

Strategic Priorities for the Russian Seaports Cargo Turnover Structure Development*



**Murad K.
ALIMURADOV**
Lomonosov Moscow State University
Moscow, Russian Federation
e-mail: amkpro5@gmail.com
ORCID: 0000-0001-6512-2613



**Anastasiya S.
GORACHEVA**
TC Miratorg
Moscow, Russian Federation
e-mail: Nastya4985@gmail.com
ORCID: 0000-0001-9061-8805



**Aleksei N.
KURBATSKIY**
The 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

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Abstract. Trends in the world economy and trade, as well as the process of globalization, contribute to the seaports development as a strategic driver of economic growth in many countries. Seaports play a major role in optimizing trade relations; they act as key nodes in global transport chains and serve as connecting elements of the socio-economic systems in many countries. We have identified global, national and regional trends in the development of port facilities, analyzed cargo transshipment in the sea ports that are strategic objects of the state; this determines the need to improve methods and forms of management of their development on the basis of advanced technology. The development of port infrastructure will ensure economic growth both in the regional location and in the country as a whole. It is in the regions that it is necessary to form a competitive environment for economic entities, in particular seaports. Their development should have a positive impact on economic and social aspects: economic growth of territorial entities, market competition, development of innovative technologies and investment inflow. Empirical estimates of the links of neighboring regions economic growth were obtained on the basis of Moran's *I*, as well as from studies on how Russia's export cargo flows through seaports depend on GDP and on the index of industrial production in the period from 2006 to 2018. We analyzed the relationship between cargo turnover and shocks such as the financial and economic crisis of 2008–2009 and the imposition of sanctions, which for obvious reasons increase the observed volatility of international trade and, in particular, cargo volumes in ports. In the conclusion of the article we have formulated strategic priorities for the development of cargo turnover structure in sea ports on the basis of the identified opportunities and the obtained forecasts.

Key words: seaports, maritime transport, cargo flows, cargo turnover structure, strategic priorities, port infrastructure, Moran's *I*, autoregressive model with distributed lag, ex-post analysis, OTSW-analysis, strategizing.

Goal setting and overview of studies

Russia has a long coastline and an advantageous geostrategic location between Europe and Asia. Therefore, its seaports play a major role in the system of factors for the development of the national economic complex and service of foreign trade [1; 2]. Consistent implementation of an economically sound and efficient strategy for the development of the seaports' cargo turnover structure will ensure economic growth both in the regions and in the country. In this regard, investigation of Russian seaports' cargo transshipment processes becomes extremely relevant: reasons for the dynamics of volumes, commodity structure, and the most stable observed trends [3]. One of the relevant tasks is to select and justify strategic priorities for the development of the seaports' cargo turnover structure, implementation of which is secured by available resources and competitive advantages.

Absence of such priorities leads to the situation when the management of the country's port economy is focused on solving accumulated problems, rather than determining long-term development prospects.

Theoretical and methodological basis of the work includes the works of scientists devoted to the analysis of global trade and its prospects, the study of sea transportation and cargo, as well as the theory and methodology of strategizing: V.L. Kvint [4; 5], Yu.A. Shcherbanin [6], V.I. Rusa-kov [7], D.Yu. Golyzhnikova [8], E.N. Smir-nov [9], P.E. Achurra-Gonzalez, P. Angeloudis, N. Goldbeck [10], T. Lakshmanan [11], Z.H. Munim, H. Schramm [12], T.B. Bjorner [13], M. Kulshreshtha и B. Nag [14], D.J. House [15].

We thoroughly discuss economic importance and capabilities of modern seaports, including COVID-19 pandemic, in the article [16]. Due to

rapid changes taking place in the countries' economies, a modern seaport becomes a logistics and industrial hub in complex intertwining global chains. Thus, modern ports should form competitive advantages that ensure their attractiveness for cargo carriers. Justification of relevant strategic priorities will make such ports attractive for investment and allow creating conditions for their infrastructure modernization.

The article [17] studies the factors that contribute to ports becoming more stable. One of the studies' fundamental questions is how to quantify intangible performance indicators of ports. Obviously, there are inputs and outputs that can be measured and evaluated using conventional tools, but many of them are limited to "measurable" data about port management and their operations. In the work [18], these general problems are considered within the framework of this area; a comprehensive scheme for evaluating the ports' efficiency is created on the basis of generalization of various points of view.

The article [19] discusses the evolution of the "seaport" concept, characteristics of services, and socio-economic changes.

To holistically understand the problems related to seaports and their development, it is necessary consider legal peculiarities of regulating this sphere. The problems of harmonization of national and international legal norms, the lack of uniformity in the sources of private international maritime law are discussed in article [20].

They obviously create an additional barrier to increasing cargo flows through seaports. Simultaneously, the author concludes that it is very difficult for many carriers to abandon the Hague-Visby rules, despite their obsolescence, since the mechanisms of relations with the clientele are already established.

The article [21] became one of the first Russian domestic works on similar problems. In it, the interdependence between the level of transport infrastructure development and macroeconomic indicators is studied on the basis of panel data.

The dependence of Russian maritime transport on the growth rates of the global economy and international trade is discussed in the article [22]. Consideration of trends in the development of international maritime transport is necessary for forecasting cargo turnover and the volume of the Russian Federation's port capacity. For example, in 2015, the growth rate of global trade was lower than the growth rate of the global economy, and it reduced the growth rate of international maritime transport. It is noted that the growth rate of cargo turnover of Russian seaports is higher than the global average, and the devaluation of the national currency, sanctions, and import substitution are changing the cargo turnover structure of Russian ports. A significant role of Asian countries in the global trade, according to the author, contributes to the implementation of innovative scenario of the Strategy on the Development of Russian Seaport Infrastructure till 2030.

The article [23] pays special attention to the econometric analysis of cargo transportation using the autoregressive model with a distributed lag and the vector autoregression model. It studies the interrelation between the demand for cargo flows and the macroeconomic situation and estimates the long-term elasticity of the demand for cargo transportation. In the work [24], the authors assess the relationship of export cargo flows of the Russian Federation with macroeconomic indicators, paying special attention to cargo transshipment in domestic ports and ports in neighboring countries.

We provide detailed statistics for redirections of cargo from Ukrainian and Baltic ports to Russian ones. Such sources as "Review of UNCTAD Maritime Transport"¹ and "State of marine basins of Russia"² in the journal "Seaports" ("Morskije porty") review all activity of the Russian port complex.

¹ UNCTAD. *Review of Maritime Transport*. Available at: <http://unctad.org>

² *Seaports*, no. 1 (42) 2006 – no. 10 (182) 2019, information is provided by ZAO "Mortsentr-TEK".

The study of global and national strategic trends in the development of seaports, as well as the analysis of scientific literature, determined the **relevance** of developing an approach to identifying and formulating strategic priorities in the development of the Russian seaports' cargo turnover structure, assessing factors that stimulate the implementation of identified opportunities and limit their potential. Realization of the Russian seaports' strategic potential will ensure the solution of the most important tasks of the national economy: organization of sea cargo transportation in accordance with the modern economy's requirements, introduction of efficient mechanisms for organizing activities of seaports integrated into international transport relations, creation of new high-tech jobs, growth of income, tax revenues, etc.

The purpose of this work is to substantiate strategic priorities for the development of the Russian seaports' structure of cargo turnover. To achieve it, the following **tasks** were solved in accordance with the logic of the study:

- to identify the strategic role of seaports;
- to analyze global strategic trends in the development of the cargo turnover structure of sea transportation and port infrastructure;

- to analyze the state of the Russian maritime infrastructure and the dynamics of the cargo turnover structure of sea transportation through the basins;

- to conduct an econometric analysis of the relationship between the volume of cargo flows in Russia and national macroeconomic indicators;

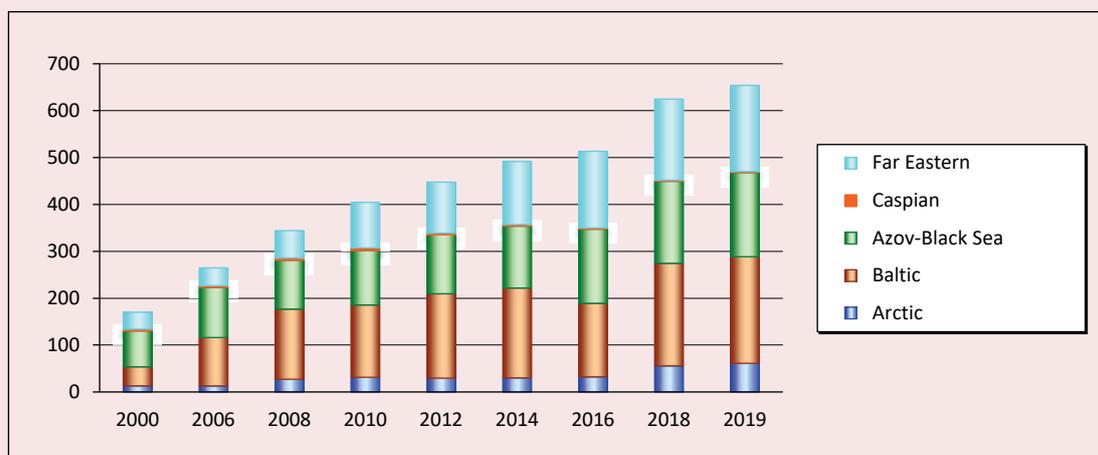
- to substantiate strategic priorities for the development of the Russian seaports' cargo turnover structure, provided with resources and competitive advantages.

The information and empirical basis of the study includes data of the Federal State Statistics Service (Rosstat), World Bank, ZAO "Mortsentr-TEK", UNCTAD conferences, and statistical data of Associations of Commercial Sea Ports (ACSP).

Analysis of the dynamics of maritime transportation

The volume of cargo transportation through seaports increases every year, and such positive dynamics is largely ensured by sustainable development of the port transport infrastructure. The main trend in the development of the seaports' infrastructure is the increase in port capacity and investment in the industry [25]. Several key investment projects are being implemented to

Figure 1. Volume of transshipment of export cargo in Russian sea basins n 2000–2019, mill. tons



Complied according to: data of the journal "Seaports". 2000–2018, information is provided by ZAO "Mortsentr-TEK".

increase the seaports' capacity, which are planned to be completed by 2030 [26].

We would like to start by studying the export cargo flow, since export has always been considered the most popular transportation type. *Figure 1* shows a graph of changes in cargo turnover in the marine basins of Russia in 2000–2019.

These data show a steady increase in cargo turnover across all Russian basins over the past 19 years. It was mostly assured by an increase in transshipment of coal, ore, oil and petroleum products, liquefied gas, wood, cargo in containers and grain. Special attention should be paid to the positive dynamics of the activities of companies engaged in the process of loading and unloading ships. After the USSR collapse, the stevedoring industry became an impetus for the growth of cargo transshipment in Russian seaports. This activity led to an increase in cargo turnover in 1990–2014 by 28%³.

State regulation of the development of Russian seaports in 1990–2020

Various state programs ensuring the improvement of port infrastructure, including increase in port capacity, automation of port activity processes, retraining of personnel of the navy, improvement of port areas and general transport infrastructure, positively affected the growth of cargo transshipment. Obviously, general transport infrastructure acts as a key development driver of cargo transshipment, since 83% of cargo was delivered by pipeline and rail transport in 2018.

The most important element of state regulation is the fact that this issue is included in the Development Strategy of Russia until 2030⁴. It provides information that cargo processing in seaports will grow, and the transport infrastructure will improve, which is related mostly to the development of trade and economic relations

between Russia and far abroad. At the same time, the draft Strategy assumes that the cargo basis of the north-western and southern routes, which is processed in the ports of the Baltic States and Ukraine, will be reoriented to Russian seaports. This will entail the reorientation of port facilities and the improvement of port infrastructure.

The question of the development of seaports has been raised for a long time. As part of the implementation of the federal target program “Revival of the merchant fleet for 1993–2000”, the volume of transshipment of Russian cargo in seaports increased by 56% (from 176.1 million tons in 1993 to 275.1 million tons in 2001), including 82% in Russian ports (from 113.0 to 205.6 million tons).

The subprogram “Sea transport” of the federal target program “Modernization of the transport system of Russia (2002–2010)” set the task of meeting the needs of the Russian economy and foreign trade in the transshipment of export-import, transit and coastal cargo at a high technical, technological, and organizational level in close cooperation with related modes of transport and cargo owners. As a result of the implementation of the proposed measures, modern high-tech mechanized transshipment complexes with a capacity of 317 million tons were introduced in 2002–2009.

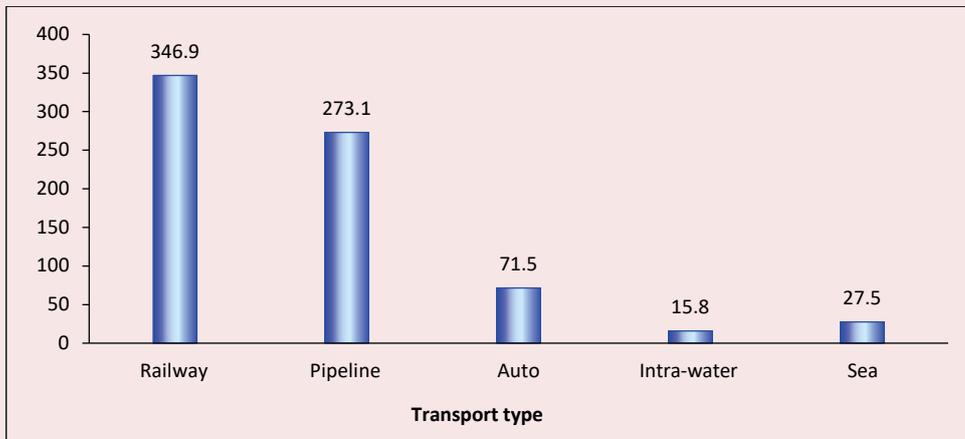
Therefore, in 2011–2018, within the “Sea transport” subprogram of the federal target program “Development of the transport system of Russia for 2010–2020”, port infrastructure development was implemented. To complete the picture, it is appropriate to indicate the distribution of cargo delivery for departure to the seaports of Russia (*Fig. 2*).

The federal project includes a comprehensive plan for the modernization of the primary infrastructure until 2024, which assumes an increase in capacity of the seaports of the Russian Federation for all basins in total to 1.3 billion tons.

³ Statistics. Associations of Commercial Sea Ports. Available at: <http://www.morport.com/rus/content/statistika>

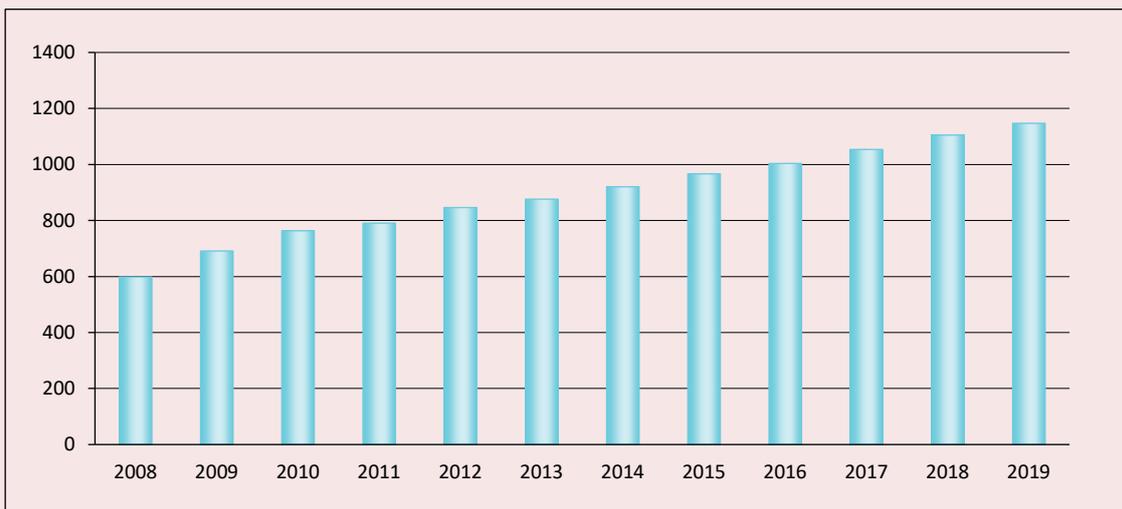
⁴ Federal target program “Development of the transport system of Russia until 2030”.

Figure 2. Cargo delivery (for sea departure) to Russian seaports by various modes of transport, 2019, mill. tons



Complied according to: data of the journal “Seaports”. 2020, information is provided by ZAO “Mortsentr-TEK”.

Figure 3. Capacity of Russian seaports in 2008–2019, mill. tons



Complied according to: data of the journal “Seaports”. 2009–2020, information is provided by ZAO “Mortsentr-TEK”.

Figure 3 shows that several program measures led to a large-scale increase in port capacity: in 2008–2019, the increase amounted to 548.8 million tons.

However, despite the positive dynamics, the level of workload at seaports remains low. According to the results of the Accounting Chamber’s audit,

the level of workload of Russian seaports does not exceed 76% of the design capacity⁵. On this background, the implementation of strategic priorities, aimed at increasing the capacity of seaports, may be ineffective, and therefore it is necessary to solve complex tasks related to the need to form a direct port infrastructure capable of serving

⁵ Report on the results of the control event “Checking the effectiveness of the use of budget allocations aimed at the implementation of investment projects and other measures taken to increase the production capacity of seaports in 2016–2018 and the expired period of 2019”.

the national economy's growing cargo turnover needs and to implement projects to ensure the development of port infrastructure, the construction of approach channels, water areas and berths. All of this requires ensuring the consistency of the national strategy for the development of Russian seaports with the strategies of private investors. So far, in 2016–2019, only 13 of the planned 36 state-owned facilities of the port infrastructure were put into operation.

The development of digitalization processes in seaports is one of the most relevant and significant trends of the last decades. Initial digital technologies were used in the port of Rotterdam back in 1993, when various unmanned means for handling and horizontal transshipment of containers began to be used. This trend also affects the formulations adopted in Russian strategic documents of various levels regulating the development of the country's port economy. The need to adopt strategic priorities for the digitalization of the port economy is mentioned in the Order of the RF President "On national goals and strategic tasks for the development of the Russian Federation until 2024" and in several strategic documents directly regulating the development of the transport sector (for example, in the departmental target program "Digital platform of the transport complex of the Russian Federation"). The analysis of the strategic documents forming the legislative and regulatory basis for the digitalization of the Russian port economy is provided in the article [27].

Digitalization of seaports is a large-scale project that requires the formation of fundamentally new strategic competitive advantages and the introduction of technologies that allow creating digital port counterparts, "smart ports", which will provide an opportunity to continuously monitor movement of ships, state of the port infrastructure and to consider changes in weather conditions, etc. Digitalization of port facilities allows automatic management of loading and

unloading processes, coordination of ship traffic, analysis, and consideration of the busiest points on the port railway when choosing routes, etc. Several digital technologies, such as electronic document management, "single window" principles and mechanisms, container number recognition systems, digital security systems, etc., are already being used in Russian seaports. However, digitalization is still fragmented, and it requires further study and development.

Empirical analysis of the cargo turnover in seaports

Export cargo flows of Russia through seaports are obviously related to the macroeconomic situation. To identify relevant relationships, we will use indicators like Russia's export cargo flows through seaports, GDP, and the industrial production index, taken as a percentage of the previous year, in the period from 2006 to 2019. The growth of the industrial production index should be associated with the volume of export cargo transportation, which, in turn, directly affects the increase in the growth of the country's economic development indicator. At the same time, it is impossible not to consider the impact on economic indicators of such events as the 2008–2009 financial crisis, the sanctions policy after the entry of Crimea into the Russian Federation in 2014, the COVID-19 pandemic.

We used MS Excel, R and IDE RStudio (dynlm, plm, and splm packages) as a software. According to data, given in *Table 1*, a linear regression model is constructed.

The *GDP* variable is the logarithm of GDP growth at current prices, *IPI* is the logarithm of the increase in IPI, *GDP(-1)* and *IPI(-1)* are the corresponding lag values, and the dependent variable is the logarithm of the increase in the volume of cargo transshipment in the basins of Russia. The binary variables *Crisis_08-09* and *Crimea* are also introduced. The rows are checked for stationarity.

Table 1. Statistical data of increases for 2007–2019

Year	Cargo turnover of Russian sea ports	GDP	IPI
2007	-0.133837429	0.235176764	0.004703669
2008	0.984286338	0.241500865	-0.058052434
2009	0.091948966	-0.059830219	-0.112326044
2010	0.059629331	0.193296605	0.201567749
2011	0.018250951	0.301758856	-0.021435228
2012	0.05862584	0.130741094	-0.015238095
2013	0.040564374	0.072912495	-0.02901354
2014	0.085254237	0.082941016	0.012948207
2015	0.057160706	0.050920647	-0.014749263
2016	0.066627271	0.03337154	0.015968064
2017	0.089196676	0.070678826	0.018664047
2018	0.03853001	0.125283828	-0.00192864
2019	0.028651892	0.06194838	-0.001932367

Source: data of the Federal Statistics Service and ZAO "Mortsentr-TEK". Available at: <https://www.gks.ru/accounts>; the journal "Seaports" for 2006–2020. Available at: <http://www.morflot.ru>

The values of correlations by increases turned out to be as follows: $GDP \sim IPI = 0.320$; $IPI \sim$ Cargo turnover volume = -0.255 ; $GDP \sim$ Cargo turnover volume = 0.176 .

The change in the GDP indicator has a positive effect on the volume of cargo transshipment in the same period, and the dependent variable with the IPI have a negative correlation. Consequently, the indicators at the observed stage change in the counterphase. It is not surprising that some factors enter the model with a negative sign.

The best model with the inclusion of binary variables was selected according to information criteria.

The volume of cargo transshipment in Russian basins = $-0.2739 + 2.3446 \times (GDP) - 1.75269 \times (IPI(-1)) - 1.44482 \times (IPI) + 0.18027 \times (Crimea) + 0.30167 \times (Crisis_{08-09})$

The positive values of coefficients for binary variables are explained by the fact that the growth of cargo turnover continued in the corresponding years, although there was a noticeable drop in its rates.

The final model with all significant coefficients took the form:

The volume of cargo transshipment in Russian basins = $-0.04331 + 3.10847 \times (GDP) - 1.58216 \times$

$(GDP(-1)) - 2.87851 \times (IPI(-1)) - 4.63506 \times (IPI)$

In the current situation, considering the specifics of 2020, the coefficient of determination and the intra-sample forecast cannot be measures of the model's quality. The forecast for 2021 should take into account the forecast estimates of relevant indicators. Therefore, an out-of-election forecast was built considering not optimistic forecast values of GDP of 1–2%⁶ and IPI at the level of 2.5–3%. The growth of cargo turnover in 2021, according to the model, should be 1.5–6.9%.

Researchers have been trying to understand and evaluate the relationship between economic growth and transport development for a long time. Yu.A. Shcherbanin notes that some researchers do not see the direct connection, while others think that transport development favors economic growth [28]. The works [28; 29] indicate that it is necessary to consider intra- and non-industry effects while determining the impact of transport on a region's economy, and the authors emphasize two problems: difficulties in determining the latter and aggregation of indicators. The article [30] also mentions the difficulties of assessing the contribution of seaports

⁶ Projections of the CB, MED RF, IMF, OECD, IEC.

Table 2. Moran's I and P-value of Moran's test

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Index	0.026	0.166	0.077	-0.021	0.030	0.172	0.134	0.034	0.183	-0.004	0.033	-0.076

Source: author's calculation are based on data of the Federal State Statistics Service and socio-economic indicators of Russian regions.
Available at: https://rosstat.gov.ru/regional_statistics

to a region's economy. Its author proposes to consider the seaport as a "stimulator of a region's economic growth". Consequently, the assessment of the relationship between regional economic growth is the following task.

To measure the economic development of neighboring regions, let us consider the logarithm of the gross regional product adjusted for purchasing power. The regions are heterogeneous in various indicators, but for natural reasons, development of a region should have a positive impact on its neighbors, thereby contributing to the integral development of the whole country. To prove this, they usually resort to calculating the Moran's I, which acts as a spatial analogue of the correlation coefficient. According to the data of the RF Federal State Statistics Service concerning the socio-economic indicators of 79 regions of Russia, an index was calculated and the Moran test was conducted to identify spatial dependencies. In this case, a normalized boundary weights matrix was used. Below are the values of the Moran's I for the first differences of the variable for each year up to 2018 (*Tab. 2*), which turned out to be positive in most situations.

Moreover, using a randomized cross-dependence test [31], the presence of spatial dependencies was revealed, which indicates the need to take into account spatial lags when modeling and forecasting regions' economic growth. This conclusion is consistent with the assumption that the development of a region entails the development of its neighbors.

It is worth paying attention to the conclusions obtained in [32], where it is noted that the priority issue of the medium-term development of coal ports

in the Far Eastern region is the creation of modern specialized terminals with reliable environmental protection. Meanwhile, ecological deterioration of adjacent territories due to the growth of coal dust and the formation of traffic congestion makes these regions unattractive.

More specific methods and tools for the development of port infrastructure are already proposed by scientists in the article by E.S. Shmeleva [33]. One of the tools that will ensure the increase of seaports' capacity should be the digitalization mentioned above, because currently a lot depends on the introduction of IT systems and their use in strategic and operational planning by personnel, as well as on improving the regulatory framework. The 2020 situation, caused by the COVID-19 epidemic, revealed the need to use digital technologies in most areas of port operation and showed who has already managed to transfer business processes to digital rails. However, in addition to digitalization, infrastructure changes, like transport links to the port and terminal, should help.

To sum up, we can confidently conclude that, despite the aforementioned problems, the development of port infrastructure can act as one of the drivers of the country's economic development, and an increase in cargo turnover should lead to a partial economic recovery.

OTSW analysis

We will conduct the OTSW-analysis (Opportunities, Threats, Strengths и Weaknesses)⁷ to develop a strategy for the development of the infrastructure

⁷ The abbreviation is used in accordance with the V.L. Kvint's methodology.

of Russian seaports. It will allow identifying strategic opportunities and threats, as well as strengths and weaknesses of the development of a strategizing object [34]. Strategic priorities are formulated to implement the opportunities identified in the analysis process, which are provided with resources and competitive advantages. This is what the further analysis in our work is devoted to.

1. Favorable geostrategic location.

One of the basic strategic *opportunities* for the development of port infrastructure in Russia is determined by an advantageous geostrategic location that ensures the intersection of international transport corridors. At the same time, the sanctions, which have been imposed by several states since 2014, entail serious threats to the development of export-import relations between Russia, the United States, and the countries of the European Union.

A strength is the long coastline, which provides access to 13 seas and three oceans, accessibility to logistics corridors, as well as convenient reorientation of cargo. The barriers established between Russia, the EU, and the US have led to the need to review economic relations between Russia and the countries of the Asia-Pacific region and to justify the priorities of this direction of cargo flows. For instance, the development of the domestic ice fleet will allow Russia to use the Northern Sea Route all year round and will provide an opportunity to make fast cargo transportation between the countries. *A weakness* is the fact that not all ports have a favorable location on the coastline, and it is necessary to carry out dredging of water areas, due to the presence of obstacles to the acceptance of multi-tonnage vessels, in some of them.

2. High transit potential.

The second *opportunity* that opens after identifying priorities is a high transit potential. However, the foreign policy situation with the EU and undeveloped ports' infrastructure, located on the main transport corridors, lead to *threats* that

significantly reduce the potential (it is implemented by only 8–12%)⁸. At the same time, Russia's potential for the formation of transport corridors is unique on a global scale, which forms the country's *strengths* in the development of transit cargo transportation. However, due to the lack of modern maritime transport infrastructure facilities, significant investments are needed.

3. High potential of the Northern Sea Route.

The Northern Sea Route with a length of about 5,600 kilometers – from the Kara Gate to Providence Bay – is an example of a corridor that has several advantages for Russia, the EU, and the countries of the Asia-Pacific region. In turn, the development of the port infrastructure of the Northern Sea Route, considering its future integration into the global transport system, requires improvement of the country's transport infrastructure and advancement of customs procedures.

Usage of this potential is the third possibility. With the right approach, it will reduce transport costs and cargo delivery time, which will lead to an increase in competitiveness in the international arena. In [35], several competitive advantages of the Northern Sea Route relative to the Suez Canal were noted.

Negative climate and environmental changes are *a threat* to the implementation of this strategic opportunity. The change of climatic zones and environmental pollution can greatly affect the state of the ice, which does not always provide ships with a fast and unhindered passage.

A strength is the active financing of the Northern Sea Route⁹, since this corridor is of particular interest from domestic and foreign companies. Usage of the potential of the NSR will allow

⁸ Russia's transit potential – new solutions for developing markets. TASS. Russia. 2019. Available at: <https://tass.ru/pmef-2017/articles/4291776>

⁹ Emelianenkov A. Ice has moved. The Northern Sea Route is waiting for cargo. *Rossiyskaya gazeta*. 2019. No. 266 (8024).

Russia to increase competitiveness and create new jobs [36]. *A weakness* is the undeveloped domestic construction of new icebreaker-class vessels.

4. Development of sea terminals for coal transshipment.

Another strategic *opportunity* is the construction of new coal terminals for coal transshipment, the growth of exports, and the high demand for existing coal terminals [37]. Russia is the world's third largest coal exporter. Its exports account for about 210 million tons, the share in world exports is 14%¹⁰. China is the main importer of coal, and the EU also accounts for a large volume of exports. Over the past 10 years, there has been a steady increase in the production and export of Russian coal, and the export rates have exceeded production rates.

However, in late 2018—early 2019, the demand for imported coal in the countries of the Atlantic decreased. *A threat* is also a decrease in demand in the EU countries, which has recently begun to reduce the size of coal generation and follow national restrictions on the volume of emissions of harmful substances.

By analyzing the internal environment, we can identify one of *the strengths that Russia has for implementing* this strategic opportunity. The reorientation of cargo flows to the growing markets of the Asia-Pacific region against the background of the implementation of the Eastern Landfill development program, as well as the construction of new coal terminals in the Far East in the medium-term perspective will lead to a positive result: namely, further growth in coal transportation and transshipment is expected [38]. *A weakness* is the lack of available production capacity in the ports. Insufficient funding for the construction of new coal terminals leads to a slowdown in the pace of coal transshipment.

5. Surplus of terminal capacities in ports of the Baltic basin.

¹⁰ BP Statistical Review of World Energy 2019.

The surplus of terminal capacities in the ports of the Baltic basin becomes a new *opportunity* to increase the container turnover of Russian seaports. In 2018, there was an increase in container cargo for export and import. Export growth was 9.3% and reached 5.1 million TEU, while imports – 9.4%. An indirect *threat* to the use of this opportunity is the reorientation of cargo flows to the Far East, which entails the greatest increase in container turnover in the ports of the Far Eastern basin. This is confirmed by the growth of imports from the countries of the Asia-Pacific region.

The analysis of the internal environment suggests that *a strength* is a possibility of maximum utilization of free port production capacities, which will have a positive impact on the overall economic situation in the country. *A weakness* is an inability to redirect available production capacities of the Baltic Basin to the ports of the Far Eastern basin due to the disagreement of the technological maps of the equipment.

6. Growth of global demand for grain.

The growth of global grain consumption is a strategic *opportunity* to increase the transshipment of this cargo in Russian seaports, as well as an impetus for the growth of production port capacities for grain transshipment. In Russia, since 2014, the grain harvest has been exceeding 100 million tons¹¹. In 2017–2018, the Russian Federation occupied the fifth place in grain production, and the share of its exports was 13%. The main *threat* is a decrease in the volume of grain exports from Russia, as stated in the report prepared by the International Grains Council¹². The reduction of grain production directly depends on weather conditions, and negative climate changes will lead to a decrease in grain reserves [39].

¹¹ Federal State Statistics Service. Available at: https://www.gks.ru/bgd/regl/b15_11/IssWWW.exe/Stg/d02/16-15.htm

¹² International Grains Council. Available at: <https://www.igc.int/en/default.aspx>

A strength is that Russia, according to the federal project “Export of IA products”¹³, should increase grain sales to 11.4 billion dollars by 2024, i.e., 1.5 times more than in 2017. *A weakness* for achieving this opportunity is a small supply of grain, with the help of which it would be possible to regulate the demand for grain crops.

Strategic priorities

The formation of strategic priorities is necessary for the further development of the industry strategy and its successful implementation. They should be secured by competitive advantages that can be divided into three types:

- 1) available competitive advantages;
- 2) competitive advantages that can be created taking into account available investment resources and time required for this;
- 3) lost competitive advantages with the potential for possible restoration.

The first *opportunity* for developing the seaport infrastructure is the favorable geostrategic location of Russia, which allows us to justify *the strategic priority of increasing port capacity and ensuring the effective development of port infrastructure*. We would like to note competitive advantages for the implementation of this priority.

1. *Available competitive advantages*. Russia is attractive for transit vessels due to its long coastline and advantageous strategic location, which allows the country to connect the EU and Asia.

2. *Competitive advantages that can be created* for implementing this priority is the development of transport infrastructure in Russia. Sole development of ports and port-side zones, including an increase in port capacity, will not have a strong impact on the effective development of port infrastructure. It is necessary that the entire transport system works properly, for which it is necessary to have a developed railway and other types of transport provided with modern technologies.

¹³ The federal project “Export of IA products”, dated December 14, 2018.

3. Effective development of the port infrastructure will be achieved with the help of *lost competitive advantages that are possible to restore now*. After the collapse of the USSR, most ports remained in disrepair due to the lack of resources for its restoration. However, current infrastructure development is funded annually, and the time frame allows implementing this priority. It is necessary to start with the justification of a possibility of developing an existing port or building a new one.

The strategic priority for seizing the opportunity to use the potential of the Northern Sea Route is *to ensure safe navigation, functioning of the seaport infrastructure and sea transport*. It becomes crucial since the increased interest of many countries in the Northern Sea Route requires increased security of ports and sea transport.

This strategic priority has the following competitive advantages:

1. *Available competitive advantages*. The Northern Sea Route is a Russian national transport artery, which is provided great attention. Significant funding is directed to the development of the infrastructure of the NSR, as well as ensuring the safety of navigation and the most careful attitude to the fragile ecosystem of the region.

2. *Competitive advantages that can be created* for this priority is the necessity to increase control and safety of vessels which use the SNR for transit.

3. *Lost competitive advantage* is that after the collapse of the USSR, many ports were transferred to neighboring countries, and there was a great personnel leak. Special attention has been paid to special training of navy personnel only since 2012.

The third strategic *opportunity* is the construction of new coal transshipment terminals. Currently, there is an increase in exports, as well as a high demand for existing coal terminals in Russia. *There is a need to adopt the next strategic priority – modernization and construction of new coal terminals*. Over the past few years, there has been a positive trend in the growth of coal production and

consumption: for instance, in 2018, the growth in its export volumes amounted to 10%¹⁴.

We will consider the competitive advantages for the implementation of this strategic priority in more detail:

1. The total volume of coal transshipment in the seaports of the Russian Federation increased from 154.6 million tons in 2017 to 161.4 million tons in 2018¹⁵. The main drivers of growth were the export orientation of the domestic coal industry and a recent stable increase in production volumes. The main volume of exports goes to China and Mexico, the rest – to the US and the EU.

2. *There are competitive advantages that can be created* for this strategic priority. The share of coal transshipment volume in seaports in 2018 was 42%. The growth of the indicator was recorded for the first time, indicating that the production facilities are overflowing, and the existing coal terminals are fully in demand. In the period up to 2030, it is expected to build new coal transshipment terminals in the Far Eastern basin, since the main volume of exports is carried out through its ports. To create this competitive advantage, several investment projects have been accepted for implementation.

3. There are no *lost competitive advantages* in this strategic priority, since all port terminals were restored in 2012–2016.

The growth of global grain consumption is a strategic *opportunity* to increase the transshipment of this cargo in Russian seaports. *A strategic priority is the modernization and increase of port capacities in port terminals for transshipment and processing of grain.*

Competitive advantages for the implementation of this strategic priority are:

1. *Available competitive advantages* of the modernization and increase of port capacities are

¹⁴ Overview of the cargo transportation industry in Russia. *E&Y*. 2019. Available at: [https://www.ey.com/Publication/vwLUAssets/ey-transportation-services-2019-rus/\\$FILE/ey-transportation-services-2019-rus.pdf](https://www.ey.com/Publication/vwLUAssets/ey-transportation-services-2019-rus/$FILE/ey-transportation-services-2019-rus.pdf)

¹⁵ Sea ports, 2019, no. 6 (178). Information is provided by ZAO “Mortsentr-TEK”.

due to the high growth rates of the grain harvest in Russia. The total volume of grain transshipment has significantly increased: from 47.9 million tons in 2017 to 55.7 million tons in 2018. The growth of the indicator by 16.3% indicates that this strategic priority cannot be abandoned, since the improvement of the port infrastructure, among other things, will lead to a cumulative increase in exports.

2. The development of grain exports is much faster than the expansion of their transshipment capacities. Therefore, several investment projects have been adopted concerning the construction of new grain transshipment terminals. The main construction will take place in the Azov-Black Sea basin, where the bulk of grain cargo transshipment is carried out. This strategic priority is supported by *competitive advantages that can be created*.

3. In the context of sea basins, more than 95% of grain loading volumes are carried out through the seaports of the Azov-Black Sea basin, among which the port of Novorossiysk is the largest in terms of volumes. The main investment resources will inevitably be directed there, even though the production facilities are already outdated and need to be modernized. In this regard, this strategic priority has *competitive advantages that can be restored*.

Conclusion

The analysis of transshipment of cargo flows across the basins clearly indicates a trend of direction changes. For instance, a large-scale development of transport infrastructure has begun in the area of ports and border crossings of the Far East, due to the fact that the economic sanctions imposed on Russia by the European Union and the United States lead to the need to reorient the cargo base to other countries.

The financial and economic crisis of 2008–2009, the sanctions policy, and the COVID-19 pandemic together with growing international trade disputes increase uncertainty and negatively affect, among other things, port cargo flows. Countries

are recovering from economic crises with a wariness toward supposed benefits of free trade and globalization.

At the time of writing, the COVID-19 pandemic had a serious impact on economic activity in the world and in seaports. Moreover, there is a moderate or strong decrease in cargo volumes and ship calls at ports around the world, as well as a general decrease in the level of activity in logistics and industrial clusters in and around ports. Despite this, for Russia, the decline in cargo turnover in seaports in 2020 should be replaced by a 1.5–6.9% increase in 2021. The forecast was based on a model with a distributed lag and considering various forecast values of GDP growth and IPI. The country and its regions' economic recovery can be significantly supported by the development of seaports,

because the spatial relationship of the economic development of the regions is confirmed by the Moran's I. A detailed analysis of cargo turnover in each of the basins allowed us to identify competitive advantages for strategic priorities.

A detailed analysis of cargo turnover in each of the basins made it possible to identify competitive advantages for strategic priorities.

1. The potential to increase port capacity and ensure the efficient development of port infrastructure.
2. Provision of safe navigation, functioning of the seaport infrastructure and sea transport.
3. Modernization and construction of new coal terminals.
4. Modernization and increase of port capacities in port terminals for grain transshipment and processing.

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Information about the Authors

Murad K. Alimuradov – Candidate of Sciences (Economics), Associated Professor, Lomonosov Moscow State University (1, building 61, Leninskie Gory Street, Moscow, 119234, Russian Federation; e-mail: amkpro5@gmail.com)

Anastasiya S. Goryacheva – Leading Specialist, TC Miratorg (17–19, Prechistenskaya Embankment, Moscow, 119034, Russian Federation; e-mail: nastya4985@gmail.com)

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

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