

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



**Maksim A.  
SIDOROV**

Vologda Research Center, Russian Academy of Sciences  
Vologda, Russian Federation  
e-mail: ma.sidorov@mail.ru  
ORCID: 0000-0002-5683-8182; ResearcherID: N-3104-2018

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

---

**For citation:** Sidorov M.A. (2022). Sales markets for the goods of the regions of the Northwest of Russia: Quantitative assessment. *Economic and Social Changes: Facts, Trends, Forecast*, 15(3), 91–112. DOI: 10.15838/esc.2022.3.81.5

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

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

### Acknowledgment

The reported study was funded by RFBR grant number 20-010-00643.

### Introduction

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

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

The catalyst for the aggravation was the growing political rivalry between the United States and China, which quickly turned from trade negotiations to conflicts on the “economic front”. At the same time, the steps taken by the largest players in the world markets do not make the situation more stable. So, in 2020, a series of mutual conflicts between the United States and China resulted in the introduction of a number of mutual duties. One of the consequences of the tension on world markets

was the official statement on the reorientation of the Chinese economy to the domestic market (Zhu, 2020). A new model of China’s economic development will focus on increasing consumption in the domestic market while simultaneously focusing on attracting foreign investment and stabilizing international trade. The main idea behind the development of the 14th five-year socio-economic development plan is the concept of “double circulation”: internal and external. At the same time, internal circulation is declared as the main one and implies the development of national supply and demand production chains. In the long term this strategy is aimed at eliminating the dependence of the Chinese economy on foreign markets and technologies<sup>2</sup>.

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

<sup>1</sup> Khabibullin D.Z. The port crisis provoked economic redistribution in the world. Available at: [https://www.ng.ru/kartblansh/2022-02-10/3\\_8369\\_kb.html](https://www.ng.ru/kartblansh/2022-02-10/3_8369_kb.html) (accessed: February 21, 2022).

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

of more powerful domestic demand as a strategic resource that would give domestic entrepreneurs confidence<sup>3</sup>.

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

One of the drivers of the policy of mobilizing the spatial factor of national economic development in the Spatial Development Strategy of the Russian Federation<sup>5</sup> is the division of the country’s economic space into macroregions (Minakir et al., 2020). The need to allocate macroregions increases when the potential of individual subjects is very small to

solve certain tasks and it is necessary to consider their potential together and in a broader context (Kotov, 2021).

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

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

Table 1. Composition of macroregions of the Russian Federation

Federal district	Macroregion
Central	Central
	Central Chernozem
Northwestern	Northwestern
	Northern
Volga	Volga-Kama
	Volga-Ural
Southern	Southern
North Caucasian	North Caucasian
Ural	Ural-Siberian
Siberian	South Siberian
	Angara-Yenisey
Far Eastern	Far Eastern

Source: Spatial Development Strategy of the Russian Federation for the period up to 2025.

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

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

<sup>5</sup> Spatial Development Strategy of the Russian Federation for the period up to 2025. Available at: <http://static.government.ru/media/files/UVAIqUtT08o60RktoOXI22JjAe7irNxc.pdf> (accessed: February 21, 2022).

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

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

#### **Literature review**

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

The second half of the 20th century was marked by a sharp increase in world trade and increased competition between countries and regions. As a result, theories of competitive advantages of individual territories began to appear. In particular, M. Porter identified patterns in the competition of territories: the more developed the competition in the domestic market, the more likely the success of

the country (region) in international markets (and vice versa, the weakening of competition in the national market may lead to the loss of competitive advantages) (Savel'ev, 2010).

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

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

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

- increasing labor productivity and stimulating the innovation process by creating favorable conditions for this (Savel'ev, 2010);
- using the advantages of proximity (concentration) more effectively, to create favorable conditions for the manifestation of economies of scale and reducing operational costs (Pilipenko, 2005).

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

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

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

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

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

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

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

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

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

#### **Methodology and data**

In the course of the study, a quantitative assessment of the sales markets of the regions of the Northwest of Russia was carried out. The methodological basis was the work of P.A. Minakir (Minakir et al., 2020), which presents the results of the analysis of the effectiveness of the allocation of

macroregions for the development of mesoregional economic ties on the example of the Far Eastern Federal District).

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

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

<sup>7</sup> Spatial Development Strategy of the Russian Federation for the period up to 2025. Available at: <http://static.government.ru/media/files/UVAIqUtT08o60RktoOXI22JjAe7irNxc.pdf> (accessed: February 21, 2022).

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

<sup>9</sup> For the remaining indicators, data for 2016 were also used, unless it is indicated otherwise.

<sup>10</sup> Products of food, light, timber processing, petrochemical, chemical, metallurgical industry, mechanical engineering, production of non-metallic mineral products.

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

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

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

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

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

In order to clarify the structure of supplies for these types of activity, the following corrective steps were applied: for enterprises associated with the extraction of coal (Komi Republic) and metal ore (Republic of Karelia, Murmansk Oblast) in the regions of Northwest Russia, the main direction of supplies is the macroregional market, since

the relevant enterprises are part of PAO Severstal (Vologda Oblast). Fuel and energy balances of the regions were used to assess the structure of crude oil supplies and products of the sector “production and distribution of electricity, gas and water”. In the study of non-ferrous metals sales markets, an important source was the reporting of PJSC MMC Norilsk Nickel and OJSC Timan Bauxite. With regard to other types of activity, such as construction, services and agriculture, it is conventionally assumed that their sales are completely concentrated on local markets<sup>11</sup>. The supply flows of the products of the military-industrial complex were not taken into account.

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

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

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

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

Region	Local markets	Macroregional market	National market	Foreign markets
<b>Northwest of Russia</b>	<b>3834</b>	<b>227</b>	<b>425</b>	<b>102</b>
Republic of Karelia	33	5	0	0
Komi Republic	408	28	141	9
Arkhangelsk Oblast	128	13	78	8
including Nenets Autonomous Okrug	59	0	42	7
Arkhangelsk Oblast except Nenets Autonomous Okrug	69	13	36	1
Vologda Oblast	68	0	2	0
Kaliningrad Oblast	102	0	17	0
Leningrad Oblast	289	64	65	0
Murmansk Oblast	133	115	6	53
Novgorod Oblast	39	2	0	0
Pskov Oblast	33	1	2	0
Saint Petersburg	2600	0	114	32

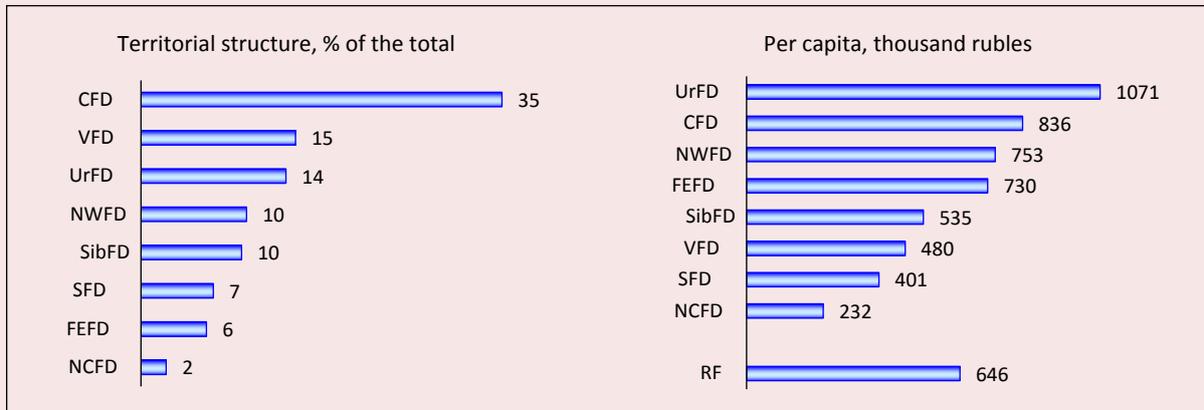
Source: own elaboration.

Table 4. Estimation of sales of products of the regions of the Northwest of Russia by various types of markets, billion rubles

Region	Output	Local market	Macroregional market	National market	Foreign markets
<b>Northwest of Russia</b>	<b>9084</b>	<b>4656</b>	<b>661</b>	<b>2755</b>	<b>1011</b>
Republic of Karelia	145	84	13	13	35
Komi Republic	747	451	74	181	42
Arkhangelsk Oblast	322	142	25	111	44
including Nenets Autonomous Okrug	111	60	1	42	8
Arkhangelsk Oblast except Nenets Autonomous Okrug	211	82	24	69	36
Vologda Oblast	600	135	45	209	210
Kaliningrad Oblast	491	162	14	267	48
Leningrad Oblast	1182	351	221	282	328
Murmansk Oblast	417	173	119	15	111
Novgorod Oblast	183	62	22	40	59
Pskov Oblast	95	45	25	24	1
Saint Petersburg	4903	3052	103	1613	134

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

Figure 1. GRP production in the context of federal districts of Russia in 2019



Note: CFD – Central Federal District, VFD – Volga Federal District, UFD – Ural Federal District, NWFD – Northwestern Federal District, SibFD – Siberian Federal District, SFD – Southern Federal District, FEFD – Far Eastern Federal District, NCFD – North Caucasian Federal District.

Source: compiled according to Rosstat data.

## Results

The Northwest accounts for 9.9% of the area of Russia and 9.5% of its population. The macroregion has a fairly high level of economic development, it produces about 10% of the total gross regional product (GRP) of the country (*Fig. 1*). The volume of GRP per capita is 753 thousand rubles, which is 17% higher than the average Russian level.

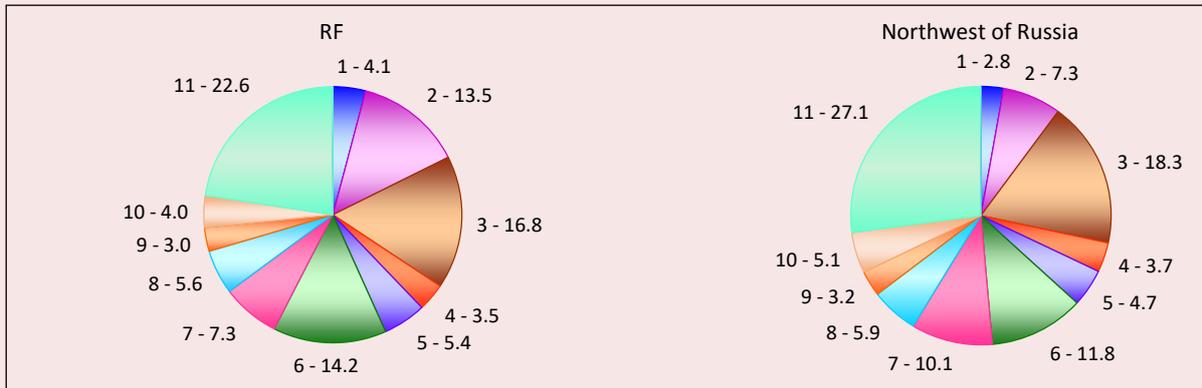
Proximity to the European Union and international transport corridors, and the presence of Arctic territories have led to a smaller share of agriculture in the structure of the economy of the macroregion and a greater share of manufacturing, as well as transportation and storage (*Fig. 2*).

The functional and sectoral structure of the economy of the Northwest determined its spatial configuration. Almost half of GRP of the macroregion is created in Saint Petersburg, another 12% – in the Leningrad Oblast (*Fig. 3*). The high rates of the Arkhangelsk Oblast that follows the two regions are due to the location of machine-building and mining capacities in it. The least (2%) of GRP is produced in the

agrarian-oriented Pskov Oblast. In terms of GRP production per capita, the Northwest of Russia exceeds the national average. At the same time, the leaders in the average per capita GRP volume are the regions with the most developed industry: Saint Petersburg, the Komi Republic and the Murmansk Oblast.

The Northwest of Russia is an industrially developed macroregion. It occupies leading positions in the country in the construction of sea and river vessels, the production of automobiles, as well as in the pulp and paper and woodworking industries. Almost half of the total industrial production of the macroregion is produced in Saint Petersburg and the Leningrad Oblast (*Fig. 4*). At the same time, the total contribution of the territories (republics of Karelia and Komi, Murmansk and Vologda oblasts), which have the metallurgical production chain, which is the most important in the connecting role of the regions of the Northwest of Russia, is 22%. The Murmansk Oblast is the leader in the production of industrial

Figure 2. GRP production structure in Russia and the Northwest of Russia in 2019, % of the total



Note: 1 – Agriculture, forestry, hunting, fishing and fish farming; 2 – Mining; 3 – Manufacturing; 4 – Production and distribution of electricity, gas and water; 5 – Construction; 6 – Wholesale and retail trade; 7 – Transportation and storage; 8 – Public administration and military security; social security; 9 – Education; 10 – Health care; 11 – Other services.

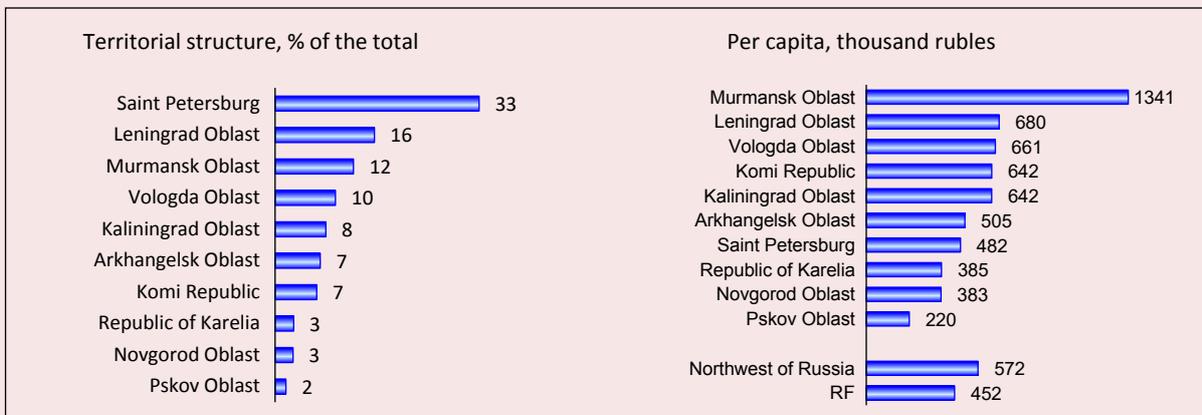
Source: compiled according to Rosstat data.

Figure 3. GRP production by regions of the Northwest of Russia in 2019



Source: compiled according to Rosstat data.

Figure 4. Specific indicators of industrial production in the Northwest of Russia in 2020



Source: compiled according to Rosstat data.

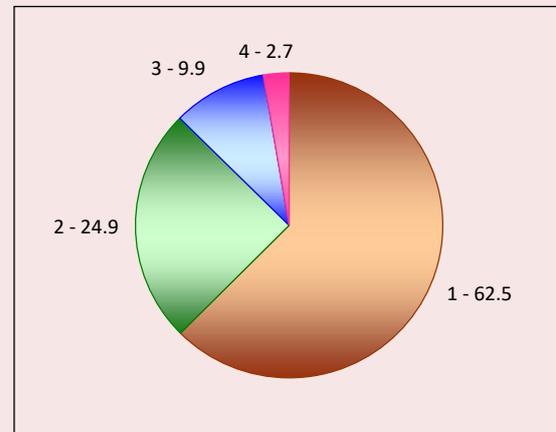
products per capita, the level of which is almost three times higher than the national average (such a high indicator is primarily associated with highly developed non-ferrous metallurgy). It is curious that, despite its proximity to Saint Petersburg, the volume of per capita industrial production (642–680 thousand rubles) in the Leningrad Oblast is similar to the Vologda and Kaliningrad roblasts, as well as the Komi Republic.

The structure of industrial production in the Northwest of Russia is dominated by the manufacturing industry, the share of value added produced is 62% (Fig. 5). Mining accounts for another 25%.

The current production structure in the regions of the Northwest of Russia largely determines the nature of the supply of the macroregion’s products to markets at various levels. Its geographical proximity to the Central Federal District and the borders of Europe is also important.

As a result of the distribution of data on the missing part of the output by the main types of markets in which products created in the regions of the Northwest of Russia are sold, an estimated structure of markets as of 2016 was obtained (Tab. 5).

Figure 5. Branch structure of industry in the Northwest of Russia in 2020, % of the total



Note: 1 – Processing industries; 2 – Mining; 3 – Provision of electric energy, gas and steam, air conditioning; 4 – Water supply; sanitation, organization of waste collection and disposal, activities to eliminate pollution.  
Source: compiled according to Rosstat data.

Let us consider the role of each of the abovementioned types of markets (local, macroregional, national, foreign) in ensuring the functioning and maintenance of market equilibrium in the Northwest of Russia as a whole and in its constituent entities.

Table 5. Structure of markets for the sale of products by regions of the Northwest of Russia, % of the total

Region	Local market	Macroregional market	National market	Foreign markets
<b>Northwest of Russia</b>	<b>51.3</b>	<b>7.3</b>	<b>30.3</b>	<b>11.1</b>
Republic of Karelia	58.0	8.9	9.2	23.9
Komi Republic	60.3	9.8	24.2	5.6
Arkhangelsk Oblast	44.0	7.9	34.5	13.6
including Nenets Autonomous Okrug	53.8	0.9	38.2	7.0
Arkhangelsk Oblast except Nenets Autonomous Okrug	38.8	11.5	32.5	17.1
Vologda Oblast	22.5	7.5	34.9	35.1
Kaliningrad Oblast	32.9	2.9	54.4	9.7
Leningrad Oblast	29.7	18.7	23.8	27.8
Murmansk Oblast	41.4	28.6	3.5	26.6
Novgorod Oblast	34.1	11.8	21.9	32.3
Pskov Oblast	47.3	26.4	25.2	1.1
Saint Petersburg	62.3	2.1	32.9	2.7

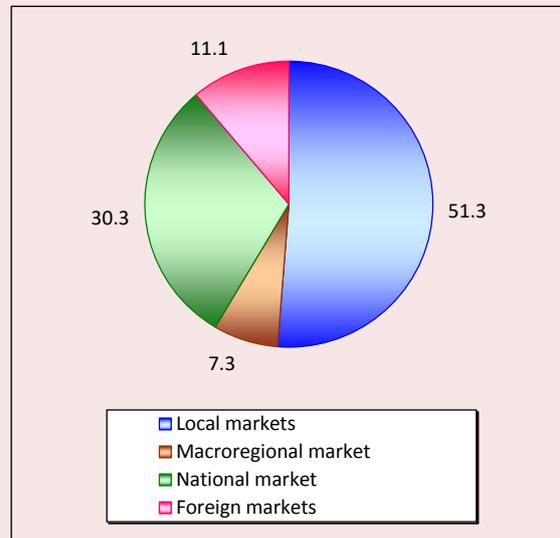
Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: <http://sophist.hse.ru/rosstat.shtml>

**Local markets**

Local markets are the most important ones in the functioning of the regional economy. In general, in the Northwest of Russia, more than half of output is consumed within the framework of producing entities, while the macroregional market is only 7.3%, which indicates a weak connectivity of territories within the macroregion (Fig. 6). At the same time, a significant excess of the share of local markets over the macroregional market largely indicates that the regions of the Northwest of Russia use possible synergetic effects only to a small extent.

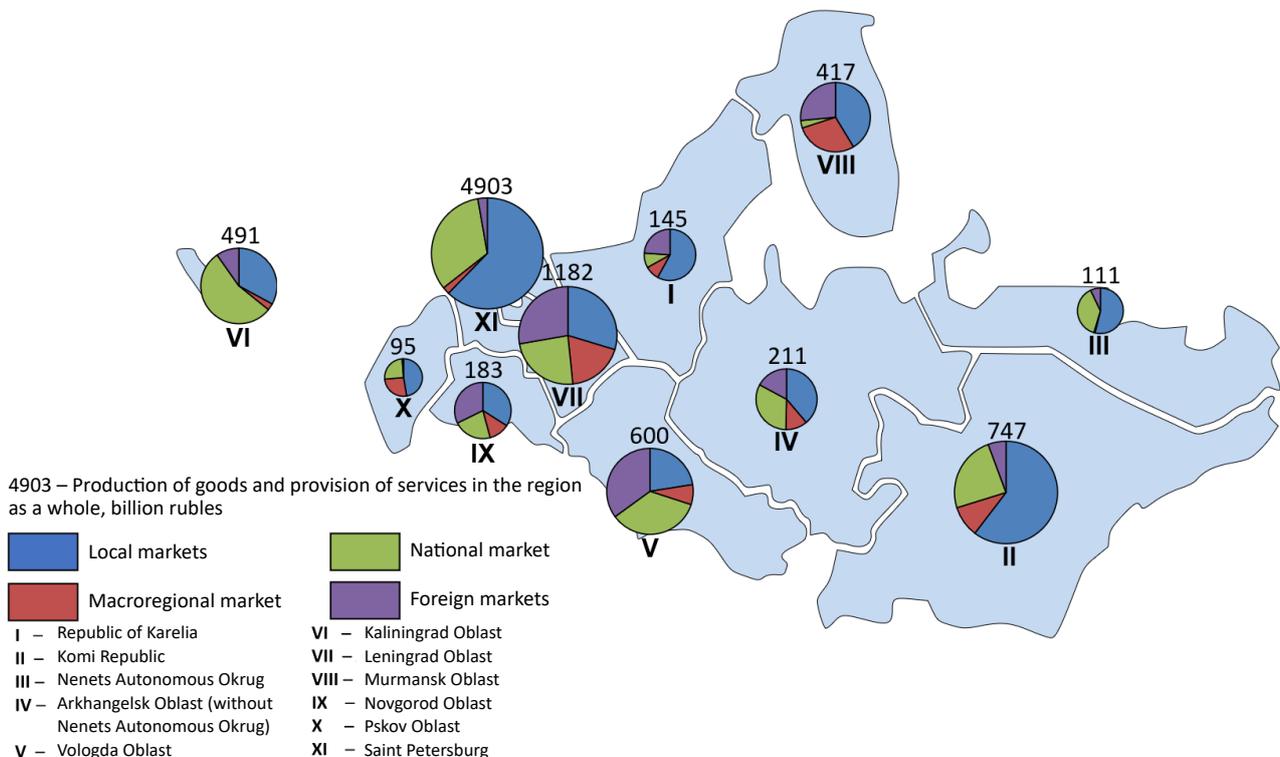
On the other hand, this indicates a high level of territorial specialization of these regions. The most notable exception from the general series is the Leningrad Oblast, whose economy is aimed at the demand of Saint Petersburg (the share of the local market in it is 29.7%, Fig. 7), and mainly the export-oriented Vologda Oblast (with the smallest share of the local market in the macroregion – 22.5%).

Figure 6. The structure of markets for the sale of products of the regions of the Northwest of Russia, %



Source: compiled according to the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: <http://sophist.hse.ru/rosstat.shtml>

Figure 7. The scale of output and the structure of sales by type of markets in the regions of the Northwest of Russia



Source: compiled according to the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: <http://sophist.hse.ru/rosstat.shtml>

We should note that, in addition to export orientation, another important factor determining the high share of foreign markets in the total output of the region is the development of its economic system (Savel'ev, 2010). An example is the Leningrad Oblast (Fig. 8), whose production is most diversified in comparison with other regions of the Northwest of Russia.

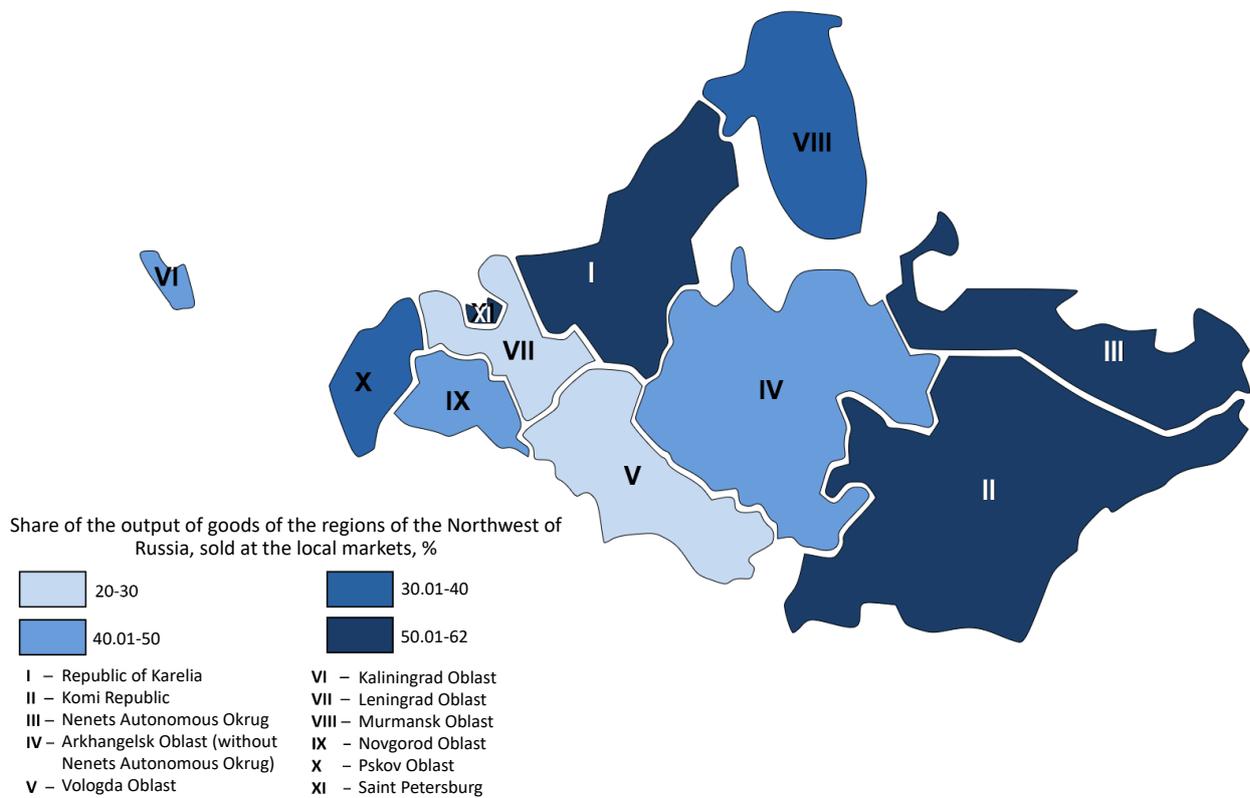
**National market**

A significant part of the products and services produced in the economy of the Northwest of Russia is directed to the markets that are foreign relative to it. Thus, 30.3% of the total output of the macroregion is supplied to the national market (see Fig. 6). One of the prerequisites for this phenomenon is the stability of the historically conditioned specialization of the economy of the Northwest of Russia, formed as a complex of VCs

of the unified national economic complex of the USSR. At the same time, the importance of the national market for the subjects of the macroregion is heterogeneous, since it is determined by the specifics of their specialization. The main volume of exports of products and services from the macroregion to the markets of RF constituent entities of other macroregions (78.7%) falls on Saint Petersburg, as well as on the Leningrad and Kaliningrad Oblasts (58.6, 10.2 and 9.7% respectively; Fig. 9).

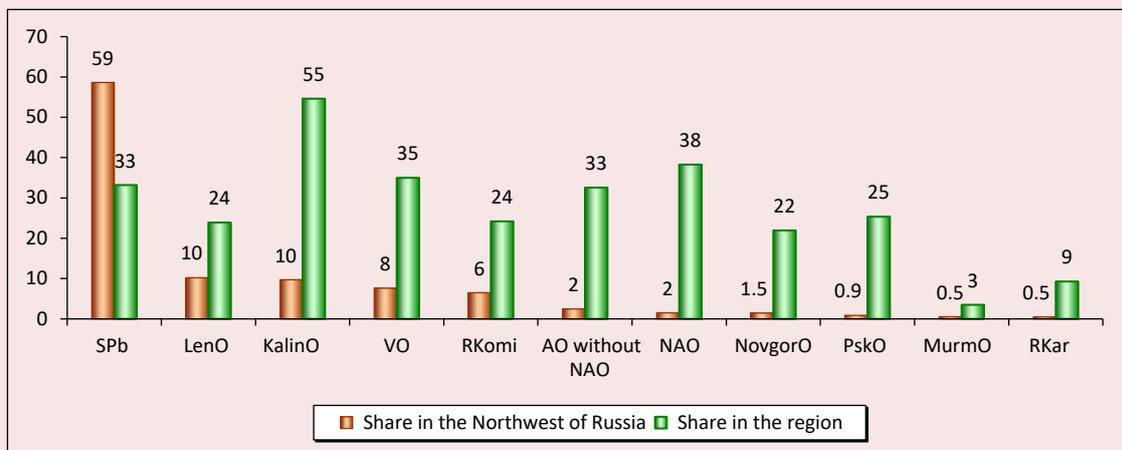
At the same time, half of the Northwestern regions account for only 7.3% of the total volume of supplies of the macroregion's products to the national market. Due to the low economic potential, the Novgorod and Pskov oblasts collectively carry out only 2.4% of the total volume of supplies from the Northwest of Russia

Figure 8. Distribution of regions by the share of local markets



Source: compiled according to the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: <http://sophist.hse.ru/rosstat.shtml>

Figure 9. The share of the national market in the total sales of products of the regions of the Northwest of Russia, % of the total



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

to the national market, although this direction occupies 22 and 25% respectively in the structure of their implementation. One of the reasons that the Murmansk Oblast appears to be the least active participant in trade on the national market in the macroregion is a combination of the nature of its involvement in production processes (interaction within the macroregion and export activities) and remote geographical location. From the point of view of the importance of the national market for the economy of the region, the Kaliningrad Oblast stands out among other territories of the Northwest of Russia by the fact that in the structure of its implementation, the national market accounts for more than half. The Vologda Oblast, which is next in importance, has a volume of supplies to the national market that exceeded sales on the local market (for the rest of the regions, the local market is the largest).

#### Foreign markets

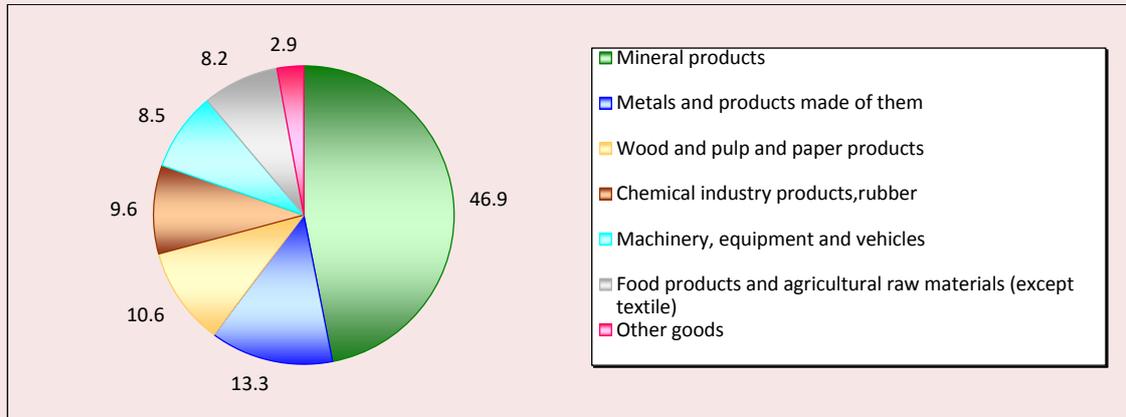
The foreign direction of product sales is one of the most significant for the regions of the Northwest. At the same time, despite the fuel and energy specialization, the industry structure of supplies is quite diversified: the key export goods

are mineral products, almost entirely represented by hydrocarbons (46.9%; *Fig. 10*), the next most important are metal and products made from it (13.3%), wood and pulp and paper products (10.6%), chemical industry products (9.6%), as well as machinery, equipment and vehicles (8.5%).

Almost a third of the macroregion's total exports come from the Leningrad Oblast, whose key commodities are hydrocarbons (58% of total exports) and chemical industry products (36%). Another 21% of the total exports of the Northwest of Russia comes from the Vologda Oblast (*Fig. 11*), specializing in the production of rolled metal and chemical fertilizers (49 and 36% respectively).

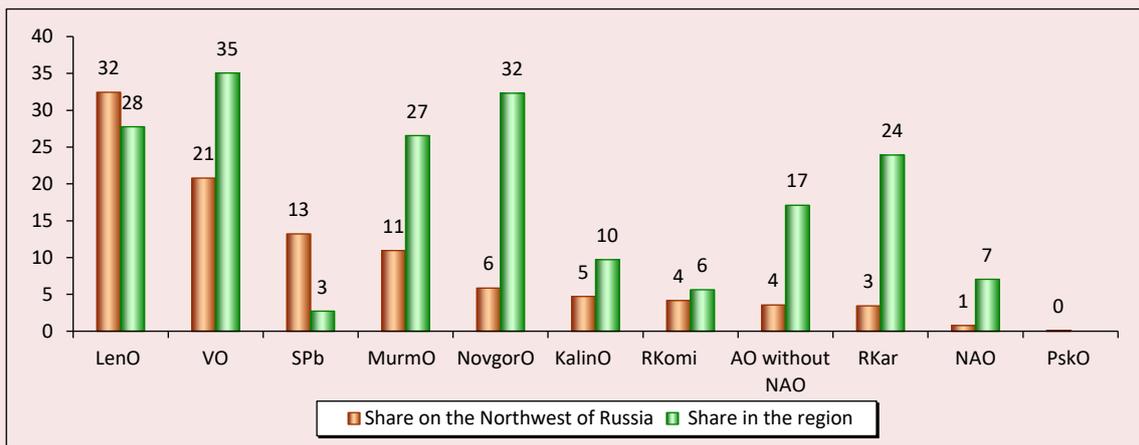
The export flow from the Northwest of Russia is largely formed by Saint Petersburg (also specializing in hydrocarbons and mechanical engineering, 63 and 14%, respectively) and the Murmansk Oblast (acting as a supplier of metal and mineral goods, 59 and 22%, respectively). Their share totals another 24%. Export plays the most important role for the Vologda Oblast, for which the share in the sale of products produced in the Northwest in foreign markets is 35%. The Novgorod Oblast and the

Figure 10. The share of commodity groups in the total exports of the Northwest of Russia, %



Source: compiled on the basis of statistics of the Northwest Customs Administration.

Figure 11. The share of foreign market markets in the total sales of products of the regions of the Northwest of Russia, %



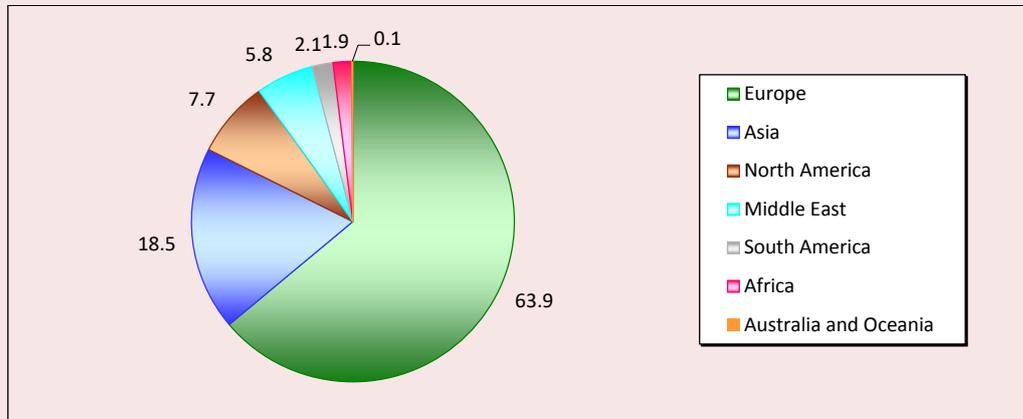
Source: compiled on the basis of statistics of the Northwest Customs Administration and materials of the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: <http://sophist.hse.ru/rosstat.shtml>

Republic of Karelia are clearly export-oriented (the share of foreign markets in the structure of their supplies is 32 and 24% respectively). It is noteworthy that for the exclave Kaliningrad Oblast, foreign markets have only limited significance. An interesting point is the extremely low share of exports (3%) in the sales channels of the border Pskov Oblast (1.1%) and in those of Saint Petersburg, which produces almost a third of the products of the Northwest of Russia.

The largest volume of supplies from the Northwest of Russia falls on European markets (63.9%), another 18.5% goes to Asian markets (Fig. 12).

The Kaliningrad Oblast has a slightly different supply structure, with 17% of its exports going to African countries. The Murmansk Oblast is almost entirely aimed at European markets, and in the export structure of the Novgorod Oblast, Asia occupies 35%, Europe 30%, and North and South America 15% each.

Figure 12. Geographical structure of foreign markets for the sale of products and services of the Northwestern regions, %



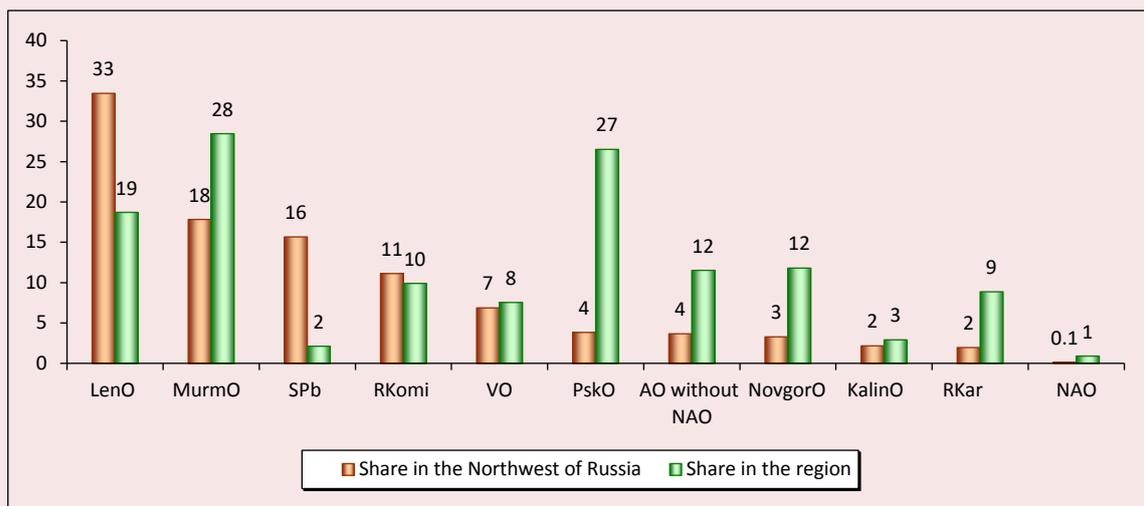
Source: compiled on the basis of statistics of the Northwestern Customs Administration. Available at: <http://sophist.hse.ru/rosstat.shtml>

### Macroregional market

Mutual supplies between the regions of the Northwest of Russia account for only 7.3% of the output produced within the macroregion (Tab. 2). The Leningrad Oblast generates the bulk of supplies

to the macroregional market (33.4%). Another 44.6% are formed by three regions: the Murmansk Oblast, Saint Petersburg and the Komi Republic (17.8, 15.7 and 11.1% respectively; Fig. 13). Other regions account for another 18%.

Figure 13. The share in the output of goods and services sold on the macroregional market in the context of regions of the Northwest of Russia



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

In general, for most of the constituent entities of the Northwest of Russia, the macroregional market is an insignificant driver of development, since it provides a small part of the sale of products created within their borders. Among the regions for which the macroregional market is significant, it is possible to note the border Pskov Oblast. The Murmansk Oblast appears to be the most market-oriented in the Northwest of Russia, and the Komi Republic, which supplies raw materials for key industries of the Vologda Oblast, also stands out against the general background. It is worth noting the Kaliningrad Oblast and Nenets Autonomous Okrug, which almost do not interact with the macroregional market, preferring the country's domestic market.

#### Economic interactions of the Northwestern regions

The mutual supplies of the regions of the Northwest of Russia are presented in *Table 6* and in *Figure 14*. The pole of the macroregional market is the trade turnover between Saint Petersburg, the Komi Republic, the Leningrad and Vologda oblasts. These territories account for 84.3% of the value volume of mutual trade of the regions of the Northwest of Russia.

The key role in the macroregion belongs to the trade of Saint Petersburg and the Leningrad Oblast, the turnover between which accounts for 60.2% of the total turnover within the subregion and 7.1% of the output of the regions of the Northwest of Russia (see Fig. 13). The main part of bilateral trade consists of deliveries to Saint Petersburg.

A significant share of exports is represented by supplies of iron ore (Komi Republic and the Murmansk Oblast) and coal (Komi Republic). Most of them are sent to the Vologda Oblast, where then, as part of the production process of PAO Severstal, rolled metal is produced; its largest buyer in the macroregion is Saint Petersburg.

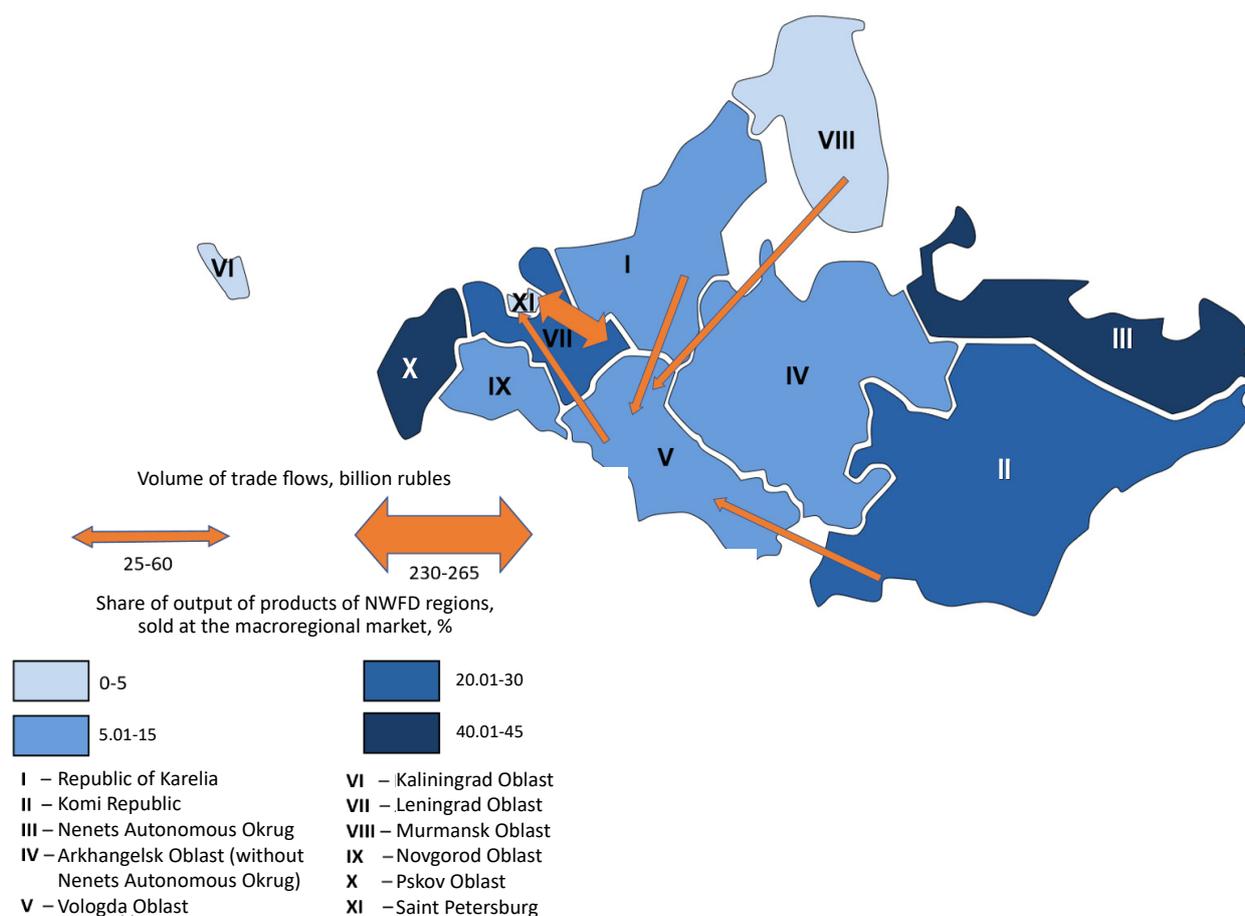
The analysis of the mutual trade of the regions of the Northwest of Russia confirms the assumption of the heterogeneity of its economic system, its differentiation in terms of the participation of constituent entities of the macroregion in interregional trade. At the same time, the existing economic ties of small economically wealthy and some highly specialized regions need to be supplemented within the framework of the integrated development of the Russian space (Mikheeva, 2018).

Table 6. Matrix of trade flows in the macroregional market of the Northwest of Russia, billion rubles

Region	RKar	RKomi	NAO	AO without NAO	VO	KalinO	LenO	MurmO	NovgO	PskO	SPb	Northwest of Russia
RKar		1.9	–	0.3	1.4	0.0	2.4	6.4	0.2	0.1	3.0	15.6
RKomi	0.3		0.4	0.5	0.5	0.0	0.4	0.0	0.0	0.0	2.8	5.0
NAO	–	0.0		0.0	0.0	0.0	0.0	–	0.0	0.0	0.0	0.1
AO without NAO	0.4	5.0	–		2.5	0.0	0.8	0.2	0.3	0.0	7.6	16.8
VO	56.3	47.6	–	0.4		0.1	1.9	49.6	0.7	0.0	4.4	160.9
KalinO	0.0	0.3	–	0.1	0.2		4.7	0.7	0.7	0.4	2.8	9.9
LenO	5.6	6.5	–	6.7	8.1	0.6		0.1	5.1	0.9	20.8	54.4
MurmO	1.0	2.0	0.9	1.3	0.5	0.5	5.6		0.9	0.1	2.1	14.6
NovgO	0.2	0.6	–	0.6	0.4	0.2	12.7	0.4		0.8	3.2	19.2
PskO	0.1	0.5	–	0.0	0.1	0.0	9.9	0.0	1.7		1.4	13.7
SPb	2.0	11.3	–	4.2	24.6	9.4	193.6	0.6	6.0	11.9		263.6
Northwest of Russia	65.9	75.7	1.3	14.1	38.3	10.9	232.0	57.9	15.6	14.1	48.0	573.8

Note: lines denote import of the corresponding RF constituent entity; columns – export of the corresponding RF constituent entity.  
Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics.  
Available at: <http://sophist.hse.ru/rosstat.shtml>; regional fuel and energy balances and reports of major companies.

Figure 14. Distribution of the regions of the Northwest of Russia by the role of the macroregional market



Source: compiled on the basis of materials from the Unified Archive of Economic and Sociological Data of the Higher School of Economics. Available at: <http://sophist.hse.ru/rosstat.shtml>; regional fuel and energy balances and reports of major companies.

## Conclusion

Summarizing the analysis of the role of various markets for the functioning of the economies of the regions of the Northwest of Russia, on the one hand, and the role of regional economies in the functioning of the macroregional market, on the other hand, we can point out the following.

1) The most important for the functioning of regional economies are local and national markets, the supply and sale of products and services on the national market has a significant impact on the maximum number of regions. The high level of territorial specialization of the regions of the Northwest of Russia in the production of intermediate products complements the development potential of intra-country VCs.

2) The macroregional market occupies the smallest share in the total volume of supplies, which indicates the weak connectivity of the regions within its borders. The Northwest of Russia uses the potential of internal cooperation only to a small extent, being to a greater extent an array of multidirectionally oriented market zones; their pole is Saint Petersburg and also a number of short VCs that are often export-oriented.

3) The potential of integration of the regions of the Northwest of Russia is strengthened by largely coinciding export channels. The largest share of exported products is absorbed by European and Asian markets. At the same time, supplies to foreign markets should not be exceptional, since the income received from the sale of primary raw

materials and semi-finished products (key goods of both the Northwest and Russia as a whole) through distribution mechanisms first become the income of business and the population (government orders, salaries, pensions, transfer payments, etc.), after which they are exchanged for foreign products, becoming the income of foreign capital. An integral tool for solving this problem, in our opinion, is the development of macroregional VCs as a form of production links that has an advantage proceeding from the reduction in transport costs.

4) The more significant role of external sales markets relative to the region is partly determined not only by its specialization in export supplies, but also by the diversification of its economic system, an example of which is the Leningrad Oblast, whose production is most diversified compared to other regions of the Northwest of Russia.

Thus, the analysis has revealed that, in general, in the Northwest of Russia, local and national markets prevail over foreign and macroregional ones, and interterritorial interaction remains fragmented.

At the same time, the federal state policy on the development of VCs within macroregions remains largely nominal. As an example, we note that,

according to the established action plan for the implementation of investment projects implemented as part of the integrated investment project “Yeniseyskaya Sibir”<sup>12</sup>, by December 2019, the strategy for the socio-economic development of the Angara-Yenisey macroregion was to be approved, but at the beginning of 2022 it still remains at the stage of development.

The novelty of the research, which determines its contribution to the development of science, lies in the identification of modern patterns in the functioning of Russian VCs based on a quantitative assessment of the sales markets of the regions of the Russian Northwest. The materials of the article can be useful for decision makers in justifying economic policy at the regional level. In future works, it is planned to develop research on designing methodological tools for managing the transformation of intra-country VCs and calculating the socio-economic effects of their development. It is important to take into account the sectoral specialization of the regions in the existing national VCs, as well as the development of public policy directions for their extension based on foresight research of production and distribution chains of industrialized countries.

## References

- Arita T., Fujita M., Kameyama Y. (2006). Effects of regional cooperation among small and medium-sized firms on their growth in Japanese industrial clusters. *Review of Urban & Regional Development Studies*, 18, 209–228. DOI: 10.1111/j.1467-940X.2006.00122.x (accessed: February 2021).
- Arndt S.W. (2008). Production networks and the open macroeconomy. *The Singapore Economic Review*, 53(03), 509–521. DOI: 10.1142/S0217590808003075 (accessed: February 2021).
- Belousova A.V. (2012). The inter-regional cooperation: The impact on the regional economy (Khabarovsk Krai). *Prostranstvennaya ekonomika=Spatial Economics*, 4, 127–137. DOI: 10.14530/se.2012.4.127-137 (in Russian).
- Beviá C., Corchón L.C. (2009). Cooperative production and efficiency. *Mathematical Social Sciences*, 57(2), 143–154. DOI: 10.1016/j.mathsocsci.2008.09.006 (accessed: February 2021).
- Chaikovskii N.G. (2008). Interregional trade as a factor of economic development of the region. *Vestnik Orenburgskogo gosudarstvennogo universiteta=Vestnik of Orenburg State University*, 2(81), 47–53 (in Russian).
- De P. (2014). Strengthening regional trade and production networks through transport connectivity in South and South-West Asia. *South and South-West Asia Development Papers*, 14(1), 35.

<sup>12</sup> RF Government Resolution 571-r, dated March 29, 2019.

- E.V. Lukin, T.S. Anosova, A.E. Mel'nikov, M.A. Sidorov. (2020). Experience in agent-based modeling of interregional value chains. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz*=*Economic and Social Changes: Facts, Trends, Forecast*, 13(6), 101–116. DOI: 10.15838/esc.2020.6.72.6 (in Russian).
- Eriksson S. (2011). Globalisation and changes of aircraft manufacturing production/supply-chains – the case of China. *International Journal of Logistics Economics and Globalisation*, 3(1), 70–83.
- Fujita M., Krugman P., Venables A.J. (1999). The spatial economy: Cities, regions and international trade. *The MIT Press*, 367.
- Gereffi G. (1994). The organization of buyer-driven global commodity chains: How US retailers shape overseas production networks. In: Gereffi G., Korzeniewicz M. (Eds.). *Commodity Chains and Global Capitalism*. Westport, CT: Praeger.
- Gereffi G., Fernandez-Stark K. (2011). Global value chain analysis: A primer. *Center of Globalization, Governance & Competitiveness*. Duke University, 40.
- Gereffi G., Humphrey J., Sturgeon T. (2005). The governance of global value chains. *Review of International Political Economy*, 12(1), 78–104.
- Gibbon P. (2001). Upgrading primary production: A global commodity chain approach. *World Development*, 29(2), 345–363.
- Han W., Wang J. (2015). The impact of cooperation mechanism on the chaotic behaviours in nonlinear supply chains. *European Journal of Industrial Engineering*, 9(5), 595–612. DOI: 10.1504/EJIE.2015.071773 (accessed: February 2021).
- Joudeh S. (2018). Global value chain participation and prospects for local upgrading in the Egyptian-Chinese economic and trade cooperation zone. *Economic Research Forum*, 1278, 25.
- Kaplinsky R. (2013). *Global Value Chains: Where They Came From, Where They Are Going and Why This Is Important*. IKD Working Paper No. 68. Milton Keynes, UK: The Open University.
- Kashbraziev R.V. (2014). The impact of international cooperation on the national economy. *Finansy: teoriya i praktika*=*Finance: Theory and Practice*, 2, 79–92 (in Russian).
- Kotov A.V. (2021). The territory requires coherent work: The role of interregional interactions in economic recovery (to the 100th anniversary of I.G. Aleksandrov's work 'Economic Regionalization of Russia'). *Prostranstvennaya ekonomika*=*Spatial Economics*, 17(1), 18–34. DOI: 10.14530/se.2021.1.018-034 (in Russian).
- Krugman P., Obstfeld M. (2005). *Mezhdunarodnaya ekonomika* [International Economics: Theory and Policy]. Saint Petersburg: Piter.
- Krugman P., Venables A. (1995). Globalization and the inequality of nations. *Quarterly Journal of Economics*, 110, 857–880.
- Krugman P., Wells R. (2006). *Economics*. Worth Publishers.
- Li J., Ku Y., Yu Y., Liu C., Zhou Y. (2020). Optimizing production of new energy vehicles with across-chain cooperation under China's dual credit policy. *Energy*, 194. DOI: 10.1016/j.energy.2019.116832 (accessed: February 2021).
- Liu Z., Yang D., Wen T. (2019). Agricultural production mode transformation and production efficiency: A labor division and cooperation lens. *China Agricultural Economic Review*, 11(1), 160–179. DOI: 10.1108/CAER-07-2017-0129 (accessed: February 2021).
- Lösch A. (1959). *Geograficheskoe razmeshchenie khozyaistva* [The Economics of Location]. Moscow: Inostrannaya literatura.
- Lukin E.V. (2013). Interregional interactions in the system of economic development of regions: Theoretical and practical approaches. *Voprosy territorial'nogo razvitiya*=*Territorial Development Issues*, 5(5). Available at: <http://vtr.vscs.ac.ru/article/1333> (accessed: January 2022; in Russian).
- Lukin E.V. (2019). Sectoral and territorial specifics of value-added chains in Russia: The input-output approach. *Ekonomicheskie i sotsial'nye peremeny: fakty, tendentsii, prognoz*=*Economic and Social Changes: Facts, Trends, Forecast*, 12(6), 129–149. DOI: 10.15838/esc.2019.6.66.7 (in Russian).

- Lukin E.V. (2021). The ferrous metallurgy of the North-West of Russia: Trends and development problems. *EKO=ECO*, 10, 110–131 (in Russian).
- Mau V.A. (2021). Coronavirus pandemic and trends of economic policy. *Voprosy ekonomiki*, 3, 5–30. DOI: 10.32609/0042-8736-2021-3-5-30 (in Russian).
- Mikheeva N.N. (2018). Long-term forecasts of regional development: Analysis of results and problems of development. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 5(170), 24–38 (in Russian).
- Minakir P.A. (2015). Spatial interdisciplinary synthesis: Experience of policy studies. *Regional Research of Russia*, 5(4), 299–309.
- Minakir P.A., Isaev A.G., Dem'yanenko A.N., Prokapalo O.M. (2020). Economic macroregions: An integration phenomenon or a political geographic rationale? Far Eastern Russia case. *Prostranstvennaya ekonomika=Spatial Economics*, 16(1), 66–99. DOI: 10.14530/se.2020.1.066-099 (in Russian).
- Naumenko E.N. (2006). On interregional commodity exchange and competitiveness of Altai Krai. *Polzunovskii vestnik*, 4-1, 296–302 (in Russian).
- Okten A., Sengezer B., Camlibel N., Evren Y. (1998). Spatial implications of the organization of production in the automotive industry in Turkey. *38th Congress of the European Regional Science Association*: 28 August – 1 September. Vienna. Available at: <http://www-sre.wu.ac.at/ersa/ersaconfs/ersa98/papers/430.pdf> (accessed: February 2021).
- Ovchinnikova T.I., Bulgakova I.N., Markov A.V. (2016). The role of outsourcing in the mechanism of economic security activities of cluster formations. *Vestnik VGUIT=Proceedings of the Voronezh State University of Engineering Technologies*, 4, 274–279. DOI: 10.20914/2310-1202-2016-4-274-279 (in Russian).
- Pilipenko V.I. (2005). *Konkurentosposobnost' stran i regionov v mirovom khozyaistve. Teoriya, opyt malykh stran Zapadnoi i Severnoi Evropy* [Competitiveness of Countries and Regions in the World Economy. Theory, Experience of Small Countries of Western and Northern Europe]. Moscow: Oikumena.
- Pleshchenko V. (2019). Prospects and limits of shared economics principles application at steel industry plants in the context of digitalization. *Chernaya metallurgiya. Byulleten' nauchno-tekhnicheskoi i ekonomicheskoi informatsii=Ferrous Metallurgy. Bulletin of Scientific, Technical and Economic Information*, 75(6), 741–747 (in Russian).
- Porter M. (2016). *Mezhdunarodnaya konkurentsia. Konkurentnye preimushchestva stran* [The Competitive Advantage of Nations]. Moscow: Al'pina.
- Rostanets V.G., Topilin A.V. (2019). Ways of formation of economic mechanisms and organizational structures of managing the development of macroregions. *Vestnik Rossiiskogo novogo universiteta. Seriya: chelovek i obshchestvo=Vestnik of Russian New University. Series: Human and Society*, 3, 3–14 (in Russian).
- Safronova I.A. (2016). The value chains of high-technology products as factor of formation of the regional comprehensive economic partnership. *Vestnik MGIMO-Universiteta=MGIMO Review of International Relations*, 51(6), 125–135 (in Russian).
- Savel'ev Yu.V. (2010). Theoretical foundations of modern interregional competition. *Zhurnal ekonomicheskoi teorii*, 2, 86–98 (in Russian).
- Sayapova A.R. (2018). Quantitative parameters of global value chains in macrostructural forecasting. *Problemy prognozirovaniya=Studies on Russian Economic Development*, 6, 31–61 (in Russian).
- Shniper R.I., Novoselov A.S. (1993). *Regional'nye problemy ryknovedeniya* [Regional Problems of Market Studies]. Novosibirsk: Nauka.
- Skopina I.V., Skopin A.O. (2007). Integrated development of regional industrial cooperation and cluster projects. *Regional'naya ekonomika i upravlenie=Regional Economics and Management: Electronic Scientific Journal*, 1(9). Available at: <https://eee-region.ru/article/901> (in Russian).
- Sopilko N.Yu. (2015). The contradictions in the development of international industrial relations. *Kontury global'nykh transformatsii: politika, ekonomika, pravo=Outlines of Global Transformations: Politics, Economics, Law*, 8(5), 58–67 (in Russian).

- Walker G. (1994). Asset choice and supplier performance in two organizations – US and Japanese. *Organization Science*, 5(4), 583–593. DOI: 10.1287/orsc.5.4.583 (accessed: February 2021).
- Xu X., He P., Xu H., Zhang Q. (2017). Supply chain coordination with green technology under cap-and-trade regulation. *International Journal of Production Economics*, 183(B), 433–442. DOI: 10.1016/j.ijpe.2016.08.029 (accessed: February 2021).
- Yeung H.W. (2009). Regional development and the competitive dynamics of global production networks: An East Asian perspective. *Regional Studies*, 43(3), 32–51.
- Zhang W., Wang M. (2015). Green supply chain management: A new market approach for climate governance. *Chinese Journal of Urban and Environmental Studies*, 03(04). DOI: 10.1142/S2345748115500335 (accessed: February 2021).
- Zhu V. (2020). *China's Dual Circulation Economy*. Available at: [https:// www.institutmontaigne.org/ressources/pdfs/publications/china-trends-7-EN.pdf](https://www.institutmontaigne.org/ressources/pdfs/publications/china-trends-7-EN.pdf) (accessed: February 2021).

### **Information about the Author**

Maksim A. Sidorov – Junior Researcher, Vologda Research Center, Russian Academy of Sciences (56A, Gorky Street, Vologda, 160014, Russian Federation; e-mail: ma.sidorov@mail.ru)

Received March 9, 2022.