.13	10
Environment	8	5	7	5	5	8	4	3	45	5.63	6
Social security	9	4	4	3	4	6	5	6	41	5.13	3
Legal security	7	3	3	6	3	5	11	5	43	5.38	4-5
Cultural and leisure sphere	6	10	5	7	10	10	6	10	64	8.00	8-9
Education	5	6	2	9	6	4	7	4	43	5.38	4-5
Landscaping of residence area	10	7	8	8	7	9	8	7	64	8.00	8-9
Association with residence area	11	11	11	11	8	11	10	11	84	10.5	11
Source: own compilation.											

Table 4. Weight coefficients of social well-being factors

Factor	Weight coefficients
Health	0.163
Material well-being	0.140
Subjective well-being	0.093
Social capital	0.059
Environment	0.096
Social security	0.104
Legal security	0.100
Cultural and leisure sphere	0.061
Education	0.100
Landscaping of residence area	0.061
Association with residence area	0.023
Source: own compilation.	

[11] The results of ranking and calculation of weight coefficients presented below are applicable only to the Arkhangelsk Oblast – the values of "weights" for other regions should be determined based on the estimates of local experts.

Table 5. Weight factors and ranks of socio-economic factors

Factor	Initial weight coefficients	Rank	Refined weight coefficients	Rank
Health	0.163	1	0.161	1
Material well-being	0.140	2	0.129	2
Subjective well-being	0.093	7	0.102	3
Social capital	0.059	10	0.064	9
Environment	0.096	6	0.095	7
Social security	0.104	3	0.101	4
Legal security	0.100	4-5	0.099	6
Cultural and leisure sphere	0.061	8-9	0.065	8
Education	0.100	45	0.100	5
Landscaping of residence area	0.061	8-9	0.061	10
Association with residence area	0.023	11	0.023	11
Source: own compilation.				

To improve the accuracy of weight coefficients, a second round of an expert survey can be conducted. The following procedure is proposed. Experts are given the right to change the value of weight coefficients, but not by more than the value of $\Delta_{k_i} = \pm\frac{1}{n}$ for one factor. In this case, the absolute value of the limit value is 0.045. At the same time, the following condition should be met: if an expert increases (decreases) the value of weight coefficient of a certain factor, then they should reduce (increase) the values of other factors together by the same amount. In the case when Δ_{k_i} is distributed between two or more factors, the sum of the corrections should be equal to Δ_{k_i}. *Table 5* shows the adjusted and averaged weight coefficients of the factors, together with the updated ranks obtained. We should note that half of the experts made partial clarifications; the rest considered the final results quite acceptable.

In the situation under consideration, "Health" factor was recognized as the most significant including such important components for the population as physical condition, life expectancy and emotional state which naturally directly affect the social well-being. Also, quite predictably, the factor of material well-being (work, income, and housing) came in second place. In the 3–7 positions in the ranking there is a group of factors related to social, legal and environmental safety, as well as subjective well-being (their weights range 0.095–0.102). Factors of cultural and leisure sphere, social capital and landscaping of residence area formed a group in the range of 0.061–0.065 (ranks 8 to 10).The factor of association with residence area turned out to be special in the resulting ranking and with a fairly low weight coefficient of 0.023 which has a quite logical explanation associated with the high emigration attitudes of residents of the region selected as an example.

Conclusion

The methodology that we have proposed for comprehensive assessment of social well-being reflects modern ideas about the multidimensionality of this phenomenon, the presence of objectified, subjective and intersubjective components in its structure. The sets of factors and variables described in the article are generally consistent with those identified within the framework of empirically tested international and Russian methods, and represent their systematization and adjustment in terms of valid indicators and relevant measurement methods and data sources.

Taking into account the disequilibrium of the influence of the factors on the social well-being level, the article also solves the problem of justifying the choice of a reliable method for calculating weight coefficients. We have proposed and tested a ranking method – a special case of the expert evaluation method. The procedure for assessing the "weights" of factors is quite clearly formalized, verified and can be recommended for practical use.

The methodology proposed in the article is adapted to Russian realities and takes into account the features of the economy and infrastructure, institutional environment and socio-cultural processes in the country. Within the framework of the Russian social system, it is universal for all regions and municipalities – adjusted for the fact that the calculation of weight coefficients of social well-being factors for specific regions / territories should be based on the assessments of local experts.

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Information about the Authors

Anton M. Maksimov – Candidate of Sciences (Politics), Associate Professor, Senior Researcher, N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences (23, Severnaya Dvina Embankment, Arkhangelsk, 163000, Russian Federation; e-mail: amm15nov@yandex.ru)

Andrei G. Tutygin – Candidate of Sciences (Physics and Mathematics), Associate Professor, Leading Researcher, N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences (23, Severnaya Dvina Embankment, Arkhangelsk, 163000, Russian Federation; e-mail: andgt64@yandex.ru)

Kristina O. Malinina – Candidate of Sciences (Sociology), Leading Researcher, head of laboratory, N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences (23, Severnaya Dvina Embankment, Arkhangelsk, 163000, Russian Federation; e-mail: malinina.ciom@gmail.com)

Lyudmila A. Chizhova – Candidate of Sciences (Economics), Associate Professor, Leading Researcher, N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences (23, Severnaya Dvina Embankment, Arkhangelsk, 163000, Russian Federation; e-mail: chijova.mila@yandex.ru)

Tat'yana A. Blynskaya – Candidate of Sciences (Agriculture), Senior Researcher, N. Laverov Federal Center for Integrated Arctic Research, Ural Branch of the Russian Academy of Sciences (23, Severnaya Dvina Embankment, Arkhangelsk, 163000, Russian Federation; e-mail: t_blynskaya@mail.ru)

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Life Expectancy in Russia's Regions

Dmitrii L.
SKIPIN
University of Tyumen
Tyumen, Russian Federation
e-mail: dskipin@mail.ru
ORCID: 0000-0001-5840-5789; ResearcherID: P-2821-2018

Yuliya A.
YUKHTANOVA
University of Tyumen
Tyumen, Russian Federation
e-mail: gaudi21@mail.ru
ORCID: 0000-0002-9365-9714

Oleg A.
KRYZHANOVSKII
University of Tyumen
Tyumen, Russian Federation
e-mail: o.a.kryzhanovskij@yandex.ru
ORCID: 0000-0002-3670-0063; ResearcherID: B-5682-2019

Elena G.
TOKMAKOVA
University of Tyumen
Tyumen, Russian Federation
e-mail: tokmake@mail.ru
ORCID: 0000-0003-4109-5213

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Abstract. Life expectancy at birth is used as a comprehensive indicator of public health and socio-economic development. The impact of the quality of healthcare, reginal economic development and people's welfare on life expectancy at birth in Russia requires more detailed and system-wide scientific substantiation at the level of RF constituent entities. The novelty of the study consists in identifying the impact of various factors on the increase in life expectancy by constructing panel vector autoregressions in groups of Russian regions identified with the help of clustering and showing similar rates of increase in life expectancy. The results of the obtained models in the context of the formed clusters demonstrate that the increase in life expectancy in all clusters correlates with the positive dynamics of economic development in the region and the increase in average per capita income. Factors contributing to the organization of the healthcare system in the regional context are poorly related to life expectancy indicators due to the underfunding of this area, orientation toward a decrease in the provision of beds in hospitals due to the optimization of the healthcare system and the cumulative nature of the impact. The conclusions obtained in the course of our study can be used in the practice of managing the quality of life and socio-economic development in Russia's regions.

Key words: life expectancy, factors, region.

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Introduction

Life expectancy (LE) at birth is a generally recognized indicator of public health at the state and regional levels, which is among the main factors contributing to the quality of human resources (Marmot, 2005; Alam et al., 2015; Wilson et al., 2020). LE also acts as a broad social indicator that covers a number of fundamental aspects of social well-being (Wilkins, Adams, 1983). LE is also actively used in the calculations of integral development indicators: the Human Development Index (HDI) (Stanton, 2007), the Gender-Related Development Index (GDI) (Klasen, Schüler, 2011), the Physical Quality of Life Index (PQLI) (Morris, 1980).

LE is studied in relation to the state of health of the nation, quality of life, and human capital. To this end, scientists analyze the results of governmental socio-economic policy and its impact on the health of the population as a whole and individuals, taking into account clinical, epidemiological and environmental developments. Constructing models of various levels of complexity and detail helps to shed light on the possibilities of managing LE indirectly through major drivers of its dynamics.

It is interesting to point out a study by A. Bergh and T. Nillson, which analyzes the relationship between the economic, social, and political dimension of globalization, and life expectancy on the basis of panel data from 92 countries for 1970–2005. The authors found out a positive impact of economic globalization on life expectancy and also assessed the effect of such factors as income, consumption, quality of nutrition, the possibility of obtaining education and health services, etc. on life expectancy (Bergh, Nillson, 2010).

The work of R. Desbordes analyzes the relationship between life expectancy and gross domestic product (GDP) per capita in 47 countries in 1940 and 1980, in some of them a nonlinear relationship between life expectancy and per capita income was revealed (Desbordes, 2011). The statistical

dependence of life expectancy on the economic situation of the country was confirmed on the basis of observations in 1940, 1980 and 2000. It is concluded that LE has a generally positive impact on economic growth and people's income, but this impact is not direct and largely depends on the prevailing social conditions (Cervellati, Sunde, 2011a; Cervellati, Sunde, 2011b).

M. Biyase and M. Malesa investigated the causal relationship between life expectancy and economic growth in a sample of 10 member states of the Southern African Development Community for the period from 1985 to 2017. The scientists have come to the conclusion that LE has a positive effect on economic growth. The stability of the results was confirmed by adding the variables such as inflation, openness of trade, government spending (Biyase, Malesa, 2019). Another team of authors conducted a study on 16 African countries for 1970–2012. Using nonparametric methods, they found out that improving the health infrastructure and economic growth can play a decisive role in increasing the level of LE (Shahbaz et al., 2019). L. He and N. Li found a bidirectional relationship between life expectancy and economic growth for 65 countries according to the data for the period from 1980 to 2014 (He, Li, 2020). As part of the analysis of the data for 1992–2016, T. Gövdeli confirmed a two-way causal relationship between economic growth and life expectancy using the example of the E7 countries (China, India, Brazil, Mexico, Russia, Indonesia and Turkey) (Gövdeli, 2019).

Socio-economic inequality among various population strata on the basis of an integrated indicator, including average per capita income and LE, was estimated by M. Pandey and J. Nathwani (Pandey, Nathwani, 1996). M. Gürler and Ö. Özsoy investigated the long-term relationship between per capita monetary income and life expectancy based on panel data from 56 developing countries in North Africa, the Middle East and Southeast Asia for the 1990–2015 period. As a result, they show that economic growth according to Granger causes an increase in life expectancy only for panel data, but not for cross-sectional data (Gürler, Özsoy, 2019). The results of a study by A. Sirag and colleagues indicate the existence of a non-linear relationship between LE and economic growth. In particular, an increase in LE has a positive effect on economic growth, but only up to a certain threshold level, any further increase in LE has a negative impact (Sirag et al., 2020).

When addressing the task at hand, we consider it important to look at F. Halicioglu's research on life expectancy in Turkey in 1965–2005 in relation to certain social, economic and environmental factors. Empirical results have shown that the quality of nutrition, its availability and healthcare costs are the main conditions for increasing life expectancy, while smoking causes many diseases and shortens life (Halicioglu, 2011).

A team of scientists analyzed the factors that determine life expectancy in the United States. For example, along with socio-demographic, economic factors, provision of medical facilities and health services, a favorable environment positively affects life expectancy (Poudyal et al., 2019).

H. Mahyar, using the 1966–2013 data on Iran as an example, found that economic growth had a positive statistically significant impact on life expectancy (Mahyar, 2016). The Preston model is also of interest, it reflects the relationship between LE and gross domestic product per capita, given in comparable prices (Preston, 1975; Edwards, 2016).

The World Bank's *World Development Report 2018 (WDR 2018) – LEARNING to Realize Education's Promise* notes that almost a quarter of children around the world are stunted and this hinders their cognitive development[1]. Meanwhile, half of the world's population is not covered by basic health services, and 80% of poor people in low-income countries do not have social protection.

[1] World Development Report 2018 – LEARNING to Realize Education's Promise. World Bank Group.

Nevertheless, simple cross-country comparisons of healthcare systems turn out to be unreliable due to a significant difference in indicators. Developed, developing and poor countries face not only underfunding of healthcare, but also significant distortions associated with mismanagement in the system (Merson et al., 2006). We agree with V. Mau who noted that effective systems that meet modern challenges, including those in the healthcare system, simply do not exist in the world (Mau, 2013).

In Russia, there still remain significant differences between regions, despite huge efforts undertaken to improve the situation. The task of optimization in the Russian healthcare system has turned from an economic problem into a large-scale social issue (Shabunova et al., 2017). G.F. Romashkina and colleagues, studying health capital at the meso-level, which includes LE, found out that according to this indicator, the regions of the Arctic zone lag significantly behind the all-Russian level and the dynamics remain negative. The decline is due not only to differences in the development of territories and the quality of healthcare, but to other factors as well (Romashkina et al., 2020).

Empirical research on LE based on Russian data in the context of regions are mainly focused on studying the dependence of LE on economic and social factors (Prokhorov, 2011; Lokosov et al., 2018; Chistik, Blinova, 2018; Lavrinenko, Rybakova, 2015; Kossova et al., 2017; Kostromina, 2017; Zhukova et al., 2016; Shkol'nikov et al., 2014; Andreev, Shkol'nikov, 2018; Kolosnitsyna et al., 2019; Kossova, 2020).

A team of specialists under the guidance of B.B. Prokhorov was studying life expectancy in the framework of the quality of public health in the regional context, according to the data from 1991 to 2007. According to B.B. Prokhorov, the quality of public health can be assessed using the following indicators: LE, standardized mortality rates, infant mortality, general morbidity. The scientists pay special attention to the dynamics of socio-economic reform in Russia and its results in the context of medical and demographic indicators (Prokhorov, 2011).

The sphere of scientific interests of V.V. Lokosov, E.V. Ryumina, and V.V. Ulyanov is connected with the research on the population quality in conjunction with regional economic indicators. By clustering regions and conducting a regression analysis, the authors studied the influence of population quality factors (one of which is life expectancy) on the indicator of sustainable development of territories – GRP per capita. As a result, it was found that the factors characterizing population quality were not among the significant ones' however it does not diminish the importance of these indicators for studying regional and global socio-economic problems (Lokosov et al., 2018).

P.A. Lavrinenko and D.A. Rybakova conducted a comparative analysis of regional differences in public health, ecology and healthcare. At the same time, they assess public health using indicators of average life expectancy and general morbidity due to all reasons with the use of econometric methods (Lavrinenko, Rybakova, 2015). The scientists drew attention to the dependence of life expectancy in men and women on a number of factors, such as per capita income, unemployment rate, Gini coefficient, alcohol consumption, as well as mortality due to external causes, from 2008 to 2013 in Russia and by region (Kossova et al., 2017). E.V. Kostromina analyzed the prospects for economic growth and development of certain Russian regions connected with improving the quality of healthcare (Kostromina, 2017).

A.K. Zhukova, A.M. Silaev, and M.V. Silaeva studied the influence of a number of socio-ecological indicators on life expectancy in certain regions of Russia from 2000 to 2014, taking into account spatial effects. The authors divided all the regions geographically into western and eastern, and name the specifics of the influence of factors typical of these RF territories (Zhukova et al., 2016).

E.M. Andreev and V.M. Shkol'nikov confirm the need to study the dependence of LE on the economic situation in the region. The authors came to the conclusion that life expectancy in Russia is significantly lower than the level that, according to the Preston model, corresponds to the domestic gross domestic product, noting that the task of protecting health and prolonging life in modern Russia has not yet received proper priority (Shkolnikov et al., 2014; Andreev, Shkolnikov, 2018).

We agree with T.V. Kossova and co-authors who point out that life expectancy in Russia is lower than in countries with a comparable level of economic development. The study demonstrates the unequal influence of various factors, including the development of the economy and the health system, on public health, depending on the countries' belonging to different clusters in terms of life expectancy (Kolosnitsyna et al., 2019; Kossova, 2020).

Identifying groups of countries or regions with similar characteristics by conducting cluster analysis helps to identify the influence of factors on LE in the selected groups (Lokosov et al., 2018; Lavrinenko, Rybakova, 2015; Kostromina, 2017; Kolosnitsyna et al., 2019). Most scientists assume that LE largely depends on a set of factors specific to individual countries or regions. In order to study the influence of factors on LE, the least squares method (LSM) is traditionally used for panel data (Bergh, Nillson, 2010; Desbordes, 2011; Cervellati, Sunde, 2011a, 2011b; He, Li, 2018; Gövdeli, 2019; Sirag et al., 2019; Halicioglu, 2011; Poudyal et al., 2019; Edwards, 2016; Acemoglu, Johnson, 2007, Zhukova et al., 2016), a two-stage LSM (Biyase, Malesa, 2019; Halicioglu, 2011; Acemoglu, Johnson, 2007), random and fixed effects models (Bergh, Nillson, 2010; Biyase, Malesa, 2019; Gürler, Özsoy, 2019; Kossova et al., 2017; Kostromina, 2017), spatial modeling: SAR (Spatial Autoregressive Model), SEM (Spatial Error Model), SDM (Spatial Durbin Model) (Zhukova et al., 2016).

Over the past decades, important advances have been made in the study of dynamic panel data models with fixed effects for typical conditions when the cross-section size (N) is large and the time size (T) is small. Classical regression methods based on LSM are inapplicable due to the Nickell bias, which does not disappear asymptotically if $N \to \infty$ and T is stable (Nickell, 1981). One of the solutions to this problem is to apply the generalized method of moments estimation popularized by L. Hansen in economics (Hansen, 1982). The work of D. Holtz-Eakin, W. Newey and H. Rosen evaluates and tests the coefficients of vector autoregression on panel data. Vector autoregressions are a standard part of the toolkit of applied econometrics (Holtz-Eakin et al., 1988). It is impractical to apply standard methods for estimating vector autoregressions to panel data; therefore, modern models allow non-stationary individual effects and are evaluated by applying instrumental variables to quasi-differential autoregression equations.

The purpose of our work is to make a comparative assessment of how the changes in the factors contributing to organizing health and well-being influence the indicator of LE growth, taking into account the specifics of formation of LE in the selected groups of regions with similar characteristics of its growth. Tasks: to identify clusters of RF constituent entities according to the growth rates of life expectancy due to strong interregional differentiation; to assess the influence of healthcare and well-being factors in the selected clusters reflecting regional features in the formation of LE; to discuss the results of testing the interrelation of factors on LE in the context of the formed clusters.

The novelty of our study consists in identifying the features of the influence of factors on the growth of LE by constructing panel vector autoregressions in selected groups of RF regions with similar rates of increase in life expectancy.

Materials and methods

Based on the regional panel data of Rosstat for 1995–2017, time series clustering using DTW (Dynamic Time Warping) is carried out according to the growth rates of life expectancy in one calendar year. DTW time series clustering is a dynamic programming algorithm that tries to find the optimal transition path between two series. Within the framework of the selected clusters, panel vector autoregressions (Sigmund, Ferstl, 2021) of the increase in LE depending on the drivers of development of the healthcare system and people's well-being were constructed. The PVAR (Panel Vector Autoregression) model is a combination of a dynamic panel model (DPM) with one equation and a vector autoregression model (VAR) for p lags of m endogenous variables (matrix of coefficients $A_l(m \times m)$), k predefined variables (matrix of coefficients and strictly exogenous variables (matrix of coefficients $C(m \times n)$):

$$y_{i,t} = \mu_i + \sum_{i=1}^{p} A_l y_{i,t-l} + Bx_{i,t} + Cs_{i,t} + \epsilon_{i,t}. \quad (1)$$

Its main advantage consists in the use of all values of all independent variables as tools, which allows us to get closer to the true estimate of the coefficient. The task of such an analysis is to find and prove a statistically significant influence of a factor on a dependent variable.

The popularity of the PVAR model in empirical economics is confirmed by the high citation of the work of I. Love and L. Zicchino (Love, Zicchino, 2006). They represent an unofficial STATA code, which was expanded by M. Abrigo and I. Love (Abrigo, Love, 2016), using the Generalized Method of Moments (GMM), an estimation method of the first generation proposed by T. Anderson and C. Hsiao (Anderson, Hsiao, 1982) to cope with the Nickell bias (Nickell, 1981). The panelvar package used in the work implements a direct extension of the method of T. Anderson and C. Hsiao, the method for the first difference GMM estimation (Holtz-Eakin et al., 1988; Arellano, Bond, 1991) and a more complex GMM system (Blundell, Bond, 1998) for the PVAR model.

The choice of indicators is based on the experience of many empirical works (Alam et al., 2015; Bergh, Nillson, 2010; Desbordes, 2011; Cervellati, Sunde, 2011a, 2011b; Biyase, Malesa, 2019; Shahbaz et al., 2019; He, Li, 2020; Gövdeli, 2019; Pandey, Nathwani, 1996; Gürler, Özsoy, 2019; Sirag et al., 2020; Halicioglu, 2011; Poudyal et al., 2019; Mahyar, 2016; Preston, 1975; Edwards, 2016; Chistik, Blinova, 2018; Kossova et al., 2017; Kostromina, 2017; Zhukova et al., 2016; Kolosnitsyna et al., 2019; Kossova, 2020) and the availability of data in Rosstat's statistical reporting. The sample consists of 1,580 observations in 83 regions for 1995–2017. Panel data analysis increases the reliability and stability of conclusions. Analyzing modern research, it is possible to identify factors considered as determinants of life expectancy, the main of which are economic factors, health organization, urbanization, food consumption, living conditions: provision of hospital beds per 10,000 people (availab_hosp); capacity of outpatient clinics per 10,000 people (power_clinics); population per doctor (popul_doc); number of mid-level practitioners (doc_middle_level); real gross regional product per capita (grp_real); average per capita real monetary income in rubles (income_real); number of deaths broken down by stratum and individual causes of death per 100,000 people per year, cause of death – homicide (mdk); number of own light motor vehicles per 1,000 people (cars); total area of residential premises, on average per inhabitant (living_space); consumption of meat and meat products (including by-products of category II and raw fat) per capita (consume_meat); share of urban population in the total population (share_urban).

In the present study, we put forward the following hypothesis: the trend of changes in LE in the selected clusters is not equally related to the dynamics of welfare, health organization, urbanization, food consumption, and living conditions.

Results

Based on Rosstat data, we designed maps of life expectancy at birth in RF constituent entities in 1995 and 2017. During the period under consideration, life expectancy at birth tended to increase *(Fig. 1, 2)*.

The average life expectancy was the highest (more than 73 years) in the North Caucasian Federal District, namely in the Republics of Dagestan and Ingushetia. The smallest average value of life expectancy (58.6 years) was demonstrated by the Republic of Tyva (Siberian Federal District). The maximum life expectancy (81.59 years) was recorded in the North Caucasus Federal District, the minimum (53.76 years) – in the Siberian Federal District. The distribution of life expectancy by region shows the greatest

Figure 1. Life expectancy at birth in RF constituent entities in 1995

Compiled according to: *Regions of Russia. Socio-Economic Indicators. 2002: Statistics Collection.* Rosstat. Moscow, 2002. Pp. 55–56.

Figure 2. Life expectancy at birth in RF constituent entities in 2017

Compiled according to: *Regions of Russia. Socio-Economic Indicators. 2019: Statistics Collection.* Rosstat. Moscow, 2019. Pp. 79–84.

variation in life expectancy in the regions of the Northwestern, Ural and Siberian federal districts, with a relatively small variation in this indicator in the Southern, Volga and Far Eastern federal districts.

Due to the fact that life expectancy in all the observed RF constituent entities has increased significantly over the studied period and is showing an upward trend, the generated data panel was checked for stationarity. The extended Dickey–Fuller test for life_expectancy with a constant and trend revealed the absence of stationarity for all analyzed regions in terms of life expectancy. Therefore, in addition to the fact that monetary variables are taken in constant prices for the construction of econometric models, dependent and explanatory variables are taken in logarithm differences (percentage increments year to year, the prefix dlog_ is introduced for all variables subject to this procedure (Alam et al., 2015; Bergh, Nillson, 2010; Desbordes, 2011; Cervellati, Sunde, 2011a, 2011b; Shahbaz et al., 2019; He, Li, 2020; Gövdeli, 2019; Gürler, Özsoy, 2019; Halicioglu, 2011; Poudyal et al., 2019; Preston, 1975; Edwards, 2016; Zhukova et al., 2016; Kolosnitsyna et al., 2019; Kossova, 2020), the suffix _lag1 is used to denote lag variables (for the previous year) (Bergh, Nillson, 2010; He, Li, 2020; Gövdeli, 2019; Halicioglu, 2011; Mahyar, 2016).

The extended Dickey–Fuller test for life_expectancy with a constant and trend indicates the presence of stationarity for all the analyzed regions according to the difference in the logarithms of life expectancy.

Changes in life expectancy over the analyzed period in the regions have a general positive trend, but the growth rates vary significantly. We carry out the clustering of DTW time series according to the growth rate of life expectancy for one calendar year.

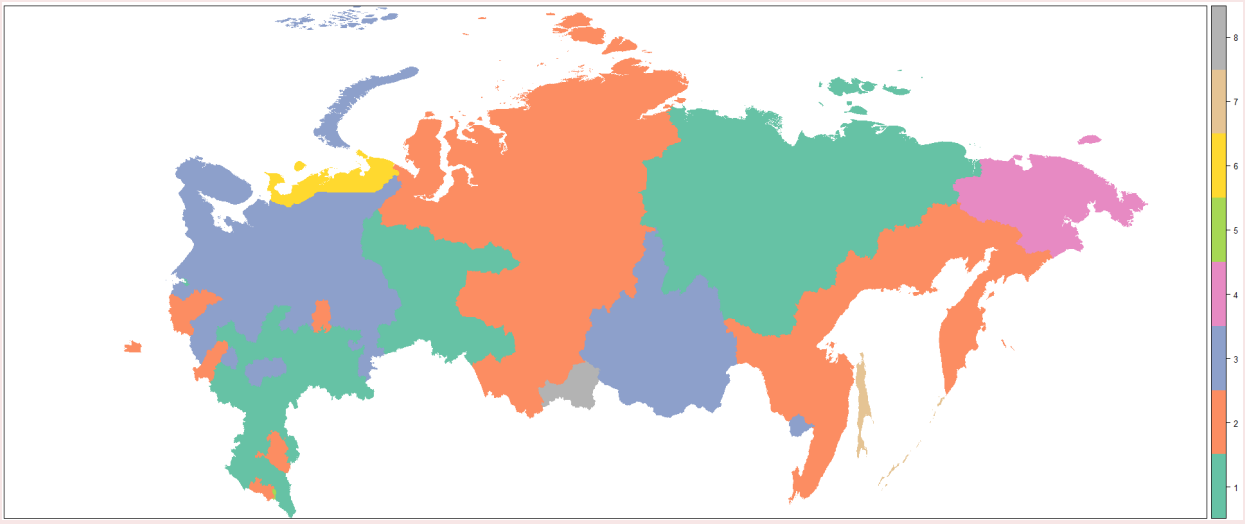
As a result of clustering, we identified eight clusters *(Tab. 1, Fig. 3)*.

The first cluster includes the following regions: Adygea, Astrakhan Oblast, Republic of Bashkortostan, Belgorod Oblast, Republic of Chuvashia, Saint Petersburg, Republic of Dagestan, Khanty-Mansi Autonomous Okrug, Krasnodar Krai, Kurgan Oblast, Kursk Oblast, Lipetsk Oblast, Republic of Mordovia, Moscow, Moscow Oblast, Nizhny Novgorod Oblast, Novosibirsk Oblast, Omsk Oblast, Oryol Oblast, Orenburg Oblast, Rostov Oblast, Ryazan Oblast, Yakutia, Samara Oblast, Saratov Oblast, Stavropol Krai, Republic of Tatarstan, Tyumen Oblast (without the autonomous okrugs), Ulyanovsk Oblast, Volgograd Oblast, Voronezh Oblast. This cluster is characterized by a low average annual increase in life expectancy, the lowest variance, that is, changes from year to year are the least volatile compared to other clusters *(Fig. 4)*.

Table 1. Descriptive statistics for life expectancy growth rate in RF constituent entities for 1995–2017

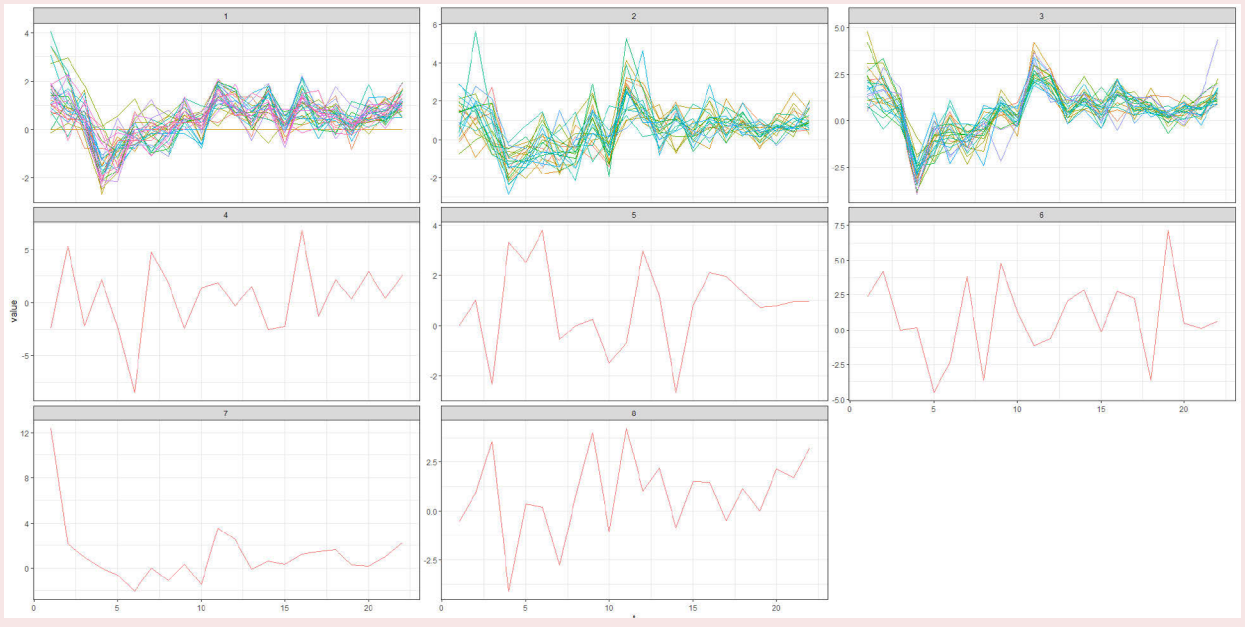
Cluster	I	II	III	IV	V	VI	VII	VIII
Minimum	-2.66	-2.84	-3.97	-8.49	-2.66	-4.52	-2.08	-4.10
Maximum	4.05	5.64	4.82	6.86	5.00	7.17	12.39	4.21
Standard deviation	0.87	1.17	1.34	3.35	1.91	2.90	2.84	2.05
Arithmetic mean	0.46	0.53	0.53	0.46	0.96	0.85	1.14	0.84
Median	0.48	0.60	0.62	0.89	0.88	0.56	0.47	0.97
Number of regions	32	22	24	1	1	1	1	1
Regions	In the text	In the text	In the text	Chukotka AO	Ingushetia	Nenets AO	Sakhalin Oblast	Tyva
Proportion of RF population in 2017, %	59.72	15.97	23.35	0.03	0.34	0.03	0.34	0.22
Calculated according to: Regions of Russia. Socio-Economic Indicators. 2002–2019: Statistics Collection. Rosstat. Moscow, 2002–2019.								

Figure 3. Clustering RF constituent entities by growth rate of life expectancy at birth



Compiled according to: *Regions of Russia. Socio-Economic Indicators. 2002–2019: Statistics Collection.* Rosstat. Moscow, 2002–2019.

Figure 4. Dynamics of the increase in life expectancy at birth, broken down by cluster



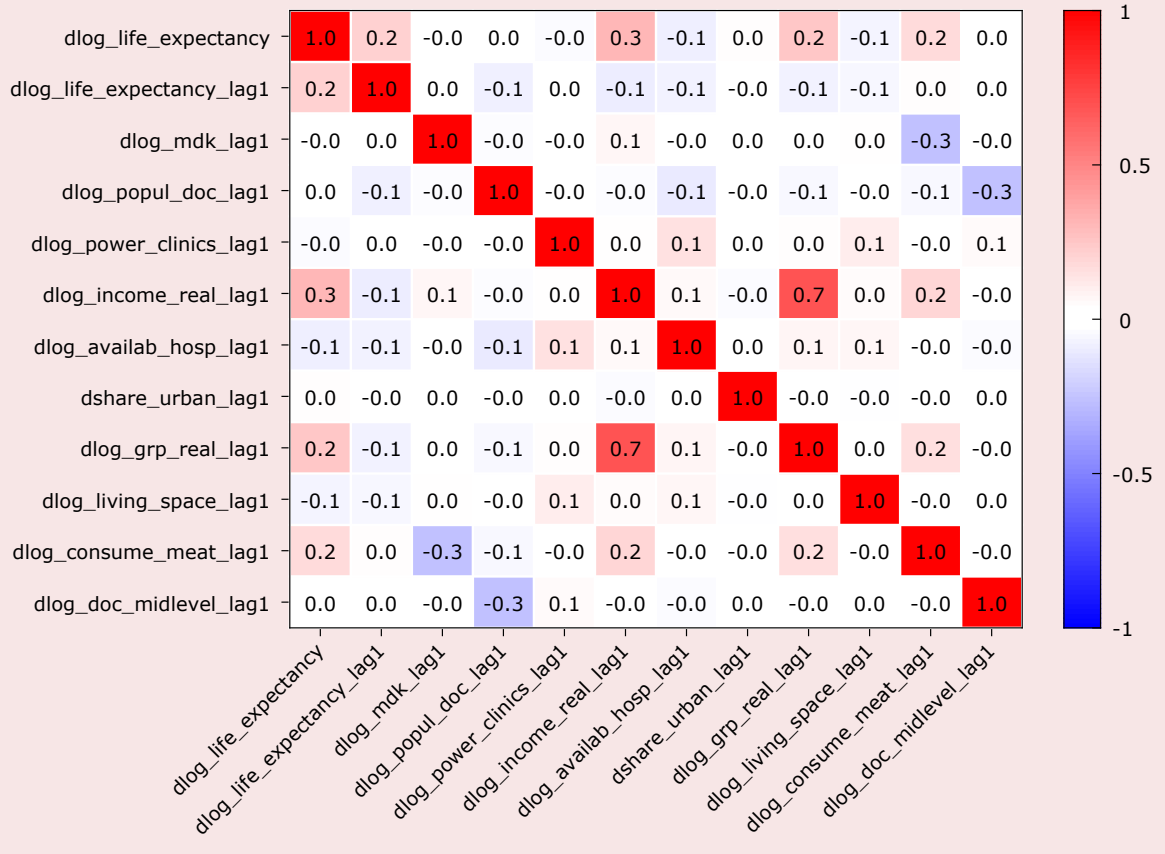
Compiled according to: *Regions of Russia. Socio-Economic Indicators. 2002–2019: Statistics Collection.* Rosstat. Moscow, 2002–2019.

The second cluster includes the following regions: Altai Krai, Amur Oblast, Bryansk Oblast, Altai Republic, Kabardino-Balkaria, Kaliningrad Oblast, Republic of Kalmykia, Kaluga Oblast, Kamchatka Krai, Karachay-Cherkessia, Kemerovo Oblast, Khabarovsk Krai, Republic of Khakassia, Krasnoyarsk Krai, Magadan Oblast, North Ossetia, Novgorod Oblast, Primorsky Krai, Pskov Oblast, Tomsk Oblast, Republic of Udmurtia, Yamalo-Nenets Autonomous Okrug. The cluster is characterized by a higher average annual increase in life expectancy, while there is a large variance, that is, changes from year to year compared to the first cluster.

The third cluster includes the following regions: Arkhangelsk Oblast, Republic of Buryatia, Chelyabinsk Oblast, Irkutsk Oblast, Ivanovo Oblast, Republic of Karelia, Kirov Oblast, Republic of Komi, Kostroma Oblast, Leningrad Oblast, Republic of Mari El, Murmansk Oblast, Penza Oblast, Perm Oblast, Smolensk Oblast, Sverdlovsk Oblast, Tambov Oblast, Tula Oblast, Tver Oblast, Vladimir Oblast, Vologda Oblast, Yaroslavl Oblast, Jewish Autonomous Oblast, Zabaykalsky Krai. This cluster is characterized by approximately the same average annual increase in life expectancy as the second cluster, while there is an even greater variance, that is, changes from year to year compared to the first cluster.

The fourth, fifth, sixth, seventh and eighth clusters each consist of one region. They are outliers (the dynamics of the analyzed indicator in these cluster regions is very different from all other clusters). We will exclude them from further analysis.

Figure 5. Correlation matrix for life expectancy at birth and regressor factors



To select the parameters, we designed a correlation matrix for life expectancy at birth and regressor factors *(Fig. 5)*.

The correlation coefficients are relatively low, the factors with near-zero correlation coefficients were excluded from further analysis. As a result of the study, we constructed panel vector autoregressions (Sigmun, Ferstl, 2021) for life expectancy at birth: the dependent variable is the change in life expectancy in the first differences of logarithms (dlog_life_expectancy), regressors – change in life expectancy (dlog_life_expectancy_lag1), change in the population per doctor (dlog_popul_doc_lag1), change in the capacity of outpatient clinics per 10,000 people (dlog_power_clinics_lag1), change in the provision of hospital beds per 10,000 people (dlog_availab_hosp_lag1), change in the real gross regional product per capita (dlog_grp_real_lag1), change in per capita real monetary income (dlog_income_real_lag1), change in consumption of meat and meat products (including by-products of category II and raw fat) per capita (dlog_consume_meat_lag1). All built models use 11,277 tools. All regressors are represented in the first differences of logarithms, the values are given for the previous year. The study of life expectancy was carried out for each cluster *(Tab. 2)*.

Discussion

Empirical studies of the nature of the influence of factors on LE sometimes show contradictory results at the regional level. Traditionally, an increase in LE is associated with an increase in the level of well-being of the region and its population, as well as with the organization of the healthcare system. We made an attempt to reveal the existing relationships at the regional level on the basis of Rosstat panel data.

At the meso-level, there is a positive LE in all RF constituent entities for the period under consideration, but the growth rates in the regions vary greatly. Clustering RF constituent entities

Table 2. Panel vector autoregressions of the increase in life expectancy in RF constituent entities, 1995–2017

Indicator	Cluster 1	Cluster 2	Cluster 3
dlog_life_expectancy_lag1	0.3136 ***	0.1903 ***	0.3907 ***
	(0.0284)	(0.0550)	(0.0214)
dlog_popul_doc_lag1	0.0208 **	0.0224 *	0.0061
	(0.0073)	(0.0114)	(0.0138)
dlog_power_clinics_lag1	0.0068	0.0090	0.0033
	(0.0064)	(0.0096)	(0.0123)
dlog_availab_hosp_lag1	-0.0221 **	-0.0257 *	-0.0334 *
	(0.0082)	(0.0119)	(0.0131)
dlog_grp_real_lag1	0.0105 **	0.0039	0.0102
	(0.0040)	(0.0035)	(0.0053)
dlog_income_real_lag1	0.0128 ***	0.0190 ***	0.0332 ***
	(0.0028)	(0.0041)	(0.0054)
dlog_consume_meat_lag1	0.0142 ***	0.0105	0.0111
	(0.0045)	(0.0065)	(0.0081)
Const	0.0010 ***	0.0023 ***	-0.0001
	(0.0003)	(0.0005)	(0.0004)
Number of observations	600	420	480
Number of groups	32	22	24
Observations per group	20	20	20
Number of tools	11277	11277	11277
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.			

according to LE growth rates revealed regional specifics of the formation of LE. The first cluster is characterized by a low average annual increase in life expectancy with the lowest variance, that is, changes from year to year are the least volatile in the first cluster compared to others. The second cluster is characterized by a higher average annual increase in LE and a greater variance compared to the first cluster. The third cluster has an average annual increase in life expectancy similar to the second one and an even greater spread of values.

As a result of further analysis based on autoregression models in the context of the formed clusters, a significant impact with a positive vector was demonstrated by an increase in real per capita income and GRP per capita in the previous year. The impact of changes in average per capita income on the growth of LE manifests itself in different ways. In clusters with a smaller spread of fluctuations in the LE growth rate, the impact of the factor is reduced, compared with clusters in which the spread is significant. This effect can be explained by the growth of income differentiation in the regions, most clearly manifested in the third cluster, when people with greater wealth can afford better medical care and food. A significant factor in the growth of LE in regions of the first cluster is the consumption of animal protein per capita, which is indirectly associated with more stable per capita incomes and the level of regions' welfare.

GRP per capita had the most significant impact in the first cluster, which includes regions where 59.72% of the population of the Russian Federation lives. These are more attractive territories with positive development dynamics. The positive impact of this factor is due to the availability of infrastructure facilities, including healthcare institutions.

The study revealed the positive impact of the growth of the number of residents per doctor, that is, there are faster rates of population growth compared to the dynamics of the number of doctors. This can be explained by the intensification of the doctor's work associated with the standardization of medical services, aimed at providing maximum assistance during one visit, reducing unproductive time spent on repeated visits due to the introduction of lean technologies that are an integral part of the quality management system in medical organizations.

The influence of the factor "provision of hospital beds per 10,000 people" (avail_hosp) on the target variable has a negative sign. This effect demonstrates that the quality of medical services, rather than the number of hospital beds, significantly affects the growth of LE. Provided that comparable healthcare costs are maintained and the number of hospital beds per 10,000 people is reduced, the quality of services and the ability to provide highly qualified and high-tech medical care are improved. Thus, positive results of standardization of medical services are manifested.

It is important to note that the provision of hospital beds per 10,000 people in all clusters showed a negative impact with a simultaneous stable positive effect of the capacity of outpatient clinics per 10,000 people on the dependent variable, which explains the tendency to reduce therapeutic hospital beds in the hospital and increase the volume of outpatient care. Inpatient care provides round-the-clock medical supervision and is provided mainly for severe or emergency diseases. The coverage of inpatient care is several times less than the volume of outpatient care. Medical care provided in a hospital does not imply a mass long stay. All this confirms the importance of strengthening the outpatient link in terms of early disease detection, as well as subsequent timely and effective treatment, which should lead to an increase in life expectancy.

Conclusion

Thus, the results of modeling demonstrate that LE growth is more influenced by inertia – the increase in LE in the previous year. This may mean that the current state of LE in Russia's

regions is the cumulative result of changes in other latent factors, including social well-being, public trust and security, commitment to a healthy lifestyle, etc. The increase in LE in all clusters is influenced by the positive dynamics of regional development and the growth of per capita incomes.

Health factors, having a delayed and cumulative effect on an individual, as a rule, accumulate and manifest themselves in the medium and long term. The vectors of their influence confirm the current trends of healthcare reform associated with the intensification of the work of doctors due to the introduction of a quality management system in medical organizations, including through the standardization of medical services and the use of lean technologies. The social environment also affects the state of public health, including LE: the quality of social relations, lifestyle, social stress, mentality, urbanization; all this also requires additional research.

The results obtained can be useful to government agencies when developing a strategy for managing the quality of life, in particular for improving programs and modeling scenarios for the development of Russian regions. Our conclusions make it possible to better understand the disproportions in the formation of life expectancy in groups of regions of the Russian Federation with similar characteristics of LE. In the future, we will continue studying LE from the position of the impact of gender differences, education and employment, commitment to a healthy lifestyle, environmental factors.

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Information about the Authors

Dmitrii L. Skipin – Candidate of Sciences (Economics), Associate Professor, head of department, University of Tyumen (6, Volodarsky Street, Tyumen, 625003, Russian Federation; e-mail: dskipin@mail.ru)

Yuliya A. Yukhtanova – Candidate of Sciences (Economics), Associate Professor, associate professor of department, University of Tyumen (6, Volodarsky Street, Tyumen, 625003, Russian Federation; e-mail: gaudi21@mail.ru)

Oleg A. Kryzhanovskii – Candidate of Sciences (Economics), associate professor of department, University of Tyumen (6, Volodarsky Street, Tyumen, 625003, Russian Federation; e-mail: o.a.kryzhanovskij@yandex.ru)

Elena G. Tokmakova – Candidate of Sciences (Economics), Associate Professor, associate professor of department, University of Tyumen (6, Volodarsky Street, Tyumen, 625003, Russian Federation; e-mail: tokmake@mail.ru)

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Reproductive Attitudes of Young Families: Driving Forces and Implementation Conditions (on the Basis of In-Depth Interviews)

Aleksandra V. KOROLENKO
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: coretra@yandex.ru
ORCID: 0000-0002-7699-0181; ResearcherID: I-8201-2016

Ol'ga N. KALACHIKOVA
Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Moscow, Russian Federation
Vologda Research Center, Russian Academy of Sciences
Vologda, Russian Federation
e-mail: onk82@yandex.ru
ORCID: 0000-0003-4681-4344; ResearcherID: I-9562-2016

Abstract. Promoting population reproduction is one of the key tasks from the standpoint of ensuring national security. In the conditions of aging motherhood, the young family becomes the most important object of demographic policy, since it is a prosperous two-parent family with children that is the main resource of quantitative and qualitative parameters of human capital. The article analyzes reproductive attitudes of young families and the drivers of their implementation. We reveal that, on average, young people are focused on creating a family and having few children. The registered failure to fulfill reproductive intentions (the desired number of children is more than their expected number) is due to the financial and economic situation of the family, the uncertainty (possible risks) of the future, and intra-family relations. The formation of young people's reproductive attitudes largely depends on their parents' example, the quality of child-parent relations and the immediate environment. With a high probability, those raised in

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a family with few children or those who have no siblings at all may not want to have many children or have children at all. As for children from medium and large families, they may have different views on having children. Reproductive attitudes are linked to marital ones. As a rule, the orientation toward a legitimate happy marriage is reinforced by the desire to have children. A variant of child-centered motives is observed in girls and manifested in the desire "to have a big family and many children", which somewhat shifts the focus of the priority of intra-family relations. The importance of the housing issue and ensuring a decent standard of living for oneself and one's children is determined by the fact that the unresolved nature of these problems influences the intention to have the first child and reduces the chances of having a few and many children even if they are desirable. State support for young families is needed, despite differences in the estimates of its effectiveness. The difference lies in determining the most desirable mechanisms – it is either direct support in the form of allowances, benefits, etc., or the creation of conditions for raising children (affordable quality social infrastructure) and the possibility of decent earnings for parents. Today, a young family needs state support, and, undoubtedly, the needs of young families should be taken into account in the national demographic policy.

Key words: young family, reproductive attitudes.

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Introduction

In 2020, the natural decline in the population of Russia exceeded 700 thousand people and was almost twice as high as in 2019 (317.2 thousand people), approaching the scale of natural decline in the early 2000s. Compared to 2014, when the highest fertility rates in the last two decades were recorded, in 2020 the total number of births decreased by more than 500 thousand, and the total fertility rates fell from 1.8 to 1.5 children per 1 women of reproductive age. At the same time, there is a tendency toward aging of motherhood: the average age of a mother at first birth in Russia rose from 25.8 in 2000 to 28.8 in 2020 (Shabunova et al., 2021).

Young families are recognized as an important "demographic reserve" in terms of solving demographic problems (Chernova, 2010). Thus, within the framework of the *Concept of state policy on the young family*, approved by the Ministry of Education and Science of Russia in 2007, a young family was singled out as a special type of family, in relation to which state policy should be conducted[1]. The provision of state assistance to young families was subsequently included in the list of tasks of the *Concept of State Family Policy for the period through to 2025*, approved in 2014[2], and directions for the implementation of youth policy, reflected in the *Federal Law of the Russian Federation "On youth policy in the Russian Federation",* adopted in 2020[3].

Among the specific features of young families, researchers emphasize the instability of intra-family relations (high divorce rate), mastering new social roles (spouses, parents), specific problems – financial and housing, increased financial needs in connection with the formation of family life,

[1] "On the Concept of State Policy on the Young Family": Letter of the Ministry of Education and Science of the Russian Federation no. AF163/06, dated May 08, 2007.

[2] "The Concept of State Family Policy for the period through to 2025": Government Decree no. 1618-r, dated August 25, 2014.

[3] "On Youth Policy in the Russian Federation": Federal Law, adopted by the State Duma on December 23, 2020, and approved by the Federation Council on December 25, 2020.

including the need to purchase their own housing and set up home (Chernova, 2010; Rostovskaya, 2014). The vulnerable position of young families, both in terms of financial situation and marital stability, on the one hand, and their high demographic potential, on the other, make the study of young families' attitudes toward having children and the factors determining them necessary and urgent.

The purpose of our study is to examine the reproductive attitudes of young families and to identify factors and conditions of their realization based on the results of a series of in-depth personal interviews with representatives of this category of families. This type of qualitative sociological research makes it possible not only to assess the reproductive attitudes and plans of young families, but also to identify their underlying factors and preconditions, including the life experience of the family of origin, to explain the "origins" of reproductive behavior formation (Rostovskaya et al., 2021c).

Theoretical aspects of the study

Approaches to interpreting the concept of "young family". As Zh.V. Chernova notes, the concept of "young family" is not used as an independent category in Western sociological literature. Analysis of the socio-psychological and economic problems that spouses face in the early years of family life, as a rule, is carried out in the study of the stages of the family life cycle or family life course. Different models of social policy in Western countries also do not operate with this category and do not consider a young family (a couple where the age of the spouses does not exceed 30 years old) as a special object of social and family policy (Chernova, 2010). In view of this, we turn to the Russian experience of allocating criteria for defining a young family.

The category "young family" is most often used in studies in the field of sociology of family and demography, social psychology and pedagogy, as well as in strategic, containing a program of action and other normative legal documents that regulate issues of socio-demographic, family and youth policy. The common criteria for all established approaches to the interpretation of a young family are ***the fact of registered marriage*** and ***the age of the spouses*** *(Tab. 1)*. Most often the upper age limit for young family members is 30 years, but for participants in housing programs it is higher and reaches 35 years (Rostovskaya, 2014).

A number of researchers-demographers, sociologists and educators, some state documents reflecting the tasks of youth policy, such as the "Main directions of state youth policy in the Russian Federation", dated 1993, designate the length of time the spouses have lived together as a mandatory criterion for young families. In the works of Russian sociologists E.M. Zuikova and N.V. Kuznetsova, as well as in the directions of state youth policy in the Russian Federation, the duration of young spouses' cohabitation is limited to three years. However, in families with children the duration of marriage is not taken into account. Other researchers define the duration of spouses' cohabitation in a young family as up to 5 years.

Some scholars consider that the criterion for defining a young family is ***the order of marriage***, namely the fact that ***both young spouses are in their first marriage*** (T.K. Rostovskaya, T.A. Gurko, M.S. Matskovskii, I.V. Grebennikov, L.V. Kovin'ko, E.M. Zuikova, N.V. Kuznetsova, I.P. Katkova).

It is noteworthy that conceptual and other normative legal documents additionally stipulate criteria for the composition of young families based on the presence of a married couple (single- or two-parent family) and parenthood status of the family, which is probably related to the definition of those who need support.

In our study, a young family is defined as *a family in which both spouses are under the age of 35, are in their first officially registered marriage, have a child (children) or plan to have them.*

Research on the reproductive attitudes of young families. In Western countries, research on reproductive attitudes is conducted within the

Table 1. Approaches to defining a young family

Criteria	Definition of a young family	Author(s), sources
- Registered marriage - Age of the spouses - Length of cohabitation	Marital relations of young people in the first 5 years of cohabitation.	B.Ts. Urlanis
	A family with up to 5 years of marriage and the age of the spouses not exceeding 30 years	A.I. Antonov
- Registered marriage - Age of the spouses - Order of marriage (first marriage)	A family where the spouses are in their first registered marriage, the age of each spouse or one parent in a single-parent family does not exceed 30 years (for participants in housing programs to support young families, the age of the spouses increases up to 35 years)	T.K. Rostovskaya
- Registered marriage - Age of the spouses - Length of cohabitation - Order of marriage (first marriage)	A family with up to 5 years of cohabitation, where the spouses are under 30 years of age and are married for the first time	T.A. Gurko, M.S. Matskovskii, I.V. Grebennikov, L.V. Kovin'ko
	Families with up to 3 years of cohabitation, where both spouses are in their first marriage and have not reached the age of 30	E.M. Zuikova, N.V. Kuznetsova
	Families with no more than 5 years of marriage, in which both spouses are no older than 29 and both are in their first marriage	I.P. Katkova
- Registered marriage (in case of two-parent family) - Age of one of the spouses - Length of cohabitation (in case of childlessness) - Presence of a married couple (single- or two-parent family) - Parental status (have/don't have children)	Families in the first three years of marriage (in the case of the birth of children – without limiting the duration of the marriage), under the condition that one of the spouses has not reached the age of 30, as well as single-parent families with children whose mother or father has not reached the age of 30	The main directions of state youth policy in the Russian Federation (ceased to be in force on January 10, 2021)*
- Registered marriage - Age of the spouses - Presence of a married couple (single- or two-parent family) - Parental status (have/don't have children)	A full family, where the age of each spouse does not exceed 30 years, or a single-parent family consisting of one young parent under 30 years of age and one or more children	The concept of state policy for the young family**
	A young family, including those with one or more children, where the age of each spouse or one parent in a single-parent family does not exceed 35 years	Federal targeted program "Housing". Subprogram "Providing Housing to Young Families"***
	Persons who are married in accordance with the procedure established by the laws of the Russian Federation, including those who are raising a child (children), or a person who is a single parent (adoptive parent) of a child (children), under the age of 35 years inclusive.	Federal Law "On Youth Policy in the Russian Federation"****
	A family in which both spouses are under 30 years of age, as well as a single-parent family with children in which the mother or father is under the age of 30	S.B. Denisov

* "On the main directions of state youth policy in the Russian Federation": Resolution of the Supreme Soviet of the Russian Federation no. 5090-1, dated June 3, 1993.
** "On the concept of the state policy in respect of the young family": Letter of the Ministry of Education and Science of the Russian Federation no. AF-163/06, dated May 08, 2007.
*** Federal target program "Housing" for 2015–2020: approved by RF Government Resolution no. 1050, dated December 17, 2010.
**** "On youth policy in the Russian Federation": Federal Law of the Russian Federation. Adopted by the State Duma on December 23, 2020. Approved by the Federation Council on December 25, 2020.
Source: compiled according to (Valentei D.I., Broner D.L., Darskii L.E. (1977). *Young Family*. Moscow: Statistika. 18, P. 96; Matskovskii, Gurko, 1986a; Zuikova, Kuznetsova, 1994; Denisov, 2000; Rostovskaya, 2014).

framework of the *theory of planned behavior*, the foundations of which were laid in the works of Ajzen and Fishbein (Ajzen, Fishbein, 1980). The population's attitudes toward having children (or so-called reproductive intentions) are often seen as inextricably linked to actual fertility (Coombs, 1979; Westoff, 1990; Bongaarts, 2001; Morgan, 2001; Morgan, Rackin, 2010; Testa et al., 2011; Philipov, 2009).

The main approach to the study of reproductive attitudes in Russian sociology and social demography is *the concept of the family's need for children*[4] (Borisov, 1976; Darskii, 1972; Darskii, 1979; Sinel'nikov, 1989; Arkhangel'skii, 2006). Under reproductive attitudes within this approach, we understand the mental states of a person, which condition the mutual coordination of different kinds of actions, characterized by positive or negative attitudes toward having a certain number of children[5]. The need for children is numerically expressed through a system of three indicators – the ideal, desirable and expected number of children. The ideal number of children is the cognitive component of the reproductive attitude (orientation to social norms), the desirable one is the cognitive-emotional component, the expected one is the practical component (Borisov, 1976). Similar indicators are used in foreign studies of reproductive intentions, but the former is the most criticized. For example, according to the Dutch demographer D. Van de Kaa, the ideal number of children is more abstract, so it is poorly related to the actual experience of having children (Van de Kaa, 2001). The indicator of the desired number of children best reflects the individual need for children, but is recognized as a weak predictor of real fertility, because preferences regarding the desired number of children can change over the course of life (Van Peer and Rabušic, 2008; Heiland et al., 2008). In low-fertility countries, the desired number of children will always be greater than the actual number, with little variation between the two (Tyndik, 2012). The indicator of the expected number of children is recognized as more stable and reliable both by foreign (Philipov, 2009) and Russian researchers (Andreev, Bondarskaya, 2000). As A.O. Tyndik notes, reproductive attitudes, measured through the desired and expected number of children, in countries with fertility below population replacement level (which includes Russia) set the upper limit of actual fertility (Tyndik, 2012).

Reproductive attitudes of young families within the framework of Russian demography were studied at different times by A.G. Volkov (Volkov, 1986), V.A. Belova and L.E. Darskii (Belova, Darskii, 1972; Belova, 1975; Darskii, 1979), V.A. Borisov (Borisov, 1976), A.G. Vishnevskii[6], V.N. Arkhangel'skii (Arkhangel'skii, 2006), A.O. Tyndik (Tyndik, 2012) and others, within the framework of family sociology by A.G. Kharchev (Kharchev, 1979), S.I. Golod (Golod, 1998), M.S. Matskovskii and T.A. Gurko (Gurko, 1985; Matskovskii, Gurko, 1986a; Matskovskii, Gurko, 1986b), A.I. Antonov and V.M. Medkov[7], V. Zotin (Zotin, Mytil', 1987), (1987), I.F. Dement'eva (1991), I.P. Mokerov and A.I. Kuz'min (1986a; Kuz'min, 1986b; Mokerov, Kuz'min, 1990; Kuz'min, 1993), A.V. Poimalov[8] et al.

Driving forces of young families' reproductive attitudes. The analysis of Russian studies on the determination of the reproductive attitudes of young families allowed combining the factors contributing to reproductive preferences into five groups *(Tab. 2)*.

[4] Antonov A.I., Medkov V.M. (1996). *Sociology of the Family: Textbook*. Moscow: Izd. MGU: Izd-vo Mezhdunarodnogo universiteta biznesa i upravleniya.

[5] Antonova A.I. (2005). *Sociology of the Family: Textbook*. 2nd ed. revised and supplemented. Moscow: INFRA-M.

[6] Vishnevskii A.G. (2006). *Demographic modernization of Russia*, 1900–2000. Moscow: Novoe izdatel'stvo.

[7] Antonov A.I., Medkov V.M. (1996). *Sociology of the family*. Moscow: Izd. MGU: Izd-vo Mezhdunarodnogo universiteta biznesa i upravleniya.

[8] Poimalov A.V. (2010). *Reproductive behavior of young families: a sociological analysis: Candidate of Sciences (Sociology) dissertation*. Penza.

Table 2. Driving forces of young families' reproductive attitudes in Russian studies

Roup of factors	Factor	Researchers
Marital and family characteristics of the family of origin	Example of a family of origin, in particular the number of children	T.E. Safonova, I.Yu. Rodzinskaya, O.V. Grishina, I. Osipova
	The nature of the relationship between family members, common family values	A.I. Kuz'min, A.I. Antonov, A.V. Zhavoronkov, S.I. Malyavin, T.V. Kuz'menko
Value orientations of spouses	Values of family and marriage, children and parenthood (including the relationship between family values (marriage, children) and non-family values - self-development (education, career), leisure, financial well-being, personal freedom)	A.I. Antonov, A.B. Sinel'nikov, V.M. Karpova et al., V.N. Arkhangel'skii, N.V. Zvereva, and S.N. Varlamova, A.V. Noskova, N.N. Sedova
Socio-demographic characteristics of a young family (spouses, children)	Territory of residence (urban/rural)	V.M. Medkov, V.A. Belova, L.E. Darskii, V.N. Arkhangel'skii, I. Osipova, V. Zotin, and A. Mytil', G.F. Kravtsova, M.V. Pleshakova, V.N. Arkhangel'skii, A.O. Tyndik
	Age of spouses (age difference)	
	Education level of spouses	
	Ethnicity of the spouses	
	Religion	
	Number and gender of existing children	
Matrimonial Behavior and Family Stability	The nature of the relationship between spouses and marital satisfaction, family stability	A.I. Kuz'min, V.N. Arkhangel'skii, M.S. Matskovskii, T.A. Gurko
	Age of marriage	I.P. Katkova, V.A. Belova, L.E. Darskii, V.L. Krasnenkov, N.A. Frolova, V.N. Arkhangel'skii
	Attitudes toward marriage registration	
Socio-economic status of the family	Standard of living of the family	I.P. Katkova, A.I. Kuz'min, G.F. Kravtsova, M.V. Pleshakova, E.M. Andreev, G.A. Bondarskaya and T.L. Khar'kova, V.N. Arkhangel'skii, T.K. Rostovskaya, E.N. Vasil'eva
	Living conditions of the family	V.M. Dobrovol'skaya, I.P. Katkova, V.N. Arkhangel'skii
	State socio-demographic and family policy for young families	V.N. Arkhangel'skii, N.G. Dzhanaeva, T.K. Rostovskaya, O.V. Kuchmaeva, T. Maleva, A. Makarentseva, E. Tret'yakova, A.A. Shabunova, O.N. Kalachikova, I. Osipova, E. Borozdina, E. Zdravomyslova, A. Temkina

Source: compiled according to (Safonova, 1982; Rodzinskaya, 1986; Grishina, 2008; Osipova, 2020; Kuz'min, 1986a; Antonov et al., 2005; Kuz'menko, 2010; Arkhangel'skii, 1987; Arkhangel'skii; 2006; Arkhangel'skii et al., 2005; Varlamova et al., 2006; Medkov, 1986; Belova, Darskii, 1972; Zotin, Mytil', 1987; Kravtsova, Pleshakova, 1991; Tyndik, 2012; Kuz'min, 1986b; Kuz'min, 1993; Gurko, 1985; Matskovskii, Gurko, 1986b; Katkova, 1971; Katkova, 1973; Krasnenkov, Frolova, 1984; Kravtsova, Pleshakova, 1991; Andreev et al., 1998; Arkhangel'skii et al., 2021; Dobrovol'skaya, 1974; Arkhangel'skii, Dzhanaeva, 2014; Rostovskaya et al., 2021a; Maleva et al., 2017; Shabunova, Kalachikova, 2013; Borozdina et al., 2012); A.I. Antonov. (2021). *Similarities and differences in the value orientations of husbands and wives according to the results of a simultaneous survey of spouses*. Moscow: Pero.

One driving force in the reproductive attitudes of the Russian population that requires consideration is the Covid-19 pandemic. Despite the novelty of this issue and its incomplete study, the available Russian studies confirm the negative impact of the COVID-19 pandemic on the reproductive plans of Russians, expressed, in particular, in postponing having children by the young population (under the age of 35), which threatens to reduce the final birth rate (Makarentseva, 2020). This also confirms N.E. Rusanova's opinion that socio-economic uncertainty during the pandemic forces couples to postpone any long-term investments, of which children are a prime example, and thus further to reduce fertility (Rusanova, 2020).

Methodological aspects of the study

Studies of the population reproductive attitudes are carried out by quantitative and qualitative sociological methods. Quantitative surveys are used, for example, in the framework of population censuses (Microcensus 2015[9]) and sample surveys of the Federal State Statistics Service (for example, sample surveys of reproductive plans in 2012[10] and 2017[11]). The family and fertility sample surveys in 2009[12], one-time and multi-year (monitoring) sociological surveys of the population (for example, "Parents and children, men and women in family and society" of HSE University[13]). There are also a number of qualitative methods for studying reproductive attitudes and their factors, such as focus group studies (Gudkova, 2019) and in-depth interviews (Shabunova, Kalachikova, 2008; Ipatova, Tyndik, 2015; Zhuk, 2016).

According to the results of the first wave of the all-Russian sociological survey "Demographic well-being of Russian regions", conducted by mass questionnaire survey in late 2019 – early 2020 (the total sample size was 5,616 people), we studied the reproductive attitudes of the population, including its different socio-demographic groups. (Rostovskaya et al., 2021d).

The article presents the results of the second stage of the all-Russian sociological survey "Demographic well-being of Russian regions" conducted in 2021 in the framework of the project no. 20-18-00256 "Demographic behavior of the population in the context of national security of Russia" with the support of the Russian Science Foundation.

Research method – in-depth personal interview (method of selection of informants – purposive, method of "snowball"). *The sample design (purposive method of selection)* was carried out by recruiting informants through social networks (both personal social relations and Internet communities in social media) (Rostovskaya et al., 2021b). We sampled young families in which both spouses are under the age of 35, married, and are planning to have children. We interviewed 17 informants in the republics of Bashkortostan and Tatarstan, the Volgograd, Vologda, Ivanovo, Moscow, Sverdlovsk, and Nizhny Novgorod oblasts, and Stavropol Krai.

All informants were from wealthy families, regardless of their social and professional background (the level of wealth of the informants was median for the region). We conducted the analysis using the research questions reflected in the guides for this group of informants with a parallel search for possible regional differences.

Main results and their discussion

According to the data of the first wave of the all-Russian sociological survey "The demographic well-being of Russian regions", among married young

[9] Results of the 2015 Microcensus. *Federal State Statistics Service*. Available at: https://gks.ru/free_doc/new_site/population/demo/micro-perepis/finish/micro-perepis.html

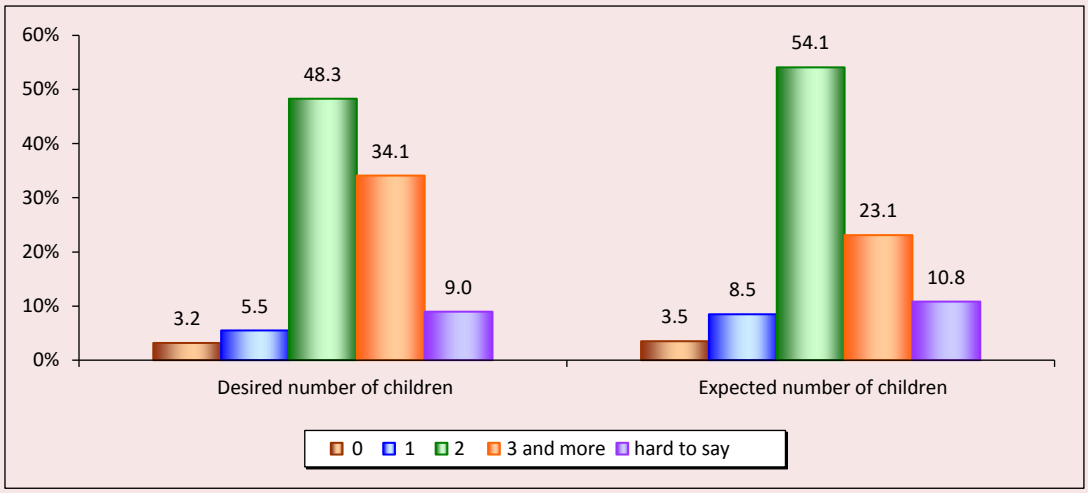
[10] Sample survey of the population reproductive plans in 2012. *Federal State Statistics Service*. Available at: https://www.gks.ru/free_doc/new_site/RPN/Publisher/index.html

[11] Sample survey of the population reproductive plans in 2017. *Federal State Statistics Service*. Available at: https://www.gks.ru/free_doc/new_site/RPN17/index.html

[12] Family and fertility. Main results of the sample survey. 2009. (2010). Moscow: IITs "Statistika Rossii".

[13] Parents and children, men and women in family and society. *National Research University Higher School of Economics*. Available at: https://www.hse.ru/org/hse/4432173/mathbase/databases/db_11

Distribution of answers of young married respondents (17–29 years old) about the desired and expected number of children, %



Source: Data from the all-Russian sociological survey "Demographic well-being of Russia", 2020 (N = 351).

respondents (17–29 years old) both in terms of the desired (i.e. if all the necessary conditions are available) and the expected (actually planned) number of children, the attitude to have two children prevails *(Figure)*. However, while every third family respondent aged 17–29 years old expressed a desire to have three or more children (34%), only 23% of representatives of this category actually plan to have many children, which indicates serious barriers to fulfilling of the need for having many children. While the proportion of those who plan to have few children is 9 percentage points higher than in the case of those who want to have 1–2 children even if they have the necessary conditions (63% vs 54%).

According to the data of in-depth interviews, two types of reproductive attitudes (plans) are found among young family respondents: those who want few children (having 1–2 children) and many children (having 3 or more children).

Some of the informants who plan to have few of children (1–2 children) admit that, given all the necessary conditions (desired number of children), they would like to have more children in the family, which indicates the initial need for having many children.

– "We are planning to have two or more children if opportunities allow and if there are no adverse health indications. But I think not one. Because then maybe the child will grow up to be selfish..." (*male, 22 years old, married, no children (about to have a baby), 2 children in the family of origin, university student, the Ivanovo Oblast*);

– "The ideal number of children for us is two. If we had everything we needed, we would like to have three children" *(female, 22 years old, married, no children, 4 children in the family of origin, university student, the Moscow Oblast)*;

– "Well, I would like to have two. We are open to have children, but we'll see whether there will be opportunities for this. Three children, yes, we would like to" *(note – "if we made more money and had a two-bedroom apartment") (male, 32 years old, married, no children, 2 children in the family of origin, unfinished higher education, Republic of Tatarstan)*.

Another part of the informants with attitudes to having few children ***are not ready to change their plans, even provided all the necessary conditions for having more children:***

– "If we had everything we needed, we would want to have at least two children. To give our

children everything, we still need financial wherewithal, so in order not to limit the children in anything, two children would be an ideal solution" *(female, 30 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*;

– "Well, I think at least have one baby first and see how you feel... I mean, whether you are comfortable with one child. And again, if health allows having more children, why not? And the image of the perfect family is like that TV advertising with a happy family – a boy, a girl and that's it" *(female, 26 years old, married, no children, the only child in the family of origin, higher education, the Nizhny Novgorod Oblast)*.

Analysis results of in-depth interviews revealed the correlation of reproductive attitudes of young families with the following factors: the example of the family of origin, including the number of children, matrimonial behavior of spouses and their attitude toward marriage, combining career and parenthood, measures of state socio-demographic policy, housing and financial conditions, and the COVID-19 pandemic. Let us dwell on each of them in more detail.

Matrimonial behavior and attitudes toward marriage

It is noteworthy that those informants who initially (since childhood) dreamed of marriage and family more often have reproductive attitudes toward having many children and do not postpone it:

– "Well, I dreamed, like all little girls, that I will have a good family... <...> we want about two or three children, but wait and see" *(female, 21 years old, married, no children, 3 children in the family of origin (half-brother and -sister), university student, Republic of Bashkortostan)*;

– "Yes, since childhood I have dreamed of getting married in a beautiful white dress... <...> As for children, I plan to have two or three, depending on the work, earnings, and financial situation... I love children very much. I want a lot of children and I hope it will come true" *(female, 21 years old, married, no children, 2 children in the family of origin, university student, the Ivanovo Oblast)*;

– "I dreamed of marriage... We wanted and still want to have two or three children" *(male, 22 years old, married, no children, 2 children in the family of origin, higher education, the Moscow Oblast)*.

However, according to the answers of other respondents, child-centrism can be traced. Thus, the initial attitudes toward having a family and many children are not necessarily combined with attitudes toward marriage:

– "...I haven't dreamed of marriage in and of itself. I didn't have such a goal to get married as soon as possible... I've had a very reverential attitude toward children since I was a kid. I've always been very fond of children, nursing nephews, brothers, sisters, whoever I could. Always wanted a big family. My husband and I are planning at least three children" *(female, 22 years old, married, 1 child, 2 children in the family of origin, higher education, Stavropol Krai)*;

– "In fact, I did not have such a thing that from an early age I dreamed of a white dress, of a prince on a white horse. No, there was no such thing... Of course, I really want to have children. You never know, but I would like to have three children. I believe that every woman should become a mother, to continue her family line. I have a very positive attitude toward it, and I think it's everyone's duty" *(female, 24 years old, married, no children, 2 children in the family of origin, higher education, the Volgograd Oblast)*.

Example of a family of origin

Of great importance in the formation of marriage and family and reproductive attitudes in young spouses are ***relationships in the family of origin and a positive image of the parents' marriage, as well as close relatives (grandparents).*** Even divorced parents could set an example of a happy family and instill family values in their children:

– "My parents are divorced. They didn't get on... <...> They understood happiness as love, family values, family well-being... <...> They took good care of us. Spent time with us, watched movies together, went for walks in nature, went to sea" *(female, 21 years old, married, no children, 2 children in the family of origin, university student, the Ivanovo Oblast)*.

When building their own family, including when planning to have children, respondents are guided by ***a positive model of marital and family behavior of parents and close relatives:***

– "We are used to living in a friendly environment with a large number of people. And we wanted a big family, too. And from about the age of 16 we planned that we wanted six children. My grandfather was the first child in a family of nine children. My wife's grandmother also came from a family with 9 children, but not all of them lived to adulthood. In my grandfather's family, everyone lived to adulthood" *(male, 20 years old, married, no children, 2 children in the family of origin, university student, Republic of Bashkortostan)*;

– "I dreamed of marriage. More along the cliché lines of my parents' family. That's probably how it turned out. We are happy and focused on having children. I hope the marriage will be strong and prosperous" *(male, 22 years old, married, no children, 2 children in the family of origin, higher education, the Moscow Oblast)*;

– "I've always wanted a big family. My husband and I are planning at least three children... Naturally, like any other woman, I always dreamed of being a good mother to my children. For me, the example is my mother, who raised my brother and me. I take a lot from her, I remember how we grew up in the family, how our parents treated us, and I try to give my child the best of everything, not without my husband's help, of course" *(female, 22 years old, married, 1 child, 2 children in the family of origin, higher education, Stavropol Krai)*.

Number of children in the family of origin

As the data from in-depth interviews showed, the only children in the family more often have reproductive attitudes toward having few children (1–2 children) and are more oriented toward postponing it:

- "Yes, we discussed (note: how many children they want and when they will have them). Together we've decided that it was too soon. My spouse supports me in this opinion, we are unanimous on this point... <...> We would like to have one or at most two children, I think that is the optimal number" *(male, 23 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*;

– "Yes, we discussed and agreed that first you need to establish your life, the quality of life more or less, and then think of having children. Well, first we'll give birth to one, and then we'll see. How can you, let's say, want two or three children, maybe you'll have one, and you won't like it... I'm 26 now, at 28 I'll probably think of it. If we don't solve the problem with the apartment and the repair by 30, we won't have time for anything, or something will go wrong, we'll probably have to... Well, in general, you have to take your health condition into account. Someone at 35 gives birth successfully, someone at 20 – not so easily" *(female, 26 years old, married, no children, the only child in the family of origin, higher education, the Nizhny Novgorod Oblast)*.

Conditions for the realization of reproductive attitudes

The main conditions necessary for having children in the answers of almost all young family respondents, especially men, are ***financial well-being and availability of housing:***

– "I'd like to earn enough; I'm making my plans on how to achieve that. To have enough of everything. To improve my financial situation, so that I could afford to buy myself a stroller, for example, which costs 25,000 rubles" *(male, 20 years old, married, no children, 2 children in the family of origin, university student, Republic of Bashkortostan)*;

- "The main condition is financial prosperity, to be able to provide the child with everything they need, medical care, education, development, recreation, since most of these services are now chargeable. Of course, it is also important to have a place of your own, so you don't have to move to a rented apartment with your child..." *(male, 23 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*;

– "The first condition is own housing, as well as the financial situation" *(female, 21 years old, married, no children, 2 children in the family of origin, university student, the Ivanovo Oblast)*;

– "It all comes down to one thing – I would like to make a decent living. To have a nice house, a good car, opportunity to give a good education. It all comes down to one thing: finances" *(male, 22 years old, married, no children (about to have a baby), 2 children in the family of origin, university student, the Ivanovo Oblast)*.

At the same time in the answers of some representatives of young families the *housing factor was recognized as a* ***key factor*** *in making the decision to have a child:*

– "Right now, we're living in a rented apartment, so to speak. We don't have our own, the plan is to buy our own place first, to give the child their own roof over head" *(male, 32 years old, married, no children, 2 children in the family of origin, unfinished higher education, Republic of Tatarstan)*.

In addition, in some cases, the main condition for having a child is ***the certainty of the family's place of residence.*** The main limiting factor here is the spouse's occupation, which is associated with frequent changes of residence (or the itinerant nature of work, or a member of the armed forces):

– "Yes, we are planning children, we want to, but due to my spouse's work and the fact that Vologda is not our final destination, we don't know how it will turn out yet... <...> We would like to finally decide on the place of residence, since the birth of children is a certain attachment to kindergarten, school, arrangement of the house for the children, we would like to finally decide where and when we will stay" *(female, 30 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*.

Among other things, young spouses named intra-family factors as conditions for the birth of children. These include the state of health, psychological readiness to have children, the parents' moral character (responsibility, absence of deviations), and the nature of spouses' relationship (mutual understanding):

– "Besides that, I guess, a woman should be in good health, to carry a child, and psychological maturity is important, while I still feel that I'm not ready to have children" *(female, 21 years old, married, no children, 3 children in the family of origin (half-brother and -sister), university student, Republic of Bashkortostan)*;

– "...the moral adequacy of the parents. An understanding of responsibility both for each child and for the family as a whole. The absence of any factors that exclude social irresponsibility in order to reproduce offspring, i.e. alcoholism, drugs, gambling and other addictions" *(male, 25 years old, married, no children, 2 children in the family of origin, higher education, the Nizhny Novgorod Oblast)*.

External factors such as the availability of medical facilities, good environmental conditions, assistance from parents (not only financial), and crisis phenomena in the country are also significant conditions for young families to have children:

– "I would like to have housing near the forest, so that there would be clean air, and to have medical facilities nearby... Of course, we still need the help of parents. We don't have any experience, and parents can share theirs" *(female, 21 years old, married, no children, 2 children in the family of origin, university student, the Ivanovo Oblast)*;

– "...but perhaps such collapses of humanity, society, and particularly Russia in the future – yes, they can (note: affect the decision to have a child)" *(male, 23 years old, married, no children, 2 children*

in the family of origin (half-brother), university student, the Sverdlovsk Oblast).

In addition, some informants noted ***the impact of the COVID-19 pandemic on their reproductive attitudes*** and expressed their willingness to reconsider their plans to have children because of the worsening situation or have already postponed pregnancy because of health risks to the child, fear of getting infected, and the suspension of elective care during lockdown and self-isolation:

– "The pandemic has affected us only in the sense that there are risks of getting infected. And we don't know how the virus will affect the child, so we're still waiting for all this to be over, at which point we'll move" *(female, 30 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*;

– "Not for now, although we don't know what will happen next (note: about the impact of the pandemic). I think it won't affect us. But if this situation continues, we'll have to postpone it, because it's scary" *(female, 21 years old, married, no children, 2 children in the family of origin, university student, the Ivanovo Oblast)*.

State socio-demographic policy

In relation to the measures of state socio-demographic policy, informants had different opinions, which can be divided into three groups. ***The first group*** is young families who do not count on government assistance, relying only on the self:

– "We still try to be on our own, because the laws change very often. Now the maternity capital is paid even for the first child, and it is possible that when we have a baby it will no longer be paid, that is, we are ready for this, we are not going to give birth sooner, just to get the maternity capital. We're trying to rely more on ourselves, though" *(female, 21 years old, married, no children, 3 children in the family of origin (half-brother and -sister), university student, Republic of Bashkortostan)*;

– "I don't think you should count on government help. Of course, it would be good if there were help and support from the authorities, but we have to rely primarily on ourselves, which is why we are in no hurry to have a child" *(male, 23 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*.

The second group is young families who rely on state assistance, but its measures do not influence their decision to have children, being only a "bonus":

– "In my opinion, parents should have children for themselves. Accordingly, it does not matter what state support measures will be offered to you if you want to have a child, if you are willing to support him or her. Yes, it's certainly not a bad bonus when having children, because finances are required anyway, but that's not the most important thing" *(female, 30 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*;

– "I'm counting on maternity capital. No, they do not affect *(note: about whether state/regional support measures will affect the decision to have children)" (female, 24 years old, married, no children, 2 children in the family of origin, higher education, the Sverdlovsk Oblast)*.

The third group is young families who count on state assistance and recognize the influence of measures on their decision to have children:

– "Well, I know about some of the allowances and benefits from the state and when I get close to having a child, I'll go deep into that and count on it. Yes, I think any movements and help from the state on this issue helps to encourage to have a child" *(male, 23 years old, married, no children, 2 children in the family of origin (half-brother), university student, Sverdlovsk Oblast)*;

– "Yes, if there were any benefits for young families, young parents – we would not refuse. I think they will have an impact; it will be easier financially. I think that if there is support from the state, it will be possible to have more children" *(female, 21 years old, married, no children, 2 children in the family of origin, university student, the Ivanovo Oblast.)*.

The most well-known measure of state support among young family respondents is maternity capital – almost all respondents are informed about it (including the terms of its provision). The main uses of maternity capital, according to informants, are to ***improve living conditions***, in particular, to make a down payment on a mortgage, as well as ***the education of children***:

– "Maternity capital is in any case an investment in the future of children, part of the repayment of mortgages or the education of children" *(female, 30 years old, married, no children, the only child in the family of origin, higher education, the Vologda Oblast)*.

Attitude toward balancing career and parenthood

Young families have ***two attitudes*** toward ***balancing a career and parenthood***. ***Some believe that children are not a hindrance to a career:***

– "Well, like, I want to build a career. Probably get some other education, maybe open some business, or kind of stay in the military... A child is not a hindrance to a career if there is someone to help, say, for instance parents, grandparents. Maybe for a while career can be interrupted, but during pregnancy, you can develop yourself, well, in general, pregnancy, children are not an obstacle" *(female, 22 years old, married, no children, 2 children in the family of origin, university student + is working, Stavropol Krai)*.

Other informants, on the other hand, ***recognize the influence of having children on career development:*** "Yes, it just pulls away (note: career development) ... affects, appropriately, only in terms of the time factor. One child pulls back your career opportunities by two years. I mean ... if a man babysits, it affects a man's career, if a woman, it affects a woman's career" *(male, 25 years old, married, no children, 2 children in the family of origin, higher education, the Nizhny Novgorod Oblast)*. At the same time, some informants ***have high hopes for family (parents) to help them raise their children*** during their careers: "I plan to work and develop as a specialist, to conquer new markets, new heights in my field and earn even more, these are my professional plans. Of course, I count on my parents, that is, my mother and mother-in-law, on their help in caring for and raising the child, and I hope to make time for it myself" *(male, 23 years old, married, no children, 2 children in the family of origin (half-brother), university student, Sverdlovsk Oblast)*.

Discussion

The results of the study largely agree with those obtained earlier. For example, a survey of unmarried young people in the Nizhny Novgorod Oblast shows a connection between marital and reproductive attitudes. Its results show that those who hold the view that it is advisable to postpone marriage registration for a year or two have a lower number of children, both desired and expected. Women who believe that marriage registration should precede the beginning of marital relations had a significantly higher average expected number of children (Arkhangel'skii, 2006). Other studies prove the weakening role of officially registered marriage in the birth of children (Mitrofanova, 2011).

A.I. Kuz'min (Kuz'min, 1986a), A.I. Antonov, A.V. Zhavoronkov and S.I. Malyavin (Antonov et al., 2005), T.V. Kuz'menko (Kuz'menko, 2010) make conclusions about the positive influence on reproductive attitudes of good relationships in the family of origin and instilling family values. Many Russian studies also show that respondents have relatively higher reproductive orientations when there are more children in the family of origin (Safonova, 1982; Rodzinskaya, 1986; Grishina, 2008; Osipova, 2020). At the same time, the results of a survey in the Nizhny Novgorod Oblast showed that even given all the necessary conditions, on average people would like to have fewer children than their parents intend to have and actually have (Arkhangel'skii, 2006).

V.N. Arkhangel'skii analyzing the data of the first wave of the All-Russian monitoring "Demographic well-being of Russian regions" points out the ambiguity of the connection between the number of children in the family of origin and

the reproductive orientations of young people: respondents whose family of origin had two, three or four children had no significant differences in either the desired or the expected number of children (Rostovskaya et al., 2021a).

The results of in-depth interviews with representatives of young families correlate with the data of the first wave of the all-Russian sociological survey "Demographic well-being of Russian Regions" and the importance of demographic policy measures, namely in terms of solving the housing problem: 60% of married respondents aged 17–29 years rated assistance in obtaining housing most highly. The importance of maternity capital for improving the housing conditions of young families has been confirmed in a number of Russian studies (Borozdina et al., 2012; Osipova, 2020).

However, housing conditions and living standards primarily influence the decision on having children, and it is this that differentiates the expected number of children. For example, according to the surveys in Moscow and the Samara Oblast, a direct link between the assessment of living standards and living conditions and the expected number of children is primarily applicable to those who would like to have three or more children under the most favorable conditions (Arkhangel'skii, 2006).

The underestimation of the population policy role may be related to the perception that people make decisions in their lives regardless of any external circumstances (Arkhangel'skii, Dzhanaeva, 2014). When deciding whether or not to have a child, people are guided by personal motives (Osipova, 2020).

Young people showed a greater response to pandemic risks. As Makarentseva's research shows, the proportion of young respondents who prefer to postpone childbearing for financial reasons increased more strongly during the pandemic (spring 2020) than among respondents over 35 years old: 15% (from 46 to 61%) among 20- to 34-year-olds versus 5% (from 43 to 48%) among 35- to 44-year-olds (Makarentseva, 2020).

As for balancing a career and parenthood, it is achieved by having few children and with the support of relatives, as well as the ability to hire a nanny (Zhuk, 2016).

Conclusion

Thus, according to the results of in-depth interviews, the majority of young families are oriented toward the traditional full family and having children. In many respects their reproductive attitudes depend on the role model of parents' and close relatives' families, in particular on the nature of their relationship, and on instilling family values in their children.

There are two behavioral patterns among representatives of young families with regard to the role of the officially registered marriage in having children. For some, marriage continues to be an important condition for creating a family and having children (the traditional "marriage – family – children" sequence), while for others the role of marriage itself is less important against the background of a desire to have a "big family and many children". As a rule, this is a female model of child-centrism, which, however, does not deny the importance of the husband as the father of the children.

The results of the interviews confirmed the fact that financial well-being, mainly own housing, plays an important role in the realization of the reproductive intentions of young families. It is noteworthy that three positions are observed among young family informants regarding state socio-demographic policy measures and their impact on having children: the first group – not counting on state support and not recognizing its influence on having children, the second group – counting on state support but not recognizing its influence on the realization of reproductive intentions, the third group – counting on state support and recognizing its influence on childbearing. The first position turned out to be the most common, which indicates, on the one hand, the socio-economic self-sufficiency of modern young families, on the

other hand, the need to find new tools to stimulate reproductive attitudes in this population category, in particular increasing the need for children. Nevertheless, almost all informants recognize the significant role of maternity capital in solving the housing problem, which indicates its importance and popularity among young families.

Young family respondents generally do not see a problem in combining career and parenthood, but in fact the problem exists and is mediated through the popularity of the opinion that one should first "get on the feet" professionally and only then have children. In addition, there are great hopes for the help of the older generations.

As for the COVID-19 pandemic, it did not have a significant reproductive impact on many young families, namely it did not change their plans for having children. However, some of the informants among young couples postponed having a child "until better days". This in itself is a factor contributing to the decline in the birth rate and requires serious scientific reflection.

All the above mentioned indicates that the "young family" category is rather heterogeneous both in the nature of reproductive attitudes and in the factors determining them: the influence of the family of origin, matrimonial behavior and attitude to marriage, attitude to measures of state socio-demographic policy, as well as the influence of the COVID-19 pandemic, which should be taken into account in the state socio-demographic, youth and family policy.

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Information about the Authors

Aleksandra V. Korolenko – Researcher, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: coretra@yandex.ru)

Ol'ga N. Kalachikova – Candidate of Sciences (Economics), Leading Researcher, Institute for Demographic Research, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (6, building 1, Fotieva Street, Moscow, 119333, Russian Federation), deputy director for science, head of department, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: onk82@yandex.ru)

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Influence of the Spouse on Reproductive Attitudes and Motives

Flyura B.
BURKHANOVA
Sociological Institute, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Ufa, Russian Federation
e-mail: burhanova.flura@mail.ru
ORCID: 0000-0002-7342-3974; ResearcherID: AAV-2747-2020

Guzel' R.
BAIMURZINA
Sociological Institute, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Ufa, Russian Federation
e-mail: guzrim@mail.ru
ORCID: 0000-0002-1844-2689; ResearcherID: G-4824-2017

Abstract. As a micro-level factor, the spouses or partners influence each other's reproductive intentions, motives, and decisions. This article examines only two areas of influence from a possible spectrum, namely the impact of the nature of the relationship and the other spouse's position on having children. The empirical basis is the opinion poll "Demographic well-being of Russia", conducted in 2020 in 10 regions, including Moscow. Respondents, both officially married and being in cohabiting relationship, aged up to 49 years old inclusive (2,776 people) participated in the survey. According to the evaluations of relationships using the criteria of "cohesion", "conflicts", and "big quarrels and scandals", respondents were divided into three groups: the worst (12–16%), average (29–36%), and best (42–53%) evaluations. The most favorable relations are typical of families with a traditional power structure (husband is head of the family), joint management of income (husband and wife make decisions together), better living conditions, and younger age of the spouses. We found that an improvement in relationship estimates was accompanied by an increase in the proportion of those intending to have a child, while a deterioration

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in the estimates was accompanied by a decrease in the proportion of those intending to have a child. The groups with the most cohesive, conflict-free relationships are the most likely to have children in the coming years, and it increases if new family support measures are introduced. In postponing the birth of children of different order, as well as in planning their birth, the position of the other spouse or partner (the desire to postpone having a child or the intention to have one) is one of the most significant motives of reproductive behavior. The importance of motives is conditioned by both favorable and unfavorable relations in families. The results of the study actualize one of the directions of state socio-demographic and family policy – activities to harmonize marital and family relationships and to reduce the influence of a range of factors complicating these relationships, which can have a positive impact on the decision to have children.

Key words: reproductive attitudes, reproductive intentions, reproductive motives, reproductive decisions, marriage, marital relationships, marital conflicts, adverse relationships, favorable relationships.

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Introduction

Issues of reproductive behavior are a successfully developing area of research in both foreign and Russian science. The main factor actualizing the research is the real processes of fertility, characterized by low levels that do not ensure population replacement, a decrease in the number of children in a family, as well as an increase in the number of people who refuse to have children.

The main direction of the study is the search for factors influencing the reproductive behavior of the population and fertility, acting at different social levels. The works of scientists show how, at the micro level, gender, age, education, marital status, place of residence, income, living conditions and standard of living, ethnicity, religiosity, life values, work and some other characteristics of individuals determine their attitudes toward having children, motives for having and delaying having children (Arkhangel'skii, 2006; Arkhangel'skii et al., 2021; Arkhangel'skii et al., 2020; Rostovskaya et al., 2021; Makarentseva et al., 2021; Nazarova, Zelenskaya, 2017; Tyndik, 2012; Churilova, Zakharov, 2019).

Among the micro-level factors, reproductive intentions, motives, and decisions in couples are influenced by the spouse or partner. Individual reproductive intentions regarding the birth of the first or subsequent child are adjusted not only by the standard of living, income, housing conditions, health status, and other life circumstances of the family, but also by the desire or unwillingness of the partner to have children in general or to have a certain number of them. Postponing the birth of a child may also be due to the partner's assessment of the current situation as unfavorable for having a child, the desire to wait with the birth. Partners can broadcast their attitudes in cohabitation, resulting in the couple's actual reproductive behavior. The nature of the relationship between spouses or partners, their perception them as favorable or unfavorable for the birth of children is significant and can have an impact. Conflicts and quarrels between spouses are a negative background for the life of the whole family, the birth and upbringing of children. Confidence in the strength of the marriage or, on the contrary, uncertainty, can adjust intentions, decisions and behavior.

Given that spouses influence each other's reproductive perceptions, plans, and decisions about having children, and ultimately the actual reproductive behavior of their couple, it becomes

an urgent task to analyze this influence and to consider it when making predictions and developing measures to stimulate fertility.

The first Russian studies of the influence of spouses on each other's reproductive attitudes and behavior began back in the 1970s. A review of studies prior to the early 2000s, conducted by V.N. Arkhangel'skii, led to the conclusion that "most of them showed a positive impact of marital stability, successful marital life on parenthood status and fertility rates" (Arkhangel'skii, 2006). However, there were works where there was no or opposite correlation with marital satisfaction and thoughts about divorce as an indicator of marital stability and well-being. The situation changed when the relationship of satisfaction was analyzed not with the total expected number of children, including those already born, but with the intention to have another child. In such a case, a higher estimate of marriage was accompanied by a higher expected number of more children (Arkhangel'skii, 2006).

Recent studies have also raised questions about the influence of the spouse. The relationship between reproductive behavior and marital status (registered marriage or cohabiting relationship), the order of marriages (first marriage and remarriages) has been shown. Postponement of childbearing due to uncertainty about the stability of marriage is much more common in cohabiting unions than in formal marriages (Sinel'nikov, 2019). There is a steady increase in the contribution of remarried couples to fertility, especially in the birth of second and third children. Entering into a remarriage makes it possible to compensate for the birth deficit that occurs in individuals who are in a pre-divorce or post-divorce state. At the same time, the likelihood of having two or more children for a woman increases the possibility of entering into both a remarriage and cohabiting relationship (Zakharov et al., 2016).

In the course of studying how the combination of the spouses' nationalities affects the reproductive attitudes of one of them, we revealed the following: due to the fact that Bashkirs in general have higher reproductive attitudes than other ethnic groups, the "Bashkir component" in an interethnic couple "works" to increase the orientation toward having children (Burkhanova, Mukhamadieva, 2020).

The qualitative data highlight three models that men and women follow when entering marriage and deciding on the number of children in the family. In the first model they focus on their own ideal model and do not take into account the orientation of the partner, which can create risks when discovering differences. In the second model, they agree on the model of marriage and the number of children in the development of family relationships, concede to each other. The third model: future spouses before marriage have the same ideas or agree on how to build a relationship and how many children there will be in their family. The authors made the assumption that women are more inclined than men to form an ideal family before marriage and strive to realize it when they get married (Baimurzina, Vasil'eva, 2021).

Another aspect of the spouse's influence was studied in a survey of mothers. We have found that both first-married couples and stepfamilies (remarried couples) are somewhat more likely to plan to have a second child if there is a high rate of "father involvement" in the upbringing of their already-born child1. In first-married couples, spouses are also more likely to plan for a second child if the first child was expected and the husband was happy to have it. In addition, a positive correlation was found between plans for the birth of a second child and the feelings of "happiness-unhappiness" of the mothers interviewed. Since sensation is largely determined by the quality of the marital relationship, the connection can be interpreted as their influence on reproductive intentions (Gurko, 2014).

[1] Involvement was assessed on the basis of fathers' initiative and frequency of activities with the child in eight types of joint activities, and mothers' assessments of the time the father spends with the child.

A study conducted under the supervision of A.I. Antonov, based on a survey of both spouses, found that a significant proportion of couples had different attitudes toward the number of children (52.7% of couples had the ideal number of children, 43.8% the desired number and 72.2% the expected number) and identified socio-demographic factors contributing to the closeness and differences in reproductive attitudes (in the first case, the increased length of marriage and similar religious preferences, in the second, the increased age difference between the spouses and the presence of a formal marriage). In addition, the authors showed that the proximity of attitudes on the number of children is positively related to marital satisfaction[2].

The data from the study "Reproductive plans of the population-2017" (Gudkova, 2019) revealed the importance of the husband/wife's position, his/her desire in the system of motives for having a second and third child. His or her desire ranks second or third in the overall hierarchy of reproductive motives. At the birth of the second child the motive is significant for 61.5% of men and 58% of women, and at the birth of the third child – for 48.5 and 48.4%, respectively. Almost half of men and women (44.4–49.9%) want to have a child because they want to strengthen their families. The influence of the factors restraining the birth of children – the desire of the husband/wife to wait with the birth of a child, as well as the uncertainty about the stability of the marriage – is not as large-scale. But they are still significant (35.5% of women and 41.8% of men; 32.2% of women and 27.1% of men).

For a comprehensive review of foreign studies on fertility factors at the micro level, see (Balbo et al., 2017). The authors showed that a great deal of attention has been paid to examining the influence in a married couple of the partner's reproductive intentions, the nature of the marital relationship, the occupational gender segregation, and remarriages.

The most prominent works that describe decision-making models for having a child or several children in couples are studies in the USA (Miller et al., 2004), Sweden (Thomson, Hoem, 1998), Italy (Testa et al., 2012), etc. The American authors, based on the results of a series of studies, proposed a computational model that takes into account the degree to which a person accepts their partner's desires and how the partner's own and perceived desires are integrated when forming intentions, and how the intentions of both partners are realized in reproductive behavior. The value of Swedish and Italian work lies in the implementation of longitudinal studies of a quite large number of couples, as well as testing the influence of a similar set of factors on the decision to have a child. The factors are: the nature of the family responsibilities distribution, the ability of partners to negotiate with each other. A special place in all of these studies was given to assessing the impact of the partner's disagreement on the birth of a child.

We found that when a couple disagrees about the expected birth of a child, the chances of one partner realizing his or her reproductive intentions decrease. Thus, according to the interpretation of M.R. Testa and her colleagues, people do not want to have a child without the consent of the partner, because procreation has long-term consequences for both partners.

With regard to the effect on procreation of stability/instability of the union and/or poor quality of the partnership, there are two opposite directions. Some studies find a negative relationship between the two: couples who have unstable relationships are less likely to have children (Myers, 1997; Thomson, Hoem, 1998). The conclusion of others is that an unstable union leads to earlier childbearing, as children are seen as a factor in reducing uncertainty and a way to strengthen the marriage.

There are also different results regarding the impact of the occupational gender segregation. What they have in common is that inequality in the

[2] Antonova A.I. (2021). Similarity and difference in the value orientations of husbands and wives based on the results of a simultaneous spouses' survey. Moscow: Pero.

distribution of housework in favor of women has a negative impact on reproductive intentions and decisions.

Studies show that partners who already have children from previous unions are more likely to want and have a child together (Thomson, Hoem, 1998). According to some work, remarried couples have even higher fertility rates than full families with biological children because: 1) remarried couples are more motivated to have their biological children in order to strengthen the new relationship (Vikat et al., 1999); 2) the number of remarriage cases tends to grow (Guzzo, 2014). At the same time, the likelihood of having children in new relationships is significantly reduced if a woman already has two or more children (Thomson et al., 2014).

Thus, foreign researchers generally agree that partners (both women and men) as well as other family members can have a significant influence on the realization of a couple's reproductive attitudes. However, this influence may manifest itself differently in different countries and in different periods.

Research methodology

The theoretical model of influence and the research task. The influence of spouses on each other's reproductive attitudes and motives, as well as on decisions to have children, can be exercised primarily through the marital status of the couple. Formal marriage and unregistered relationships, first marriage and remarriage create different contexts and motivations for having children. Influence is also possible through the inherent demographic and social characteristics of spouses. Education, background, urban or rural residence, ethnic identity, and religion (level of religious commitment) are significant factors influencing individual attitudes and intentions. In a couple, it is the combination of these characteristics in the spouses that is important. The combination of a husband and wife's educational levels, nationality, social background, and place of residence prior to marriage can possibly adjust each other's attitudes and decisions about having children together. The third direction of influence depends on the existing marital relations in the couple: the stability of the marriage and the nature of relations (favorable/unfavorable, the extent of conflict, satisfaction with the marriage, etc.). The fourth direction of influence can be connected with the division of household and educational activities in a couple, first of all, with the degree of the husband's involvement in housework and the process of raising children. The power structure of the couple (who is the head of the family, makes the major decisions, and manages the income) hypothetically also has an impact.

We should also talk about the system of life values inherent in spouses, in which the value of children and reproductive plans are embedded. Their mismatch can become a ground for negotiation and agreement with the possibility of different outcomes, including the marriage dissolution. The opinion of the spouse on the number of children in the family, the birth, postponement or refusal to have a child (reproductive position) can be both an incentive and a limitation of reproductive behavior.

The spouse can have a direct influence on reproductive attitudes and motives through their position (e.g., "husband/wife wanted/did not want to have a child", "husband/wife wanted/did not want to wait to have a child") and an indirect influence through established relationships, the power structure, household and socialization and educational work. The purpose of our article is to focus on some areas of influence from the possible spectrum, namely to identify the impact of the nature of marital relationships (or rather, their assessments) and the position of the spouse (in the interpretation of this position by the other spouse).

Sampling and method of data collection. The analysis presented below is based on the data obtained in 2020 in a survey of the Russian population conducted as part of the study "Demographic well-being of Russia", which covered 10 regions (the city of Moscow, the Vologda,

Volgograd, Ivanovo, Moscow, Nizhny Novgorod, Sverdlovsk oblasts, Stavropol Krai, the Republic of Bashkortostan, the Republic of Tatarstan). We used questionnaires and personal interviews to collect information. A description of the research methodology, the sample obtained, and the main results can be found in work (Rostovskaya et al., 2021).

The total sample of the survey is 5,616 people. The analysis presented in the article refers to respondents under the age of 49 inclusive, who are in a marital relationship. There are 2,776 people in the sample, of whom 86.5% are officially married and 13.5% are in cohabiting relationship. Men account for 48.6% and women for 51.4%. In their first marriage are 85.2% and 14.8% are remarried. Those who live in urban areas – 77.5%, in rural areas – 22.5%. Those who have one child – 32.1%, two – 40.5%, three or more – 10.7%, and have no children – 16.6%. Respondents who have children in the current marriage – 86.2%, those who have children from different marriages – 13.8%. The average number of children per respondent is 1.48. Age at the time of the survey: up to and including 25 years – 8.0%, 26–35 years – 36.7%, 36–45 years – 41.6% and 46–49 years – 13.7%. Those surveyed who consider themselves religious – 61.1%, not religious – 18.0%, and 20.9% hesitated to respond the question about faith.

Measurement and analysis methodology. Only one spouse in a couple was interviewed. The questionnaire contained questions that provided information about the nature of the relationship in the family. This is a question-evaluation of marital relations according to the criterion of "cohesion/disunity" on a five-point scale (1 – disunity, 5 – cohesion); a question about the presence of a problem of conflictual relations with a spouse (1 – "the problem is of almost no importance", 5 – "the problem is of very great importance"); a question about whether there are big quarrels and scandals in the family (with a nominal scale converted in the course of the analysis into a five-point scale, where 1 – no quarrels and scandals, 5 – frequent quarrels and scandals). We converted the five-point scales to three-position scales in order to analyze groups with different attitudes.

We measured reproductive attitudes toward the number of children by asking questions about the desired and expected (planned) number of children.

We tracked the influence of the other partner on reproductive attitudes by analyzing the correlation of their indicators with the indicators of marital (family) relations described above (descriptive statistics: frequency tables, averages); on reproductive motives – based on subjective assessments of the interviewed spouse regarding this influence. Empirical indicators reflecting influence (desire/unwillingness of the other spouse to have a child; desire to strengthen the marriage, the family) were included in the lists of responses to the five questions3: the reasons for the discrepancy between the desired and expected number of children (asked of respondents who want to have more children than they plan to have); the reasons for postponing the birth of a first-born or another child (asked of respondents who said they were going to have a child but were postponing the birth of a child); motives for having a second child (for respondents who already have or are going to have a second child); motives for having a third child (for respondents who already have or are going to have a third child). Note that the questions were formulated in such a way as to make it possible to trace the motives behind both the decisions already made regarding the birth of a child and the decisions to be made.

Main hypotheses:

1) people's perception of their marital relationship as unfavorable (conflictual, disunited, with quarrels) reduces the orientation on the number of children, the intention to have another child, as well as the likelihood of having one;

[3] The wording of the questions is given in the notes to the tables.

2) both favorable and unfavorable relationships determine the degree of importance of the spouse's position on the issue of childbirth (unwillingness and/or desire to have children, a desire to postpone their birth).

The material is presented in the following order: first we look at assessments of the nature of marital relationships, then at reproductive attitudes about the number of children in groups with different types of relationships. Next, we analyze the place of the motives for having children associated with the position of the spouse in the overall system of motives and in groups with different types of marital relationships.

Results and discussion

Nature of marital relationships as assessed by respondents. About half of the respondents assessed their marital (family) relationships as favorable *(Tab. 1)*. Respondents who consider their relationship with their husband (wife) to be very cohesive – 52.8%, completely conflict-free – 42.0%, and 47.8% indicate that there are almost never any big quarrels and scandals in their family. The group with unfavorable relationships ranges from 12.2% (as measured by conflict) to 16.4% (as measured by the presence of big quarrels and scandals). The proportion of the middle group in which relations between spouses are partly cohesive, partly conflict-free, and quarrels and scandals are rare, ranges from 29.1% (cohesion) to 35.8% (quarrels and scandals).

Women in the socio-demographic groups assessed marital relations on average better on the criteria of cohesion and conflict *(Tab. 2)*. Younger groups are better at assessing their relationships; as respondents get older, assessments of cohesion, conflict, quarrels, and scandals worsen. There is no clear direct correlation between the level of education, but respondents with higher and incomplete higher education were less likely to report big quarrels and scandals in the family or conflicts with their spouse. Rural residents have, on average, more cohesive relationships, but they are more likely to have conflicts in marital relationships, big family quarrels and scandals. We found no differences between religious and not religious people.

Table 1. Distribution of respondents in the entire sub-sample according to their assessments of marital relationships

Cohesion/disunity in the relationship with the spouse*		Conflictual relations with the spouse**		Big quarrels and scandals in the family***	
Group	%	Group	%	Group	%
Disunited (1–3 points)	13.6	Conflictual (4–5 points)	12.2	Often and occasionally (responses 1, 2)	16.4
Partly cohesive (4 point)	29.1	Partly conflictual (2–3 point)	31.4	Rarely (response 3)	35.8
Very cohesive (5 points)	52.8	Conflict-free (1 point)	42.0	No quarrels and scandals (responses 4, 5)	47.8
Hesitate to respond	4.5	Hesitate to respond	14.5	Hesitate to respond	0.0
Total	100	Total	100	Total	100
Average point	4.36	Average point	2.02	Average point****	2.29

* Question wording: "Try to rate your relationship with your spouse on a 5-point scale, where 1 means disunited and 5 means cohesive".
** Question wording: "Do you and your family face the following problems: conflictual relationship with your spouse?" (Rate on a five-point scale, where 1 is "it is almost irrelevant" and 5 is "very important")
*** Question wording: "Do you have big quarrels and scandals in your family?" (answers: 1 – "often", 2 – "occasionally", 3 – "rarely", 4 – "almost never", 5 – "used to be, now not"). This scale cannot be considered good enough, because the variants "rarely" and "occasionally" are poorly distinguished in terms of meaning. In addition, the answer options are not uniformly formed. The option "used to be, now there are no conflicts" evaluates the presence/absence of conflicts in time, during the married life, and the rest of the answer options refer to the present time.
**** We converted the nominal scale to a five-point straight scale in order to calculate the average point: "yes, often" – 5 points; "yes, occasionally" – 4 points; "rarely" – 3 points; "used to be, now there are no" – 2 points; "almost never happens" – 1 point.
Source: The study "Demographic well-being of Russia", 2020.

Table 2. Marital relationship assessments of socio-demographic groups, mean point on a five-point scale

Indicators for evaluating relationships	Across the sub-sample	Sex		Age, years old				Education*			Place of residence	
		male	female	up to 25	26–35	36–45	46–49	Group 1	Group 2	Group 3	city	rural area
Cohesion/ disunity	4.36	4.23	4.31	4.43	4.31	4.24	2.22	4.34	4.21	4.27	4.24	4.37
Conflicts	2.02	2.10	2.03	2.02	2.00	2.02	2.17	2.14	2.14	2.02	2.08	2.13
Big quarrels and scandals	2.29	2.29	2.28	2.23	2.16	2.41	2.38	2.32	2.36	2.27	2.31	2.34

* Group 1 – Education level: pre-vocational and lower; Group 2 – vocational secondary education; Group 3 – higher and incomplete higher education.
Source: The study "Demographic well-being of Russia", 2020.

The analysis of assessments of relationships in families with different power structures revealed that families with a traditional one (the husband is the head) are more cohesive, less conflictual, and have fewer cases of big quarrels and scandals *(Tab. 3)*. Couples where the wife becomes the head have the most conflictual relationships and are more prone to the "big quarrels and scandals". Perhaps such data can be explained through the connection with the husband's role as the main breadwinner and the economic situation of the family. In couples where the husband effectively fulfills the traditional role and income demands are met, his position as head of the family is recognized and family relationships are better.

This is partially confirmed by the connections of two indicators – assessments of relationships and assessments of family living conditions *(Tab. 4)*.

Table 3. Assessments of marital relationships in families with different power structures, mean point on a five-point scale

Answers to the question "Who is the head of the family?"*	Across the sub-sample, %	Assessments of marital relationships		
		Cohesion/ disunity	Conflicts	Big quarrels and scandals
Husband	55.0	4.47	1.99	2.21
Wife	12.6	4.20	2.15	2.48
There is no the head of the family	16.5	4.27	2.02	2.32
Total**	100	4.36	2.02	2.29

* There were also options of "another family member" and "someone else" (3.3%), and "hesitate to respond" (12.6%).
** Taking into account the options given in the previous paragraph.
Source: The study "Demographic well-being of Russia", 2020.

Table 4. Assessments of marital relationships depending on assessments of living conditions, mean point on a five-point scale

Assessments of marital relationships	Across the sub-sample, %	Assessments of family living conditions*		
		Low (1–4 points)	Medium (5–7 points)	High (8–10 points)
Cohesion/disunity	4.36	3.84	4.23	4.61
Conflicts	2.02	2.58	2.00	1.86
Big quarrels and scandals	2.29	2.76	2.35	2.08
Proportion a group, %	100	10.01	45.8	44.1

* The question wording is: "If you use a rating scale of 1 to 10 for your family's overall living conditions, how would you rate your living conditions".
Source: The study "Demographic well-being of Russia", 2020.

The group with very good living conditions (rated at 8–10 points) also stands out with the best assessments of marital relations (cohesion/disunity – 4.61 points; conflicts – 1.86 points; quarrels and scandals – 2.08 points). In the other two groups, with poor (1–4 points) and average living conditions (5–7 points) average estimates of attitudes are lower, there is a direct positive correlation with all attitude indicators.

Similar trends in the distribution of average estimates are found in families with different models of family budget management *(Tab. 5)*. Joint budget management is most common in the couples studied (more than two-thirds of families). Less common is the practice of managing by only one spouse, wife or husband (in total, every fifth to sixth couple). Even rarer is so-called separate management (one in eleven couples), where husband and wife manage their own income, but may pool it for major family expenditures or agree on which household expenses each spouse is responsible for.

Couples where both spouses manage the family budget jointly have the most cohesive, not so conflictual and almost quarrels- or scandals-free relationship. Couples with separate budget management are characterized by the most disunited relationships, with female management – the most conflictual, and with male management – with big quarrels and scandals in the family.

Assessments of the relationship nature with the spouse and reproductive attitudes about the number of children and the intention to have a child. The analysis of the relationship between attitudes about the number of children and assessments of the relationship between spouses on the scale "cohesive/disunited" showed that the factor that we denote as "the nature of marital relations" partially influences the formation of the desire to have children and plans for their birth *(Tab. 6)*. The group in which spouses described their relationship as very cohesive had the highest rates

Table 5. Assessments of marital relationships in families with different models of budget distribution, mean point on a five-point scale

Answers to the question "Who manages family income and expenses?"	Across the sub-sample, %	Assessments of marital relationships		
		Cohesion/ disunity	Conflicts	Big quarrels and scandals
Joint	73.0	4.48	1.93	2.20
Husband	9.5	4.09	2.21	2.57
Wife	7.9	4.13	2.33	2.55
Separate	9.0	3.95	2.14	2.52
Total	100*	4.36	2.02	2.29

* The amount is 100% including other responses (0.6%).
Source: The study "Demographic well-being of Russia", 2020.

Table 6. Average desired and expected number of children as a function of marital relationship assessments

	Total	Disunity/ cohesion *			Conflictual marital relations **			Quarrels and scandals ***		
		Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Desired	2.47	2.43	2.50	2.52	2.50	2.46	2.48	2.46	2.56	2.40
Expected	2.06	2.02	1.98	2.13	2.05	2.06	2.06	2.06	2.10	2.00

Note: The first groups have the worst assessments, the second groups have average assessments, and the third groups have the best assessments.
* Group 1 – "disconnected", Group 2 – "partly cohesive"; Group 3 – "very cohesive".
** Group 1 – "conflictual", Group 2 – "partially conflictual", Group 3 – "non-conflictual".
*** Group 1 – "occasionally", Group 2 – "rarely", Group 3 – "there are no quarrels and scandals".
Source: The study "Demographic well-being of Russia", 2020.

of desired and expected number of children, while the other two groups with the worst relationship assessments had lower numbers of children. The dependence of the average desired and expected numbers of children on conflict assessments is not so obvious: we cannot say that a worsening of assessments consistently leads to a decrease and vice versa.

Partly unexpected data were obtained for married couples who differed according to the "quarrels and scandals" criterion. In the group with no quarrels and scandals there were the lowest reproductive attitudes, in the group where quarrels and scandals are rare – the highest attitudes, the group where quarrels and scandals happen often occupies an intermediate position according to the indicators *(see Tab. 6)*. The explanation may lie in the wording of the question. According to which, the respondent was supposed to assess relationships in the family as a whole, not just marital relationships. The subjects of acute conflict in the family are not only husbands and wives, but also children and members of the extended family. And there is another explanation: it is a testimony that couples with an unfavorable family environment consider the birth of a child as a way to stabilize and improve the situation.

Previously, researchers obtained unexpected and close to the above-described data on the relationship between some indicators of marital relations and the desired and expected number of children (Arkhangel'skii, 2006), concluding that "the current assessment of marriage probably has more influence not on the total (including those already born) expected number of children, but on how many children one intends to have in the future". Therefore, we tested the links of relationship assessments with intentions to have not *any total number* of children, but *one more* child (of any order: the first if there are no children, or one more if there is a child or children). In this case, we found a direct positive correlation: a deterioration in the assessments of attitudes on all criteria entails a decrease in the proportion of those who intend to have a child, while an improvement in the assessments is accompanied by an increase *(Tab. 7)*. All of this speaks well for the fact that it is the negative family atmosphere with quarrels and scandals, disunited, conflictual relations of spouses that is determinative or, at least, among the determinative reasons for refusing to have a child.

The intention to have one more child is more pronounced in families where the husband is the head (31.4% intend to have a child, 42.9% do not intend to have a child, 19.4% hesitate to respond), and in couples where there is no head (27.4% intend to have a child, 50.7% do not intend to have a child, 21.9% hesitate to respond). Couples where the head is the wife are strongly inferior to these two groups (17.9% intend to have a child, 58.7% do not intend to have a child, and 23.5% hesitate to respond).

Table 7. Intention to have the first and/or another child* depending on the assessment of the marital relationship, %

Response option	Total	Disunity/ cohesion			Conflictual marital relations			Quarrels and scandals		
		Group1	Group2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Yes	28.4	21.0	25.2	32.5	25.1	30.4	38.0	20.3	28.1	31.2
No	49.7	54.3	52.8	46.5	57.9	50.9	44.6	61.4	49.9	47.0
Hesitate to respond	21.9	24.7	22.0	21.0	17.0	18.7	24.6	18.3	22.5	21.8
Total	100	100	100	100	100	100	100	100	100	100

* The question wording is "Are you going to have a child, your first if you don't have children, or subsequent one?" The first groups have the worst assessments, the second groups have average assessments, and the third groups have the best assessments.
For detailed group designations, see the note to Tab. 6.
Source: The study "Demographic well-being of Russia", 2020.

The influence of the spouse's position toward having children on the family's reproductive motives. As noted above, the survey showed a difference between the desired and expected number of children: on average, respondents plan to have fewer children than they would like. The main reasons for this, which have a high degree of significance (5 points), are socio-economic: insecurity about the future, financial difficulties, housing difficulties, unemployment and inability to look after the child when a woman goes back at work. These reasons in the overall sample are important ("very hindering" and "hindering" from planning to have the desired number of children) for almost every second respondent. The other spouse's influence was at the very bottom of the list: only 6.9% pointed to the reluctance of their husband/wife to have as many children as the respondent would like *(Tab. 8)*.

Much more strongly the position of the spouse affects the motivation to postpone the birth of a child and the motivation to have a second and a third children. The answer "husband/wife wants to wait with the birth of a child for now" was among the five most significant reasons for postponing the birth (2.93 points, 19.5% chose 5 points) along with such reasons as the need to invest in a child born ("Raising a child is quite difficult, requires a lot of effort and time"); assessment of the current job as not paying enough to have a child ("I need to find a better-paying job"); desire to live freely, without caring about a child ("I want at least some time to live for myself"); lack of material conditions for the birth and upbringing of a child ("So far, material opportunities do not allow").

Among the motives for having a second child, "a strong desire of the spouse" was one of the first five significant (mean – 3.18 points, 3rd place, 30.0% chose 5 points) along with the desire to give an already-born child a brother/sister ("so that the already-born child does not feel lonely"), the desire to have a child of a different sex, to have a baby again, and to strengthen the family. A strong desire of the spouse is also among the six most significant motives for having a third child (average – 2.45 points, 6th place, 17.5% chose 5 points).

Thus, the births of a second and a third children (realized reproductive decisions), as well as future plans for their births, are largely determined by the position of the spouse.

In order to understand the importance and consideration of the spouse's position on having a child in couples with favorable and unfavorable

Table 8. Responses about the influence of the spouse's position on decisions to have children, over the entire subsample

Response option	Average on a five-point scale	Place in the hierarchy of all responses by mean point	% who chose 5 points
If you would like to have more children than you intend to have, what and to what extent would prevent you personally from having the desired number of children?*			
Husband/wife unwillingness	2.10	16	6.9
To what extent is your desire to delay having a baby related to the following reasons?**			
The husband (wife) wants to wait with the birth of the child for now	2.93	5	19.5
To what extent was or could the birth of your second child (if you don›t have one yet, but intend to have one) be due to the following reasons?***			
Strong desire of the spouse to have a second child	3.18	3	30.0
To what extent was or could the birth of your third child (if you don›t have one yet, but intend to have one) be due to the following reasons?****			
Strong desire of the spouse to have a third child	2.45	6	17.5

* The question included assessment of the importance for the respondent of 20 reasons.
** The question included an assessment of the importance of 18 motives.
*** The question included an assessment of the importance of 14 motives.
**** The question included an assessment of the importance of 13 motives.
Source: The study "Demographic well-being of Russia", 2020.

relationships, we calculated average assessments of the importance of motives for postponing childbirth and motives for having a second and a third child in groups with different characteristics of marital relationships. We obtained interesting results confirming the tested hypothesis about the influence of the nature of marital relations on reproductive motives. The motive "husband/wife wants to wait with the birth of a child" is most significant among respondents who assess the relationship with their spouse as cohesive, without big quarrels and scandals, which is evidence in favor of the desire of spouses in such couples to consider the opinion of the other partner and make coordinated decisions. This motive also has the highest significance for those who rated the problem of conflicts with their husband/wife as very important for their couple (compared to those who said it was partially important and completely unimportant). In this case the postponement of the birth of a child is clearly due to a not very favorable relationship.

The spouse's strong desire to have a second child as a birth motive is most significant for respondents with medium and low assessments of conflict in marital relations, for very cohesive spouses, and for families in which big quarrels and scandals rarely occur or do not occur at all. In the rationale for having a third child, the motive "strong desire of the spouse" is similarly related to the "nature of the marital relationship" on two criteria ("marital conflicts", "big quarrels and scandals"). Disunited spouses demonstrate the highest importance of this motive. Perhaps it indicates that the third child is often seen as intended to strengthen the marriage[4].

In the survey, respondents were asked to estimate the likelihood of having their first or subsequent child in the next 3–4 years in two situations: if no new additional state measures of family support were introduced, and if such measures were introduced. According to the answers to the question it is possible to make a forecast of the birth rate in the short term. The probability that the couple will have a child in the absence of any new support measures is very low – 2.91 points out of 10 *(Tab. 9)*. One in two (50.2%) assessed the probability as zero; only one in ten (10.6%) was absolutely certain (10 points) that they would have

Table 9. Assessments of the probability of having a child in the next 3–4 years* as a function of marital relationship assessments, average point on a 10-point scale

State measures to support families	Total	Disunity/ cohesion			Conflictual marital relations			Quarrels and scandals		
		Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Without new measures	2.91	2.24	2.49	3.29	2.98	3.04	2.97	2.12	2.94	3.04
With new measures	3.83	3.32	3.82	4.05	3.72	3.92	4.10	2.93	4.05	3.97

* The question wording is: "Assess your probability of having a child in the next 3–4 years (the first if you have no children, or another child) if: a) there are no new additional measures to support families; b) if there are any additional measures to support families in addition to those currently in force". The rating was given on a 10-point scale, where 0 means "we will not have a child", 10 means "we will almost certainly have a child".
The first groups have the worst assessments, the second groups have average assessments, and the third groups have the best assessments.
For detailed group designations, see the note to Tab. 6.
Source: The study "Demographic well-being of Russia", 2020.

[4] The list of answers to the question about the motives for having a third child did not include the response option "desire to strengthen marriage, family". This motive was included in the list of 14 answer options to the question about the motives for having a second child. As noted above, it was among the five most significant motives.

a child. In the situation where new measures are introduced, the probability of having children is also low, but it is already 3.83 points. At the same time, 43.4% have a zero probability, and 17.6% are absolutely sure (10 points) that they will definitely have a child.

Despite low overall probability estimates for having children in the absence of new state measures to support families, there is still a marked upward trend in the probability with improving estimates of attitudes across all criteria. An even more pronounced increase in probability is observed in responses to the question about the possibility of having a child if new measures of family support are introduced. It is particularly consistent across assessments of cohesion/disunity (3.32, 3.82, and 4.05 points) and conflictual marital relationships (3.72, 3.92, and 4.10 points). Thus, in the near term, it is families with more favorable marital and family relationships that are most likely to decide on having children.

Conclusions and research directions

The study of various aspects of the spouse's influence on the reproductive behavior of a married couple is an urgent task. It aims to consider the reproductive behavior of people in a marital relationship as a group behavior. Most of the available data suggest that there is such an influence. However, there are also results indicating that the links are not so unambiguous, not always a direct positive correlation can be detected. Many questions remain to be raised in future research, including questions of methodology regarding measurement and the selection of adequate variables.

Our analysis tested two hypotheses about the relationship between assessments of the nature of marital relationships and reproductive attitudes, intentions, and motives. The first hypothesis was partially confirmed. Cohesive couples, in conflict-free relationships, are more likely to report intentions to have a child, more likely to give a positive prognosis for having a child in the next 3–4 years, especially if new measures of assistance to families with children are introduced. Families with more favorable relationships are most likely to decide on having children. Disunity, and conflict in the relationship entail lower rates, couples with such a relationship are less likely to assess their prospects for having a child in the coming years and are much less likely than others to intend to have another child.

Regarding the second hypothesis, we note that there is no unambiguous and direct correlation between the position of the other spouse on having children and the nature of the marital relationship. The obtained data also indicate that the traditional power structure in marital relations (the husband is the head of the family) not only remains widespread (at least at the level of statements that a man performs this role), but is also positively associated with reproductive intentions.

Our options are limited by the lack of other variables in the set of tools that allow tracking the influence of the spouse in different ways. Variables that speak to the gender division of household responsibilities, the involvement of husbands in housework and especially in child rearing, the socio-demographic characteristics of husband and wife, new indicators of the nature of marital relationships that have been used before (such as thoughts of divorce) and not used (such as indicators of domestic violence, emotional and psychological and behavioral reactions to having children), collecting information from or about both spouses would help provide a comprehensive assessment. It is in these directions that further analysis is possible, which will bring new results and the possibility of comparing them with existing ones.

The conclusions obtained support the importance of activities aimed at harmonizing marital and family relationships (for example, the development of psychological counseling services for couples), reducing the influence of social and socio-economic factors in postponing having children and further developing socio-demographic policy measures.

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Information about the Authors

Flyura B. Burkhanova – Doctor of Sciences (Sociology), Professor, Chief Researcher, Laboratory for Regional Studies of the Quality of Life, Sociological Institute, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (20/1, 50-th Anniversary of October Street, Ufa, Republic of Bashkortostan, 450005, Russian Federation; e-mail: burhanova.flura@mail.ru)

Guzel' R. Baimurzina – Candidate of Sciences (Economics), head, Laboratory for Regional Studies of the Quality of Life, Sociological Institute, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (20/1, 50th Anniversary of October Street, Ufa, Republic of Bashkortostan, 450005, Russian Federation; e-mail: guzrim@mail.ru)

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China's Interests in the Industrialization of the South Caucasus: Comparative Analysis of Labor Productivity in the Manufacturing Sector

Ibrahim NIFTIYEV
University of Szeged
Szeged, Hungary
Azerbaijan State University of Economics
Baku, Azerbaijan
e-mail: ibrahimniftiyev@gmail.com
ORCID: 0000-0003-3437-9824; ResearcherID: AAW-3843-2021

Abstract. Due to their strategic location and relatively developed economies, the three countries of the South Caucasus, namely Azerbaijan, Armenia, and Georgia, have cooperated with China since 2015 to leverage their economic growth. China has significantly invested in these countries to boost their productive capacity and integrate them into China-centered global value chains. However, are these countries ready to launch into cooperation with advanced economic powers such as China? To address this question, the current paper integrates overall trends in aggregate and sectoral productivity to evaluate the readiness of the South Caucasus for a new phase of industrialization using Chinese investments and projects as new and important developments in the region's economic life. Overall, the results indicate a downward trend in manufacturing value added in the South Caucasian economies. While lagging trends raise concerns, Chinese foreign directed investment may resolve issues related to incomplete capacity utilization in the South Caucasus through infrastructure investments. In contrast to the existing literature on China's economic presence in the South Caucasus, this paper examines Azerbaijan, Armenia, and Georgia in both intraregional and interregional terms by comparing them to the Visegrad and Baltic countries, respectively. This approach enables the South Caucasian countries to be situated in the context of Chinese foreign direct investments influx, as the South Caucasus shares a similar history and prospects with the Baltic countries and the Visegrad countries, respectively. The results of a one-sample

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t-test indicate that, on average, capital deepening and aggregate labor productivity are higher in the South Caucasus than in the Visegrad and Baltic regions. However, manufacturing labor productivity was significantly lower in the South Caucasus than in the benchmark regions. Moreover, the estimated effect sizes at the sectoral level – as measured through eta squared – illustrated the strength of the obtained differences. These findings document the need for improved economic reforms and policies to keep pace with the regions that are driven by foreign direct investments and that have successfully integrated into global value chains. Otherwise, China-led economic development may fail to industrialize the South Caucasus, misguiding the respective parties' beliefs and expectations. Thus, further research is needed alongside specific sectoral policy strategies to document country- or region-specific challenges related to the increase in Chinese projects and foreign direct investments in the South Caucasus.

Key words: South Caucasus, Azerbaijani economy, Armenian economy, Georgian economy, manufacturing labor productivity, South Caucasian industrialization, Belt and Road Initiative.

Introduction

China has successfully integrated into the global economy by implementing gradual market reforms that have enabled it to overcome the flaws of the socialist system and shock therapy since the late 1980s (Weber, 2021). In addition, like advanced industrial nations, China has shifted its exports from labor-intensive products to high-tech products, becoming a valuable part of global production networks (Athukorala, 2017). As one of the fastest-growing economies, China has spent its accumulated wealth on investments. One of the destinations for Chinese foreign direct investments (FDI) is the South Caucasus region, where projects such as the New Silk Road (NSR) and the Belt and Road Initiative (BRI) aim to increase trade and boost infrastructure. However, is the South Caucasus worth investing in?

The main reason why China is interested in the South Caucasus is the fact that the corridor between Central Asia and Western Asia passes across countries such as Azerbaijan and Georgia (Ismailov, Papava, 2018). China offers considerable investments to these countries in return for their cooperation; in turn, South Caucasus countries see China as a reliable economic partner. Indeed, Chinese investments can be very beneficial. Zhai documented these benefits both along and beyond BRI routes, which include USD 1.6 trillion global in welfare gains (accounting for 1.3% of worldwide Gross Domestic Product – GDP); however, non-BRI countries demonstrated fewer improvements in bilateral trade (Zhai, 2018). In addition, Jain argued that China's increasing trade with countries that lie alongside BRI routes indicates that it seeks alternative trading partners due to the recent trade war between China and the United States (Jain, 2020). Such developments in the world economy because of Chinese economic projects urge regularly to study China-related projects at the country and regional levels. However, high-quality work remains scarce despite a steady increase in journal articles, conferences, and books about the BRI (Blanchard, 2021).

The intellectual realization of manufacturing's comparative labor productivity in the South Caucasus is unclear among the internationally published literature examples. This aspect of the region's economy becomes more significant when a foreign partner such as China makes export-oriented industrial production plans related to the South Caucasus. Accordingly, this paper's main research questions are as follows. First, how might

the South Caucasus countries—namely, Azerbaijan, Georgia, and Armenia—benefit from Chinese projects that aim to increase industrialization? Do the South Caucasus countries demonstrate a statistically significant difference with comparable regions (i.e., the Visegrad and Baltic countries) in terms of aggregate and manufacturing productivity? A research paper that focuses on manufacturing labor productivity in the South Caucasus to the author's best knowledge does not yet exist in the literature. A comparative perspective to establish the region's economic potential in the face of increasing Chinese investments and projects increase the actuality of the topic. Therefore, the present study aims to outline China's increasing economic initiatives in the South Caucasus to evaluate labor productivity trends and compare them with other post-Soviet and post-socialist regions to conceptualize the region's prospects in the face of increasing Chinese involvement in the region.

To address the abovementioned research questions, this paper examines trends and patterns in industrial activity and aggregate and sectoral productivity in the manufacturing sector in the South Caucasus countries. Moreover, figures are analyzed to make intraregional and interregional comparisons. Lastly, for policy considerations, a one-sample *t*-test provides preliminary statistical evidence of differences between the South Caucus and the European regions such as Visegrad and Baltic countries.

It was found that Azerbaijan may benefit from Chinese investments to boost its fading non-oil manufacturing sector. Georgia focuses on the advancement of transportation and logistics to meet the Chinese demands in the collaboration between East and West. Meanwhile, Armenia may be indirectly involved in projects such as the BRI due to its challenging geographic location. Moreover, the aggregate productivity of the South Caucasus is significantly lower than that of Visegrad countries, while it is higher than that of Baltic countries. However, the sectoral labor productivity of the manufacturing sector in the South Caucus is significantly lower than in either of the other regions. Therefore, the South Caucasus has much to learn from the FDI recipient countries of the Visegrad region and the service-led growth of the Baltic region.

Although several papers tried to analyze the South Caucasus economies both as a region and separately, still there was no comparative statistical analysis of the labor productivity in the South Caucasus. Such an analysis would be a vital contribution to the current understanding of the region, as the region always is a hot spot for geopolitical, political and economic developments. The growing involvement of China increases a necessity to examine the region's economy further. Therefore, the study contributes to the limited literature on the subject, also pinpointing significant discrepancies in manufacturing of the South Caucasus in terms of their labor productivity via a well-known statistical examination instrument—one-sample *t*-test.

China's interests in the South Caucasus

After the collapse of the Soviet Union in 1991, the South Caucasus consisted of three independent countries: Azerbaijan, Armenia, and Georgia. The region became politically unstable, economically and institutionally dysfunctional, and rife with inter-ethnic conflict during the first half of the 1990s (Nixey, 2010). In addition, throughout the early 1990s, a lack of economic and political integrity impeded solutions to chronic poverty, isolation, and majority-minority issues (Waal, 2012). However, the South Caucasus overcame extreme poverty in the beginning of the transition period until the end of the first decade of the 2000s (Aristei, Perugini, 2012).

Economic projects such as the Baku-Tbilisi-Ceyhan (BTC) oil pipeline and the Baku-Tbilisi-Erzurum (BTE) gas pipeline integrated Azerbaijan, Georgia, and Turkey, streamlining foreign exchange within a short period (Cornell, Ismailzade, 2005). Although all these intense developments rapidly took place, still the South Caucasus took a stand against economic challenges (e.g., low income and de-industrialization) after the transition period, and China-led growth promised attractive outcomes for the failed trials of economic catch-up of the regional countries. Along with economic prosperity, the South Caucasus presented an attractive set of economic opportunities due to its optimal position as a transit hub between the East, West, and the Middle East. Thus, China's interest in the South Caucasus was based on the region's export-enhancing infrastructure, optimal location, and the political propensity of domestic elites to diversify international trade partners.

From China's perspective, one of the main tools of integration with the West was the BRI. The latter encompasses two sub-projects: the Silk Road Economic Belt (SREB) and the 21st-century Maritime Silk Road Initiative (MSRI) (Ge, 2016). As the BRI covered the regions of Asia Pacific, Europe, and Central Asia, the revival of ancient trade routes in the form of modern economic integration and deep multilateral partnerships promised new horizons for member countries, especially post-transition and post-Soviet emerging economies (Ge, 2016). The influx of Chinese FDI into the South Caucasus signaled infrastructure development among the developing post-Soviet countries, which would allow them decrease their dependency on Russia and other major global powers (e.g., the United States and the European Union). However, there were concerns that these countries would fall into a new dependency by becoming "satellite countries" for China to fulfill its demand for raw materials and transportation. On the one hand, China's investments in natural resource extraction, agriculture, transportation, and communication filled gaps within the recipient countries; on the other hand, post-Soviet countries were incorporated into China-centered development plans through projects such as the BRI and the MSRI.

China significantly invested in infrastructure and trade facilitation to fuel domestic cohesion and development among the BRI's participating countries. According to Schneider, the main reason for this was to emulate the early developmental stages of the large capitalist powers (Schneider, 2021). In the same way that telegraph lines, railroads, and canals transformed the modern global economy, China aimed to replicate this western-style expansion plan in a much more modern way. The South Caucasus countries have already developed their infrastructure capacity to support necessary domestic and international economic activities. Therefore, China's first steps in the region were exploratory but forthcoming investments might have a bigger scale and more significant ambitions to boost the BRI.

To maximize the benefits of the BRI, partner countries must cooperate with both each other and China to overcome challenges such as a lack of infrastructure, institutional gaps, deficient human capital, and massive need for funding (Zhai, 2018). Moreover, each country's current capacity may be a barrier to transforming the region into an integrated hub for FDI to become a valuable, functional, and trustworthy point of departure for Chinese exports. Thus, the following sections briefly examine contextual developments related to China's increased involvement in the South Caucasus.

At the country level, China's interests in Azerbaijan, Georgia, and Armenia differ. These differences can shed light on the present and future status of the partnership between China and the South Caucasus. Moreover, all three countries share similar challenges in terms of industrial activity and productivity.

Azerbaijan

There are multiple reasons why foreign countries, including China, seek to expand their cooperation with Azerbaijan. For instance, Azerbaijan's infrastructure presents a rich set of logistical opportunities for East-West partnerships, as the country encompasses six international airports, Baku Cargo Terminal, Alyat Trade Port, Caspian Flotilla, and the Baku-Tbilisi-Kars railroad (Babayev, Ismailzade, 2020). In addition, according to Mammadova, Baku International Sea Port appears to be attractive to Chinese companies that wish to further increase China's international trade[1].

China has also developed deep interests in international projects initiated by Azerbaijan. For example, China's Asian Infrastructure Investment Bank (AIIB) invested USD 600 million in the Trans-Anatolian Gas Pipeline (TANAP) and pledges tens of millions in USD to State Oil Company of the Azerbaijan Republic gas processing and petrochemical plants (SOCAR-GPC) (Rolland, 2018).

China's increasing involvement in the South Caucasus as a main source of FDI, which provides the financial impetus to leverage industrial capacity, has also been widely discussed among local think tanks[2]. For instance, recent non-oil investments in Azerbaijan included an industrial port in Alyat (USD 1.5 billion), an integrated steel mill in Ganja (USD 1.17 billion), and a tire plant in Sumgait (USD 300 million). Meanwhile, Azerbaijan has also invested USD 1.7 billion in China since 2017. In fact, Azerbaijan's interest in the Chinese markets led to the creation of the first trading house in 2017, which allowed the direct promotion of goods and the analysis of sales opportunities. The influx of Chinese FDI into Azerbaijan is being evaluated as a new opportunity to diversify the country's oil-based industrial production[3].

Although much has been achieved between Azerbaijan and China, BRI and NSR routes must also be integrated with the Trans-Caspian International Transport Route (TITR) to expand transportation between the East and the West. To achieve this, Azerbaijan must expand its partnership with China by forming intercountry working groups to increase the marginal economic benefits of future cooperation (Babayev, Ismailzade, 2020). In addition, excess unused capital (Hasanli et al., 2021), low productivity (Onder, 2013), and an undiversified economic structure (Ahmadova et al., 2021; Guliyev, 2020) are obstacles to economic well-being and sustainable economic development.

Georgia

Thanks to its favorable geographical position and reformed economy, Georgia is another South Caucasian country that is attractive to foreign investors. Georgia offers a friendly business environment with a low corruption rate, liberal foreign trade, economic freedom, and a strategic position between Asia and Europe (Gigauri, Damenia, 2019).

[1] Mammadova L. Chinese CNEEC to build tire plant in Azerbaijan. 2019. Available at: https://www.azernews.az/business/150089.html (accessed: June 14, 2021).

[2] Mammadov M. Azerbaijan's membership in the EAEU: The Devil is in details. 2021. Available at: https://top-center.org/en/reports/3112/azerbaijans-membership-in-the-eaeu-the-devil-is-in-details (accessed: June 13, 2021).

[3] Dilek Ş. Demirden İpek Yolu: Bakü-Tiflis-Kars demiryolu hattı [Silk Way out of Iron: Baku-Tbilisi-Kars Railroad]. 2017. Available at: https://www.setav.org/demirden-ipek-yolu-baku-tifliskars-demiryolu-hatti/ (accessed: June 14, 2021).

Georgian authors perceive Chinese involvement in the South Caucasus as a positive development and a new economic prospect. The BRI and the NSR are expected to bring new opportunities to poor regions by creating jobs, attracting investments, establishing new industrial bases, and improving transportation (Gigauri, Damenia, 2019). Gigauri and Damenia view Chinese investments as an opportunity to upgrade the current industrial capabilities of the South Caucasus region by importing advanced technologies to increase competitive advantage (Gigauri, Damenia, 2019).

However, Gambino is more pessimistic about how Chinese investments will alter the balance of power in Georgia (Gambino, 2019). The argument that Georgia is in the center of a geopolitical competition between Russia, Turkey, China, and the European Union because of its transportation capabilities is also supported by van Dijk and Martens (Van Dijk, Martens, 2016). In addition, Kharaishvili et al. highlighted the low technical capacity of Georgian transportation companies, weak legal frameworks, slow institutional regulations, and high shipment rates (Kharaishvili et al., 2021). Moreover, the lack of a government strategy in transportation hinders digitalization and innovation in shipment infrastructure.

Existing studies have voiced particular concerns about labor productivity in the Georgian economy. For instance, Gambino has mentioned the risks that Georgia took on by agreeing to participate in Chinese economic projects (Gambino, 2019). These risks include low labor productivity, the existence of an unskilled and unemployed labor force, undifferentiated exports, and lagging internal infrastructure; as a result, sustainability is endangered in favor of meeting great expectations from both China and other BRI partner countries. Moreover, industrial policies in Georgia have not been sufficiently altered to achieve desired reforms and outcomes (Diakonidze, 2016). Labor markets and new regulations have been reintroduced without major improvements since the collapse of the Soviet Union (Diakonidze, 2016).

Armenia

Due to Armenia's landlocked position and closed borders with Azerbaijan and Turkey, China's interests in the country are geopolitical rather than economic. Therefore, Armenia's participation in the BRI may take place mainly through infrastructure and trade rather than production. Although this significantly limits Armenia's contributions to Chinese projects such as the BRI and the MSR, it can still be involved via the fast-growing information and communications technology (ICT) sector, which was inherited from the Soviet years (Gigauri, Damenia, 2019). ICT is a crucial part of modern manufacturing production and the rapid transformation of Armenia into a vibrant ICT hub is promising for the integration of Chinese projects into global value chains (GVCs).

Armenia has developed free industrial zones (FIZ), such as the one in Meghri, that could benefit from BRI investments, along with the Meghri – Yerevan – Bavra highway and planned railroad, which will follow the same route. However, as Gambino noted, highway and railroad development are plagued by several logistical challenges (Gambino, 2019). Chinese companies such as Synohidro have already taken part in the finalization of Armenian infrastructure projects, which signals that Armenia's domestic capacity to complete strategic projects is highly limited.

Like Azerbaijan and Georgia, Armenia's economy suffers from low productivity levels, inefficiencies, and the suboptimal distribution of economic activities (Hakobjanyan, Yeghiazaryan, 2016). Low productivity limits the country's major

push for industrial activity and improvement of unemployment and poverty (Valerio et al., 2015). Thus, there is a solid expectation to suspect low contribution of the Chinese investments into the overall industrialization process in Armenia as there are natural limits from both the national economy and geographic location of the country.

Data and methodology

Assessing past trends to determine the readiness to China-led industrialization and upcoming dynamics in aggregate and sectoral productivity requires a systematic, critical, and comparative analysis of the South Caucasus countries. The analytical portion of the work includes an examination of explanatory trends through a systematic and comparative figure analysis of manufacturing dynamics – particularly with regard to labor productivity – in the South Caucasus.

The main data source for the current research consists of aggregated and sectoral labor productivity data (manufacturing) from the World Bank's report on global productivity, which was edited by Dieppe et al. (Dieppe et al., 2020). The data set covers aggregated and sectoral labor productivity levels across a wide range of regions and countries.

However, the World Bank data set does not contain any data on Armenia's labor productivity, either in real or purchasing power parity (PPP) terms. To obtain relevant time series data, data on the nominal value added of the manufacturing sector was first collected from statistical yearbooks published by the Statistical Committee of the Republic of Armenia[4]. Then, the nominal value added of the manufacturing sector was converted to current U.S. dollars (the exchange rate was 1 Armenian dram to USD 0.0020, based on data provided by Armenian Central Bank on July 16, 2021)[5]. To adjust nominal values to real values, the consumer price index (CPI; 2010 = 100%) provided by the World Bank[6] was introduced into the calculations by using equation (1). Finally, real labor productivity between 2001 and 2017 was available for Armenia, which allowed for the construction of a regional average to compare each South Caucasus country against.

$$\text{Real value added in manufacturing} = \frac{\text{Nominal value added in manufaturing}}{\text{CPI} / 100}. \quad (1)$$

This paper also provides comparisons of productivity between the South Caucasus and the Visegrad and Baltic regions to illuminate possible differences between post-socialist and post-Soviet countries. The Visegrad region includes countries such as Hungary, Poland, the Czech Republic, and Slovakia; it mainly serves as a benchmark. The Visegrad region has promoted FDI inflow, which has made it one of the largest investment recipients (Éltető, Antalóczy, 2017) that the South Caucasus might experience because of Chinese investments. The Baltic region includes Latvia, Lithuania, and Estonia. The Baltic countries were also part of the Soviet Union and now follow a services-led economic structure (Maksimtsev et al., 2017), which is similar to the South Caucasus. Lastly, the average of the South Caucasus region was also used in the figure analysis of labor productivity in terms of PPP; it is mainly based on data from Azerbaijan and Georgia due to the limited availability of data from Armenia.

[4] Statistical Committee of the Republic of Armenia. Available at: https://armstat.am/en/ (accessed: July 1, 2021).

[5] Central Bank of Armenia. Exchange Rates Archive. Available at: https://www.cba.am/EN/SitePages/ExchangeArchive.aspx/ (accessed: July 16, 2021).

[6] Consumer Price Index (2010 = 100) – Armenia. The World Bank. Available at: https://data.worldbank.org/indicator/FP.CPI.TOTL?locations=AM (accessed: July 16, 2021).

The calculated moving averages (MAs) are the last three-year averages between 1997 and 2017. For example, the MA indicated in 2000 contains the average of 1997, 1998, and 1999, while 2001 comprised 1998, 1999, and 2000. The application of MAs enables the regions to be dynamically compared to each other rather than using a static approach. However, the part of the data set related to real labor productivity (RLP) and labor productivity (LP) in terms of PPP for 2001 and 2002 had missing values for Georgia. These were filled in using the Trend function in Google Sheets (an online spreadsheet tool), which predicted the missing values in a linear fashion based on the least squares method (i.e., linear interpolation).

A one sample *t*-test was used to analyze differences in aggregate and sectoral productivity between the South Caucasus and the Visegrad and Baltic regions. *Table 1* reports the descriptive statistics and the results of the normality test (Shapiro-Wilk) of the variables (the main sample or dependent variable) used in the one-sample *t*-test. The main sample in the statistical analysis was tested for the variables of interest. Then, the sample was tested against specific test values. The test values were obtained by averaging the variables of interest (e.g., capital deepening and labor productivity growth rate) for either the Visegrad region or the Baltic region. The one-sample *t*-test was performed using SPSS software, Version 23.0.0.0 for the Mac operation system (Mac OS).

However, it should be noted that only capital deepening, real labor productivity, and labor productivity in terms of PPP fulfilled the main assumptions for the one-sample *t*-test *(Tab. 2)*. Nevertheless, results for the other variables also were reported for the sake of comparison. Therefore, any final considerations regarding establishing final regional discrepancies based on the one-sample *t*-test must be carefully handled.

Table 1. Descriptive statistics for the variables of interest used in the one-sample t-test

Variable name	Min.	Max.	Mean	St. dev.	Shapiro-Wilk normality test
Capital deepening, % contribution	-2.84	13.92	2.24	2.90	0.974
Labor productivity (LP), gross domestic product (GDP) per employment, in USD, 2010 prices and exchange rates	1,799.41	12,796.77	6,468.28	3,435.91	0.806***
Labor productivity growth rate, in %	-38.36	32.86	3.67	11.56	0.874***
Total factor productivity in log difference, in %	-51.54	24.13	0.50	12.08	0.800***
Real labor productivity, 2010 constant prices, in thousands (local currency)	5.17	29.36	12.89	7.06	0.958
Labor productivity, 2011 international purchasing power parity (PPP) exchange rate, in thousands USD	10.12	45.81	28.81	9.74	0.968

Source: Own compilation.
Notes: The numbers were rounded to the second decimal place for concision. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The null hypothesis for the Shapiro-Wilk test covers the normal distribution of the variables. According to the box plot visualizations for the data (not reported here but available upon request), total factor productivity had six outlier values and the labor productivity growth rate had five outlier values.

Table 2. Comparison of results against the main assumptions for the one-sample t-test

Variable name	Interval or ratio level	Independence	Significant outliers	Normal distribution
Capital deepening, % contribution	Yes	Yes	No	Yes
Labor productivity (LP), gross domestic product (GDP) per employment, in USD, 2010 prices and exchange rates	Yes	Yes	No	No
Labor productivity growth rate, in %	Yes	Yes	No	No
Total factor productivity in log difference, in %	Yes	Yes	Yes	No
Real labor productivity, 2010 constant prices, in thousands (local currency)	Yes	Yes	Yes	Yes
Labor productivity, 2011 international purchasing power parity (PPP) exchange rate, in thousands USD	Yes	Yes	No	Yes
Source: own elaboration based on general IBM® SPSS® statistics guides.				

Lastly, as argued by Pallant, the effect size of the computed differences must be identified to make more conclusive and meaningful interpretations (Pallant, 2010). Effect size is a standardized and objective measure of observed effect (Gerald, 2018). Although there are various techniques for estimating effect size (e.g., Cohen's *d*, Pearson's correlation coefficient *r*, and the odds ratio), a more practical one is eta squared (), which can be calculated according to the formula below (He, Lyles, 2008):

$$\eta^2 = \frac{1}{1 + \frac{n-1}{t^2}}, \quad (2)$$

where *n* is the sample size and *t* is the calculated value of the dependent sample *t*-test (Gerald, 2018). The effect size can be small (0.01), moderate (0.06), or large (0.14). Overall, it ranges between 0 and 1.

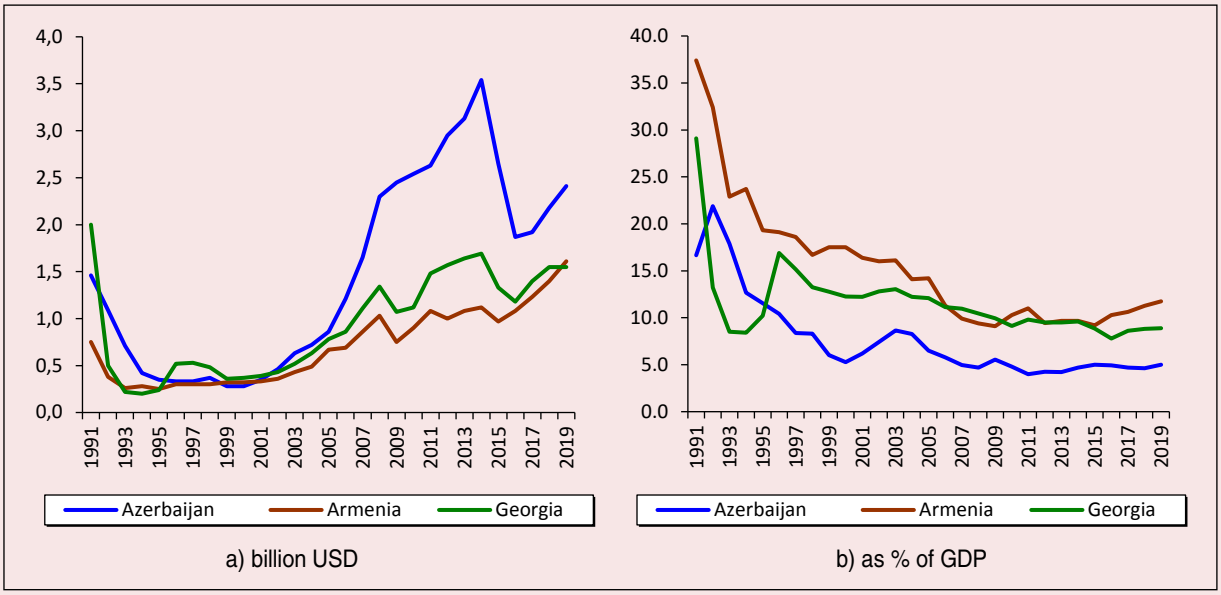
Results

To understand the overall status of the manufacturing sector in the South Caucasus, it is useful to analyze the trend of manufacturing value added. Although Azerbaijan and Georgia demonstrated an increasing trend in manufacturing value added during the transition period (1991–2005), as measured in billions of USD *(Fig. 1a)*, the overall share of manufacturing value added in GDP has weakened since independence *(Fig. 1b)*. In Azerbaijan, the share of manufacturing value added fell from 21.88% in 1992 to 3.99% in 2011; in Georgia, it decreased from 16.9% in 1996 to 7.79% in 2016. Meanwhile, Armenian data shows that, since 2016, the manufacturing value added has increased in both current price levels and as a share of GDP; however, Armenia exhibited the same dynamics as Georgia and Azerbaijan until then.

Table 3 reports aggregate productivity indicators for the South Caucasus region between 1980 and 2018. In terms of capital deepening, the countries experienced noticeable improvements, mainly during the 2005–2009 period. However, Azerbaijan experienced higher capital deepening between 2000 and 2004. Nevertheless, the region's overall average has decreased since 2010 (to 1.70% from highs of 3.70% and 2.99%), with slight improvements from 2015 to 2018 (1.97%).

Labor productivity in the South Caucasus, as measured in GDP per employment in 2010 constant dollars, reached USD 11,060.56 from 2015 to 2018,

Figure 1. Manufacturing value added in the South Caucasus, 1991–2019



a) billion USD b) as % of GDP

Sources: *Economic structure*, The Global Economy (2021); *World Data Atlas*, Knomea (2021).

Table 3. Aggregate productivity indicators for the South Caucasus, 1980–2018

		1980–1989	1990–1999	2000–2004	2005-2009	2010–2014	2015–2018
Capital deepening, % contributiol	*AZE*	1.72	0.63	8.70	2.36	3.18	1.83
	ARM	1.13	1.35	2.12	4.55	1.56	1.48
	GEO	2.07	1.87	0.27	2.07	0.63	2.59
	Ave.	1.64	1.28	3.70	2.99	1.79	1.97
Labor productivity (LP), gross domestic product (GDP) per employment, in USD, 2010 prices and exchange rates	*AZE*	n.a.	3,618.45	4,117.16	7,764.34	12,226.62	12,004.67
	ARM	n.a.	2,505.40	4,412.83	9,395.68	8,791.89	11,786.58
	GEO	7,610.30	3,750.48	4,140.45	6,529.44	8,135.39	9,390.43
	Ave.	n.a.	3,291.44	4,223.48	7,896.49	9,717.97	11,060.56
Labor productivity growth rate, in %	*AZE*	n.a.	-6.00[a]	9.07	20.09	1.28	-1.46
	ARM	n.a.	-0.94[a]	14.95	6.43	4.85	6.88
	GEO	0.83	-5.49	5.30	7.77	4.52	3.92
	Ave.	n.a.	-3.73[a]	9.78	11.43	3.55	3.11
Total factor productivity in log difference, in %	*AZE*	n.a.	-7.43[a]	-0.61	13.21	3.09	-2.94
	ARM	n.a.	-4.31[a]	11.54	3.40	-2.27	4.74
	GEO	n.a.	-7.30[a]	4.21	4.40	3.38	1.14
	Ave.	n.a.	-6.35[a]	5.05	7.00	1.40	0.98

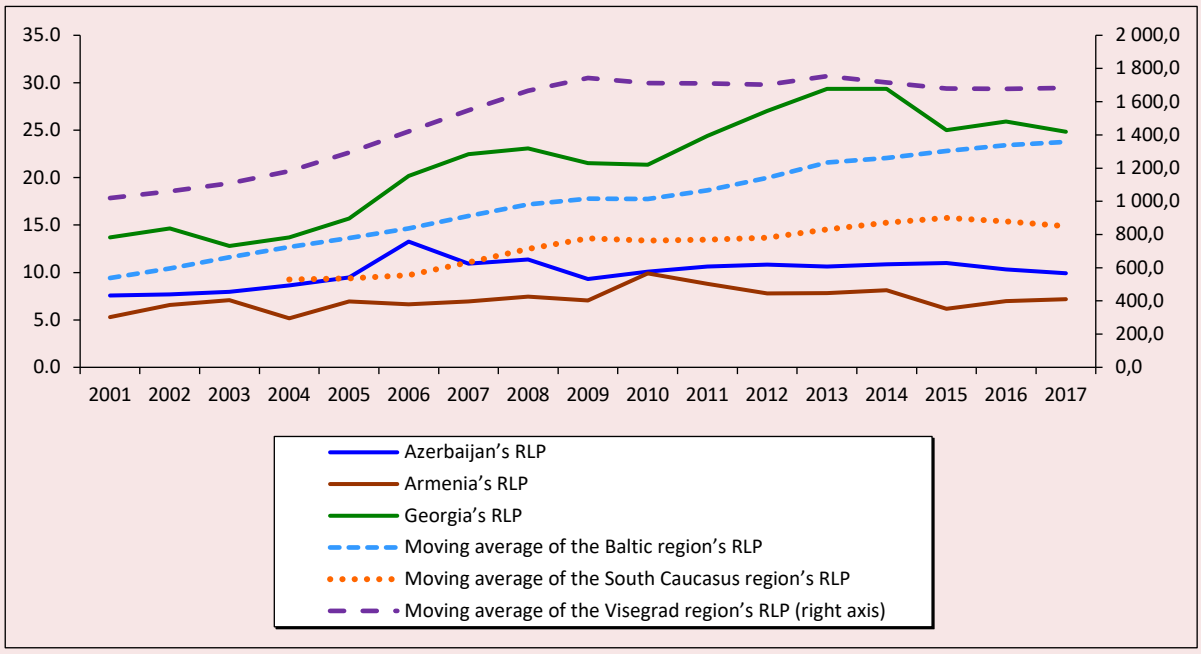
Notes: AZE – Azerbaijan, ARM – Armenia, GEO – Georgia. "n.a." means "not available." *a* means that the average for the period starts from 1991. The numbers were rounded to the second decimal place for concision. "*Ave.*" denotes the average of the selected periodic indicators for the South Caucasus and was calculated only if data for all three countries was available.
Source: (Dieppe et al., 2020),

which is 65.9% higher than the average for 1990–1999 and 40.1% higher than the average from 2005 to 2009 (see Tab. 3). However, the countries demonstrated individual differences. For instance, Azerbaijan is the only country in which labor productivity fell from 2015 to 2018 compared to previous periods, while performance in Armenia and Georgia was more sustainable and gradual. The labor productivity growth rate was negative (-1.46) in Azerbaijan between 2015 and 2018. In addition, the labor productivity growth rate in Georgia slowed down during the same period but recovered in Armenia by 6.88%.

Lastly, although total factor productivity (TFP) in the South Caucasus recovered from the severe damage of the 1990s (-6.35%) and rose to 5.05% and 7% between 2000 and 2004, and 2005 and 2009 respectively, the lowest TFP since the 1990s (0.98%) was observed during the period from 2015 to 2018. At the country level, Azerbaijan and Georgia's TFP decreased (from 3.09% to -2.94% in Azerbaijan's case and from 3.38% to -1.13% in Georgia's case), while Armenia's TFP increased (from -2.27% to 4.74%) between 2015 and 2018.

World Bank data indicate that Georgia is a leading country in the South Caucasus in terms of manufacturing real labor productivity (RLP) *(Fig. 2)*. Georgia also exceeds the MAs of both the South Caucasus and Baltic regions between 2001 and 2017. However, this cannot be said for Azerbaijan and Armenia. Although RLP spiked in Azerbaijan in 2006 and reached 13.25 thousand Azerbaijani manat (AZN), it has not exceeded the MAs of the South Caucasus since then. Azerbaijan also performed significantly worse than the Visegrad and Baltic regions. Meanwhile, Armenia's average per annum of 7.17 thousand Armenian drams (AMD) from 2001 to 2017 was the lowest in the South Caucasus Visegrad, and Baltic regions. Moreover, since 2010, the trend of RLP in the manufacturing sector has mainly been negative in Armenia.

Figure 2. Real labor productivity of the manufacturing sector in the South Caucasus, 2001–2017

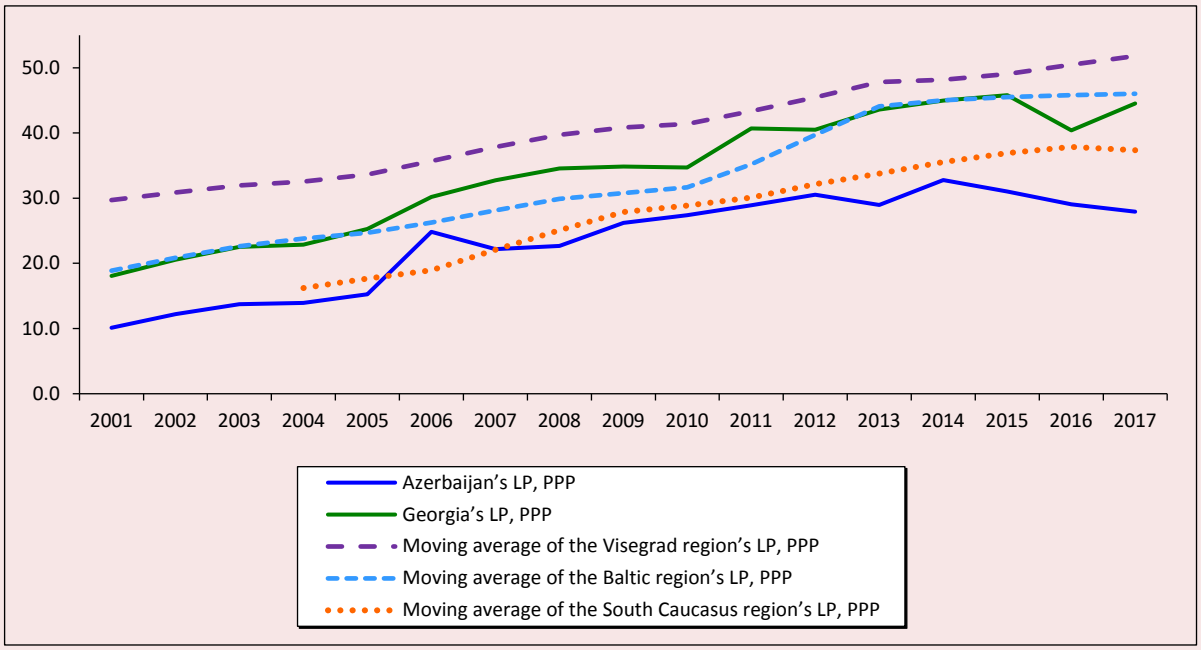


Source: (Dieppe et al., 2020).

In terms of purchasing power parity, Azerbaijan's LP in the manufacturing sector is lower than that of Georgia and the MAs of the Visegrad and Baltic regions *(Fig. 3)*. Since 2015, Georgia's LP in terms of PPP has exceeded that of the Baltic region and approached the average of the Visegrad region. It slightly deteriorated in 2016, which translated to a decrease from USD 45.52 thousand to USD 44.51 thousand (2015). Overall, the main trend of LP in manufacturing in terms of PPP was positive in both Azerbaijan and Georgia until 2014 and 2015, respectively. After 2014 to 2015, only Georgia showed recovery in LP that could potentially keep pace with the MAs of Visegrad and Baltic countries.

Surely, not only labor productivity determines the foreign interest to invest in a given country. The historical direction of the overall flow of FDI might provide information about the attractiveness of an economy. *Table 4* reports the correlation coefficients based on Kendall's tau-b methodology (due to the small sample size and non-normal distribution risks, Kendall's tau-b provides more reliable results compared to Pearson's *r* or Spearman's rho). While there was not a statistically significant correlation in the South Caucasus in terms of their FDI, Armenia's FDI and Armenia's RLP, as well as Georgia's FDI and Georgia's RLP are statistically significant and positively correlated. Interestingly, Azerbaijan's FDI and RLP were not statistically significant. These results show that in the South Caucasus besides labor productivity, also overall FDI is a key factor to determine the further FDI, including conceivable Chinese economic interest in the near future.

Figure 3. Labor productivity of the manufacturing sector in the South Caucasus in terms of purchasing power parity, 2001–2017



Source: (Dieppe et al., 2020).

Table 4. Kendall's tau-b correlation coefficients for the South Caucasus countries between FDI and RLP, 2001–2017

	Azerbaijan's FDI	Armenia's FDI	Georgia's FDI	Azerbaijan's RLP	Armenia's RLP	Georgia's RLP
Azerbaijan's FDI	1.00	0.25	0.25	0.31	-0.04	0.13
Armenia's FDI	0.25	1.00	0.29	0.50***	0.41**	0.29
Georgia's FDI	0.25	0.29	1.00	0.59***	0.18	0.53***

Note: FDI – foreign direct investments; RLP – real labor productivity; symbols **, and *** indicate statistical significance at the 5%, and 1% levels, respectively.

The results of the one-sample *t*-test revealed that the South Caucasus exhibits statistically significant differences in LP per employee, RLP, and LP in terms of PPP compared to the Visegrad and Baltic regions *(Tab. 5)*. However, with regard to capital deepening, there was only a statistically significant difference between the South Caucasus and the Visegrad region (mean difference of 0.68%, p-value < 0.05). Moreover, the results for LP growth rate (the mean difference between the South Caucasus and the Visegrad and Baltic regions was 1.11% and 1.04%, respectively) and TFP (the mean

Table 5. Differences in results of the one-sample t-test between the South Caucasus and the Visegrad and Baltic regions

	One-sample statistics				One-sample t-test		
	N	Mean	St. dev.	St. err. mean	t	df	Mean difference
Capital deepening (CD), % contribution							
Visegrad region	84	2.44	2.90	0.32	2.16	83	0.68**
Baltic region					1.30	83	0.41
Labor productivity (LP), gross domestic product (GDP) per employment, in USD, 2010 prices and exchange rates							
Visegrad region	84	6,468.28	3,435.91	374.89	-65.36	83	-24,503.63***
Baltic region					10.45	83	3,918.90***
Labor productivity growth rate (LPGR), in %							
Visegrad region	84	3.67	11.56	1.26	0.88	83	1.11
Baltic region					0.82	83	1.04
Total factor productivity (TFP) in log difference, in %							
Visegrad region	84	0.50	12.08	1.32	-0.34	83	-0.34
Baltic region					0.36	83	0.47
Real labor productivity (RLP) in manufacturing, 2010 constant prices, in thousands (local currency)							
Visegrad region	51	12.89	7.06	0.99	-1,479.72	50	-1,462.49***
Baltic region					-6.14	50	-6.07***
Labor productivity (LP) in manufacturing, 2011 international purchasing power parity (PPP) exchange rate, in thousands							
Visegrad region	34	28.81	9.74	1.67	-8.64	33	-14.42***
Baltic region					-4.36	33	-7.28***

Source: Own compilation.
Notes: The numbers were rounded to the second decimal place for concision. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The test values are as follows: CD (Visegrad) = 1.56%; CD (Baltic) = 1.83%; LP, GDP per employee (Visegrad) = USD 30,971.91; GDP per employee (Baltic) = USD 2,549.38; LPGR (Visegrad) = 2.56%; LPGR (Baltic) = 2.63%; TFP (Visegrad) = 0.84%; TFP (Baltic) = 0.03%; RLP (Visegrad) = 1,475.38; RLP (Baltic) = 18.96; LP PPP (Visegrad) = USD 43.23; and LP PPP (Baltic) = USD 36.09. For the aggregate productivity indicators, the time period covered is 1991–2018. For the sectoral productivity indicators, the time period covered is 2001–2017.

difference between the South Caucasus and the Visegrad and Baltic regions was -0.34% and 0.47%, respectively) were not statistically significant.

In the South Caucasus, RLP in the manufacturing sector was lower than in the Visegrad (mean difference of -1,462.49, p-value < 0.01) and Baltic regions (mean difference of -6.07, p-value < 0.01); these results were statistically significant[7].

Regarding LP in terms of PPP, the results of the one-sample *t*-test were similar to RLP. In other words, the South Caucasus had a lower sectoral LP than the Visegrad (mean difference of USD -14.42, p-value < 0.01) and Baltic regions (mean difference of USD -7.28, p-value < 0.01).

Lastly, the effect size measured by eta squared () was small in the case of capital deepening in the South Caucasus compared to the Visegrad and Baltic regions (Baltic region: 0.02; Visegrad region: 0.01). However, RLP and LP in terms of PPP demonstrated large effect sizes (Baltic region: RLP – 0.43 and LP in PPP terms – 0.37; Visegrad region: RLP – 0.99 and LP in PPP terms – 0.70; *Tab. 6)*.

Concluding remarks and policy implications

The countries of the South Caucasus appear to be receptive to the Chinese investments that have found their way into the region since 2015 through various economic projects. Although Chinese projects promise new employment opportunities, increased international trade, and new income sources, investing in economies with a low productivity can be a risky endeavor for China. In addition, as the South Caucasus countries actively market their national economies, they may find themselves on a precarious position after a couple of years if actual economic outcomes do not meet their expectations. China continues to increase its partnerships with these countries due to their optimal geographical position, available infrastructure, and political propensity to cooperate. While the growing FDI may promise economic development in life of the South Caucasian countries, the reality is more complicated when their readiness for FDI-based industrialization is being tested.

The current research focuses on aggregate and sectoral productivity in the manufacturing sector of the South Caucasus. Also, the current paper provides a comprehensive and comparative examination of the labor productivity in manufacturing on the background of the increasing Chinese FDI in the South Caucasus. The novelty of the study lies in the use of the one-sample *t*-test to identify statistically significant differences between the

Table 6. Effect size of estimated one-sample mean differences

	Baltic region	Visegrad region
Capital deepening, % contribution	0.02	0.01
Real labor productivity (RLP), 2010 constant prices, in thousands (local currency)	0.43	0.99
Labor productivity (LP), 2011 international purchasing power parity (PPP) exchange rate, in thousands	0.37	0.70
Source: Own compilation. Note: Only the variables that fully fulfill the assumptions of the one-sample *t*-test have been reported.		

[7] As the original data set expressed RLP in the local currencies+, the obtained mean difference lacks a final currency. Therefore, there is a limit about the outcome of the t-test regarded RLP; however, still, the t-test shows a difference in sectoral productivity of the South Caucasus countries calculated by their mean values.

South Caucasus region and Visegrad and Baltic countries. Such an approach allows us to reliably assess the interregional discrepancies, so the governments may adjust their economies to meet the increasing FDI and expectations. The novelty of this research is the ability to analyze and evaluate the South Caucasus as an entire region in comparison with other post-Soviet and post-Communist regions in terms of manufacturing productivity.

In monetary terms, manufacturing value added showed volatile behavior in the region. However, the trend analysis revealed that manufacturing value added, as a share of GDP, exhibited a downward trend between 1991 and 2019, with improvements between 2016 and 2019. Aggregate productivity has slowed down since the transition period and, in real and PPP terms, manufacturing labor productivity is lower in the South Caucasus than in the Visegrad and Baltic regions. In addition, in terms of country rankings, Armenia's economy is the least productive, as measured by RLP in the manufacturing sector; Georgia is the leader, while Azerbaijan is second. In addition, an analysis of LP in terms of PPP shows that Georgia is more productive than Azerbaijan; it is on par with the average in the Baltic region and exceeds the average in the South Caucasus but is lower than the average in the Visegrad countries.

In addition, according to the results of the one-sample *t*-test, there are statistically significant differences in RLP and LP in terms of PPP between the South Caucasus countries and the Visegrad and Baltic countries. In other words, the South Caucasus has lower productivity levels that cannot be ignored and viewed as a coincidence. The effects of these differences are important and make it clear that, as China becomes a new economic partner, the South Caucasus countries should be concerned about their labor productivity to keep up with requests to meet competitive production in the manufacturing sector. Meanwhile, the one-sample *t*-test also showed statistically significant and higher capital deepening in the South Caucasus, which can be seen as an opportunity to utilize particular financial resources to overcome the labor productivity issues via already accumulated capital.

Given these findings, the South Caucasus countries must consider certain policy implications to improve their productivity levels and cope with their new economic partner. The extent of economic success in the South Caucasus, which is an integral part of the BRI project, depends on the build-up of labor productivity and can be reflected in the manufacturing sector as China aims to integrate the region into GVCs. In fact, previous research established a positive relationship between the real GDP of the host countries and China's expansion of outward FDI (He, Lyles, 2008; Cheng, Ma, 2010). Furthermore, the current low productive labor resources in the South Caucasus, in combination with the decreasing manufacturing value added, creates uncertainty and may severely impact future economic capacity. Thus, each country must design country- and sector-specific policies to address labor productivity challenges.

Specifically, Azerbaijan may enjoy upcoming transit fees and Chinese FDI in non-oil sectors, thus diversifying its economy. However, a risky aspect of this deal stems from the fact that the agreements are mainly made between Azerbaijani and Chinese state-owned companies rather than in the private sector, which limits free market mechanisms (Babayev, Ismailzade, 2020). As the largest Chinese FDI receiver and oil wealth holder, Azerbaijan should focus on innovation-based productive capacity in manufacturing to keep up with GVCs and compete in consumer markets. Stimulation policies must encompass a revival of the manufacturing sector led by market mechanisms and fueled by Chinese FDI,

which will in turn decrease oil dependency – Azerbaijan's main challenge in economic growth and development.

Furthermore, while Armenia's participation in China-authored economic projects is limited by geographic and political challenges, Georgia should extensively improve its logistical capabilities to meet the future needs of its cooperation with China. However, Kharaishvili et al. highlighted the important role of policies in Georgia's case (Kharaishvili et al., 2021). Georgia must increase investments in shipment and logistics, in parallel to the standardization and harmonization of rules and standards with other countries to manage food shipments. Integration into the global systems and securing international and regional transport systems would also develop effective infrastructure for shipments (Schneider, 2021). In fact, China is closely collaborating with the Georgian government to fill these gaps.

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Information about the Author

Ibrahim Niftiyev – PhD Candidate, Researcher, University of Szeged (1, Kálvária Avenue, Szeged, 6722, Hungary; e-mail: ibrahimniftiyev@gmail.com), Azerbaijan State University of Economics (6, Istiglaliyyet Street, Baku, AZ 1001, Azerbaijan)

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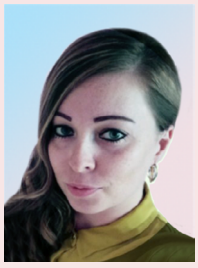
Innovation Impact on the Circular Economy

Stefan RAYCHEV
Plovdiv University "Paisii Hilendarski"
Plovdiv, Bulgaria
e-mail: stefan1@abv.bg
ORCID: 0000-0002-6539-080X



Dobrinka STOYANOVA
Plovdiv University "Paisii Hilendarski"
Plovdiv, Bulgaria
e-mail: bini_stoyanova1@abv.bg
ORCID: 0000-0002-2395-5972

Gergana DIMITROVA
Plovdiv University "Paisii Hilendarski"
Plovdiv, Bulgaria
e-mail: gergana.gu@gmail.com
ORCID: 0000-0003-2304-3372

Blaga MADZHUROVA
Plovdiv University "Paisii Hilendarski"
Plovdiv, Bulgaria
e-mail: bmadzhurova@yahoo.de
ORCID: 0000-0002-8769-2737

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Abstract. The paper presents the arguments and counterarguments used in the scientific discussion on the issue of how innovations affect the circular economy and whether it changes accordingly. The main purpose is to analyze the extent to which EU member states manage to boost the circular economy through investment and employment. Review of literary sources and approaches for solving the problem of the multilateral and two-way impact of innovation on the circular economy indicates that the green economy could not exist without the development of innovation, but on the other hand they are its engine. Environmental practices show that there is a need to develop new business models taking into account functionally related innovative changes. The research methods and methodology covers the period from 2008 to 2018. The paper presents the results of an empirical analysis examining the extent to which EU member states manage to boost the circular economy through investment and employment, which showed that measures to increase their economic activity should be in line with the policy of attracting of investment in the circular economy. The research empirically confirms and proves that there still exist certain problems hindering the full implementation of the circular economy; and they are due to the consciousness of the population and employment opportunities in these areas, despite the efforts of the responsible institutions. The results of the research can be useful for public institutions dealing with the circular economy, as well as for the business sector.

Key words: green economy, green innovations, labor market, business models.

Acknowledgment

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Introduction

The world and Europe are not the same anymore after the all-encompassing crisis they have been submerged into. Alongside the many negative effects, the possibility of a green innovative recovery has come to the fore, which will significantly increase the resilience of economies and societies in the face of a severe recession and accelerating environmental challenges. There is a problem which indicates that "while a number of countries are focusing on measures which can boost sustainability while stimulating jobs, income and growth, a few countries are proposing measures which support environmentally harmful activities"[1]. However, green fiscal spending may lead to stronger economic returns than traditional ones (O'Callaghan, Murdock, 2021). In addition, studies show that well-designed green spending can counteract environmental crises caused by climate change, pollution and biodiversity loss, while providing significant social benefits (Hepburn et al., 2020). Traditionally, the focus of green innovation has been put on minimizing the negative environmental impacts of production and consumer activities (e.g. pollution control technologies, vehicle catalysts). However, they are not enough to address most of the global sustainability challenges. The focus falls now on green innovations with demonstrable business benefits, including cost savings (for example, by improving material and energy efficiency) and new markets (e.g. green products and service-based business models). The scale and urgency

[1] Making the Green Recovery work for jobs, income and growth. Available at: https://doi.org/10.1787/a505f3e7-en (accessed: May, 2021).

of societal challenges call for combinations of different innovations, including wider and faster implementation of tested green technologies, as well as new forms of flexible systemic innovations such as circular economy business models or integrated approaches to mobility.

The circular economy as a model of production and consumption which minimizes waste is a key part of the philosophy of sustainable development and the green economy as a whole. The promotion of the methods and elements of the circular economy is vital not only for the enhancement of the economic activity but also in response to the need to define the place and role of labor in a period of fundamental social and economic change in the context of globalization, the Fourth Industrial Revolution, climate change, etc. In support of the transition to a circular economy in 2015 the European Commission adopted the first action plan towards a circular economy. It includes measures to support Europe's transition to a circular economy, increase global competitiveness, to promote sustainable economic growth and create new jobs. In 2020, the European Commission published its new Circular Economy Action Plan in support of the European Green Treaty. "*To achieve climate-neutrality by 2050, to preserve our natural environment, and to strengthen our economic competitiveness, requires a fully circular economy*", said Frans Timmermans, the Commission's vice president in charge of overseeing the European Green Deal[2].

The results of the foreground analysis show that the European economy is largely still linear, as only 12% of materials being recycled and returned to the economy. One of the reasons for this is that most of the products are made for single use only and reuse is impossible.

This calls for a rethinking of the way products are produced and is set as a target in the Commission's New Circular Economy Action Plan[3].

All this emphasizes the importance of innovation (and green innovation in particular) and entrepreneurship (environmental, bio- and green entrepreneurship).

The proposed methodology for deriving the link between policies to promote the transition to a circular economy and the level of investment (gross investment as% of GDP) and green employment (number of employees as a percentage of total employment) is among the scientific contributions of the article.

The practical contribution aspects can be outlined in the context of approbation of the proposed methodology (on the example of the EU and considered three sectors of the circular economy). This forms trends, barriers and challenges, on the basis of which to assess the problem areas hindering the transition to a circular economy.

Theoretical review

The contribution of entrepreneurship and its impact on the economic growth, competitiveness and the achievement of sustainable development of national economies are indisputable, and its potential is realized through the creation, construction and implementation (commercialization) of innovations. Schumpeter sees innovation as a novelty which transforms reality and introduces the term "*creative destruction*", in which existing products and production methods are destroyed and replaced with new ones (Schumpeter, 1934).

[2] The European Green Deal and Just Transition Mechanism Explained. Available at: https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_24 (accessed: May, 2021).

[3] Changing how We Produce and Consume: New Circular Economy Action Plan Shows the Way to a Climate-Neutral, Competitive Economy of Empowered Consumers. Press Release. Brussels. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_20_420 (accessed: June, 2021)

The innovation activity of the nations is among the leading priorities of the EU, which turns the development of R&D into its main strategic goal. Through Europe 2020, innovation is given a central place for economic growth, and Member States are encouraged to invest in R&D, with investments amounting to 3% of GDP. This continues with Horizon Europe (2021–2027), the EU's 2021–2027 framework program for research and innovation[4].

Innovation is already seen as a leading competitive advantage (Chiou et al., 2011; Kengatharan, 2012; Yosifov, 2019) and critical success factor for the business organizations to achieve sustainable economic development (Nacu, Avasilcãi, 2014).

The ongoing climate change, scarce resources and increasing consumption (and production), as well as the emerging modern environmental challenges: pollution and environmental protection, "high consumption of materials, water and energy" (Fatoki, 2019) lead to the corresponding socio-economic changes (Angelova, Pastarmadzhieva, 2020). This necessitates their evaluation, the "greening of the economic activities" (Taylor, Walley, 2004) and the focus on "green entrepreneurship" (Packiyanathan, Pushpanathan, 2021), also known as "eco-entrepreneurship" (Schaper, 2002; Schaper, 2016; Chell, 2008), "bio-entrepreneurship" (Angelova, Pastarmadzhieva, 2020). It is considered as a type of social entrepreneurship, in the context of the so shaped "social aspect of sustainability, relationships and cultural cooperation" (Packiyanathan, Pushpanathan, 2021).

In 2020, the European Green Deal[5] was launched as a new growth strategy with the aim of integrating environmental sustainability into the strategic goals for sustainable growth and competitiveness of the EU member states *(Fig. 1)*. The pact sets out the two main priorities for growth: the green economy and the digital economy, as well as a comprehensive set of actions aimed at knowledge generation, research and innovation, partnerships, synergies, clustering, bioeconomy, digitalization, etc.[6].

To achieve the strategic goals of the European Green Deal, the European Green Deal Investment Plan (EGDIP), also called the Sustainable Europe Investment Plan (SEIP), is adopted, which is expected to mobilize "€ 1 trillion in sustainable investments" to implement the transition to green economy[7].

The research on environmental practices highlights the need to implement new business models beyond those already established (Hisrich et al., 2017) and/or their transformation, taking into account the importance of "green innovation" and the provision of innovative business solutions in response to emerging environmental and social challenges. There is a growing commitment to an ecological economy (Schilirò, 2019) and the building of a "more sustainable ecological, trade and economic system" (Packiyanathan, Pushpanathan, 2021).

According to the published information[8], Bulgaria is "increasingly integrating into the European circular economy", as about one fifth of innovative companies (representing 12% of all) have implemented "green innovations" in their activities – percentage-wise and in practice (by expression of any of the indicated characteristics/activities) shown in *Figure 2*.

[4] Horizon Europe. Available at: https://horizon2020.mon.bg/page/--26 (accessed: May, 2021).

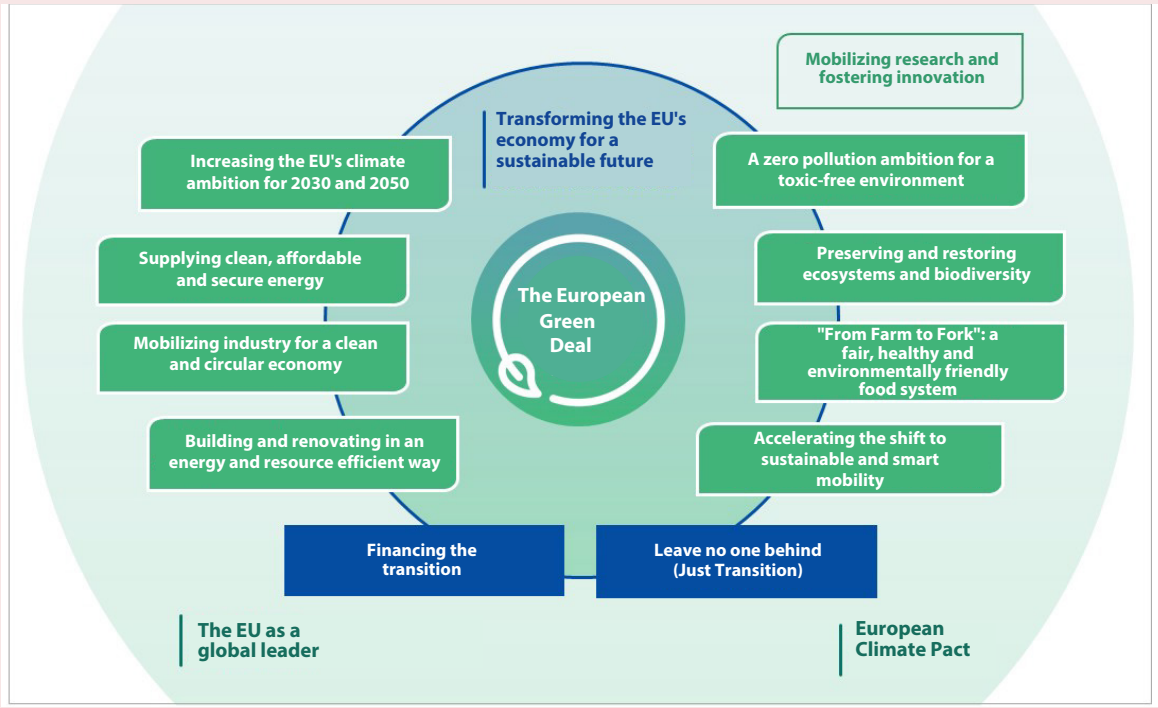
[5] The European Green Deal. Available at: https://ec.europa.eu/info/sites/default/files/european-green-deal-communication_en.pdf (accessed: May, 2021)

[6] Innovation.bg 2020: Economic Resilience through Innovation. Available at: http://www.arcfund.net/arcartShow.php?id=18491 (accessed: May, 2021).

[7] EC European Green Deal Investment Plan. Available at: https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_24 (accessed: May, 2021)

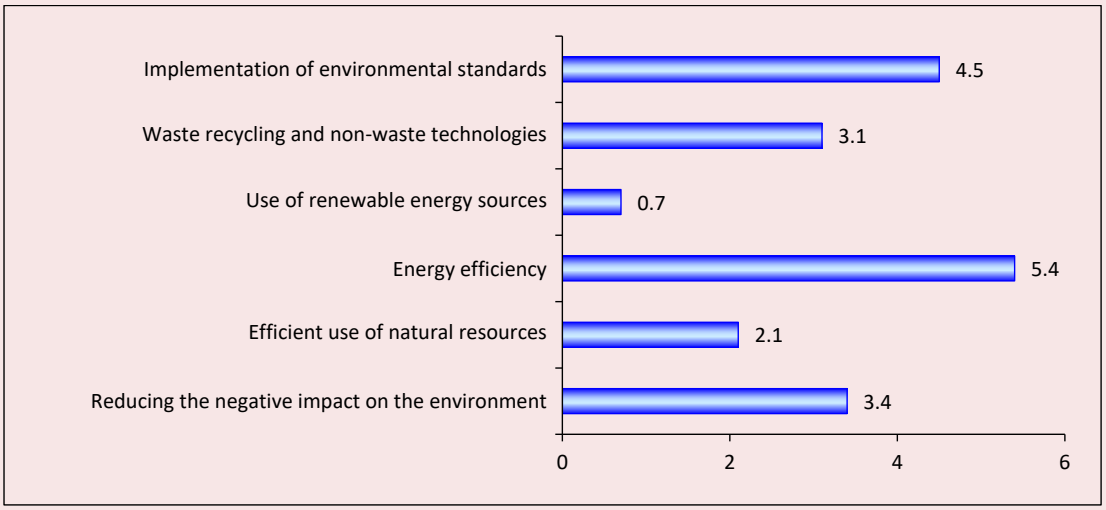
[8] Innovation.bg 2020: Economic Resilience through Innovation. Available at: http://www.arcfund.net/arcartShow.php?id=18491 (accessed: May, 2021)

Figure 1. European Green Deal



Sources: EC Europe. Available at: http://publications.europa.eu/resource/cellar/8d8026dc-d7d7-4d04-8896-e13ef636ae6b.0016.02/DOC_2 (accessed: May, 2021); European Green Deal. Available at: https://ec.europa.eu/info/sites/default/files/european-green-deal-communication_en.pdf (accessed: May, 2021).

Figure 2. Environmental impact of innovation



Sources: Innovation.bg 2020: Economic Resilience through Innovation. Available at: http://www.arcfund.net/arcartShow.php?id=18491 (accessed: May, 2021); Applied Research and Communications Foundation.

Investments in green energy, transport and emissions have one of the strongest economic impacts, both among green and among traditional incentive policies (O'Callaghan, Murdock, 2021). These investments can provide long-term, high-quality employment and management opportunities (Dvořák et al., 2017; Lehr et al., 2012; Wei et al., 2010). Given the significant interests of the private sector, the cost of green energy is particularly useful for pushing out additional private capital, which in practice multiplies the impact of public investment. The level of expenditure currently foreseen in the budget for the European Green Treaty is well below what the European Union will need in order to achieve the set emission reduction targets. The EC estimates a budget of 1 trillion euros for 2021–2030 for everything, including investments in clean energy, as well as transition programs[9]. This includes funding from all public and private sources, with about half of the money coming from the EU budget and the other half provided by a combination of national governments and private investment. This level of funding averages around 100 billion per year of total expenditure for the period 2021–2030, which is equivalent to only about 0.7% of total EU GDP per year[10].

Citizen engagement *(Fig. 3)* and changes in behavior and social norms are an integral part of the success of the circular innovative economic transition. This means that people are involved in new forms of consumption, re-use (requires a change in attitudes towards repair and renovation) and recycling (separation of waste streams and its sorting). Bulgaria still does not reach the EU average.

Even though Bulgaria ranks last in terms of the effectiveness of eco-innovation *(Fig. 4)*, it has the potential to move from a modest to a moderate eco-innovator only if it manages to fill the structural gaps in an eco-innovation system and improve related systems such as: science and innovation, support for SMEs and the energy system. Strategic documents are needed, including eco-innovation and the circular economy, as well as radical measures to improve environmental performance at the public level. The reasons for the poor results are in the less tangible aspects of the social capital, the presence of supporting structures and business intermediaries and the overall structure of the economy. Only some elements of the circular economy are integrated into Bulgaria's strategic and political priorities. The potential of the new circular business models has not yet been explored despite some success with some waste streams such as plastic packaging. Green public procurement does not play the role it should, in terms of stimulating the supply of green products and services. Despite the relatively large number of companies certified with environmental management systems, this has not led to an increase in the supply of eco-friendly products and eco-innovation. There are some promising new start-ups in the field of collaborative economics and bioeconomics[11].

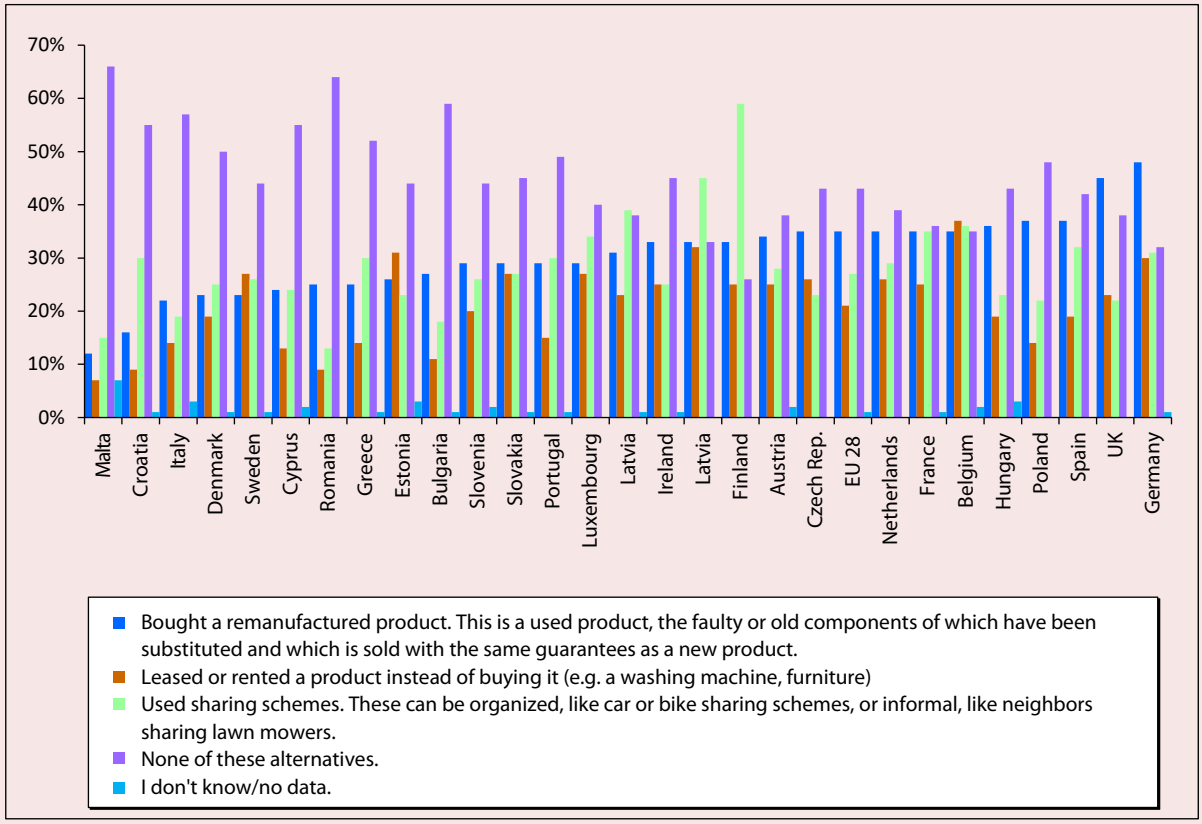
System innovations include functionally related innovative changes, including product and organizational ones, which constitute joint synergy processes emerging between value-added sectors. It should be noted that the special focus of the EC is on the role of government and management mechanisms to stimulate the supply and demand of green innovations. The traditional rationale for political support for innovation is based on market failure. The market failure manifests itself in an insufficient allocation of capital for risky and long-term innovation projects, despite the promise of

[9] The European Green Deal and Just Transition Mechanism Explained. Available at: https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_24 (accessed: May, 2021).

[10] Ibidem.

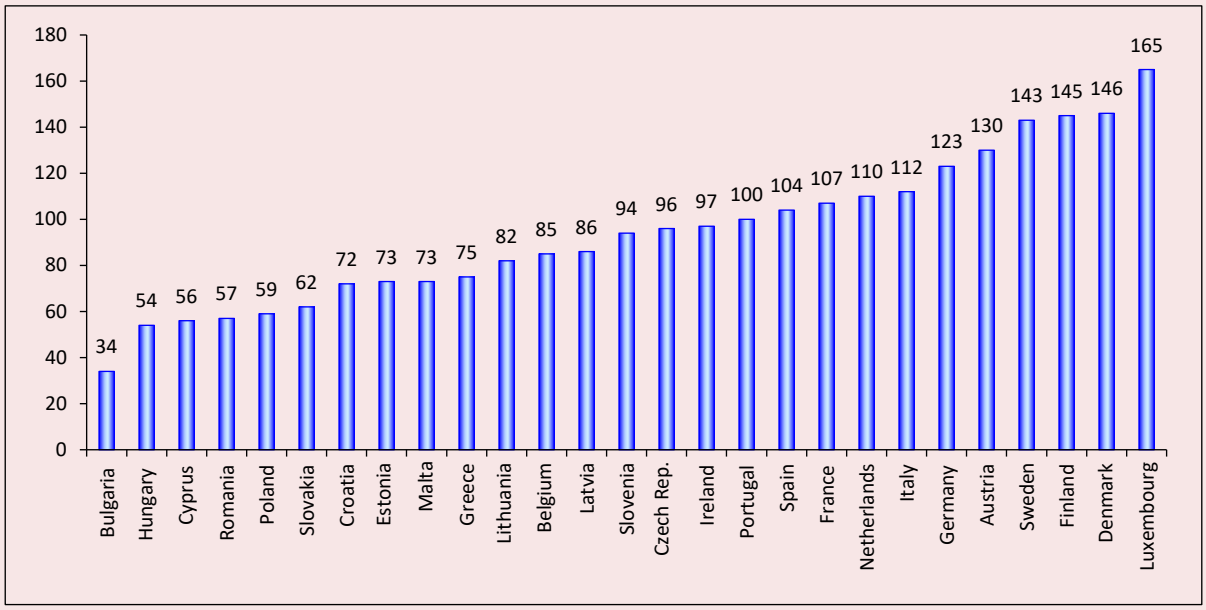
[11] Eco-Innovation Country Profiles. Available at: https://ec.europa.eu/environment/ecoap/indicators/societal-behaviours_en (accessed: May, 2021).

Figure 3. Citizen engagement



Sources: Flash Eurobarometer 388; Eurostat. Available at: https://ec.europa.eu/eurostat/databrowser/view/cei_cie010/default/table?lang=en (accessed: May 2021).

Figure 4. Eco-innovation, by country



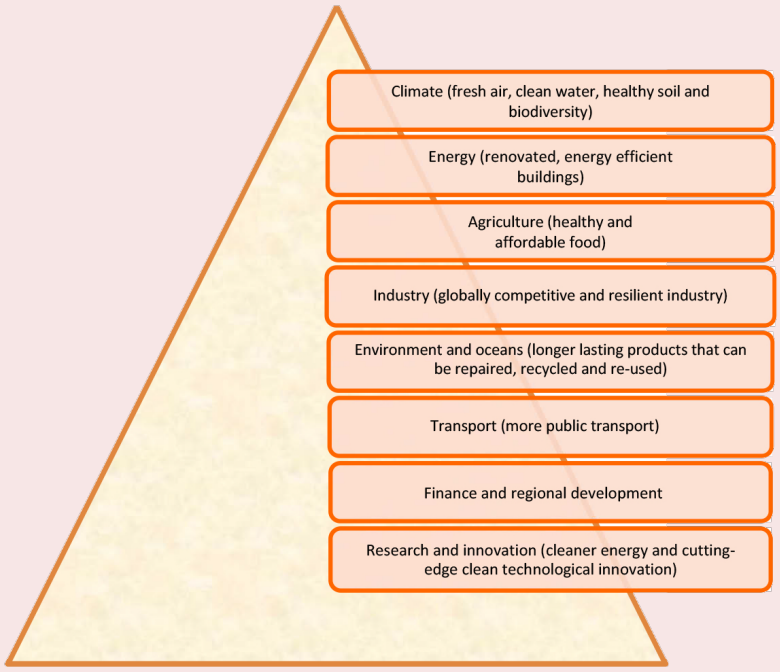
Source: Eurostat. Available at: https://ec.europa.eu/eurostat/databrowser/view/t2020_rt200/default/table?lang=en (accessed: May 2021).

future public benefits. Green innovation suffers from additional market failure, manifested by the failure of prices to reflect social and environmental costs (Miedzinski et al., 2020). The goal is to build effective support for green innovation. Examples are both green business recovery opportunities and the creation of new green jobs.

The effects of globalization affect various areas, including the economic and social sphere. Undoubtedly, there are shifts in the labor market and in the structure and composition of the factors of the economic growth. Along with the effects of globalization, the consequences of the coronavirus pandemic pose significant challenges to the economies, making the transition to a green economy and green jobs increasingly important for the economic development. The European Green Pact is the EU's main instrument for economic recovery and improving the well-being of society. The main goal of the green transition is to transform the EU economy into a modern, resource-efficient and competitive economy, which can be achieved by meeting the following sub-goals: no net greenhouse gas emissions by 2050; the economic growth will be separated from the use of resources; no person or region will be abandoned[12].

For the implementation of the goals set in the Green Pact, targeted actions are envisaged in several specific areas *(Figure 5)*.

Figure 5. Effects of the European Green Pact



[12] Sustainable Products in a Circular Economy – Towards an EU Product Policy Framework contributing to the Circular Economy. European Commission, 2019 (accessed: May, 2021).

The effects of the European Green Pact are aimed at creating conditions for such development of all sectors important for the economy, which is based on climate-friendly actions and support for the decarbonization process. Other benefits of the green transition are:

- modernization of the economy by creating innovative productions and technologies;
- modernization of the infrastructure through construction of energy efficient buildings;
- creation of sustainable agricultural and food systems;
- introduction of clean technologies and new business models in industry as a main catalyst for the ecological and digital transition;
- protection of biological diversity and ecosystems;
- sustainable and intelligent mobility;
- creation of research and innovation which contribute to the improvement of the economy and the environment[13].

The development of the green economy undoubtedly influences the tendencies of the labor market as the so-called "green jobs" begin to be created. The purpose of this modern type of employment is to support environmentally friendly economic activities. Curiously, the term "green employment" does not have a generally accepted definition and the approach to its analysis may differ from one member state to another. For example, in Germany, "green jobs" refers to "professions that directly contribute to environmental protection, conservation of resources, sustainable use of nature, recycling or similar purposes"[14].

According to the ILO definition, "green jobs" are "decent jobs which contribute to preserving or restoring the environment, whether in traditional sectors such as manufacturing and construction or in new emerging green sectors such as renewable energy and energy efficiency" (Kapsos, 2005).

Other authors define "green jobs" as "jobs which contribute to increasing environmental resilience, including reducing carbon emissions, conserving biodiversity and ecosystems, and adapting to climate change" (Miteva, 2017).

Despite the broad definitions of "green jobs", the basic idea is that this form of employment contributes to protecting the environment, improving energy efficiency and achieving a green transition in the economy.

"Green employment" is also present in the employment policy of Bulgaria, as it is included in the Employment Promotion Act (SG No. 59 of 31 July 2010) in the form of a new incentive measure for the creation of "green jobs".

Green energy assets are long-term economic multipliers, especially when technological components are produced domestically for the countries (Garrett-Peltier, 2017). It should be borne in mind that the zero-emission target requires major technological innovations. These "green" sectors and activities offer significant employment creation prospects. The International Renewable Energy Agency (IRENA) estimates that renewable energy could employ more than 40 million people by 2050 and total employment in the energy sector could reach 100 million by 2050[15]. Energy efficiency also offers significant opportunities for rapid job creation, with the potential for up to 2.5 million new jobs per year as part of the recovery effort[16]. However, there are significant

[13] Communication from the Commission. The European Green Deal. Brussels, December 11, 2019 (accessed: June, 2021).

[14] *Skills for Green Jobs: 2018 Update. European Synthesis Report*. Luxembourg: Publications Office of the European Union, 2019. Available at: http://data.europa.eu/doi/10.2801/750438 (accessed: June, 2021).

[15] OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis. DOI: 10.1787/1686c758-en (accessed: May, 2021); Making the Green Recovery work for jobs, income and growth. Available at: https://doi.org/10.1787/a505f3e7-en (accessed: May, 2021).

[16] Making the Green Recovery work for jobs, income and growth. Available at: https://doi.org/10.1787/a505f3e7-en (accessed: May, 2021).

regional differences in employment creation in the energy sector, with job profits in some parts of the world outpacing losses in others. In addition, some population groups, in particular ethnic minorities and women, do not benefit from employment creation to the same extent as others (Kapsos, 2005). Identifying policies which balance the impact of the transition while maximizing socio-economic opportunities is essential to a more inclusive transition that supports the most vulnerable groups in society. Nature-related positions are also an important potential source of employment in green recovery. The transition to a greener economy also requires new skills. Without a properly trained workforce, the transition will be impossible. All households and individuals must have equal opportunities to adapt and benefit from the green transition, and investment in their skills and education must be an integral part of the recovery plans[17]. Comprehensive vocational training and retraining measures can improve movability across companies and sectors, thus enhancing the ability to move successfully when needed. While energy transformation is likely to have an overall net positive impact on employment, millions of fossil fuel workers will have to find new jobs. Fair transition policies can also facilitate the retraining process. Partnerships between governments and industry can be built to fund retraining and ensure that the content of training meets the changing needs of the sector[18].

Most of the studies on the link between innovation and economic growth mainly use novation as a measure of innovation. The special contribution of this study is that we expand the analysis by developing the concept of green transition and exploring green innovation and green jobs. For this reason, the theory mentions various views and are summarized in directions to mark what is done until now.

Methodology and research methods

The subject of the study is the circular economy. To define the concept, the EU opinion is used, according to which – the circular economy covers the entire life cycle of the product and is aimed at finding solutions to maintain its value as long as possible, by repeatedly investing resources and materials in the production cycle and minimizing of waste. The expected benefits are: intelligent product design and production processes, saving resources, avoiding inefficient waste management, creating new business opportunities and more[19].

The aim of the research is to determine the extent to which the EU and the member states manage to promote the circular economy through investment and employment.

The research methodology of the present study aims to confirm or reject the author's hypothesis that there is a relationship between policies to promote the transition to a circular economy on the one hand and investment and (green) employment on the other.

The methods of statistical analysis used provide the necessary tools for the study of problems beyond purely economic science. Due to the dependence of spheres on both the economic and the social system, and in particular the labor market, three main assumptions and limitations are placed.

First, tools from the applied analysis of economic statistics, which is related to the study of social and economic problems, will be used.

Second, due to the studied issues, the toolkit of applied economic statistics will be used as a key element of the research methodology due to the study of economic time series.

[17] Making the Green Recovery work for jobs, income and growth. Available at: https://doi.org/10.1787/a505f3e7-en (accessed: May, 2021).

[18] OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis. DOI: 10.1787/1686c758-en

[19] Eurostat. Circular Economy – Overview. Available at: https://ec.europa.eu/eurostat/web/circular-economy/overview (accessed: May, 2021).

Third, the methods of inference statistics will be used. All statistical conclusions validate the purpose of the study through the relationship statistical assumptions – statistical models.

Tasks:

1) to make some theoretical remarks regarding environmental sustainability, eco-innovation, circular economy, green entrepreneurship and transition to a green economy – policies, investments and (green) employment;

2) to make a description of the dynamics of the investments in the sectors of the circular economy;

3) to make a description of the dynamics of the employment in the sectors of the circular economy.

The used methods are: processing of quantitative data, sectoral analysis, situational and comparative analyzes, content analysis and graphical dynamic analysis.

The indicators that are investigated:

- gross investment in tangible goods as a percentage of GDP;
- jobs – as the number of employees and as a percentage of total employment.

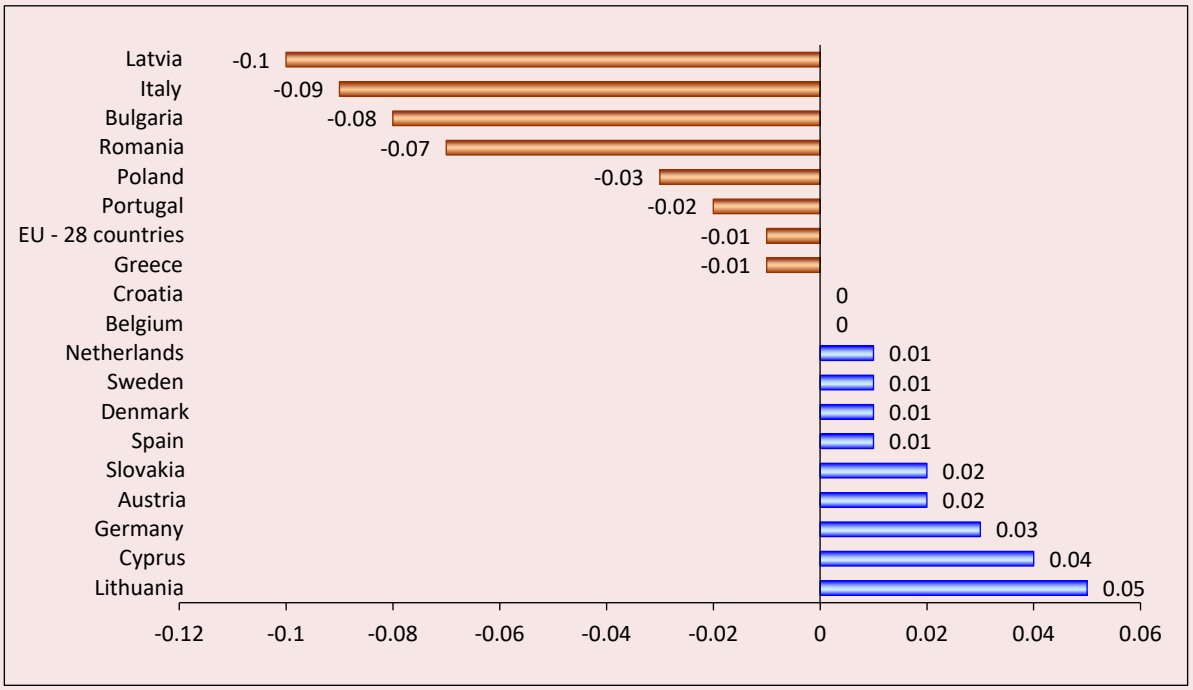
Their analysis is focused on sectors of the circular economy.

The sources of the data are: structural business statistics (SBS), SPSS.

Results

As required by Regulation (EC) No 250/2009 of the European Commission, the indicator "Gross investment in tangible goods" as a percentage of GDP is collected within the framework of Structural Business Statistics (SBS). Through its dynamics, related to the following three sectors: the recycling sector, the repair and reuse sector and the rental and leasing sector, it aims to show the extent to which investment in the circular economy is changing dynamically within the EU by member states *(Fig. 6)*.

Figure 6. Gross investment in tangible goods, % of GDP



Source: Eurostat.

The value shows the change in percentage points in 2018 compared to 2010. It can be clearly seen that in general the member states are divided into two clearly separated and equal in size groups, such that the change is negative, i.e. there is a decrease in gross investment as a percentage of GDP, and a group of member states with an increase in gross investment reflected in a positive value. In the first group with negative values, the largest fall is marked by Latvia with (-0.1) percentage points, followed by Italy, Bulgaria and Romania with (-0.09), (-0.08), (-0, 07).

In most countries the change fluctuates within +/-0.01 percentage points. However, the largest increase is scored by Lithuania with (+0.05), followed by Cyprus and Germany with (+0.04), (+0.03) percentage points respectively. Overall, the EU average is negative (-0.01) for the period of study. These data indicate that policies to promote the transition from a linear to a circular economy face serious challenges in the context of investment promotion. Certainly, measures aimed at increasing the economic activity of the member states should comply with the policy of attracting investment in the sectors related to the circular economy.

The Table shows the jobs, which are expressed in the number of employees and as a percentage of the total employment in the following three sectors: the recycling sector, the repair and reuse sector and the rental and leasing sector.

Jobs related to circular economy sectors, percentage of the total employment in EU countries

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EU – 28 countries				1.69	1.68	1.7	1.71	1.7	1.73	1.71	1.7
Belgium		1.13	1.13		1.19	1.13	1.12	1.16	1.11	1.1	1.1
Bulgaria	1.59	1.61	1.73	1.79	1.83	1.82	1.75	1.72	1.76	1.72	1.7
Denmark	1.52	1.24	1.24	1.3	1.32	1.29	1.37	1.38	1.36	1.36	1.4
Germany	1.15	1.32	1.41	1.43	1.42	1.38	1.47	1.43	1.47	1.49	1.5
Greece				1.4		1.24	1.5	1.34	1.51	1.42	1.5
Spain	1.6	1.61	1.67	1.67	1.75	1.9	1.94	2	2.04	2.04	2.0
France			1.66	1.62	1.65	1.66	1.78	1.54	1.52	1.63	
Croatia			2.14	2.13	2.16	2.2	2.31	2.26	2.24	2.26	2.5
Italy	2.17	2.1	2.11	2.07	2.1	2.09	2.08	2.05	2.05	2.06	2.1
Cyprus	1.56	1.5	1.5	1.48	1.56			1.91	1.99	1.99	2.1
Latvia	2.33	2.38	2.48	2.48	2.66	2.71	2.84	2.86	2.89	2.82	2.7
Lithuania	2.46	2.24	2.33	2.55	2.6	2.77	2.78	2.72	2.69	2.77	2.7
Hungary	1.69	1.86	1.89	1.9	1.88	1.78	1.74	1.82	1.92	1.88	2.0
Netherlands	1.17	1.17	1.22	1.22	1.23	1.18	1.16	1.17	1.18	1.19	1.2
Austria	1.47	1.47	1.46	1.46	1.48	1.52	1.51	1.5	1.49	1.51	1.4
Poland	2.17	2.01	2.07	2.1	2.11	2.2	2.13	2.21	2.21	2.2	2.2
Portugal	1.73	1.76	1.75	1.76	1.76	1.78	1.79	1.81	1.82	1.84	1.9
Romania	1.49	1.44	1.42	1.53	1.55	1.59	1.52	1.54	1.58	1.54	1.5
Slovenia	1.83	1.78	1.88	2.01	2.17	2.17		2.17	2.09	2.06	2.0
Slovakia	1.16	1.07	2.13	2.08	1.83	1.81	1.74	1.78	1.76	1.78	1.8
Finland	1.44	1.49	1.58				1.74	1.74	1.65	1.58	
Sweden	1.61	1.53	1.53	1.6	1.59	1.56	1.56	1.58	1.56	1.58	1.5
Iceland								2.07	2.06	1.99	1.9
Norway	1.99	1.83	1.86	1.79	1.8	1.83	1.87	1.92	1.93	1.94	2.0
United Kingdom	1.45	1.51		1.62	1.56	1.61	1.47	1.59		1.51	1.6

Source: Eurostat. Available at: https://ec.europa.eu/eurostat/databrowser/view/cei_cie010/default/table?lang=en (accessed: May 2021).

The information in the Table demonstrates on the one hand, the change in the dynamic order of employment in the EU member states, and on the other, the employment rate as a percentage of total employment. Belgium and the Netherlands have the most negative results, with employment rates ranging from/to 1.2%. On the other hand, Lithuania and Latvia show the highest employment rates, with a percentage reaching 2.7 in the last year of the study period, sometimes reaching almost 2.9%. Countries such as Spain, Croatia, Hungary, Italy, Cyprus, Poland and Norway stand out with employment of up to 2%. On the other pole - large European economies (such as Germany, Britain, Denmark, Austria, Sweden) reach employment between 1 and 1.5%. Bulgaria reached a value of 1.7% in 2018, which is 0.11 percentage points higher than in 2008 and a lasting decrease from 2012 with each passing year.

As a general conclusion about the dynamics and values of investments and employment in the sectors of the circular economy, it can be summarized that there is a serious difficulty in reaching the desired levels in both directions. What is more, there is a negative trend in the last five years in terms of employment and gross investment.

Despite the efforts and the widespread promotion of the circular economy and sustainability, there are still a number of barriers to the transition to a circular economy, including;

• as a whole, politicians still do not have sufficient competences, knowledge and skills to effectively integrate all these aspects of the circular economy;

• the involvement of stakeholders in the production and consumption chain is difficult;

• the costs associated with the production of these products can also act as a barrier and consumer awareness, which is increasing, but at the moment is still insignificant and is usually related to niche markets (Camocho et al., 2019).

Conclusion

The paper presents theoretical notes on environmental sustainability, eco-innovation, the circular economy, green entrepreneurship and the transition to a green economy – policies, investment and green employment.

A methodology has been proposed to draw the link between policies to promote the transition to a circular economy and the level of investment and green employment. It is considered a scientific contribution due to the novelty of the dependency approach in the transition to a circular economy.

The trends, barriers and challenges are monitored, based on which the main conclusions and recommendations are drawn.

The objectives and benefits defined in EU policies regarding the circular economy are based on the understanding that the transition from a linear to a circular model makes it possible to make national economies more resilient and competitive to global challenges. This includes benefits such as: more innovative and efficient ways of production and consumption; protection of business against lack of resources and unstable prices; opportunities for local jobs and social integration; optimization of waste management, which stimulates recycling and reduces waste accumulation; energy savings, as fewer production processes require less energy; environmental benefits in terms of climate and biodiversity, air, soil and water pollution[20].

[20] Eurostat. Circular Economy – Overview. Available at: https://ec.europa.eu/eurostat/web/circular-economy/overview (accessed: May, 2021).

Certainly, some of the factors for this situation and dynamics are found in the low levels of economic growth, the slow recovery of the European economies from the global crisis, the Euroscepticism of the recent years found its strongest manifestation in the UK exit, the migrant crisis and so on. However, the commitment of the member states to a transition to sustainability, in the name of global change, in the context of environmental protection and social stability and justice, requires a redefinition of measures and policies towards clearer and more decisive action. The transition to a circular and green sustainable economy is not only a necessity due to climate change and global economic and social shifts, but also a commitment to the future generations.

The conclusions of the analysis clearly show that the transition to a green economy is clearly visible in terms of employment in sectors related to the circular economy and the environmental economy. Despite the varying degrees of green transition, employment is increasing in all EU member states. The positive net investments made in the green sectors for the research period are the main means for strengthening the dynamics and achieving the set goals for sustainable and green economic development and growth.

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Information about the Authors

Stefan Raychev – PhD in Economics, Associated Professor, associated professor of department, Plovdiv University "Paisii Hilendarski" (24, Tsar Asen Street, Plovdiv, 4000, Bulgaria; e-mail: stefan1@abv.bg)

Dobrinka Stoyanova – PhD in Economics, Associated Professor, associated professor of department, Plovdiv University "Paisii Hilendarski" (24, Tsar Asen Street, Plovdiv, 4000, Bulgaria; e-mail: bini_stoyanova1@abv.bg)

Gergana Dimitrova – PhD in Economics, Chief Assistant Professor, chief assistant professor of department, Plovdiv University "Paisii Hilendarski" (24, Tsar Asen Street, Plovdiv, 4000, Bulgaria; e-mail: gergana.gu@gmail.com)

Blaga Madzhurova – PhD in Economics, Associated Professor, chief assistant professor of department, Plovdiv University "Paisii Hilendarski" (24, Tsar Asen Street, Plovdiv, 4000, Bulgaria; e-mail: bmadzhurova@yahoo.de)

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Social Policy of Active Aging in Russia and European Welfare States: Comparative Analysis

Konstantin A.
GALKIN
Sociological Institute, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences
Saint Petersburg, Russian Federation
e-mail: Kgalkin1989@mail.ru
ORCID: 0000-0002-6403-6083; ResearcherID: A-8784-2016

Abstract. Population aging is a global process that characterizes both European countries and Russia. One proportionate response to the challenges of global aging is to create conditions that maximize autonomy and activity, as well as social support for older people and the opportunity to be active. The purpose of the work is to analyze the features of social policy in the field of active aging in the European welfare countries and the Russian Federation. The study highlights key trends and differences between Russian and European social policies, and identifies the main features of understanding active aging in Europe and Russia. The analysis is based on the experience of European countries, which occupy the leading positions in the world quality of life ranking for the elderly, where special attention is paid to elderly citizens and the features of their aging and activity. These countries have been implementing a variety of mechanisms in the field of active aging for many years. The article reveals the features of implementation of such a policy and provides a critical review of the strengths and weaknesses of active aging policies in European welfare states and Russia.

Key words: active aging, the elderly, European states, social policy, social activity.

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Introduction

An increase in the number of older people in the total population of countries is called population aging. It is associated with changes in the age structure and reproductive patterns of population. In the European region today, trends of population aging and an increasing number of older people over 60 persist (Golini, 1997; Reynaud and Miccoli, 2019). This trend is influenced by a general decline in population fertility and increasing life expectancy (Popova, Navicke, 2019; Sobotka, 2004). Thus, by 2050, more than a quarter of the European population will be older people at the age of 65 and over[1]. However, despite uneven growth rates across Europe, it is expected that the number of older people will increase even in regions with relatively short life expectancy, such as Central and Eastern Europe (Botev, 2012; Kashnitsky et al., 2020). Undoubtedly, the growing number of elderly people requires the creation of special norms and principles, which are reflected in European social policy, as well as enshrined in various national acts and national policies of European countries.

The growth in the number of elderly people is also common in Russia. The decline in the birth rate, along with the increase in the number of citizens over 65 years of age in the regions, is occurring in all constituent entities of the country. This situation, obviously, requires new measures enshrined in social policy (Kuznetsov, Safronova, 2018; Bucher, 2016). At the same time, there are differences in the development of social policy concepts in European countries and Russia. A common trend is the focus on healthy aging, healthy lifestyles, organization of leisure and comfortable living, implementation of elderly people's plans and extension of their working life (Grigor'eva, Bogdanova, 2020). It is these points that are becoming the most important aspects in the social policy of the states[2].

The concept of healthy aging as defined by the UN WHO is based on the concepts of "individual vitality" and "functional vitality". These indicators make it possible to correlate two key parameters on which an older person's activity is based, namely health and functioning. The first indicator relates to the totality of all the physical and mental states that older people can use at any given time in order to be more active[3]. The second indicator, the conditions within which aging occurs, refers to the environment, interactions and communication within it, as well as the specifics of social policy in the country where elderly live.

Thus, activity and "functional vitality"[4] which is an important parameter in defining and developing active aging policies, is understood, from the WHO perspective, primarily as healthy aging associated with physical and psychological factors and embedded in a particular environment[5]. In Europe, since the 1980s WHO member states have been drawing attention to the fact that a special role should be given to healthy aging in the activities of the organization's regional office (Vorob'ev, Korotkova, 2016). Healthy aging as an important starting point for active aging was the goal of the European Strategy Health for All in

[1] Chan M. (2015). World report on aging and health. *WHO*, 1, 5–7.

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the 21st Century, adopted in 1998[6]. A number of resolutions adopted by the WHO have considered successive steps to achieve the goals of active aging and health of older people in Europe. The starting point for the legitimization and implementation of active aging policy was the Madrid Plan of Action, adopted in Spain in 2002, dedicated to the problem of aging and the activity of older people, maintaining activities in old age. The WHO's contribution was to develop a document entitled "Active Aging: A Policy Framework", which urged governments to consider the needs of older people when designing social policies and to create the necessary conditions for them: functional vitality and comfortable environment for active aging[7].

A key feature of the Madrid Plan, as the main policy document that enshrines the principles of active aging, is the sharp turn from senior citizenship, free from obligations and work, to senior citizenship, where participation in the labor market and equal access (inclusion) of older people in consumption practices play an important role. This certainly makes the Madrid Plan a neoliberal project of aging, aiming to redefine age primarily on the basis of neoliberal values. A key change marked by the Madrid Plan is the rejection of a biologized and medicalized understanding of aging as a time of inevitable decline and loss of labor capacity. The maintenance of physical health, the focus on healthy aging, and the implementation of medical measures remain important aspects. The key principles of this strategy are used in the implementation of the social policies of European states, as well as the development of social policy in the context of the health of older people and the adoption of the necessary measures to maintain health and the implementation of screenings.

One of the serious problems in the concept of active aging is the problem of institutionalization, namely, issues related to the top-down orientation of social policy and the responsibility of a state and state institutions for the implementation of active aging policy. As noted in studies, top-down public policies are often ineffective (Ney, 2004; Aspalter, 2021). For example, the problem of institutionalization of the European policy of active aging creates difficulties with the development of local and individual initiatives that are implemented by older people and non-governmental organizations (NGOs).

Thus, the European policy of active aging, and in particular the institutionalization of the European policy of lively aging, is a topic that is currently under active discussion. The search for alternative models lies in the analysis of scientific concepts and the consideration of possibilities for the development of active aging.

At present, analyzing the European policy of active aging, it is possible to identify two key points that arise in the introduction and implementation of various measures. The first is related to the institutional features and nature of active aging policy, oriented to the neoliberal discourse. The second one arises from the local nature and the importance of a focused, individualized approach to the consideration and analysis of various aspects and possibilities of implementing a policy of active aging.

The purpose of this work is to conduct a comparative analysis of social policy of active aging in European welfare states and Russia as well as to consider the development prospects of the active aging policy concept based on the understanding of active aging in the countries under consideration.

A comparative analysis of active aging policy in European welfare states and in Russia allows identifying its advantages and disadvantages, outlining possible options for its improvement,

[6] Ibidem.

[7] Political Declaration and Madrid International Plan of Action on Aging (2002). Second World Assembly on Aging, April 8–12. Madrid, Spain.

therefore, it has a pronounced significance for the development of not only this branch of knowledge, but also conceptual approaches to the construction of active aging policy at the national level.

The scientific novelty of the study lies in the comparison of the social policy features of active aging in countries with different experiences of social policy for the elderly, as well as largely different principles of social policy. This comparison allows identifying and outlining the prospects for the development of active aging policy, taking into account various factors and characteristics of the countries, which is certainly valuable both when planning further research on social policy of active aging, and when considering the practical features of active aging policy implementation in the welfare states and Russia.

In the course of the work we realized the following tasks:

– examined the specifics of active aging policy in European welfare states and in Russia;

– analyzed the problems of active aging policy implementation and prospects for their solution in European welfare states and Russia.

The empirical basis includes research on sociology and social policy, as well as various normative acts and programs concerning the policy of active aging in European countries and Russia. The choice of European welfare states is due to the fact that it is in European countries that the ideas of active aging emerged and developed. In this sense, European countries can serve as a benchmark for comparing features within the framework of social policy measures for active aging. Another important aspect is the relative geographical proximity of European welfare states to Russia, hence the policy of active aging in Russia is guided by the benchmark standards in this area, inherent in European countries. We also considered differences when choosing countries: for example, social policy in the welfare states of Europe is the most mature and coherent system, while Russian social policy is a successor of Soviet social policy. In Russia development according to a plan and the role of the state are still strong. This makes it important and relevant to compare active aging as a new, emerging branch of social policy in Russia with the established system of active aging policy in European welfare states.

Active aging policies in the welfare states of Northern Europe

Over the past decades, the European welfare states have become states with rather complex political systems involving multiple risks. However, one of the distinctive features of these states is the focus on the institutional context of social policy development (Clegg, 2018; Johnson, 2005; Taylor-Gooby, 2004). The social policy measures that have been taken in these countries regarding active aging are no exception. The institutional structures of welfare states not only shape the social policy agenda, but also determine the actors and those who can participate and be involved in social policy development. At the same time, it is the institutional framework that limits the scope of social policy and promotes centralized control over the introduction of active aging policies (Walker, Maltby, 2012; De Vroom, Øverbye, 2017). The ways of implementing the institutional context of active aging policy are different. The Northern welfare states have traditionally focused on various benefits, medical care and health screenings for the elderly, as well as on bringing them back into the labor markets and developing their active participation in the labor activity. The quality of social services in the Northern countries means that not all elderly people can receive benefits for a long time, hence an important factor becomes their involvement in the labor sphere. Thus, the social policies of the Northern states focus on the integration of the elderly into social life[8].

[8] Christensen D.A., Ervik R. (2003). Active aging in Europe: Methods, policies, and institutions – Norwegian country report. Vienna: ICCR.

The key components of this political strategy are determined by the creation of institutional capacity for the implementation of active aging policy, i.e. the formation of various governmental and non-governmental organizations and programs that coordinate policy. They are also determined by the development of the individual potential of older people (training, retraining, career counseling and advice on choosing or changing careers and occupations). The main idea of social policy in the Northern countries is to activate the resources of the elderly and their inclusion in the labor activity. This is related to the fact that inactive and non-participating older workers create difficulties for the economy due to the need to pay pensions and numerous benefits (Casado-Díaz et al., 2004; Walker, 2005). Partners, state and non-state organizations, not only participate in all stages of decision-making, but also work intensively with various ministries, such as the Ministry of Labor and the Ministry of Health, to develop programs that are most comfortable and adaptable to the needs of older people. Older people's employment programs in the Northern European countries have strong research support, the effectiveness of the program and the measures used are being monitored (Gould, Saurama, 2017).

Active aging policies in the Northern European countries are centered around integrating older people into the labor market and building their professional skills, as well as developing various specialized programs that promote employment for older people (Esping-Andersen, 1990; Gould, Saurama, 2017). Regarding activity and physical health policies, the Northern countries have programs that are institutionally linked to the state and evolve from a top down. These programs motivate large numbers of older people to exercise and engage in a variety of physical activities, but one of the problems is their relatively small regional and local coverage. For example, the program on active lifestyle among the elderly, which has been implemented by the national government of Finland since 2005, enjoys quite a huge popularity today. An evaluation of the program in 13 pilot regions in Finland found a threefold increase in older adults regularly attending events related to physical activity (Karvinen et. al., 2014; Kolosnitsina, Khorkina, 2016). At the same time, the specifics of the program are focused precisely on the neoliberal understanding of age and the consideration of the state as an agent that creates special comfortable conditions for the elderly. Such a program promotes the aging of the elderly, as well as their development and involvement in various activities. When elderly people participate in sports, they engage in communication, thereby overcoming exclusion.

Features of active aging policies in welfare states in continental Europe

In continental Europe, social insurance institutions have positioned aging as an issue related to the provision of financial sustainability policies for the elderly. Legislative initiatives to raise the retirement age are one measure to stimulate older people into employment. In France, Austria, and Germany, adjustments and changes in periods of ability to work are actively used (Häusermann, 2010; Ebbinghaus, 2006). In Germany and Poland, changes in pension systems have led to a shift from defined benefit to defined contribution pension schemes and an increase in the insurance part of the pension, in which the elderly themselves are invested. Also, one of the features of the social policies of continental European countries is the stimulation of partial retirement. Similar policies are applied in Austria, where the concept of partial retirement is used by employers to encourage the employment and hiring of older people (Ney, 2004).

A feature of social policy in the field of active aging in liberal states is the focus on employment and retraining in special programs related to the integration of the elderly into labor markets[9] (Zaidi et al., 2017). The debate about social policy on active aging in liberal welfare states revolves around a discussion of age discrimination, namely a discussion of the physical, psychological, and age-related barriers that make it difficult for older people to participate in social life and integrate into society. Active aging then becomes an institutional project to remove barriers to the integration of older people into labor markets, to the development of their potential.

For example, UK policy focuses on the expansion and development of older people's rights, attracting the elderly into the labor markets. To ensure their free access to employment, the UK authorities use direct policy tools to minimize and reduce barriers to employment for older workers. The UK also uses social policy self-regulation tools: firms, communities, and individual location-regions create their own codes and their own legislation focused on hiring older workers (Walker, 2018). In terms of physical activity, the benchmark of continental European welfare states is centered around the creation of state-run physical activity programs for the elderly and the creation of a comfortable environment for them[10].

Thus, key social policy measures for active aging in continental European welfare states focus on bringing older workers back into the labor markets, creating various institutional conditions for the development and expansion of labor market integration opportunities for older employees. Social policy for active aging in welfare states has developed mainly according to the principles of the neoliberal approach to aging, when activities, in particular labor, become the basis for the integration of older people into society.

Features and dilemmas of the European policy of active aging

One of the main problems for European welfare states is the institutional view of active aging policy, and the lack of possible ways to address and change, to move away from the institutional focus of active aging policy (Walker, 2018). As researchers note, European policymakers obsessed with the financial dependent ratio, rising social security contributions, or increasing health care costs forget the real problem, namely "the level of economic activity and, in particular, unemployment among the elderly" (Walker, 2002; Walker, Maltby, 2012). However, addressing this problem will require solving the social problems of European policies, considering the features of social problems such as ageism, inequality, and social exclusion.

Ageism in a wide range of social spheres is a major cause of the problems associated with demographic aging in welfare states. At the same time, there is a stratification between the migrant elderly population and the native Europeans. There are also differences that can be considered regarding elderly poverty across different locations and different countries (Walker, 2002). In European labor markets, firm-level employment and training practices ensure that older workers are more likely to be laid off and, once unemployed, less likely to return to the labor market[11] (Walker, 2002). Despite structural differences, all European welfare states exacerbate age barriers. Because of raising the retirement age, encouraging early retirement, and sanctioning any employment during retirement, there is an institutional dilemma of welfare state retirement systems first bringing the elderly into inactivity and then institutionalizing conditions

[9] Mayhew L. (2003). Active aging in Europe: Methods, policies, and institutions – UK country report. Vienna: ICCR.

[10] Mayhew L. (2003). Active aging in Europe: Methods, policies, and institutions – UK country report. Vienna: ICCR; OECD (2004). Aging and employment policies: United Kingdom. OECD publishing.

[11] Piekkola H. (2003). Active aging in Europe: Methods, policies, and institutions – Finnish country report. Vienna: ICCR.

and special programs, through the regulation of retirement benefits (Walker, 2018).

In the healthcare sector, the institutional policies currently being implemented by European states determine the importance of treating diseases in the elderly, rather than preventing them, which creates additional treatment costs (Walker, 2018). The cost of treatment for the elderly in European countries is constantly increasing, and the reason for this growth is, among other things, the lack of preventive measures and medicine focused on health screening and prevention.

Another issue in the European policy of active aging is the lack of political activism and political involvement of citizens. Researchers note the lack of real political influence of elderly citizens, as well as the lack of real initiatives of the elderly (Walker, 2018). At the same time, the involvement of older people in political activism is an important marker for the creation of activism, as well as contributing to the deinstitutionalization of politics and the creation of various possible initiatives to improve policies for older people.

According to researchers, it is important to develop new approaches to understanding and defining aging, and it is also necessary to stop viewing age solely from the perspective of the welfare state (Walker, 2018; Boudiny, 2013; Stenner et al., 2011). The point is to create institutional, comfortable conditions for the elderly, but there are still no alternatives, no assessment of the possibility to implement various types of activities for the elderly, and there are still attachments of activity only to the positions of employment and medicine, maintenance of health. Thus, the main feature of the European policy of active aging should be a systematic transition from the welfare state and the institutionalization of activities and measures applied to aging to the understanding and consideration of the aging process from the perspective of the multidimensional features of age and a critical re-evaluation of the different needs of older people.

Researchers also note that the coordination center for developing new measures and ways to implement active aging policies for the elderly should be shifted from the national and institutional level to the local and municipal level (Foster et. al., 2015; Schulmann et al., 2019; Leichsenring, 2020). They also emphasize the special role of local municipalities and NGOs in the context of the implementation of active aging policy. It is important to outline the central issues related to the modernization of European policy of active aging:

– overcoming ageism in the labor sphere; development of multiple sources of income for the elderly, different types of employment, also combining different jobs, independent choice of work;

– creation of new pension schemes that encourage opportunities for employment and part-time work, the development of such pension schemes; tax cuts in retirement, the elimination of mandatory motivational job search policies in retirement, and mandatory continued employment for the elderly;

– development of the medical examination system, focusing on the prevention of non-viral diseases among the elderly, detection of diseases in their early stages, and consistent prevention. In order to avoid rapid increases in health care costs in the future, the link between poor health and employment must be broken (Walker, 2002). European health systems in welfare states should prevent ill health, not treat disease at great expense. In addition, the activity and participation of society in the lives of infirm people requiring effective long-term care, the number of which will increase significantly in the coming decades;

– development of senior citizenship: an opportunity to develop a new concept that older people's activism is not created institutionally through the development of public policies for active aging and the development of active participation, including in political life (Walker, 2002; Walker, 2018). Critical reflection and understanding of

age are important, and in general the participation of older people themselves and the local level, the creation of a supportive and comfortable environment is important for citizenship policy (Del Barrio et. al., 2018; Eggers et al., 2019).

The policy of active aging in Russia

State policy and social programs to support older age groups in Russia have until recently been focused mainly on solving the problems of medical care and the problems associated with the natural aging of the population. A state geriatric service established, one of the tasks of which was to create and develop a network of geriatric hospitals, as well as a system of rehabilitation facilities for the elderly (Shabalin, 2009).

The work of geriatric care in Russia includes both inpatient and home care for the elderly. However, the health aspect of the elderly in this case comes to the fore, and the service lacks the opportunity to provide psychological and medical support to the elderly (Egorov, 2007).

The concept of demographic policy of the Russian Federation up to 2025 emphasizes the need for special measures for the elderly, as well as the introduction and development of special policies. The text of the document refers to the importance of achieving a life expectancy of 75 years up to 2025 and the adoption of measures aimed at maintaining and developing a policy of active aging in Russia. Among the measures that are indicated in the text, the need to create special geriatric centers, the development of active aging and inclusion of the elderly in society are also mentioned[12].

There are currently many obstacles in the employment of citizens in the Russian Federation, including a lack of interest among employers in older workers and age discrimination against older people in the labor market. Studies of the behavior of older people in the labor market indicate that the private sector, conservative employment, and the budgetary sector, including medicine, education, and science, are the most tolerant of older people (Sizova, Orlova, 2021; Smolkin, 2014). At the same time, representatives of the commercial sector are more inclined to consider older people as professionals who perform low-skilled tasks: security guards, janitors, and representatives of the commercialized care sector.

In Russian science, mainly in studies of social policy, at this stage there are works that are based mainly on the analysis of active aging in Russia and the specifics of social policy of active aging. At the same time, the key role in ensuring conditions for active aging in Russia and the creation of special measures within the framework of social policy is assigned to the state. Russian researchers note that it is the state that must ensure and stimulate the maximum inclusion and integration of the elderly into active life, through healthcare and disease treatment prevention to encourage a healthy and active lifestyle, the maximum inclusion of the elderly in social life and the minimization of poverty and social exclusion[13] (Grigor'eva, Bogdanova, 2020; Chereshnev, Chistova, 2017; Kos'mina, Kos'min, 2016; Dobrokhleb, 2012). This approach shifts the tasks of the state to targeted assistance for older people who are experiencing problems of exclusion and various difficulties, and their active inclusion in social life.

Russian researchers note that when planning social policy in the sphere of active aging in Russia, it is important to plan the necessary infrastructure, in particular the creation of comfortable and convenient medical infrastructure and conditions for active aging in terms of maintaining the necessary level of health. At the same time, measures such as the integration of older people

[12] Concept of the demographic policy of the Russian Federation for the period up to 2025 (2020). https://base.garant.ru/191961/53f89421bbdaf741eb2d1ecc4ddb4c33/ (accessed: March 9, 2022).

[13] Rimashevskaya N.M. (2014). *The senior citizens as a resource for socio-economic modernization of Russia*. Moscow: Ekonomicheskoe obrazovanie.

into labor markets and continued employment are generally not taken into account in the social policy of active aging (Grigor'eva, Bogdanova, 2020; Evseeva, Yazova, 2020; Kustova et al., 2021; Barsukov, 2016; Kalachikova et al., 2016).

Another group of Russian researchers considers the features of active aging in terms of sociological aspects and social exclusion of the elderly. In such qualitative sociological research, a special role is given to examining the problems of poverty among the elderly, analyzing the need to continue working due to the inability to provide for oneself in retirement, and considering the special role of the family, which often acts as the only alternative in providing necessary activities for the elderly (Tkach et al., 2012; Smol'kin, 2014; Temaev, Mel'nikova, 2010). In these works, the key focus is on inequalities of all kinds, including urban and rural inequalities that limit older people's opportunities and access to activities and infrastructure.

Another group of studies considers active aging in Russia from the perspective of transferring (or substituting) the concept of "active aging" for "healthy aging", which leads to debates around the study of active aging in the context of various medical and health measures. Active aging from this point of view is mainly understood as the preservation, maintenance of health of older people, and the ability to lead an active life by older people is associated with a good level of health (Shabalin, 2009; Pervova, Kelas'ev, 2017). Most of these works are presented by medical research and analyze the features and possibilities of healthy aging of the elderly, taking into account the development of medicine in Russia.

Thus, when analyzing the Russian experience of considering the features of active aging, it is worth noting that in studies devoted to the topic of active aging in Russia, attention is mainly paid to aspects of social policy, the study of the features of social policy of active aging. It is also important to consider the medical features of active aging, but the sociological aspect is rather poorly represented in such works. We should also note that attention is mainly paid to institutional and procedural aspects of active aging, the analysis of legislative acts and the development of necessary solutions to improve social policy in the field of active aging.

An important conceptual document is the Strategy of Action for the Senior Citizens of the Russian Federation. Older people in Russia are defined in the strategy as "the senior citizens" "without the usual reasoning about their need and weakness"[14]. Senior Citizens (in the Strategy, from the age of 60) becomes a chronological condition, but not a medical definition associated with infirmity and poor health. According to the pension reform, such an age limit will be pushed back in Russia by 2028, which contradicts the age limit of 60 years adopted in the strategy. There are also a number of contradictions between the Strategy and other documents.

The main idea of the Strategy in the interests of senior citizens is their active integration into labor activities. It is the problem of labor activity in relation to the elderly that is seen as the most difficult to create their activities. According to the text of the document, the main and important points are the involvement of older people in social and work activities, the development of active integration into the work force. In this regard, one of the topical forms of activity identified in the text is volunteerism. Volunteer practices, can allow older people to participate in community activities and actively engage in communication and interaction[15].

[14] On the Approval of the Strategy of Action for the Senior Citizens of the Russian Federation up to 2025: Government Order no. 164-p, dated February 5, 2016; On the action plan for 2016-2020 for the implementation of the first phase of the Strategy of Action for the Senior Citizens of the Russian Federation up to 2025: Government Order no. 2539-p, dated November 5, 2016.

[15] Ibidem.

The main goal of the national project "Demography" is to increase healthy life expectancy to the age of 67 years[16].

The national project "Demography" noted the key criteria for the development of the elderly in Russia. They include: (1) reduction of the mortality rate of elderly people of working age to 361 per 10 thousand people of the corresponding age; (2) increase in the proportion of citizens systematically engaged in physical culture and sports to 55.0%[17]. At the same time, it remains unclear how these indicators can be achieved, and the texts of both documents do not refer to the measurement of indicators and the possibilities of achieving them. Rather, these indicators are given simply as goals to achieve and measure the effectiveness of the strategies adopted.

The federal project "Senior Citizens", which is part of the national project "Demography", is responsible for increasing the quality of life. Its tasks include the development and implementation of a program and special measures to support the quality of life of the elderly in Russia[18]. A key parameter designed to show the effectiveness of the Senior Citizens Project is the calculation of healthy life expectancy (HLE). The features of the HLE consists in taking into account both objective criteria of health status (survival indicators) and subjective assessments (self-assessments), which strengthens the competitive advantages of this indicator, ensures its comprehensiveness. The problem in the implementation of HLE is its comparative function, namely, the impossibility of comparing HLE at different survival ages (HLE at birth vs. HLE at the age of 60).

Another problem during the implementation of the project "Senior Citizens" in Russia was its institutional overload and, consequently, the focus on institutional support for the elderly, and the need to develop effective social policy measures for the elderly in the work of all institutions. However, this system largely fails to consider local and regional initiatives to integrate older people into activity and health maintenance, and does not provide for the creation of such initiatives from below (by older people themselves) and as part of various local initiatives.

The disadvantage of the project "Senior Citizens" is also the lack of funding and development of long-term care system (LTC), which allows maintaining the health of older people in the future and provide the necessary social assistance and support for the elderly in need. European concepts of active aging have long integrated the necessary standards for maintaining a system of long-term care, as well as the necessary conditions for the provision of social and psychological assistance to the elderly. Despite this, the project "Senior Citizens" offers many prospects for the development of older people, as well as creating opportunities to provide activities for older people in the context of health, to maintain an active aging on the basis of health. Consequently, the development of this project sets the stage for realization of the active aging goals in Russia.

One should note that the geriatric service in Russia is responsible for keeping people active, mainly for maintaining health, and its goals are the development of medical and social care for the elderly and the implementation of necessary outpatient treatment (Shabalin, 2009). The territorial distribution of geriatric service institutions is quite uneven: it covers mainly large and federal cities, but not the countryside and small towns, where the medical and social problems of the elderly often remain unadressed (Egorov, 2007). The Russian geriatric service has insufficient

[16] Passport of the National Project "Demography". Available at: http://government.ru/info/35559/ (accessed: March 14, 2022).

[17] Passport of the National Project "Demography". Available at: https://rosmintrud.ru/ministry/programms/demography (accessed: March 9, 2022).

[18] "Senior Generation": Implementation Prospects: Federal Project. (2021). *Effective pharmacotherapy*, 17(36), 38–41.

legal framework and no vertical management connections. There are also difficulties with the profession of geriatrician, which exists only in large medical institutions and is not included in the staff schedule of outpatient clinics and geriatric centers (Tkacheva, 2016).

All of these shortcomings create difficulties and tensions in the medical and social care of the elderly. It is worth noting that despite the fragmentation and lack of a unified system of geriatric service institutions, it has an extensive network of departmental institutions that provide work primarily with older age groups, supporting the health of their representatives.

The Presidential Decree "On the national goals and strategic objectives of development of the Russian Federation for the period up to 2024"[19] contains objectives oriented to the development of the quality of life of the elderly and the abandonment of discriminatory policies toward them: 1) increasing life expectancy to 78 years (to 80 years by 2030); 2) ensuring sustainable growth of real income of citizens and the growth of pensions above the inflation rate.

However, the ideas outlined in the documents do not make it clear how such indicators can be achieved, taking into account the fact that mortality reduction and healthy life are highly inertial processes. And one of the important problems that does not contribute to these figures is the instability in employment, as well as the discrimination against the elderly that is present in the labor market. Thus, despite the dynamics, it remains not quite clear how the goals of active aging and inclusion of the elderly in social life in the Russian Federation will be achieved.

Conclusion

Summarizing the results of the analysis of social policy documents and strategies of European welfare states and the Russian Federation in the field of active aging, we should note the differences and similarities.

The social policy of European welfare states is related to the institutional context and the importance of creating various programs to implement the principles of active aging, which include mainly two policy vectors: 1) the development of employment for older people, the creation of employment programs, the development of physical activity; 2) a focus on health and the importance of maintaining health for older people. Policies of active aging both in European welfare states and in Russia are of a similar nature, namely the prevalence of the idea "from above" and the dominance and creation of various concepts and special programs for the elderly. However, these programs do not take into account the critical component and do not contribute to the understanding of the importance of the individual needs of older people in the implementation of active aging policy.

The differences between European and Russian policy are related to the fact that European policy is more focused on the search for employment for older people and the development of their citizenship, the transition to a critical understanding and comprehension of age, based on the importance of local perceptions and views of older people on the meanings of aging, as well as on its characteristics that are embedded in the local environment. However, the cross-cutting issue of modernization and development of active aging policy in the European welfare states and Russia should be a focus on individuality and the importance of creating measures to promote the active involvement of older people in political activity, the formation of a comfortable environment for them.

Thus, active aging policies in both the welfare states in Europe and Russia must take into account the real problems of the elderly, among which the fight against various inequalities created institutionally and the transition to individual accessibility of the elderly person's choice

[19] Available at: http://kremlin.ru/events/president/news/57425 (accessed: March 9, 2021).

of preferred model/models of aging are not unimportant. The social policy initiatives for active aging examined in the study indicate that active aging in both the welfare states and Russia is now entering a phase of active transformation, which is largely related to the transition from a neoliberal discourse that denies aging and encourages the creation of various government programs that shape opportunities for the elderly, to a critical reflection on the necessary needs of the elderly.

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Information about the Author

Konstantin A. Galkin – Candidate of Sciences (Sociology), Senior Researcher, Sociological Institute, Federal Center of Theoretical and Applied Sociology, Russian Academy of Sciences (25/14, 7th Krasnoarmeyskaya Street, Saint Petersburg, 190005, Russian Federation; e-mail: Kgalkin1989 @mail.ru)

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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 (April 2022) and for the period from June 2021 to April 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 February to April 2022, the level of approval of the RF President's work increased by 8 p.p. (from 48 to 56%). The share of Vologda Oblast residents who positively assess the work of the Chairman of the RF Government increased by 6 p.p. (from 38 to 44%), the Vologda Oblast Governor – by 4 p.p. (from 34 to 38%).

Over the last 6 surveys (from June 2021 to April 2022), the share of positive assessments regarding the work of the head of state increased by 3 p.p. (from 53 to 56%); The level of approval of the work of the Chairman of the RF Government and the Governor of the Vologda Oblast did not see any significant changes (43 and 38% respectively)[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.

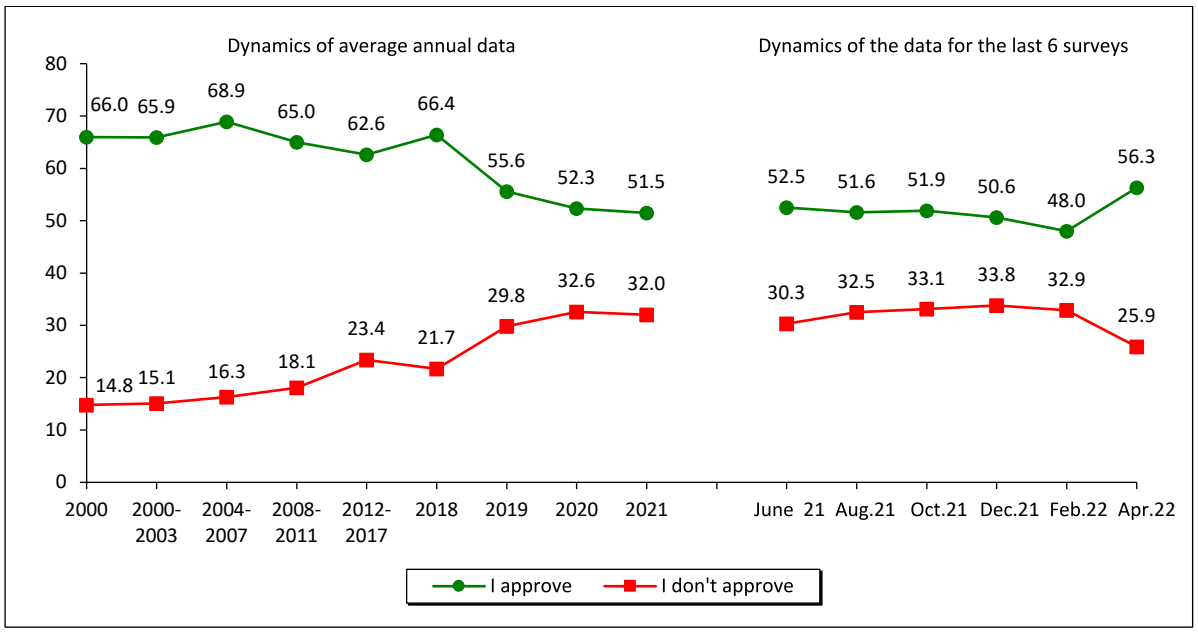
[3] Hereinafter, the results of a comparative analysis of the data from the survey conducted in April 2022 and the results of the monitoring "wave" conducted in June 2021 are given in the frame.

How do you assess the current performance of..? (% of respondents)

Answer option	Dynamics of average annual data								Dynamics of the data for the last 6 surveys						Dynamics (+/–), Apr. 2022 to	
	2000	2007	2011	2012	2018	2019	2020	2021	June 2021	Aug. 2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2021	Feb. 2022
RF President																
I approve	66.0	75.3	58.7	51.7	66.4	55.6	52.3	51.5	52.5	51.6	51.9	50.6	48.0	56.3	+4	+8
I don't approve	14.8	11.5	25.5	32.6	21.7	29.8	32.6	32.0	30.3	32.5	33.1	33.8	32.9	25.9	-4	-7
Chairman of the RF Government*																
I approve	-*	-*	59.3	49.6	48.0	41.1	38.7	39.9	42.2	42.7	39.7	38.3	37.6	43.6	+1	+6
I don't approve	-	-	24.7	33.3	31.6	38.4	40.4	37.6	35.1	36.0	38.3	38.9	37.7	32.5	-3	-5
Vologda Oblast Governor																
I approve	56.1	55.8	45.7	41.9	38.4	35.7	35.0	36.7	37.8	38.6	37.5	35.9	33.9	38.2	0	+4
I don't approve	19.3	22.2	30.5	33.3	37.6	40.2	42.5	40.5	38.4	38.5	40.7	41.9	41.6	37.3	-1	-4

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)



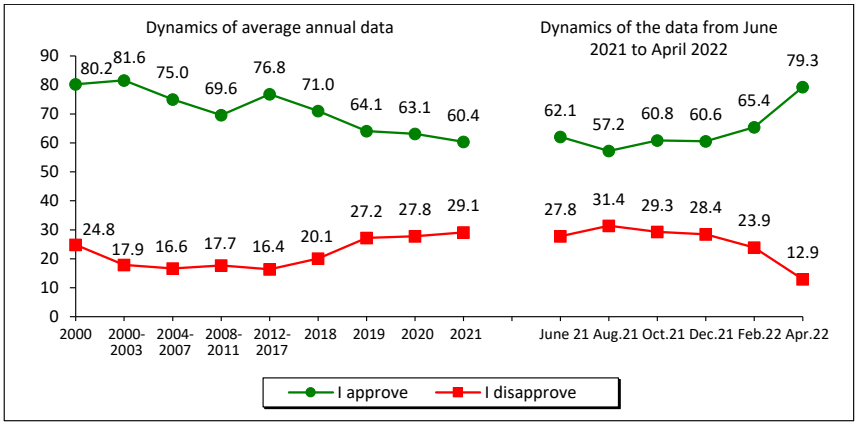
Hereinafter, all graphs show the average annual data for 2000, 2018, 2019, 2020, 2021, as well as the average annual data for the periods 2000–2003, 2004–2007, 2008–2011, 2012–2017, corresponding to the presidential terms.

For reference:

According to VCIOM, the level of approval of the RF President's work increased by 14 p.p. over the past two months (from 65 to 79%). The share of negative assessments decreased by 11 p.p. (from 24 to 13%).

Positive changes were observed in April 2022 compared to June 2021: the share of positive assessments of the work of the head of state increased by 17 p.p. (from 62 to 79%), the proportion of negative ones decreased by 15 p.p. (from 28 to 13%).

In general, do you approve or disapprove of the work of the RF President?
(% of respondents; VCIOM data)



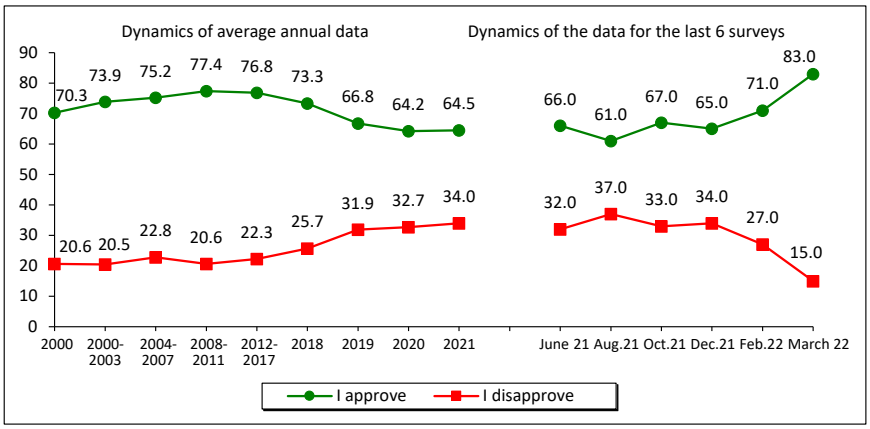
Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
I approve	+17	+14
I disapprove	-15	-11

Question: "In general, do you approve or disapprove of the work of the President of the Russian Federation?"
Data for April 2022 – average for two surveys: on April 3, 2022 and April 10, 2022.
Source: VCIOM. Available at: https://wciom.ru/

According to Levada-Center*, the share of positive assessments of the RF President's work in the period from February to April 2022 increased by 12 p.p. (from 71 to 83%), the share of negative assessments decreased by 12 p.p. (from 27 to 15%).

Compared to June 2021, the level of approval of the activities of the head of state increased by 17 p.p. (from 66 to 83%); the proportion of negative judgements decreased by 17 p.p. (from 32 to 15%).

In general, do you approve or disapprove of the work of Vladimir Putin as President of Russia?
(% of respondents; Levada-Center data)*



Dynamics (+/–), March 2022 to		
Answer option	June 2021	February 2022
I approve	+17	+12
I disapprove	-17	-12

Question: "In general, do you approve or disapprove 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.

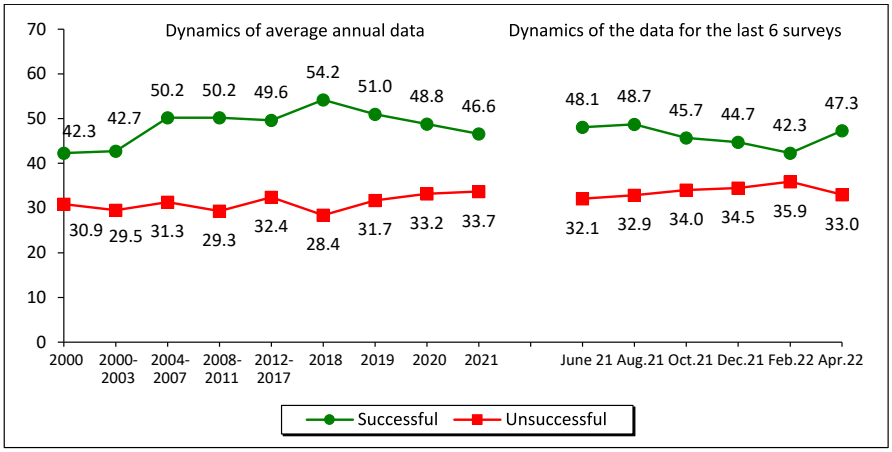
* Included in the register of foreign agents.

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 significantly (by 5 p.p., from 42 to 47%). The proportion of those who hold the opposite point of view decreased by 3 p.p. (from 36 to 33%).

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

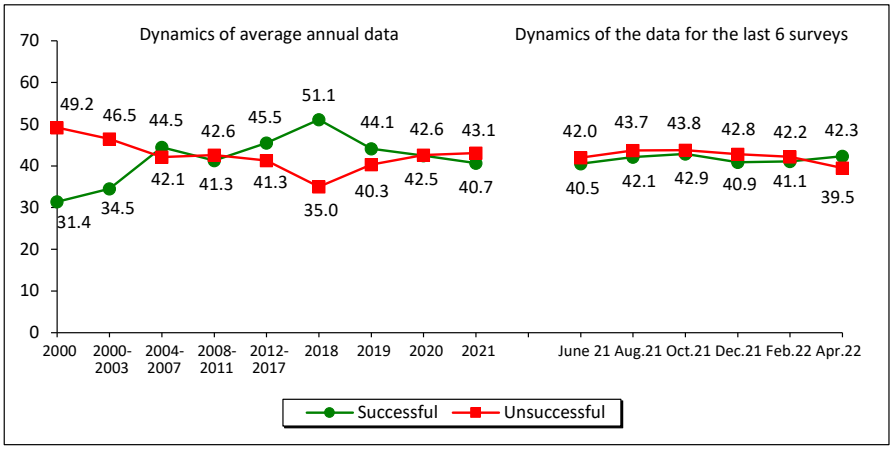


Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
Successul	-1	+5
Unsuccessful	+1	-3

In February – April 2022, the share of Vologda Oblast residents who positively assess the work of the head of state to impose order in the country did not change significantly and amounted to 41–42%.

The same can be said about the comparison of the results of the survey conducted in April 2022 with the results of the "wave" of the monitoring conducted in June 2021.

Imposing order in the country

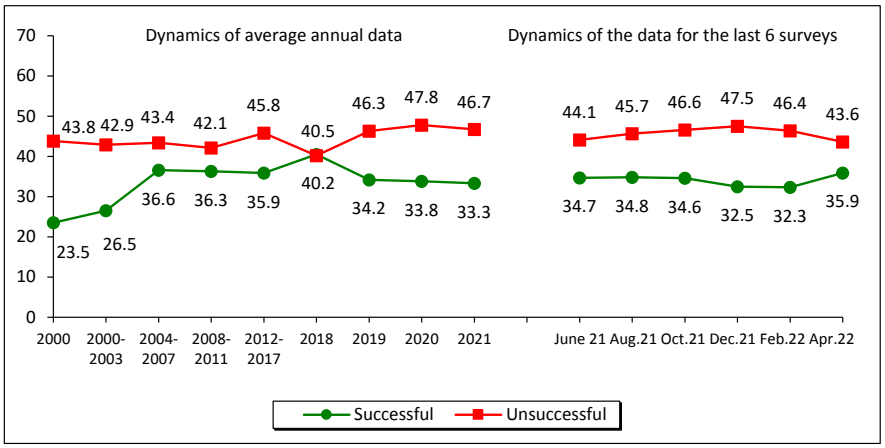


Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
Successul	+2	+1
Unsuccessful	-3	-3

Positive changes over the past two months were noted in the dynamics of people's assessments of the RF President's success in protecting democracy and strengthening citizens' freedoms. During this period, the share of positive judgments increased by 4 p.p. (from 32 to 36%), and the proportion of negative assessments decreased by 2 p.p. (from 46 to 44%).

Over the last 6 surveys (from June 2021 to April 2022), there were no significant changes in the estimates of the population.

Protecting democracy and strengthening citizens' freedoms

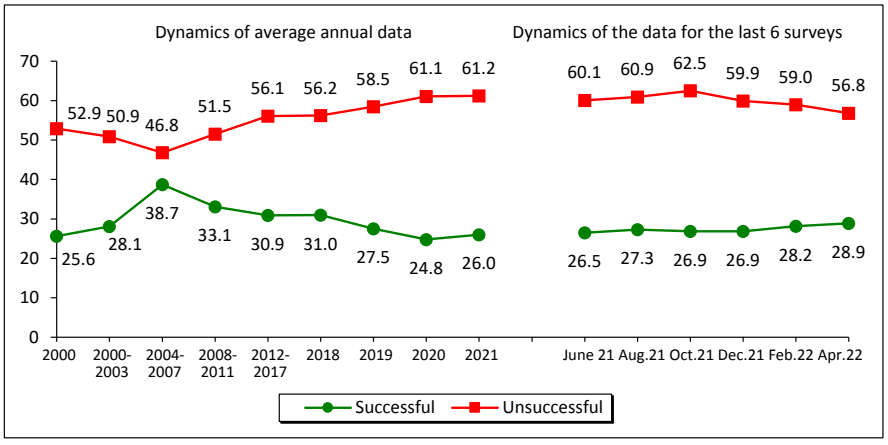


Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
Successul	+1	+4
Unsuccessful	-1	-3

The assessment of the success of the President's work to boost the economy and increase the welfare of citizens in February – April 2022 did not change significantly. The share of positive judgments was 28–29%, negative – 57–59%.

The dynamics of population estimates over the past 6 surveys looks a little more positive. From June 2021 to April 2022, the proportion of positive assessments was 27–29%, negative – decreased by 3 p.p. (from 60 to 57%).

Economic recovery and increase in citizens' welfare



Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
Successul	+2	+1
Unsuccessful	-3	-2

The dynamics of political preferences of the region's residents over the past two months show a slight increase in support for the United Russia party (by 3 p.p., from 31 to 34%).

Other than that, the structure of political preferences has not changed. In particular, there still remains a high proportion of people who believe that none of the political parties represented in parliament expresses their interests, or who find it difficult to choose their political preferences (41%).

Compared to June 2021, the share of supporters of parliamentary parties has not changed. However, we should note that during this period the proportion of those who are not satisfied with any of the political forces represented in the State Duma has significantly decreased (by 4 p.p., from 35 to 31%).

Which party expresses your interests? (% of respondents; VolRC RAS data)

Party	Dynamics of average annual data												Dynamics of the data for the last 6 surveys						Dynamics (+/–), Apr. 2022 to	
	2000	2007	2011	Election to the RF State Duma 2011, fact	2012	2016	Elec-tion to the RF State Duma 2016, fact	2018	2019	2020	Elec-tion to the RF State Duma 2020, fact	2021	June 2021	Aug. 2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2021	Feb. 2022
United Russia	18.5	30.2	31.1	33.4	29.1	35.4	38.0	37.9	33.8	31.5	49.8	31.7	32.1	31.7	32.7	31.9	31.1	34.2	+2	+3
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	8.1	9.3	11.1	10.5	9.5	11.2	+3	+2
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	8.5	9.9	11.2	9.9	9.4	7.7	-1	-2
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	4.1	5.3	6.3	6.0	5.7	4.5	0	-1
New People*	–	–	–	–	–	–	–	–	–	–	5.3	2.3	–	–	–	2.3	1.6	1.3	–	0
Other	0.9	1.8	1.9	–	2.1	0.3	–	0.7	0.3	0.5	–	0.2	0.1	0.2	0.5	0.2	0.7	0.3	0	0
None	29.6	17.8	29.4	–	31.3	29.4	–	28.5	33.7	34.2	–	33.9	35.4	34.1	31.7	29.6	32.4	30.8	-5	-2
I find it difficult to answer	20.3	21.2	13.2	–	11.7	12.0	–	11.2	11.0	11.1	–	10.0	11.8	9.6	6.6	9.7	9.6	10.0	-2	0

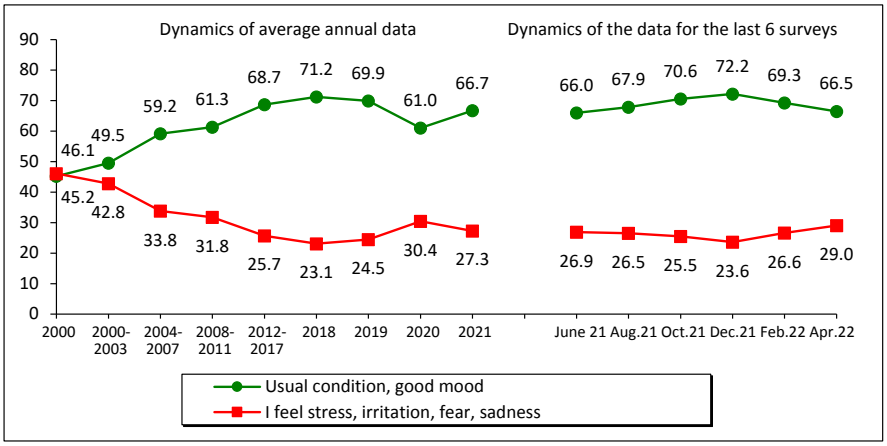
* The New People party was elected to the State Duma of the Russian Federation for the first time following the results of the election held on September 17–19, 2021.

In April 2022, the proportion of people who characterize their emotional state as being positive continued to decrease. In December 2021, it was 72%, in February 2022 – 69%, in April – 67%. The proportion of residents who "feel stress, irritation, fear, sadness" increased by 5 p.p. over the same period (from 24 to 29%).

At the same time, estimates of social mood still correspond to the level of June 2021. Over the past 6 surveys, the share of positive characteristics has not changed and amounts to 66–67%; the proportion of negative ones is 27–29%.

Estimation of social condition (% of respondents; VolRC RAS data)

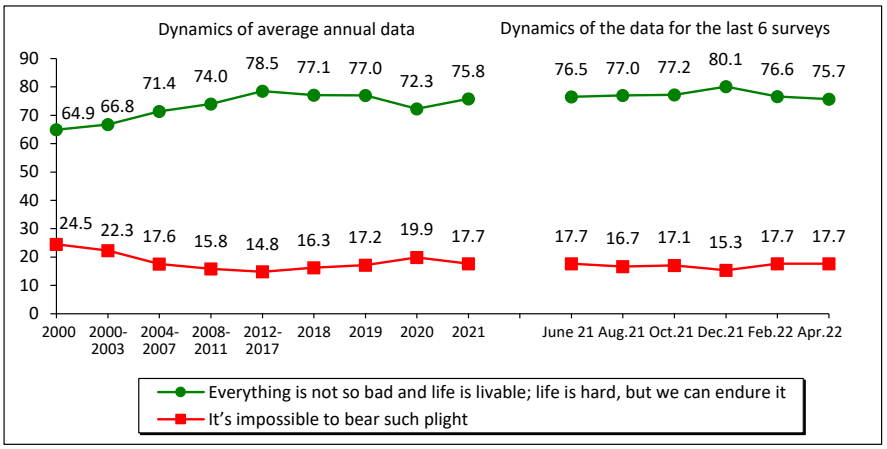
Social mood



Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
Usual condition, good mood	+1	-3
I feel stress, irritation, fear, sadness	+2	+2

The indicators of the stock of patience in April 2022 remain stable compared to February 2022 and to June 2021: the proportion of people who believe that "everything is not so bad and life is livable; life is hard, but we can endure it" is 76%, the proportion of those who believe that "it's impossible to bear such plight" is 18%.

Stock of patience

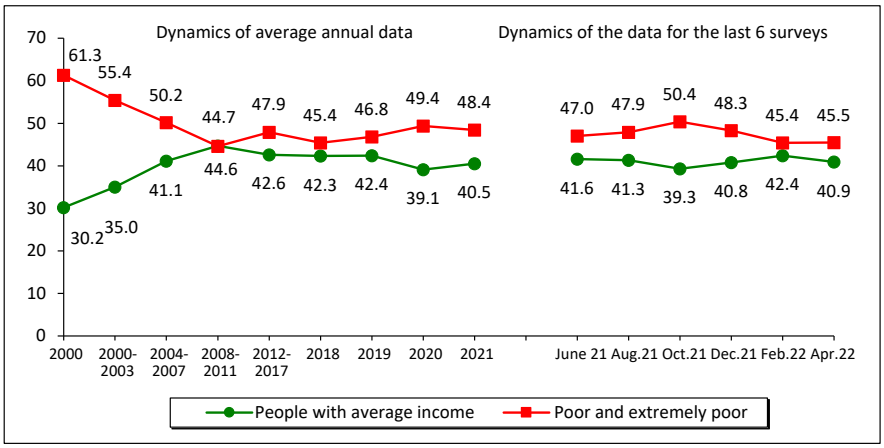


Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
Everything is not so bad and life is livable; life is hard, but we can endure it	-1	-1
It's impossible to bear such plight	0	0

In February – April 2022, the proportion of people subjectively classifying themselves as "poor and extremely poor" did not change and amounted to 45%; this is slightly more than the proportion of those who classify themselves as "people with middle income" (41–42%).

Over the last 6 surveys (from June 2021 to April 2022), residents' estimates have not changed significantly.

Social self-identification



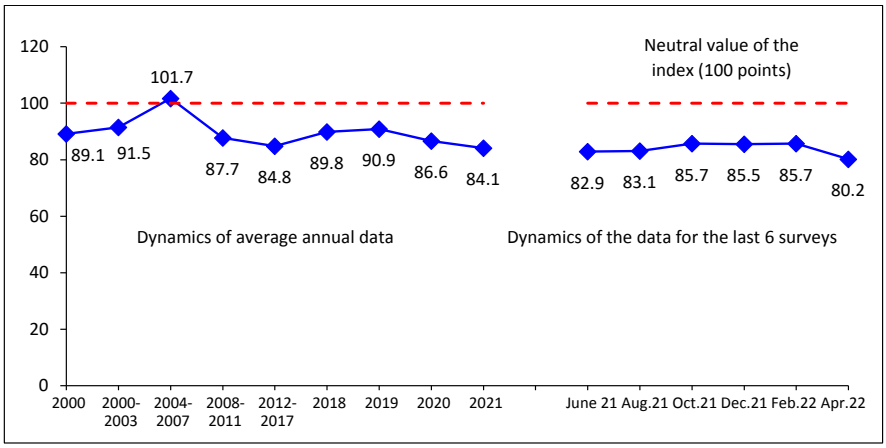
Dynamics (+/–), April 2022 to		
Answer option	June 2021	February 2022
People with average income	-1	-2
Poor and extremely poor	-2	0

Question: "Which category do you belong to, in your opinion?"

Over the past two months, the consumer sentiment index has significantly decreased (by 6 p.p., from 86 to 80 points), which indicates a deterioration in people's forecasts regarding the future economic situation in the country and their personal financial situation.

Compared to June 2021, the situation has deteriorated: the consumer sentiment index decreased by 3 points (from 83 to 80 p.).

Consumer sentiment index (CSI, points; data of VolRC RAS for the Vologda Oblast)

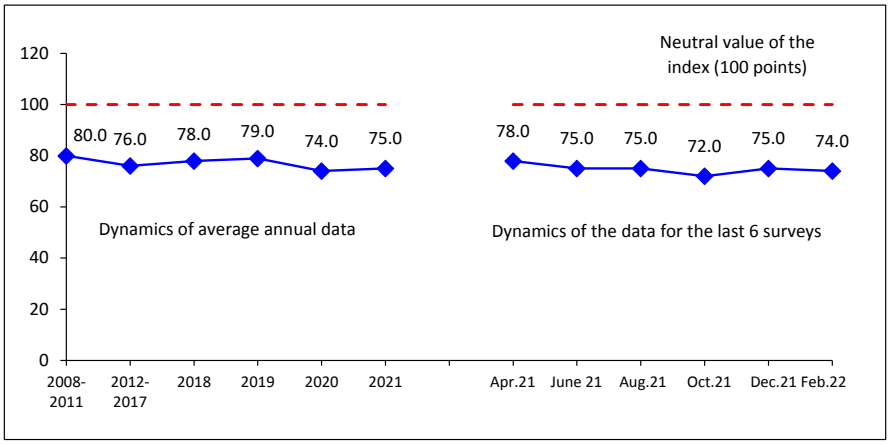


Dynamics (+/–), April 2022 to		
CSI	June 2021	February 2022
Index value, points	-3	-6

For reference:

According to the latest data from Levada-Center (as of February 2022), the consumer sentiment index nationwide amounted to 74 points, which approximately corresponds to the level of December 2021 and also to the data for June 2021.*

Consumer sentiment index (CSI; Levada-Center data* for Russia)



Изменение (+/–), февраль 2022 г. к		
CSI	June 2021	December 2021
Index value, points	-1	-1

The index is calculated since 2008.

Latest data are as of February 2022. There are no data for the period from April to August 2020.

Source: Levada-Center*. Available at: https://www.levada.ru/indikatory/sotsialno-ekonomicheskie-indikatory/

* Included in the register of foreign agents.

In the period from February to April 2022, the share of positive assessments of social mood decreased in 8 of the 14 main socio-demographic groups. The most negative changes are observed among women (by 7 p.p., from 72 to 65%), as well as among people over the age of 55 (by 10 p.p., from 65 to 55%).

The only group in which the assessments social mood have improved over the past two months are people under the age of 30, among whom the share of positive social mood assessments has increased by 7 p.p. (from 75 to 82%).

Over the past 6 surveys (from June 2021 to April 2022), positive dynamics of social mood have been observed in five socio-demographic groups (especially among people under the age of 30, as well as among the least affluent 20%). In three groups, the proportion of those who characterize their mood as "fine, normal, good" decreased (persons over 55 years old; people with higher and incomplete higher education; 60% with the middle income).

Social mood in different social groups (answer option "Wonderful mood, normal, stable condition", % of respondents; VolRC RAS data)

Population group	Dynamics of average annual data								Dynamics of the data for the last 6 surveys						Dynamics (+/–), Apr. 2022 to	
	2000	2007	2011	2012	2018	2019	2020	2021	June 2021	Aug. 2021	Oct. 2021	Dec. 2021	Feb. 2022	Apr. 2022	June 2021	Feb. 2022
Sex																
Men	50.1	65.9	64.5	69.1	72.8	70.1	60.8	65.7	65.1	65.6	70.0	71.5	65.5	68.3	+3	+3
Women	43.3	61.7	62.0	65.8	69.8	69.6	61.2	67.4	66.7	69.8	70.9	72.8	72.3	65.1	-2	-7
Age																
Under 30	59.1	71.3	70.0	72.3	80.0	81.1	67.6	73.5	73.0	82.3	75.3	81.9	75.3	81.8	+9	+7
30–55	44.2	64.8	62.5	67.9	72.6	71.2	61.8	69.5	70.0	71.4	70.8	75.1	70.7	71.1	+1	0
Over 55	37.4	54.8	58.3	62.1	65.2	63.3	57.4	60.5	58.3	58.1	68.3	65.2	65.3	55.2	-3	-10
Education																
Secondary and incomplete secondary	41.7	58.4	57.4	57.2	64.8	63.2	56.1	62.1	62.5	63.2	64.1	69.7	68.7	63.0	+1	-6
Secondary vocational	46.4	64.6	63.6	66.7	72.2	72.7	63.5	66.7	66.1	68.5	70.4	70.1	68.3	69.8	+4	+2
Higher and incomplete higher	53.3	68.6	68.3	77.0	76.8	73.4	63.3	71.5	69.7	73.0	77.1	77.6	71.5	66.9	-3	-5
Income groups																
Bottom 20%	28.4	51.6	45.3	51.5	57.3	53.2	43.4	54.6	54.2	55.0	60.4	64.0	60.5	61.5	+7	+1
Middle 60%	45.5	62.9	65.3	68.7	71.9	71.4	62.6	67.3	67.0	68.9	70.9	71.1	68.8	64.2	-3	-5
Top 20%	64.6	74.9	75.3	81.1	82.9	81.8	75.6	79.9	76.5	86.7	84.2	85.3	81.5	81.9	+5	0
Territories																
Vologda	49.2	63.1	67.1	73.6	71.0	68.6	60.9	60.3	59.4	59.7	64.0	65.7	63.2	60.2	+1	-3
Cherepovets	50,8	68,1	71,2	76,2	75,8	71,2	60,4	71,0	70,8	72,3	75,2	75,1	72,6	70,1	-1	-3
Districts	42,2	61,6	57,1	59,8	68,7	69,8	61,4	67,8	67,1	70,1	71,5	74,2	70,8	68,1	+1	-3
Oblast	46,2	63,6	63,1	67,3	71,2	69,9	61,0	66,6	66,0	67,9	70,5	72,2	69,3	66,5	+1	-3

RESUME

The main events of February 2022 were Russia's recognition of the independence of the Donetsk People's Republic and the Lugansk People's Republic (February 21, 2022)[4] and also the beginning of a special military operation on the territory of Ukraine (February 24, 2022). As the RF President noted, its purpose is "to protect people who, for eight years now, have been facing humiliation and genocide perpetrated by the Kiev regime... to demilitarize and denazify Ukraine, as well as bring to trial those who perpetrated numerous bloody crimes against civilians, including against citizens of the Russian Federation"[5].

This event has had a significant impact on the nature of geopolitical processes, the international situation and the internal situation in Russia. The level of international political tension has sharply increased (primarily between Russia and NATO countries), new economic sanctions are being imposed against our country on a daily basis, and there is an objective need for a comprehensive change in the vector of economic and cultural policy.

The events taking place on the world political arena and their implications for the Russian Federation have had a significant impact on the dynamics of public opinion.

First, against the background of the tense political and economic situation, the level of support for the RF President and for the public administration system as a whole has significantly increased (as evidenced by the increase in the level of approval of the work of the President's (by 8 p. p., from 48 to 56%), the Chairman of the RF Government (by 6 p. p., from 38 to 44%), the Vologda Oblast Governor (by 4 p. p., from 34 to 38%), the share of people whose interests are expressed by the United Russia party (by 3 p.p., from 31 to 34%), as well as by a noticeable increase in positive assessments regarding the success of the President's efforts to strengthen Russia's international position (by 5 p.p., from 42 to 47%)).

Moreover, we should note that the consolidation of society around the President is comprehensive: a noticeable (by 4 p.p. or more) increase in the level of approval of the head of state's work is observed in almost all major socio-demographic groups.

Dynamics of the level of approval of the RF President's work in February – April 2022 (% of respondents)

Population group	Feb. 2022	Apr. 2022	Dynamics (+/–) Apr. 2022 to Feb.2022
Sex			
Men	45.9	51.7	+6
Women	49.7	60.1	+10
Age			
Under 30	51.6	50.9	0
30–55	44.4	55.5	+11
Over 55	51.0	59.4	+8
Education			
Secondary and incomplete secondary	44.0	48.3	+4
Secondary vocational	48.5	59.2	+11
Higher and incomplete higher	54.2	63.8	+10
Income groups			
Bottom 20%	37.0	41.1	+4
Middle 60%	50.4	57.6	+7
Top 20%	56.5	63.4	+7
Territories			
Vologda	38.8	48.1	+9
Cherepovets	53.3	62.0	+9
Districts	50.1	57.7	+8
Oblast	48.0	56.3	+8

[4] Presidential Decree on recognizing the Donetsk People's Republic. Available at: http://publication.pravo.gov.ru/Document/View/0001202202220002; Presidential Decree on recognizing the Lugansk People's Republic. Available at: http://publication.pravo.gov.ru/Document/View/0001202202220001

[5] 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

Second, despite the fact that in the whole region over the past two months the share of positive assessments of social mood decreased slightly (by 2 p.p.), in general, psychological well-being of the population remains stable:

✓ just like at beginning of the year, 77% of the region's residents believe that "everything is not so bad and life is livable";

✓ the decrease in the share of positive assessments of social mood in February – April 2022 in the region as a whole cannot be called significant. For example, in the previous period (from December 2021 to February 2022, that is, before the start of the special operation in Ukraine), the proportion of people describing their mood as "normal, fine, good" decreased by 3 p.p. (from 72 to 69%).

We should note that the current situation could not but have a negative impact on the dynamics of people's social mood. According to experts, the very beginning, as well as the economic and social consequences of the special operation "seemed to paralyze society"[6]; "today, many people in Russia are confused"[7], and this is quite natural. Perhaps it is the emotional reaction to the events that is connected with the fact that the deterioration of social mood assessments is noted primarily among women (by 7 p.p., from 72 to 65%) and people over 55 years of age (by 10 p.p., from 65 to 55%). However, the greater value, in our opinion, is the ability of the state to consolidate society around the goals of its foreign policy in this difficult and tense period.

Third, against the background of economic restrictions that have now affected virtually all citizens of the country, the dynamics of the population's assessments of their current financial situation and prospects for its development are of particular concern.

According to the results of the monitoring, over the past two months, the proportion of people subjectively classifying themselves as "poor and extremely poor" has not actually changed (45–46%). The share of the region's residents who believe that the RF President is successfully coping with the task of recovering the economy and increasing the welfare of citizens also remained at the level of February 2022 (28–29%), and the share of those who share the opposite point of view has even slightly decreased (by 2 p.p., from 59 to 57%).

At the same time, in April 2022, the consumer sentiment index significantly decreased (by 6 points, from 86 to 80 p). Consequently, the already high level of pessimism about the forecasts of the dynamics of people's financial situation and the economy of the country as a whole is increasing further.

This imposes special requirements on all levels of the public administration system (federal, regional, municipal), because, according to experts, today's high level of support for the President and the state can have a "short-term effect (up to three months)", and then it "will directly depend on the rapid success in the military campaign and effective economic policy of the Government"[8].

The consequences of the global crisis that our country is already facing today are complex and inevitable, and in these conditions everything depends on the ability of the public administration system built by the President to "convert" negative factors and risks into new opportunities for economic growth, positive dynamics of the standard of living and quality of life, achievement and protection of full-fledged national sovereignty.

Materials were prepared by M.V. Morev, I.M. Bakhvalova

[6] 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

[7] Mozhegov V. Russia's special operation put an end to the end of history. *Vzglyad*. April 15, 2022. Available at: https://vz.ru/opinions/2022/4/15/1153019.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

AUTHOR GUIDELINES
for Submission of Manuscripts to the Editor of the Scientific Journal
Economic and Social Changes: Facts, Trends, Forecast

The Journal publishes original theoretical and experimental articles that fall within the scope of the journal. The manuscript should be of no less than 16 pages (30,000 characters with spaces). The maximum length of the paper submitted to publication is 25 pages (approximately 50,000 characters with spaces). Book reviews, information on scientific conferences, scientific chronicles are also submitted to publication. The papers should contain research findings of completed and methodologically proper works.

The decision for publication is made by the Journal's Editorial Staff on the basis of the reviewer's report. The novelty, scientific importance and relevance of submitted material are also taken into consideration. Articles rejected by the Editorial Staff will not be re-considered.

Requirements to the package of materials submitted

The following materials are submitted to the editorial office in electronic form:

1. A file containing the article in a Microsoft Word document, format .docx. The name of the file is typed in the Roman characters and reflects the author's last name (e.g.: Ivanova.docx).
2. Full information about the author on a separate page: full name, academic degree and title, place of work and position, contact information (postal address, telephone, e-mail – if available), ORCID, Researcher ID. The information should be arranged in a table.
3. Scanned copy of the commitment of the author not to publish the article in other publications.
4. A color photo of the author in the .jpeg / .jpg format of no less than 1 MB.

The package of materials is to be sent to the editor's email address: esc@volnc.ru.

Text design requirements

1. Margins

Right – 1 cm, others – 2 cm.

2. Font

Font size of the article's text – 14, type – Times New Roman (in case a special type font is needed, when typing Greek, Arab, etc. words, Windows default fonts are to be used). In case the paper contains seldom used fonts, they (font family) are to be submitted along with the file. Line interval – 1,5.

3. Indent – 1.25. Made automatically in MS Word.

4. Numbering

Page numbers are placed in the lower right corner of the page automatically with the use of MS Word tools.

5. First page of the article

In the upper right corner, the UDC is placed, under it, after the 1.5 spacing – the LBC, then – the symbol ©, indent (spacing), and the name and initials of the author in semi-bold. After the 2-spacing indent, the title of the article is given. Central alignment is used for the title of the article given in semi-bold. The abstract and key words are given below, after the 2-spacing indent, without a paragraph indent, in italics and aligned by width. Then, after the 2-spacing indent, the text of the article is placed.

6. Abstract

The abstract contains from 200 to 250 words. The abstract states the purpose of the research, points out its undoubted scientific novelty and its differences from similar works of other scientists; contains the methods used by the author and the main results of the work performed; identifies areas of application of the results of the study; briefly formulates the prospects for further research in this area.

Examples of good abstracts for different types of articles (reviews, scientific articles, conceptual articles, application articles) are available at: http://www.emeraldinsight.com/authors/guides/write/abstracts.htm?part=2&PHPSESSID=hdac5rtkb73ae013ofk4g8nrv1.

7. Key words

There should be not more than eight words or word combinations. Key words should reflect the content of the manuscript to the fullest extent. The number of words within a phrase should not exceed three.

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The caption of the table and its number (if present) are given in normal font, without highlighting. The caption runs in bold and is center aligned.

Tables are inserted; drawing tools and AutoShapes are not allowed; column and cell alignment using spaces or tabs is not allowed. MS WORD table editor is used for tables. Each piece of data of the stub and head of the table correspond to discrete cell. Only editor standard tools are applied for creating and formatting tables, no pilcrows, spaces and extra blank lines for semantic breakdown and line adjustment are allowed.

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The caption and its number are placed below the figure. The word "Figure" is in normal font (without highlighting). The caption runs in bold, center alignment, single-spaced.

MS EXCEL is to be used for creating charts, MS WORD, MS VISIO – for flow charts, MS Equation for formulas.

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Algorithm of charts insertion from MS EXCEL to MS WORD:

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10. Bibliographic description of the sources under tables and figures

Write: either "Source", or "Compiled with the use of", or "Calculated with the use of", etc., after that – information about the source.

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Page footnotes are executed according to GOST R 7.0.5 – 2008.

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The word "References" is given after a 1.5 spacing after the body of the article in lower-case letters, semi-bold italics, center alignment. Then, the list of references is given after the 1.5 spacing.

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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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