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PORTS OF EASTERN BALTIC AND RUSSIAN TRANSIT POLICY: COMPETITION AND COOPERATION

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The ports of the Baltic states have been handling Russian cargoes for many years. Thus, there is no apparent need for Russia to reroute all freight flows to domestic ports. It was not long ago that Eastern Baltic ports were regarded as ordinary competitors, however, the current geopolitical situation has drastically reshaped the framework for transport cooperation in the region. Competition and cooperation strategies are often equally viable for the ports in the Eastern Baltic Sea. Yet volatility in global markets, the unstable positions of leading exporters and importers, and changes in the economic and political environment call for new strategies and forms of interaction. This study aims to understand to what extent port authorities in the Eastern Baltic can combine competition and cooperation policies when formulating their vision and handling transit cargoes. The article draws on official statistics and Russian and international publications on the theory and practice of transport routing and the functioning of hub infrastructure. The study applies the methods of case study and statistical and comparative analysis to outline the current situation in the Eastern Baltic ports and their potential to attract more freight flows from Russia. The article tests the hypothesis that Eastern Baltic port authorities should pursue a co-opetition strategy. The study concludes that, in the immediate future, this strategy can be employed only in cases of extraordinary circumstances, for example, at peak loads.

Keywords:
co-opetition, competition, cooperation, seaports, Baltic Sea region

Introduction

Being a key link in the transport system, port activities are strategically important for the state. With the world's longest sea coastline, Russia has clear advantages in facilitating foreign trade transportation and ensuring its transit policy. At the same time, the openness of the economy, active cooperation with other countries, as well as independent logistics strategies of business structures contribute to the formation of shipping routes going through the ports of neighbouring countries.

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In such a situation, the seaports of the Eastern Baltic openly compete for freight from both domestic and international shippers. The academic literature widely discusses the prospects for Asian transit (see, for example, [1]). Kholopov and Rarovsky [2, p. 63] study the competitive routes for Asia-Europe transit container shipping through the territory of Russia. In the media, there are also proposals for establishing cooperation between the ports. For instance, the governor of the Krasnodar Territory proposes to join the efforts of the three ports located in the region (Novorossiysk, Tuapse and Taman). In his opinion, this cooperation will result in a 30% increase in the ports' capacity [3].

However, sometimes, for various reasons, ports cease the handling of all or some cargo type, which gives other ports the opportunity to receive these flows. The port business found itself in such a situation in December 2019, when the Office of Foreign Assets Control of the US Treasury (OFAC) based on the Magnitsky Act imposed sanctions against the Mayor of Ventspils Lembergs and four related industry associations on December 9, 2019.[1] The Latvian Parliament amended the laws to transfer the ports of Ventspils and Riga to the jurisdiction of the state. Based on this, the government of the country established the Ventas osta company. On December 18, 2019, after Lembergs resigned from the board of the port, the OFAC announced the lifting of the sanctions [4]. Despite the period of sanctions being brief, shippers suffered losses. The other major ports of Latvia, Liepaja and Riga, due to their specialization, were not able to redistribute the flows and fulfil the obligations of the port of Ventspils.

This shows that the market situation may require constructive cooperation from usual rivals. The restrictions imposed on the port of Ventspils did not last long. However, under other circumstances, in particular, in favourable market conditions, the leading ports of the region may be interested in redistributing the increased flow of cargo.

The syncretism of competition and cooperation in the relationship among the ports of the Eastern Baltic finds quite logical explanations in the academic literature. The ideas of a possible combination of conflicting relations, or a strategy of co-opetition, which emerged half a century ago and found reflection in interdisciplinary studies, explain the behaviour of economic entities in a difficult economic and geopolitical environment subject to a series of global and regional crises.

This study aims to assess the viability of a co-opetition strategy adoption by the management of the main ports of the Eastern Baltic region in the context of the Russian Federation' new transit policy development. The article tests the following hypothesis: the cooperation of ports for some freights with simultaneous competition for others is far more beneficial for the Eastern Baltic ports than a purely cooperative or competitive strategy. To achieve this goal, the article defines the current status and possible prospects for the development of the ports in this region.

The article contains five sections. The Introduction shows the relevance of the research, defines the goal and formulates the hypothesis. The Literature review

[1] Ventspils Free Port Authority, Ventspils Development Agency, Business Development Association and Latvian Transit Business Association.

aims at revealing the essence and basic postulates of the theory of co-opetition. The Data and Methods section contains a description of the data used, a general description of the major ports in the region and the rationale for the research methods used. The Empirical analysis part is devoted to the statistical analysis of port activities in the region in 2010—2019. The final section contains the main conclusions of the article.

Literature review

Russian and international academic and industry publications on the activities of ports as economic entities mainly focus on technical and operational issues. For instance, articles indicate that the loading of seaports is determined in most cases by the choice of shippers or specialized operators in the case of multi-modal or inter-modal transport. Modern researchers show that a combination of factors influences the choice of the scheme of delivery of foreign trade cargo in mixed traffic. These include the volume of traffic, distance, the cost of transportation, the throughput of main routes and port facilities, navigation time, depth of fairways at the approaches to ports, forms of payment of freight charges, amount of customs and other fees in seaports. The customs and certification procedures and their duration, the way local tax authorities interpret the provisions and instructions of public services are often taken into account [5]. Optimization of the interaction processes between the subjects of the transport system creates additional prospects for reducing costs in the formation of material freight flows [6]. Zhang and Lam's idea is of certain interest. They applied the Lotka-Volterra model to study the evolution of marine clusters [7]. Jung et al. and Lee et al. recognized the essential role of ports in cargo routing [8; 9]. The Chinese scientific school provides detailed studies on the issues around the competition between ports and their capabilities to attract and handle cargo [10; 13]. The studies of the ports of the eastern part of the Baltic Sea mostly concern political and geographical aspects of their operation. A few publications cover economic issues and their commercial solutions, these include the issues of competitiveness of ports, their investment mechanisms [14], the correlation between ports' performance indicators and national macroeconomic indicators, prospects for the development of ports [15].

The analysis of the competitive advantages of a port, the characteristics of its cargo terminals in dynamics are also important when a consignor chooses the shipping route [16]. When assessing the characteristics of ports located not only in one basin but also in close proximity to each other, it is necessary to take into account their ability to substitute and complement each other. In this regard, the authors consider it important to choose a general operation strategy for ports. The traditional approach, which implies either strengthening ports' competitive advantages or developing partnerships, can be complemented by a certain intermediate position presupposing the achievement of sustainable competitive advantages through cooperation in some areas. This approach is known as the theory of co-opetition.

Research on cooperation and competition has been going on for eight decades in a variety of theoretical fields. Traditionally, the relationship between

competing companies has been studied in economic theory with a focus on industrial or market structure [17]. In recent years, special attention has been paid to intrafirm competition, including within conglomerates [18]. The modern literature on strategic alliances [19—22] analyzes relations within inter-firm associations rather than their structure. Paradoxical dualistic relations emerge when firms cooperate in some activities in the framework of a strategic alliance and at the same time compete with each other in other activities [23, p. 40]. This phenomenon is called co-opetition.[2] Co-opetition involves two different ways of interaction, based, on the one hand, on hostility due to conflicting interests and on trust and mutual commitment to achieving common goals, on the other. The development of a syncretic model of competition and cooperation is based on transaction cost theory, a resource-based approach, and game theory.

The theory of transaction costs is used to underpin inter-firm cooperation. This approach justifies the existence of cooperation to favour the transfer of "tacit knowledge"[3] among firms. Traditional market mechanisms are not applicable here, because when a potential buyer is uncertain about the true value of this knowledge, its disclosure paradoxically reduces its value as then they will have it without paying for it [24, p. 182]. Transaction cost theory predicts a higher probability of failure when partners are direct competitors. In this case, competitors seek to maximize their market share. Conflicting goals lead to a decrease in the commercial performance of actors and, ultimately, to their elimination.

The resource-based approach presupposes the achievement of a competitive advantage through unique capabilities that allow a company to offer its customers better goods and services than its competitors do [25; 26]. This approach was initially based on two fundamental assumptions: firms are heterogeneous in their resource profile, and resources are not perfectly mobile across firms. Thus, persistent differences in firms' profits can be explained by differences in resources. Teece et al. propose a dynamic process and focus on how resources are accumulated and used to create sustainable competitive advantage [27]. According to this approach, the strategy of accumulating valuable technology assets is often insufficient to maintain a significant competitive advantage. Companies need to continually update their competencies to keep pace with the changing business environment. Dynamic analysis underlies the study of resources accumulation as a result of both competition and cooperation [28, p. 115]. An organization's competitive advantage can be based on informal collaborative relationships with its supplier partners, customers, and partners with whom it must cooperate and compete. Companies often look for co-opetitors to attract important difficult-to-acquire resources (spillovers, business skills, funding, etc.).

Game theory is formally suited to the analysis of relationships between nearby ports. It allows analyzing market situations with a small number of players, limited information, hidden actions, opportunities for adverse selection or incomplete contracts. Nowak et al. [29] applied this theory to study situations in which cooperative equilibrium appears (or fails to appear) as a result of reciprocal

[2] Co-opetition — from cooperation and competition

[3] Tacit knowledge — knowledge that is difficult to express, and difficult to transfer to other actors.

interactions among participants. Brandenburger and Nalebuff [30] showed that this theory provides the framework for examining the possibilities of obtaining benefits through the strategy of co-opetition. At the heart of their argument is the prisoner's dilemma based on the avoidance of costs and the pursuit of benefits. In the struggle for market share, a firm may choose to partner with, compete with, or ignore another firm. The combination of choice leads to different types of behaviour: unilateral cooperation, mutual cooperation, unilateral defection, mutual defection. Brandenburger and Neilbuff [30] showed how a firm can use game theory to make positive-sum gains as well as zero-sum gains, which is especially important for port industry actors. Establishing win-win relationships with competitors encourages managers to use competitive imitation to gain an advantage and to focus on the strategic moves of other players rather than their own strategic positions. Petraite and Dlugoborskyte [31] argued the possibilities and advantages of using the co-opetition strategy by agents from small countries included in global networks.

Cooperation and competition as alternative strategic behaviours are widely covered in the scientific literature. Most strategic management professionals tend to see them as opposite development concepts. This view is unfortunate in that it forces researchers and managers to rank strategic alternatives and choose one over the other. As a result of the combination of cooperative and competitive behaviour, several options can be identified within the framework of a strategic alliance [28, p. 120—124]: cooperation-dominated relationships, equal relationships (coopetition) and competition-dominated relationships.

Bengtsson and Kock [24] showed that cooperative behaviour is a situation where partners seek mutual benefit by combining complementary resources, skills and capabilities. In this case, common goals are more important than maximizing profits or opposing the other actor. Partners contribute to the total value created in the relationship, and they settle for a lower share of the profits to maintain this relationship. Arslan [32] emphasizes that the total benefits of an individual organisation make up a certain share of the value, the amount of which depends on its bargaining power.

Chai et al. explored the relationships between cooperation, conflict, trust, and the effectiveness of B2B innovation. Their econometric analysis shows that cooperation is positively associated with the effectiveness of technological innovation, and the consequences of conflicts depend on the level of trust in cooperative relations [33]. Trust generates economic rent in several ways [28, p. 121]: it reduces uncertainty, serves as a mechanism for social control and reduces transaction costs. Williamson notes that the achievement of one's goals, including by fraudulent means, ignoring the interests of partners, ultimately leads to an increase in transaction costs [34].

Competitive behaviour, or a competition-dominated relationship, reflects the firm's focus on achieving superior performance and creating a competitive advantage over other firms either by manipulating the structural parameters of the industry to its advantage [35] or by developing distinctive competencies that are difficult to imitate [25]. The strategy of competitive behaviour, therefore, can help companies achieve greater production efficiency, as well as foster creativity

and innovation. Lado et al. [28, p. 119] has criticized this point of view. In their opinion, rivals tend to structure their relationships according to the rules of the zero-sum game. Competition can encourage firms to create barriers around their competencies making future collaboration more difficult. This behaviour helps the organisation gain temporary value, but makes it difficult to maintain a competitive advantage over the long term.

According to research, the structural interdependence of competitors may explain why they cooperate and compete at the same time. The literature on strategic alliances argues that, despite conflicting and adversarial relationships, cooperation between competitors can have many advantages. In addition, the syncretism of competition and cooperation contributes to a greater increase in knowledge, economic development, technological progress and commercial success than competition or cooperation carried out separately [28, p. 118].

North [36] shows that intra-firm innovation stimulated by competition contributes to the increase in knowledge, economic, technical and market growth provided that property rights are well-protected. Jorde and Teece [37] believe that inter-firm cooperation can also stimulate socio-economic progress by enhancing knowledge development and utilisation, increasing the volume and quality of goods and services, and expanding markets. Cooperation with competitors is known to provide an opportunity to study rivals closely enough to predict how they will behave when the alliance falls apart. Cozzolino and Rothaermel draw attention to the fact that the discreteness of complementary assets (resources) actualizes the need to build a theoretical model explaining the competition and cooperation of market agents. For instance, the management of companies is inclined to closer cooperation in economically and politically unstable periods. Such “rifts” also provide an opportunity for existing firms to rethink their competitive and cooperative strategies within certain industries. Research into strategic alliances between old market participants and new innovative enterprises has shown the possibility of resorting to such cooperation to adapt to radical changes as well as to gain a competitive advantage [38, p. 3054].

Through this type of ties, it is possible to obtain other general advantages of a strategic alliance: complementing and strengthening the positions of the parties in such areas as production, new product introduction, entry into new markets; cost and risk reduction; creation and transfer of technologies and capabilities [23, p. 43—44]. Researchers acknowledge that knowing the key constraints to implementing a co-opetition strategy does not always improve a firm’s competitive position. This occurs when the costs associated with maintaining the balance in the new environment, routine activities and organizational resources to develop coopetition relationships are higher than the expected benefits. Problems can also arise due to different absorptive capacities and errors in innovation management leading to the loss or inaccessibility of resources, including information, and the creation of strong competitors [39; 40].

The aforementioned theoretical approaches make it possible to test the hypothesis we put forward in the Introduction: the co-opetition strategy has a greater positive effect on the activities of the Eastern Baltic ports than purely cooperative or competitive strategies.

Research methodology and data

1. Data

In the statistical analysis, we use data published by the port authorities, the official statistical services of the Russian Federation, the Republic of Estonia, the Republic of Latvia, the Republic of Lithuania, as well as data provided by national port associations, government organizations regulating port activities, and the ministries of transport of the relevant countries. The ports' performance is assessed using the indicator of port freight traffic. The choice of the period (2010—2019) is explained by the availability of comparable official statistics and the recommended duration (5—10 years) for visual statistical research. The availability of statistical data for 10 years makes it possible to use correlation analysis to identify the dependences in the ports' traffic. The official government statistics and by-country data published by individual ports and port associations slightly differ. Therefore, in some cases, the authors carried out additional calculations or were forced to narrow (expand) the compared indicators. Data for 2020 are not analysed due to the sharp decline in the value of international trade and transport indicators. The duration and consequences of the force majeure event (the COVID-19 coronavirus pandemic) can be assessed no sooner than five years after it has been overcome.

2. Research methodology

To identify the nature of the relationships between international seaports in the eastern part of the Baltic Sea, the case study method is used. It provides the framework for exploring the specialization and capacities of ports, as well as their competitive advantages. The freight handled at a port (both total and by cargo type) is used as the main indicator of its performance determining its financial results.

There are seven major[4] Russian ports in the Baltic Sea basin: the Big Port of St. Petersburg, Primorsk, Vysotsk, Vyborg, Ust-Luga, Kaliningrad and the Passenger Port of St. Petersburg. The listed ports are the final points of the Russian sections of international transport corridors. Investigating their transit potential is of academic and commercial interest. This article does not consider the potential for attracting international freight flows to the port of Kaliningrad and the Passenger Port of St. Petersburg.[5] There are no available separate statistics on the freight traffic of the Passenger Port: cargo transported by ferries is accounted for in the throughput of the Big Port of St. Petersburg. The peculiarities of the geographic location of the Kaliningrad region do not allow considering the port of Kaliningrad a transit hub for foreign trade cargo of the mainland regions of the

[4] With a turnover of over 1 million tons per year.

[5] Ferries arriving at the Passenger Port of St. Petersburg carry both passengers and rolling cargo. By order of the *Chairman of the Government of the Russian Federation No. 413-r of March 13*, 2015, the electronic resource, available at: https: //www.garant.ru/products/ipo/prime/doc/70792024/ (accessed 30. 05.2020) the classification of the checkpoint across the RF state border has been changed in this port from international passenger traffic to cargo-passenger traffic.

Russian Federation, as well as of the Eurasian countries that do not have access to the sea. In addition, in terms of freight traffic handled, this port ranks fifth among Russian ports in the Baltic Sea basin followed only by the port of Vyborg. Its share in the total freight traffic ranges from 6.34% in 2013 to 4.31% in 2019.[6]

At the end of 2019, the Russian seaports of the Baltic basin ranked second in the country in terms of handled tonnage. It amounted to 256.44 million tons (+4.1%), including dry bulk (110.19 million tons (+0.4%)) and liquid bulk (146.24 million tons (+7,1%)). The seaports of the Azov-Black Sea basin with the handled freight of 258.08 million tons, despite showing negative dynamics (–5.2%), took first place. The southern ports specialize more in handling liquid bulk (162.02 million tons (+5.8%)). Dry bulk in the southern ports showed a negative trend (–9.4%).[7] In January 2020, the Russian seaports of the Baltic basin took the leading positions. The tonnage handled amounted to 22.17 million tons (+5.4%), including 8.71 million tons of dry bulk (–0.1%) and 13.47 million tons of liquid bulk (+ 9.3%).[8]

Their leadership in freight traffic among all the Russian ports as well as their geographical proximity to European countries and national industrial regions suggest that the ports of the Baltic basin will retain their leading position in the future. The fact that they handle different types of cargo enhances their competitive advantages.

Over the last years, the freight traffic in the ports of the Baltic states (Latvia, Lithuania, Estonia) has been decreasing. The situation in the Russian ports of the Baltic Sea basin in the study period looked multidirectional. Both in Russian and foreign ports, the situation was the worst in 2015—2016. According to the ports' press offices, in 2016 the traffic decreased by 4.5% (compared to the previous year) to 138.94 million tons. However, although the share of ports of neighbouring countries in the total Russian cargo traffic is relatively low (17.1% in 2011), it is still quite high for some cargoes. For instance, in 2017, the port of Klaipeda handled about 56% of Russian coal and 54% of mineral fertilizers gravitating to the ports of the Baltic basin, while in 2016 its total throughput was a little less than 20% of that of all Russian Baltic ports.[9] Ten years ago, these ports were considered ordinary competitors in the transport services market, now, the geopolitical situation in the region has changed dramatically. As a result, in January 2020, Russian foreign trade cargo put through the seaports of the Baltic states, Ukraine, Finland decreased by 30.8% (compared to the same period in 2019) to 2.95 million tons.[10]

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[6] The authors' calculations based on the data of the *Federal State Budgetary Institution "Rosmorport"*, 2020, available at: http://www.rosmorport.ru/filials/spb_seaports/ (accessed 10.11.2020).

[7] *JSC "Morcenter-TEK",* 2020, available at: http: //morcenter.ru/news/gruzooborot-morskih-portov-rossii-za-yanvar-dekabr-2019-goda (accessed 10.05.2020).

[8] *JSC "Morcenter-TEK",* 2020, available at: http: //morcenter.ru/news/gruzooborot-morskih-portov-rossii-za-yanvar-2020-g (accessed 10.05.2020).

[9] *Exporters of Russia*, 2020, Unified information portal, available at: http: //www.rusexporter.ru/research/country/detail/2142/ (accessed 10.05.2020).

[10] *JSC "Morcenter-TEK",* 2020, available at: http: //morcenter.ru/news/gruzooborot-morskih-portov-rossii-za-yanvar-2020-g (accessed 10.05.2020).

A significant amount of Russian oil products and breakbulk is handled in the ports of the neighbouring countries. The need to redirect all Russian freight flows to national ports is not so obvious. Strategically, this reorientation should primarily concern container cargo as it has higher added value. Cargoes that are "problematic" from an environmental point of view are not commercially attractive, hence there is no urgency in transferring them to the Russian ports of the Baltic Sea. However, the statistical analysis performed gave different results.

Correlation analysis was applied to study the dependences in the ports' freight traffic dynamics. The Pearson and Spearman correlation coefficients were calculated using the SPSS statistical data processing software package. We investigated the annual data, which allows us to neglect the seasonal peaks and troughs in the shipping of some groups of cargo. Calculations are accompanied by visual statistical analysis, comparison of the dynamics of the ports' freight traffic in general and by cargo groups.

When formulating our conclusions, we proceeded from the fact that the reorientation of foreign trade cargo is possible only if alternative ports of the Baltic basin have spare capacities. This is not always the case, as the record shows. For instance, the traffic of potash fertilizers in the Russian ports of the Baltic Sea is limited by the terminal capacities. The currently implemented Lugaport, Ultramar, Eurochem and Primorskiy UPK projects only in 2025 will allow expanding opportunities for cooperation and, at the same time, facilitate competition between Russian and Baltic ports.

Empirical analysis

To test our hypothesis of the viability of co-opetition strategy adoption by the major ports of the Eastern Baltic region, we use the case study method, as well as quantitative estimates of the dependences of the port freight traffic based on correlation analysis.

1. Case studies

As noted, this research is limited to the study of freight traffic handled by the ports of the Baltic states, St. Petersburg and the Leningrad region. Table 1 shows the Russian ports' technical freight handling capacities.

Table 1

The capacity of cargo terminals of the Russian Baltic ports, thousand tons per year

Cargo type	Big Port of St. Petersburg	Ust-Luga	Primorsk	Vyborg	Vysotsk	Total	Port traffic in 2019
Total	110,180	120,880	89,500	1,970	21,200	343,735	245,374
Liquid bulk	19,084	78,837	89,500	300	12,500	200,221	143,768
Dry bulk	26,619	32,683	—	1,670	8,700	69,672	58,403
Containers, thousand TEU	5,173	780	—	—	—	5,953	2,283

Source: Rosmorport. Federal State Budgetary Institution http://www.rosmorport.ru/filials/spb_seaports/ (date accessed: 05.10.2020).

In the context of ongoing sanctions and the consequences of the economic crisis, it is important to understand the main trends in the development of the port economy. Let us take a look at the dynamics of throughput of the ports of the Baltic Sea. Table 2 shows the performance indicators of the Russian ports of the Baltic basin (excluding the port of Kaliningrad).

Table 2

Freight handled by Russian ports of the Baltic Sea basin, excluding the port of Kaliningrad, thousand tons

Cargo type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All cargo	154.8	172.3	194.5	202.1	209.6	218.0	224.9	233.7	232.3	245.4
Liquid bulk	81.7	92.0	112.1	128.8	130.2	139.9	144.5	139.3	133.5	143.8
Oil	71.8	70.1	82.5	77.8	65.6	72.0	80.8	76.8	66.4	74.0
Oil products	26.0	37.4	43.4	50.9	63.4	66.4	61.7	60.3	64.6	67.3
Dry bulk	22.1	24.8	26.7	32.9	37.2	40.8	42.7	53.5	54.4	58.1
Ores	0.6	0.7	0.8	0.9	0.8	1.0	1.1	0.7	0.8	0.7
Coal, coke	13.5	16.1	19.4	23.4	25.3	27.8	29.1	38.5	38.3	40.9
Mineral fertilizers	6.6	6.5	5.4	7.1	8.7	10.2	10.3	11.8	11.4	12.4
Bulks	0.1	0.0	0.0	0.4	0.4	0.4	0.2	0.3	0.3	0.3
Grain	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.3
Timber	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.5	0.9	1.0
Breakbulk cargo	1.5	1.7	2.5	1.9	1.5	1.6	1.6	1.8	14.2	12.3
Containers, million tons	19.0	22.0	23.1	23.6	24.7	20.7	21.6	23.7	26.6	28.0
Containers, million TEU	1.9	2.4	2.5	2.6	2.5	1.8	1.8	2.0	2.2	2.3

Source: Authors' calculations based on the data of the *Federal State Budgetary Institution "Administration of the Baltic Sea Seaports",* 2020, available at: http://www.pasp.ru/morskie_porty_baltiyskogo_morya (accessed 10.05.2020).

Although the general dynamic is positive, the value of indicators for bulk, breakbulk cargo, oil, containers (in TEU) are volatile. In 2018, for the first time, the basin's largest port of Ust-Luga handled tonnage decreased by 4% compared to 2017 to 98.73 million tons. The drop was caused, first of all, by a decrease in handled oil (by 15%) and coal (by 4%) [41]. The latter was due to the replacement and commissioning of new loading equipment at the Mixed Cargo Handling Facility and JSC Rosterminalugol. The reason for the technical re-equipment was the lack of specialized capacities for growing exports of Russian coal. The ports of Vysotsk and Vyborg showed a significant increase in coal throughput in 2018, therefore, there was no significant decrease in the basin. For oil and containers, a geographic reorientation of freight flows is taking place. The decrease in container throughput in 2015 was due to the introduction of sanctions and counter-sanctions in the second half of 2014. Note that the tonnage of handled containers changed only slightly (–12.5% in 2013—2015) compared to TEU (–30.0% over

the same period), which indicates an average increase in container weight. Due to the volatility of global commodity prices and the ruble, as well as the use of cost indicators for accounting for foreign trade, in this study, we do not consider the impact of the volume of Russian exports and imports on the domestic ports' traffic. Given the circumstances, it is difficult to talk about attracting container cargo, previously handled in the ports of the Baltic states, to Russian ports.

Table 3 shows the dynamics of freight traffic in the largest ports of Estonia.

Table 3

Freight handled by the major ports of Estonia, million tons

Cargo type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All cargo	43.6	45.7	40.6	39.5	40.2	32.7	31.7	32.6	33.8	35.8
Liquid bulk	29.1	31.4	26.6	25.7	26.0	17.0	14.4	13.9	14.8	15.2
Dry bulk	6.5	5.1	5.3	4.5	4.8	5.1	5.8	6.4	6.6	8.1
Containers	1.3	1.5	1.6	1.8	2.0	1.7	1.8	2.0	2.0	2.0
Ro-Ro	3.5	3.7	3.8	3.7	4.0	5.6	5.9	6.4	6.7	6.7
Other cargo	3.2	4.0	3.3	3.7	3.3	3.4	3.8	3.8	3.8	3.7

Source: authors' calculations based on *Statistics Estonia,* 2020, available at: http: // pub.stat.ee/px-web.2001/I_Databas/Economy/34Transport/16Water_transport/16Water_transport.asp (accessed 10.05.2020).

The 22.5% decrease in the freight handled by the ports of Estonia in 2013-2017 was mainly due to a decline in liquid bulk (46.8%). For containerized and Ro-Ro cargo, there was a positive trend: 12.6% and 35.4% increase, respectively. The analysis of the product composition of cargo handled through Estonian ports, including transit, made it possible to identify the following structural changes (Table 4). In terms of product groups, the general dynamics corresponds to Russian trends.

The most dangerous is the situation in the Coke and Oil Products Group: a 49.54% drop in the total freight handled, including a 61.69% decrease in outgoing transit cargo volume. In 2017, to overcome the extremely negative trend the Estonian joint-stock company Alexela Terminal extended the contract with PJSC NK Rosneft for the provision of transportation, unloading, storage and loading services for oil products, 3.4 million tons of fuel oil and vacuum gas oil [42]. The total freight traffic (31.11%) has considerably increased, while the outgoing transit (40.19%) of timber products has decreased. There have been substantial changes in the total traffic and outgoing transit of crude oil, coal and natural gas.

At the same time, the official statistics show a positive trend in the total traffic and outgoing sea transit of chemical products (+ 93.87% and + 97.43%, respectively), as well as metals (+131.79% and +902.86). Note the volatility of outgoing transit of metals.

Table 4

Product composition of freight handled by the ports of Estonia, thousand tons

Cargo type	2013	2014	2015	2016	2017	2018	2019
	Throughput, total						
Total, including	42,908	43,579	34,962	33,623	34,797	35,924	37,690
Agricultural products, fish	2,975	2,988	3,249	3271	3214	3,173	3,351
Coal, crude oil and natural gas, shale	118	310	39	16	104	47.8	220
Timber industry products	1,263	1,119	1,039	1,133	1,656	1,880	1,882
Coke and oil products	24,238	24,046	15,687	12,733	12,294	12,301	12,229
Chemical products	3,724	4,481	4,374	5,099	5,159	6,191	7,224
Metals and metal products	97	158	110	123	109	123	225
	Outgoing transit						
Total, including	22,889	20,800	15,556	12,662	12,733	13,965	14,591
Agricultural products, fish	3	17	22	12	65	125	76
Coal, crude oil and natural gas, shale	68	133	39	5	67	0	50
Timber industry products	117	91	46	22	70	0	8
Coke and oil products	18,793	16,022	10,958	7,466	7,134	7,653	7,200
Chemical products	3,500	4,221	4,176	4,883	4,972	5,814	6,910
Metals and metal products	7	71	11	23	11	5	70

Source: authors' calculations based on *Statistics Estonia,* 2020, available at: http: // pub.stat.ee/px-web.2001/I_Databas/Economy/34Transport/16Water_transport/16Water_transport.asp (accessed10.05.2020).

The tonnage of agricultural and fish products was stable (+ 8.04%) while there was a major 20.7-fold increase in their outgoing transit. 2016 saw the emergence of large volumes of inbound transit of food, beverages and tobacco. Experts explain this by the changes in alcohol market regulations in Russia, its new labelling requirements. The labelling is done at Estonian port facilities [41].

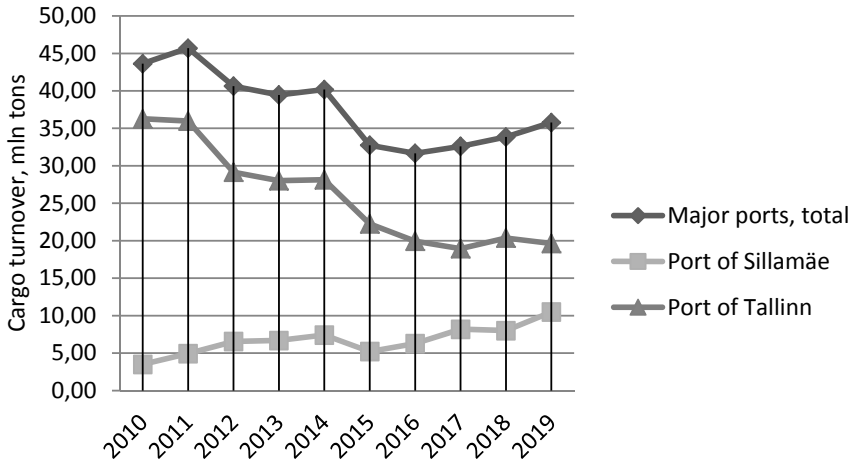

Fig. 1. Freight handled by the major ports of Estonia, million tons

Source: Statistics Estonia, 2020, available at: http: //pub.stat.ee/px-web.2001/I_Databas/Economy/34Transport/16Water_transport/16Water_transport.asp (accessed 10.05.2020).

Figure 1 showing the dynamics of freight traffic in the ports of Tallinn and Sillamäe demonstrates multidirectional trends in their development. The strong performance of the second largest port in terms of freight traffic in Estonia can be explained by the fact that it is a private port owned in equal shares by Russian and Estonian businessmen.[11] Table 5 shows the dynamics of freight traffic in the ports of Latvia.

Table 5

Freight handled by the major ports of Latvia (million tons)

Cargo type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All cargo	61.2	68.8	75.2	70.5	74.2	69.6	63.1	61.9	66.2	62.4
Liquid bulk	21.2	23.1	24.9	23.6	26.5	25.6	19.5	16.9	15.0	14.6
Dry bulk	28.1	33.3	36.8	34.7	35.3	32.8	32.1	32.6	36.6	34.2
Breakbulk	10.4	10.9	12.1	10.8	10.8	9.7	10.0	10.8	12.7	11.8
Containers	2.6	3.1	3.5	3.8	4.0	3.7	3.9	4.4	4.7	4.6
Containers, thousand TEU	209	247	284	309	321	281	294	316	356	353
Ro-Ro	2.2	2.8	3.1	3.2	3.1	2.6	2.8	3.2	3.5	3.4

Source: authors' calculations based on the *Central Statistical Bureau of Latvia*, 2020, available at: http: //www.csb.gov.lv/en/stats_table_metadata/35/ TARGET = _blank> Detailed information </A>; http: // data1. csb.gov.lv/pxweb/en/transp_tur/transp_tur__transp__kravas__ikgad/TRG260.px/ (accessed 05/10/2020).

[11] *Port of Sillamäe*, 2021, p. 5, available at: https://www.silport.ee/SILPORT-booklet_rus.pdf?rand=208 (accessed 30.06.2021).

The largest drop in throughput was in the liquid bulk cargo. Enterprises from the Republic of Belarus filled the niche of Russian companies. In November 2017, the Belarusian Oil Company (BNK) and the Latvian WT OIL Terminal agreed on joint activities of handling Belarusian oil products in the Freeport of Riga. In 2016, the oil company also concluded a sale and purchase agreement with the Novopolotsk Refinery under which dark oil products were to be shipped to the Woodison Terminal in 2018—2022 [40].

The decrease in Latvian ports' traffic in 2019 compared to 2013 (–12.33%) was due to the deterioration in the performance of the ports of Ventspils (–28.88%) and Riga (–7.63%). At the same time, the freight traffic in the port of Liepaja increased by 51.61% (fig. 2).

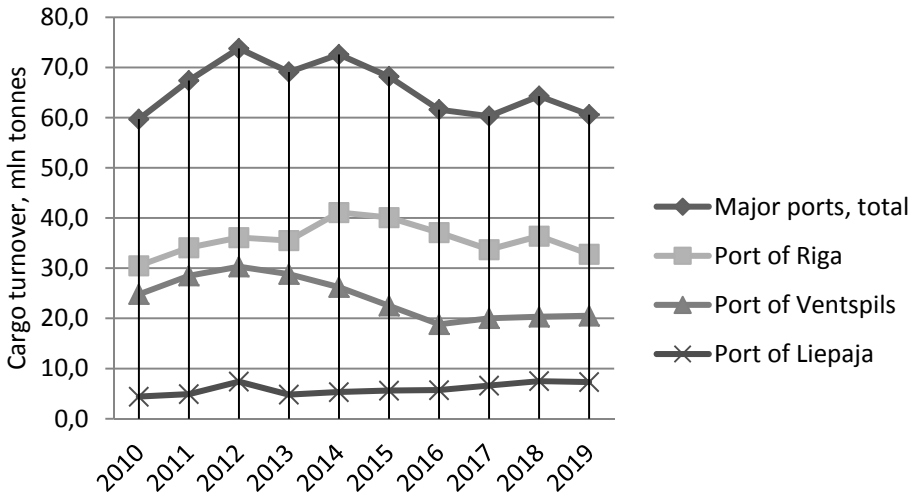

Fig. 2. Freight handled by the major ports of Latvia, million tons

Source: authors' calculations based on the *Central Statistical Bureau of Latvia,* 2020, available at: http: //www.csb.gov.lv/en/stats_table_metadata/35/ TARGET = _blank> Detailed information </A>; http: // data1. csb.gov.lv/pxweb/en/transp_tur/transp_tur__transp__kravas__ikgad/TRG250.px/table/tableViewLayout1/ (accessed 05.10.2020)

The drop in the traffic handled by the two largest ports of Latvia was primarily due to the decline in the tonnage of oil and oil products, as well as coal (fig. 3, a, b). At the same time, all ports have increased the handling of grain (3, c).

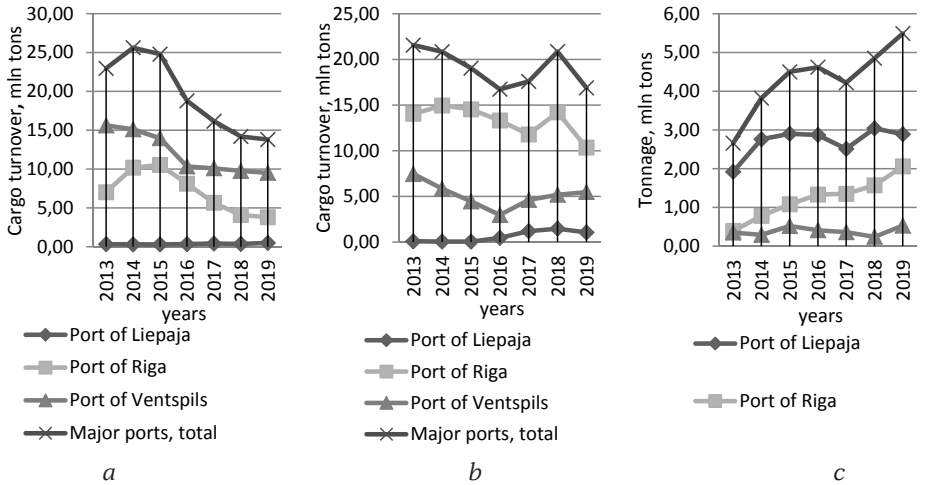

Fig. 3. Tonnage of selected goods handled by the ports of Latvia

a — Oil and oil products tonnage; *b* — Coal throughput; *c* — Grain throughput

Source: authors' calculations based on the *Central Statistical Bureau of Latvia,* 2020, available at: http: //www.csb.gov.lv/en/stats_table_metadata/35/TARGET=_blank> Detailed information </A>; http: //data1.csb.gov.lv/pxweb/en/transp_tur/transp_tur__transp__kravas__ikgad/TRG250.px/table/tableViewLayout1/, URL: http://data1.csb.gov.lv/pxweb/en/transp_tur/transp_tur__transp__transp__kravas260.gad (accessed 10.05.2020).

In contrast to the ports of Estonia and Latvia, the port terminals of Lithuania show an overall positive trend (table 6). The exception is the liquid bulk. During the reported period, its handled tonnage increased by 12.48%. Nevertheless, there were some annual variations: in 2014, there was a 34.19% decline, in 2015 — a 18.83% increase. Such volatility can be explained by multidirectional trends within this cargo category (fig. 4)

Table 6

Freight handled by Lithuanian port terminals, million tons

Cargo type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
All cargo	40.3	45.5	43.8	42.4	43.7	45.7	49.3	52.9	56.2	46.3
Liquid bulk	18.8	20.0	18.7	17.7	15.2	18.1	20.3	21.3	20.0	19.9
Dry bulk	11.8	14.5	14.1	14.0	17.0	16.7	16.7	19.1	19.9	20.7
Breakbulk	9.7	11.0	10.9	10.6	11.5	11.0	12.3	12.5	16.4	15.3
Containers	1.9	2.5	2.5	2.6	2.9	2.3	2.9	3.0	4.8	4.5
Containers, thousand TEU	295.2	382.2	381.4	402.7	450.2	350.4	441.7	474.2	749.1	705.2
Ro-Ro	2.3	2.6	2.6	2.6	2.5	2.5	2.8	2.9	3.1	3.3

Source: Port of Klaipeda, 2020, available at: http: //www.portofklaipeda.lt/statistika-porta-klaipeda; *Statistics Lithuania. Official Statistics Portal,* 2020, available at: https: // osp.stat.gov.lt/statistiniu-rodikliu-analize? # / (accessed 10.05.2020).

Dry bulk, breakbulk and containers ensure the steady positive dynamics of the port's indicators. The container throughput of the port started to grow (from 16.22 tons / TEU in 2014 to 17.52 tons / TEU in 2015) but later it decreased to 13.43 tons / TEU in 2018. This is explained by an increase in the share of LCL (less than container load) containers, as well as by a change in the range of products transported. During the study period, the share of empty containers varied from 19.98% (2014) to 29.52% (2018). There was no relationship found between containers' load and the share of empty containers. Figure 4 shows the dynamics of the throughput of the main non-container cargo types in the state port of Klaipeda.

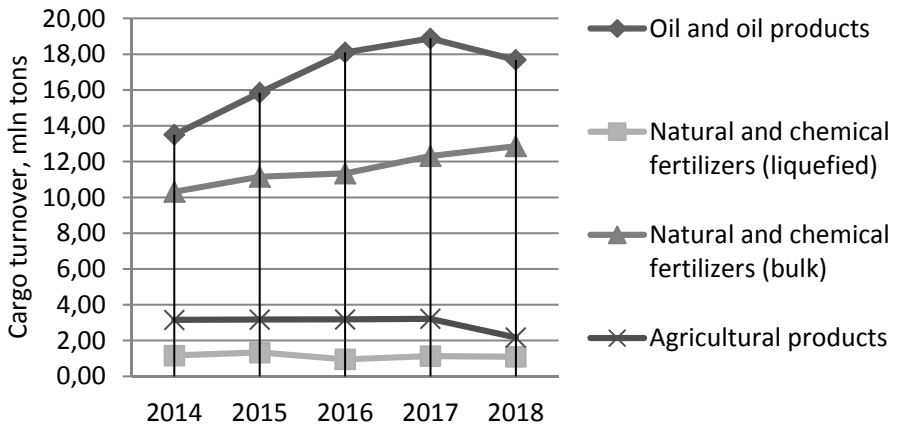

Fig. 4. Non-containerized cargo handled by the ports of Lithuania

Source: Statistics Lithuania. Official Statistics Portal, 2020, available at: https: // osp.stat.gov.lt/statistiniu-rodikliu-analize? # / (accessed 10.05.2020).

The performance of the port of Klaipeda is determined by the handling of Belarusian cargo. Despite political disagreements (in particular, regarding the BelNPP and the 2020 elections), Belarus continues to cooperate with the Lithuanian port [40]. However, regardless of their participation in the assets of the Lithuanian terminals, it is likely that in the coming years, Belarusian companies will abandon the shipping routes going through that country.

The Lithuanian port industry is represented by two cargo handling facilities: the State Port of Klaipeda and the Butinge oil terminal, which is the Lithuanian division of the Polish oil company ORLEN (fig. 5). The terminal's narrow specialization, different ownership and management structures, and the technical capabilities of the terminals made it possible to develop a specialization in the port economy. This strategy has resulted in some commercial success in attracting and retaining customers.

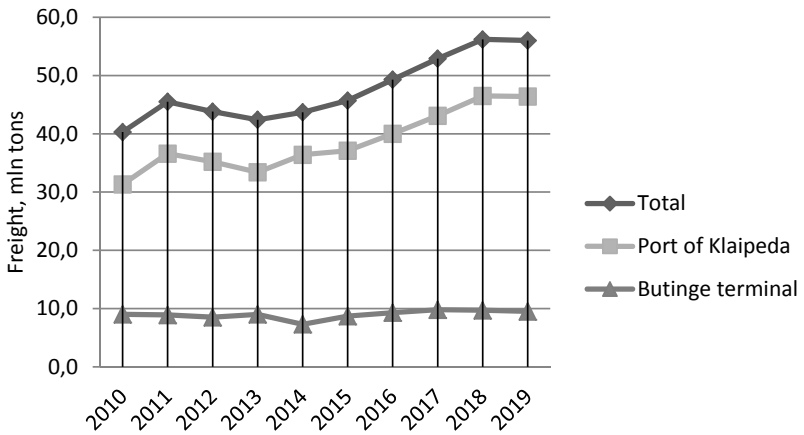

Fig. 5. Freight handled by Lithuanian ports

Source: Authors' calculations based on *Statistics Lithuania. Official Statistics Portal,* 2020, available at: https: //osp.stat.gov.lt/statistiniu-rodikliu-analize?#/ (accessed 10.05.2020)

In general, the Lithuanian port industry is in a favourable position compared to other Baltic states, where, in addition to the international competition between the ports, there is also an internal rivalry for cargo. However, the choice of the strategy by the Eastern Baltic ports largely depends on the type of goods with which the port operates. For liquid, as well as dry bulk cargo, primarily coal and fertilizers, the competition strategy turns out to be more relevant. For breakbulk cargo and containers, the strategy of cooperation is statistically justified, although even a cursory review of the port business cases shows multidirectional factors that do not allow the selection of a single international interaction strategy for this industry. Therefore, a coopetition strategy seems appropriate for doing business in an unstable external environment.

2. Correlation analysis

The correlation calculations of the freight handled by the Baltic ports of Russia and Baltic states, both general and by cargo type, revealed signs of both cooperation and competition. Table 7 shows the identified freight dependences of the ports.

Table 7

Revealed linear and rank correlations of the total freight traffic handled by the ports of the Baltic states and Russia (2010—2019)

Dependence of the total port traffic	Correlation		R^2	F-statistics
	By Pearson	By Spearman		
Russia— Baltic states	0.975**	0.952**	0.951	156.916
Russia — Estonia	-0.846**	-0.770**	0.716	20.124
Russia — Lithuania	0.821**	0.855**	0.674	16.561

* — the correlation is significant at the level of 0.05.

** — the correlation is significant at the level of 0.01.

In 2010—2019, the studied Russian ports and ports of the Baltic states generally showed similar dynamics. The reason is the successful operation of the Lithuanian port of Klaipeda and Russian ports. The policy of attracting Belarusian freight in 2010—2019 and the Russian government's actions on the reorientation of Russian freight to national ports turned out to be effective. The decrease in the traffic in the ports of Estonia and Latvia was offset by its increase in Lithuania. Note the obvious loss of freight by the Estonian ports with a simultaneous increase in the freight handled by the Russian ports of the Baltic basin. The dependence of the total freight traffic handled by the individual ports of the Eastern Baltic was not revealed.

Table 8 shows the major results of calculating the linear and rank correlation for selected product groups handled in ports.

Table 8

Revealed correlations of selected cargo groups handled by the ports of the Baltic states and Russia (2010—2019)

Cargo group	Port's country	Correlation		R^2	F-statistics
		By Pearson	By Spearman		
Oil and oil products	Russia — Estonia	-0.829**	-0.855**	0.687	17.537
Oil	Russia — Lithuania	-0.740*	-0.600	0.548	9.681
Coal	Russia — Estonia	-0. 685*	-0.710*	0.505	8.146
Fertilizers (all)	Russia — Lithuania	0.880**	0.842**	0.775	27.556
	Russia — the Baltic States	0.871**	0.782**	0.729	25.240
Timber products	Latvia — Lithuania	0.918**	0.891**	0.842	42.689
Metals	Russia — Lithuania	0.760*	0.782**	0.577	10.921
	Russia — the Baltic States	0.818**	0.855**	0.669	16.192

The end of table 8

Containers thousand of tons	Russia — Estonia	0.790**	0.758*	0.624	13.301
	Russia — Latvia	0.842**	0.842**	0.709	19.528
	Russia — Lithuania	0.884**	0.903**	0.781	28.529
	Russia — the Baltic States	0.900**	0.842**	0.809	33.927
	Estonia — Latvia	0.962**	0.939**	0.926	99.806
	Estonia — Lithuania	0.724*	0.903**	0.524	8.812
	Latvia — Lithuania	0.854**	0.964**	0.730	21.581
Containers, TEU	Estonia — Latvia	0.858**	0.818**	0.736	22.338
	Latvia — Lithuania	0.848**	0.939**	0.720	20.524

* — the correlation is significant at the level of 0.05.

** — the correlation is significant at the level of 0.01.

There is a clear tendency to shifting the handling of oil products and coal from Estonia and Latvia to Russia. Russia's transit policy led to the sale of distressed assets of the Estonian oil terminal VEOS to Liwathon by Global Ports and Royal Vopak in 2019. The lack of capacities for handling mineral fertilizers in Russian ports has resulted in active cooperation with specialized terminals in the Baltic states. However, we note that the revealed dependence is also explained by the successful cooperation between Belarusian companies and Lithuanian stevedores. The situation in the world metal markets is a determining factor in the traffic of this cargo group, therefore, unidirectional trends are observed in the Russian and Baltic ports, primarily in Klaipeda, which has its own cargo base.

The situation is different in the container sector. Cooperation between Russia and the Baltic states is seeming. It is observed only in terms of tonnage. A comparison of the average weight of a container during the study period shows that different Eastern Baltic ports handle containers with different products. The authors' calculations showed that the average weight of containers handled through the Lithuanian port in 2010—2019 ranges from 6.32 tons to 6.62 tons, Estonian ports — from 7.00 tons to 8.68 tons, Russian Baltic ports — from 9.15 tons to 12.25 tons, Latvian ports — from 12.20 to 14.01. At the same time, the weight of Russian and Latvian containers is increasing. The findings confirm that containers transport different types of cargo. The port of Klaipeda handles mainly highly processed goods, while the ports of Latvia and Russia handle raw materials and work-in-process. In this case, the container can be viewed as a more competitive package for goods, which confirms the competition between ports. In general, in terms of the speed of execution and the quality of logistics operations, Russian ports are inferior to those of the Baltic states.

Table 9 shows the revealed dependence of the freight traffic of the ports of the Baltic states and Russia on the composition of the cargo handled. The traffic of the ports of Estonia, Latvia and Russia depends on the handling of raw materials and primary processing products: oil, oil products, coal. Therefore, the ports compete to attract these cargoes. Russian ports are interested in increasing the

handling of mineral fertilizers and timber. And this tendency is manifested in the strategies and investment policies formed by the ports. The Lithuanian port of Klaipeda tends to handle fertilizers and containers. This explains its commercial interest in further cooperation with Belarusian producers and Russian transit. The traffic of the port of Klaipeda depends on the highly processed goods transported in containers.

Table 9

Goods affecting the total freight traffic of the Eastern Baltic ports (2010—2019)

Country	Cargo	Correlation		R^2	F-statistics
		By Pearson	By Spearman		
Estonia	Oil and oil products	0.962**	0.782**	0.926	99.960
	Coal	0.717*	0.927**	0.514	8.456
	Metals	0.716*	0.673*	0.513	8.431
Latvia	Oil and oil products	0.765*	0.758*	0.585	11.258
	Coal	0.891**	0.842**	0.794	30.905
Lithuania	Fertilizers	0.877**	0.939**	0.770	26.767
	Containers, thousand of tons	0.889**	0.721*	0.791	30.251
	Containers, TEUs	0.889**	0.733*	0.889	30.244
Russia	Oil and oil products	0.936**	0.869**	0.876	56.327
	Timber	0.726*	0.745*	0.527	8.921
	Fertilizers	0.874**	0.952**	0.765	26.006
	Coal	0.953**	1.000**	0.909	79.446

* — the correlation is significant at the level of 0.05.

** — the correlation is significant at the level of 0.01.

Cooperation is possible in cargo not included in the list since they do not have a significant impact on the port's traffic and, thus, usually are not commercially attractive.

The results of the correlation analysis and the study of the Eastern Baltic ports' operation reveal both competition and cooperation in different cargo groups. No effective combination of these strategies when ports interact with each other for mutual benefits has been found. The behaviour of the ports is largely determined by the state policy, interstate relations, their technical capabilities, as well as the situation in the global markets. Therefore, possible future port strategies depend on external factors.

Conclusions

The seaports of the Baltic states continue to play a significant transit role in the shipping of Russian foreign trade cargo. This study showed that the calls of Russian politicians to handle highly processed cargo (primarily containers) in domestic ports are still declarative. The reason is the economic sanctions determining the product composition of handled cargo and negatively affecting the relations between the countries in the region, as well as the strict norms of Russian legislation. At the same time, there is clearly a drive to reorient the cargo transit of oil and coal enterprises from the Baltic ports to Russian. In the future, the Baltic basin may become the main sea gateway for the export of Russian raw materials, including hydrocarbons, as well as the largest Russian sea basin in terms of container throughput.

The ports of the Eastern Baltic region are rather competitors than partners in handling both domestic and transit cargo. The ports of Estonia, Latvia and Russia have similar commercial interests in attracting cargo. The Lithuanian port of Klaipeda has a cargo base that is different from its neighbours, however, not bordering on "mainland" Russia, as well as political differences, hampers cooperation. There are two possible reasons for the ports' cooperation: common affiliation of stevedore companies and terminal owners, and the state policy regulating the routing of Russian cargo.

Russian shippers can consider the foreign ports of the Baltic Sea as reserve capacities for most of the cargo types. Using them allows optimizing investments in the domestic port business and developing the recreational potential of the seacoast. Russian companies seeking to diversify risks or redistribute the load of their transport and logistics terminals cooperate with stevedores of the Baltic states. Cooperation in the field of transport and logistics allows to maintain and strengthen business ties with neighbouring states.

Thus, our hypothesis on the viability of the co-opetition strategy in the ports of the Eastern Baltic in the 2010s has not been confirmed. The choice of a co-opetition strategy by port authorities and national port organizations of the region under study is advisable in the event of force majeure circumstances or during periods of "peak" load generated, in particular, by the favourable situation in global markets. The seaports of the Baltic states are not considered priority participants in the Russian transit policy.

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