Theoretical and Methodological Approaches to the Supply Chain Strategies Role and Analysis of Seaport Competitiveness in the Far East of Russia

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Abstract— Under market conditions, competitiveness is the main quality of any subject, whether it is an enterprise or such a complex structure as a seaport. Competitiveness was considered by many authors abroad and in Russia from different positions: cost approach, innovative approach, supply chain. Each author endured a certain aspect as the main one for analysis. The article is based on the analysis of different points of view and study object features, substantiates the essence of competitiveness through an integrated approach, since the seaport, performing a complex of specific services, fights for demand at different levels: from international to intra-port. The aim of the study was the systematization of theoretical and methodological approaches to the analysis of seaport competitiveness in the Russian Far East for the further development of proposals on competitiveness improvement. Based on the analysis, they substantiated the significance of seaports in the modern world economy and the economy of the Russian Far East. They evaluated the development potential of the Far Eastern ports. On the basis of an integrated supply chain, the competitiveness of the seaports of the Far East of Russia was assessed.

Keywords— *competitiveness, supply chain strategy, seaport, transport infrastructure, the Far East of Russia, cargo traffic analysis.*

1. Introduction

Supply chain management is the integration of key business processes from end user through original suppliers, which provides products, services, and information that add value for customers and other stakeholders. Over the past decades, competition has become one of the most important characteristics of market economy. In modern business environment, stable business results can be achieved only by a strategy for its development, the evaluation of one's own capabilities and prospects, constant monitoring of the market situation and the activities of competitors, as well as the evaluation of your company competitiveness.

The competitiveness of an organization is a characteristic that shows the degree to which a given enterprise differs from its competitors in the field of customer need satisfaction.

The theoretical contribution to the definition of competitiveness concept was made by many famous scientists. Among them, a special place is occupied by the American Economist M. Porter, who, together with K. Ketels and M. Delgado, noted that in order to understand intra-industry competition and develop a strategy for market behavior, it is necessary to analyze the industry structure from the position of five forces: the level of the existing competition, the threats to companies entering the market, the degree of buyer and supplier market power, the threat of goods and service substitution [1]. P.J. Buckley, K. Pass and K. Prescott believed that a firm can be considered competitive if it spends less on the production of goods and services of better quality than its rivals both in the domestic and global markets [2]. In their opinion, the achievement of competitiveness means the possibility of obtaining sustainable income and profits in the long run. J. Henriksson, S. Eriksson and R. Flanagan linked competitiveness with the process of setting correct goals and their achievement [3]. Among Russian studies, one can mention the work of a group of authors, edited by K.R. Gonchar and B.V. Kuznetsova, dedicated to the problems of Russian industrial enterprise competitiveness [4]. It analyzes the competitiveness, and also the possibilities of its management both from the companies themselves and from the state. Russian economists study competitiveness through the prism of the management system quality [5, 6], the level of innovative activity of a company [7, 8], the possibilities of various methods use to assess a firm level competitiveness [9-11].

However, despite the large amount of studies, the features of company competitiveness determination and evaluation the competitiveness in individual sectors of the economy are still not well understood. This, in particular, concerns transport infrastructure organizations, including seaports, which is especially important against the

background of their growing importance for the global and Russian economies.

2. Methods

The basis of the study was the use of mainly theoretical scientific methods, including:
- analysis and synthesis, systematic approach, comparison - when the definitions of competitiveness in general and seaports in particular are compared and summarized; when they evaluate the functioning of seaports in the world, Russia and the Far East of Russia; when they conduct the SWOT analysis of the seaports of the Far East of Russia;
- abstraction - when they determine the essence of seaport competitiveness from the standpoint of its features as a complex structure;
- historical method - during the determination of trends in the dynamics of seaport development indicators;
- induction and deduction, generalization and formalization - during your own conclusion development.

3. Study Results

The concept of a seaport changes over time. However, a common and most important feature of the seaports is the availability of infrastructure facilities, the condition of which determines the ability of a port to operate in the market and compete with other ports in logistics and port services in general. The infrastructure facilities, in fact, are the material essence of a port [11], which largely determines the main components of its competitiveness.
The definition of foreign and domestic researcher competitiveness is based on a comparative assessment: industry structure [1], cost, profit [2], goal setting [3], management system quality [5,6], the level of innovation activity [7,8], and the possibility of various assessment method application [9,10]. That is, these definitions make it possible to assess the port activity through a set of specific indicators [12], without taking into account the characteristics of a seaport, as a complex structure.
Therefore, in our opinion, when competitiveness is determined, an integrated approach is necessary through competition subject and object, as well as the scale of the industry market [13]. For seaports, the subject of competition is represented by provided services: stevedoring operations, freight forwarding and storage, cargo handling, mooring, towing, bunkering, passenger services, fleet maintenance, etc. The object of competition is the demand for seaport services, which is imposed by ship owners or persons operating ships on any other legal basis, as well as consignors and passengers. The subjects of competition can be both individual ports and their groups, as well as various economic entities operating in the port area. In terms of scale, they distinguish inter-country, interport, and interterminal (intraport) competition.
Thus, the competitiveness of a seaport can be determined as follows. This is the ability of a seaport as a whole or of individual companies located on its territory to provide services that are more attractive to various groups of consumers than the services of rivals both domestically and internationally. A seaport is competitive if it serves large volumes of cargo and is of better quality than its competitors. During the analysis of competitiveness, one should take into account the specifics and competitiveness factors of port services, the presence of not only commercial objectives, but also the social aspects of port operations.
The importance of seaports for the modern world economy is associated with a stable increase of maritime freight traffic (table 1). Today, shipping by sea is one of the most economical types of transportation of various groups of goods, which determines their attractiveness for cargo owners.

Table 1. International sea freight traffic by country groups in 2015-2017

Groups of countries	2015	2016	2017	Growth rate in 2016 as compared to 2015, %	Growth rate in 2017 as compared to 2016, %
International shipping, shipped in total:	10023,5	10286,9	10702,1	2,63	4,04
- Developed countries	3417,4	3594,7	3675,0	5,19	2,23
- The countries with transitional economies (Russia)	632,3	646,5	664,5	2,25	2,78
- Developing countries	5973,8	6045,7	6362,5	1,20	5,24
International shipping, total, unloaded total:	10016,4	10281,6	10666,0	2,65	3,74
- Developed countries	3733,7	3633,0	3838,3	-2,70	5,65
- The countries with transitional economies (Russia)	58,6	61,5	65,9	4,95	7,15
- Developing countries	6224,0	6587,1	6761,7	5,83	2,65

In millions of tons Compiled by the authors according to [14, 15]

According to Table 1, developing countries occupy a large share in international maritime transport in

terms of loading. In 2015, they accounted for 5973.8 million tons, or 59.6% of the total, during subsequent years it gradually grew in absolute terms (by 1.20% in 2016, and by 5,24% in 2017), but almost did not change in specific weight (58.8% in 2016, and 59.5% in 2017). In terms of unloading, the largest share was also occupied by developing countries (62.1% of the total), which in absolute terms amounted to 6,224.0 million tons. In 2016, there was the increase by 5.83%, and in 2017 - by 2.65%. Moreover, the volume of maritime cargo shipments with respect to unloaded cargoes increased in all groups of countries, but the highest rates were observed in Russia.

Table 2 presents the data on the largest ports of the world in terms of cargo handling during 2015-2017.

Table 2. The largest 10 ports of the world in terms of cargo handling in 2015-2017

Port name	Country	2015	2016	2017	Growth rate in 2016 as compared to 2015, %	Growth rate in 2017 as compared to 2016, %
Ningbo Joushan	China	873,00	918,00	1007,00	5,15	9,69
Shanghai	China	755,30	700,00	706,00	-7,32	0,86
Singapore	Singapore	581,00	593,00	626,00	2,07	5,56
Suzhou	China	480,00	574,00	608,00	19,58	5,92
Guangzhou	China	500,40	522,00	566,00	4,32	8,42
Tanshan	China	500,80	516,00	565,00	3,04	9,50
Qingdao	China	480,00	501,00	508,00	4,38	1,40
Port Hedland	Australia	421,80	485,00	505,00	14,98	4,12
Tianjin	China	540,00	549,00	503,00	1,67	-8,38
Rotterdam	Netherlands	444,70	461,00	467,00	3,67	1,30

In millions of tons Compiled by the authors according to [16-27]

Table 2 shows the leading position of Chinese seaports in the freight market. In recent years, 7 China ports were among the top 10 largest seaports of the world in terms of cargo handling.

That is why it is important to develop the seaports of the Russian Far East intensively, since they can and must compete with their Chinese neighbors.

Among fifteen ports of Russia with the largest cargo turnover, five are in the Far Eastern region. Table 3 presents the turnover of the largest ports in the region.

Table 3. The largest ports of the Far East of Russia in terms of cargo turnover in 2015-2017

Port	2015	2016	2017	Growth rate in 2016 as compared to 2015, %	Growth rate in 2017 as compared to 2016, %
Vostochny	65,20	68,50	69,20	5,06%	1,02%
Vanino	26,80	30,20	29,20	12,69%	-3,31%
Nakhodka	21,30	23,30	24,20	9,39%	3,86%
Prigorodnoye	16,00	16,40	17,40	2,50%	6,10%
Vladivostok	12,90	14,30	16,90	10,85%	18,18%
Other	28,80	32,80	34,80	13,89%	6,10%
Total freight turnover in the region	171,00	185,50	191,70	8,48%	3,34%

In millions of tons Compiled by the authors according to [16-18, 25]

In 2017, there was a significant increase in the entire sea port industry, which did not bypass Russia. The total volume of cargo turnover at Russian ports amounted to 787 million tons. At the same time, the total freight turnover of the Far Eastern region made 191.7 million tons (24.36% of the total in Russia) during the same year, having increased by 3.34% as compared with 2016. The port of Vostochny occupies the largest share in the structure of freight turnover in the region - 36.1%. However, the greatest increase of cargo turnover was observed in the port of Vladivostok - 18.18%, this port accounts for 8.8% of the cargo turnover of the Far Eastern ports. Such a rapid development of the port of Vladivostok is largely conditioned by the beginning of "Free Port of Vladivostok" project in 2015, which gave a number of competitive advantages to Primorye ports [19-24].

4. Result Discussion

In order to determine the trend of seaport development of the Russian Far East, it is necessary to assess their competitiveness on the basis of an integrated approach, using the technology of SWOT-analysis. Its results are presented on Figure 1.

Advantages	Disadvantages
- Availability of sufficient capacity and potential for their increase, high level of coverage with navigation safety systems - Proximity to the infrastructure of various types of transport, including road and rail with a low cost of transportation of goods - Favorable geographical position, proximity to the countries of the Asia-Pacific region - Availability of container terminals - Qualified staff - Reliable reputation, also among foreign partners - Construction of new port facilities in the north of the Russian Far East, which enhances the potential of southern ports - Functioning in zones with preferential regimes (Free port of Vladivostok, etc.) - Availability of a number of logistics infrastructure, transport hubs and hub ports	- Port remoteness from each other - Not all ports have convenient roads to the structures for automobile and railway transport - High degree of fixed asset depreciation and insufficient investment activity - Lack of fleet vessel support - Long terms of cargo handling - Lack of containers and equipment for rolling cargo handling during their import - Ineffective management system - Low energy efficiency - Low level of innovation activity, technological gap - Inflexible tariff policy - Underutilization of transit potential - Low level of customs procedure organization due to lack of developed infrastructure and the lack of technical equipment - Imperfection of sectoral legislation - Underutilization of public-private partnership tools to increase investment in port infrastructure
Opportunities	**Threats**
- Development of international transport corridors passing through the territory of Russia (Primorye-1, Primorye-2, Primorye-3) - The participation of Russia in the project "One Belt, One Way" - Development of the Northern Sea Route to reduce the cost of cargo delivery and delivery time, which will increase the demand for the seaport services of the Russian Far East - High rates of economic development in the countries of the Asia-Pacific region - Increased international trade in the Asia-Pacific region	- High level of competition, especially from the seaports of China - Construction of additional container terminals in the countries of the Asia-Pacific region (China, Republic of Korea, Malaysia) - Worsening global economic environment, global economic growth slowing - Tightening the rules of international shipping for Russian companies - Geopolitical risks (deterioration of the political situation in neighboring regions, which may lead to the effect reduction of Russia integration into the international transport system) - Global oil demand reduction as one of the main export shipments

Figure 1. The results of SWOT-analysis for the seaports of the Far East of Russia

In order to minimize the effects of identified disadvantages and threats and to use the capabilities and advantages of the seaports of the Far East of Russia, that is, to increase their competitiveness, efforts should be focused on the following areas:

- The activation of public-private partnership processes, including the participation of foreign investors, in the field of port infrastructure development (at present, most of the projects implemented in the Primorsky Territory have a social orientation);
- Adaptation of existing legislation to the needs of seaports (use of land for the construction of port facilities, tariff policy);
- Development of port industrial clusters together with Chinese partners;
- implementation of export-oriented investment projects with a full cycle of production and transportation of products through seaports with the participation of the Corporation for the Development of the Far East, the Agency of the Far East on investment attraction and export support;
- State financial and tax support for the modernization of fixed assets;
- The participation of seaport increase as one of the partners in technology platforms.

5. Summary

The paper has focused on seaport organisations from the perspective of logistics and supply chain management, and conceptualized a model or an approach to Organisational Effectiveness suitable for assessment and improvement of OE in seaport organisations and in any other organisations in the supply chain. Thus in the course of the study, the following results were obtained:

- They provided the definition of "seaport competitiveness" concept from the standpoint of an integrated approach;
- They substantiated the importance of seaports in the modern world economy and the economy of the Russian Far East;
- The competitiveness of the seaports of the Far East of Russia was assessed on the basis of an integrated approach using the SWOT analysis;
- They developed the proposals aimed at seaport competitiveness improvement of the Far East of Russia.

References

[1] Porter M.E., Ketels C., Delgado M. The Microeconomic Foundations of Prosperity: Findings from the Business Competitiveness Index, in World Economic 157 Forum, The Global Competitiveness Report 2007-2008, World Economic Forum. 2008. pp. 51-81.

[2] Buckley P.J., Pass C.L., Prescott K. Measures of international competitiveness: a critical survey // Journal of Marketing Management. 1988. Vol. 4 (2). pp. 175-200.

[3] Henricsson J.P.E., Ericsson S., Flanagan R., Jewell C. A. Rethinking competitiveness for the construction industry, in Khosrowshahi, F (Ed.). 20th Annual ARCOM Conference, 1-3 Sep-tember 2004, Heriot Watt University, Association of Researchers in Construction Management. 2004. Vol. 1. pp. 335- 342.

[4] Russian industry at the growth stage: the factors of firm competitiveness / ed. by K.R. Gonchar, B.V. Kuznetsova. M.: SU-HSE; Vershina, 2008. 480 p.

[5] Golikova V.V. Quality management and competitiveness of an enterprise. Chapter 10 // From the book: Essays on the modernization of Russian industry: the behavior of firms / Scientific Ed. B. V. Kuznetsov. M.: HSE Publishing House, 2014. pp. 222-239.

[6] Terenteva, T.V., Varkulevich, T.V., Vasilenko, M.E., Shumik, E.G., Smitskih, K.V. (2016) Methodical review of the social and economic development rankings of the region based on Pri-morsky Krai. International Review of Management and Marketing, 8 (4), pp. 807-813.

[7] Filosofova T.G., Lanshina T.A. International competitiveness of innovative firms: the interaction of factors of the internal environment and the national innovation system // Russia in the global world. Collection of scientific papers of the XXth All-Russian Scientific-Theoretical Conference. SPb.: Polytechnic University Publishing House, 2012. pp. 25-35.

[8] Latkin, A.P., Maidanevych, Y.P., Komarov, P.I. (2018) Analyzing and identifying the factors affecting the global supply chain competitiveness of industrial products. International Jour-nal of Supply Chain Management, 7 (6), pp. 544-549.

[9] Gurkov I.B., Avraamova E.M., Tubalov V.S. Competitiveness and innovativeness of Russian industrial enterprises (according to the results of the mass survey of their leaders) // The issues of economics. 2005. No. 3. pp. 75-90.

[10] Samoilov V.I., Podchufarov A.Yu. Methodology for assessing the competitiveness of an industrial holding company under conditions of complex import substitution // News of Tula State University. Technical science. 2016. No. 10. pp. 349-354.

[11] Druze I.B. About the modeling of the market development of regional seaports of the Far East of the Russian Federation / I.B. Druze, S.M. Zatepyakin // Transport business of Russia. Economy. Control. Transport. - 2015. - № 6. - pp. 214-217.

[12] Marchenko N. S., Konvisarova E. V. (2018) Peculiarities of diagnostics of the level of economic safety of marine port. Azimuth of Scientific Research: Economics and Administration, T. 7. № 2 (23). pp. 229-233.

[13] Bodrovtseva N.Yu. The concept and the types of sea port competitiveness // Transport business of Russia. 2017. No. 5. pp. 31-32.

[14] Review of maritime transport. 2016 [Electronic resource] // UNCTAD. URL: https://unctad.org/en/PublicationsLibrary/rmt2016_ru.pdf.

[15] UNCTAD: Review of maritime transport 2018 [Electronic resource] // UNCTAD. URL: https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf.

[16] Cargo turnover of sea ports of Russia for January - December 2015 [Electronic resource] // Association of Sea Commercial Ports. Access mode: http://www.morport.com/rus/news/document1751.shtml.

[17] Cargo turnover of sea ports of Russia for January - December 2016 [Electronic resource] // Association of Sea Commercial Ports. Access mode: http://www.morport.com/rus/news/document1842.shtml.

[18] Cargo turnover of sea ports of Russia for January - December 2017 [Electronic resource] // Association of Sea Commercial Ports. Access mode: http://www.morport.com/rus/news/document1987.shtml

[19] Konvisarova E. V., Churakov E. E. (2017) Problems and prospects of the social and economic development of Vladivostok status of a free port. Azimuth of Scientific Research: Economics and Administration, T. 6. № 1 (18). pp. 192-196.

[20] Miroshnikova, T., Taskaeva, N. (2018) Transport Complex of Primorye as a Factor of the Economic Status of the Region. International Scientific Conference Energy Management of Munic-ipal Transportation Facilities and Transport, EMMFT, 2017. Vol. 692. pp. 256-264.

[21] Krasova, E.V.; Ma, Y.X. (2015) Free Port of Vladivostok: Development Conditions, Prospects, Risks. Economic and Social Changes-Facts, Trends, Forecast. Vol. 42, Is. 6. pp. 108-122.

[22] Levchenko T.A. (2017) Clusters and their role in the development of national innovation

system in Russia. Azimuth of Scientific Research: Economics and Administration, V. 6. № 3 (20). pp. 239-243.

[23] Pakdel, M., & Talebbeydokhti, A. (2018). The Effect of Adjustment Announcement of Predicted Profit on Price and Trading Volume of Listed Companies in Tehran Stock Exchange. *Dutch Journal of Finance and Management, 2*(1), 49. https://doi.org/10.29333/djfm/5825

[24] Mondelo, V., Lado, M. J., Méndez, A. J., Vila, X. A., & Rodríguez-Liñares, L. (2017). Detection of Heart Beat Positions in ECG Recordings: A Lead-Dependent Algorithm. *Journal of Information Systems Engineering & Management, 2*(3), 13. https://doi.org/10.20897/jisem.201713

[25] Reyazi, N., & Aghaei, A. A. (2017). The relationship between strategic human resource management and job performance with the role of knowledge management Sayyad Shirazi hospital staff Gorgan. *UCT Journal of Management and Accounting Studies, 5*(2), 25-30.

[26] Ayebo, A., & Mrutu, A. (2019). An Exploration of Calculus Students' Beliefs about Mathematics. *International Electronic Journal of Mathematics Education, 14*(2), 385-392. https://doi.org/10.29333/iejme/5728

[27] Grebennikov, N., Kireev, A., Kozhemyaka, N., & Kononov, G. (2019). Hybrid electromagnetic suspension for high-speed vacuum transport. *International Journal of Power Electronics and Drive Systems*, *10*(1), 74.