
The Global Value of Distribution Networks and Logistic Opportunities

Submitted 22/04/20, 1st revision 17/05/20, 2nd revision 30/06/20, accepted 15/08/20

Olha Y. Maiboroda¹, Liudmyla S. Bezuhla², Andrii F. Gukaliuk³, Viktoriia V. Shymanska⁴, Tetiana V. Momont⁵, Tetiana V. Ilchenko⁶

Abstract:

Purpose: The present study aims to investigate the development and functioning of the distribution networks around the world. The study examines current development trends based on the Logistics Performance Index reports and Emerging Market Logistics Index surveys, identifies contemporary challenges of distribution networks in different countries, and analyses features of transport infrastructure in Ukraine.

Design/Methodology/Approach: Based on a cluster analysis of European countries by the Logistics Performance Index and consideration of cases of the formation of transport and logistics centers of Europe, the main trends in the development of the logistics sector have been identified.

Findings: The study has examined features of domestic distribution network establishment and maintenance. Conclusions have been made regarding its efficiency and opportunities on domestic and global scale. Current global economic trends allow predicting further domestic and regional collaboration as well as international partnership in this field which would be supplemented by multimodal transport hubs. Recommendations for improving the design process of the national network of transport and logistics centers have been developed.

Practical Implications: The research raises awareness of the transformation of transport and logistics systems in the world is carried out under the influence of the integration of Industry 4.0. Information flows on the movement of goods and services as well as customers' needs form a new logistics sector. The new concept of Logistics 4.0 defines the prospects for the development of transport and logistics systems and requires the study of future trends.

Originality/Value: The study highlights prospects of development of transport and logistics systems and stimulating factors of irreversible transformations have been defined.

Keywords: Distribution network and logistics, transport infrastructure, logistics hubs.

JEL Codes: R, R11, R41. **Article Type:** Research paper.

¹Associate Professor, V.N. Karazin Kharkiv National University, Kharkiv, 61000, Ukraine, E-mail: olgamayboroda@karazin.ua;

²Associate Professor, Dnipro State Agrarian and Economic University, Dnipro, Ukraine.

³Associate Professor, Ivan Franko National University of Lviv, Lviv, Ukraine.

⁴Associate Professor, Zhytomyr branch of Kyiv Institute of Business and Technology, Zhytomyr, Ukraine, E-mail: v.shimanskaya@kibit.edu.ua;

⁵Associate Professor, Zhytomyr branch of Kyiv Institute of business and technology, Zhytomyr, Ukraine, E-mail: bvh_gt@kibit.edu.ua;

⁶Associate Professor, Dnipro State University of Agriculture and Economics, Dnipro, Ukraine, E-mail: Ilchetv26@gmail.com

1. Introduction

Current stage of international economic relations requires structural changes in the operation of the transport systems worldwide. The changes should focus on interconnectivity and interoperability of various transportation modes to satisfy customer needs for high quality service.

World experience in this sphere demonstrates the most effective direction of development of the transport sector of developed countries, and this is the way to form the transport and logistics system of the country. This network ensures the interaction of all participants in the transportation and distribution process in technological and informational aspects and enables to find competitive offers for logistics and distribution services on international markets.

Transport logistics in the context of globalization of the international economy is becoming increasingly important around the world. In the framework of international logistics systems, various modes of transport are used on the basis of the principles of optimizing contact schedules, when, in the presence of long-term stable transportations, all modes of transport involved in them are managed from one logistics hub. For as much as Ukraine seeks an opportunity to join European Union and European freight transport system, the issue of creating a distribution network, which would meet both the internal and external demands of the country, has become critical. The experience of creating such structures in developed countries will be useful during the development of a national network of transport and logistics centers (Lukyanova, 2018).

2. Literature Review

The relevance of the study is confirmed by adoption of The National Transport Strategy of Ukraine 2030, approved by The Cabinet of Ministers of Ukraine No 430 from 30.05.18, which defines Ukraine as a core network corridor between Europe and Asia. The strategy is designed to develop components of the effective distribution network and multimodal transport hubs in order to raise competitiveness and provide market entry of Ukrainian products on the global transportation services market (Cabinet of Ministers of Ukraine, 2019).

Yavas and Ozkan-Ozen (2020) outline the importance of the study of conventional approaches to managing logistics hubs as part of Industry 4.0 Application development. However, certain problems in this area remain largely unsolved and require further analysis. For instance, the study of multimodal transport hubs forming features owing to the increasing attractiveness of the transportation potential of the Eastern European region and Ukraine, in particular. The scientific works of Ukrainian scholars have made a significant contribution to the development of the theory and application of transport and logistics services.

The development of logistics is characterized by the dynamism and growth of the number of logistics operators, which is accompanied by an increase in the market of e-commerce, infrastructure, automation of logistics processes. During the period 2011-2016, the number of logistics companies in Europe increased by 9%, and the turnover of companies by 16,3%. The market structure is characterized by the predominance of micro companies (58-59% with a share of 90-91%). Germany, France, Italy, Spain and the United Kingdom provide 70,9% of the value added of the logistics sector (Genchev, 2019). Europe's logistics sector is highly diversified at national and local levels through different ways of goods' transportation; an integration of national logistics into international logistics flows is carried out. At the same time, the countries of Central and Eastern Europe are limited in the formation of the global value chain due to the low level of air transport use (Sadowski, Wąsowska and Nowak, 2020). EU logistics systems have similar characteristics and are integrated into European logistics market.

Studies confirm the promising directions of logistics development in CEE countries in the context of bilateral trade and international trade. An improvement in logistics indicators in CEE countries takes place, which has also been proven (Bugarčić *et al.*, 2020). Logistics is being transformed through the dynamic integration of Industry 4.0 Application; automated supply chains are formed according to customers' needs; the logistics service sector is developing. The concept of Industry 4.0 Application radically transforms logistics (Kovács and Kot, 2016).

Technologies ensure the competitiveness of logistics operators in local, national and international markets. The higher level of development of technological solutions in logistics contributes to the higher level of development of the country's logistics. New technologies are changing the operating business models of logistics companies, providing digitalization of the product portfolio of logistics companies. Mobile applications offer customers digital logistics services in the B2B and B2C segment. Horizontal integration of technologies in the logistics sector involves the integration of "digital product service with portfolio software, networks (M2M, machine-to-machine) and data as distinctive features", analysis of demand and customer's data in real time and customization of customers.

Vertical integration takes place due to "integrated customer's solutions across the supply chain, cooperation with external actors" (Nagy *et al.*, 2018), based on a unique personalized approach to customers, integrated with the value creation system (Winkelhaus and Grosse, 2020), investors and partners (for instance, new delivery services Glovo, UberEats, Deliveroo (Maslaric *et al.*, 2016)). Thus, logistics is transformed at a rapid pace, which leads to dynamic change and development of transport and logistics systems. Prospects for the development of logistics will be determined by the speed of implementation of technological solutions, made by logistics companies. Large companies have greater access to disruptive innovation through the availability of financial resources, greater access to information flows.

Therefore, large companies will be innovators in integrating technologies into logistics (Kubiv *et al.*, 2020). Big business will set trends in the development of transport and logistics systems. The development of a digital data market will be one of the further promising trends (Bashtannyk *et al.*, 2020), it will provide logistics with information on customers' needs and demand for logistics services. Transport and logistics systems will be formed in those geographical areas where there will be the highest level of demand. Companies that integrate Industry 4.0 Application will be leaders in such geographic areas.

Research on the theoretical and practical studies of these authors suggests that they have formed theoretical foundations and practical tools for the formation of transport and logistics systems. However, here and now requires further decisions to study the features of the formation of a network of multimodal transport and logistics centers within the conditions of growing attractiveness of the transport potential of countries, which has led to the choice of research topic.

3. Research Methodology

The authors have used general scientific and special methods of research, namely: structural-logical method to build the framework of research, content analysis, bibliographic search and logical-historical approach to study current trends' development in transport and logistics systems of different countries, cluster analysis to compare prospects of logistics potential and competitiveness of national economies, graphical method to visualize the study results, and summary to justify the conclusions. Logistics Performance Index (LPI) has been used to assess the development of logistics infrastructure. Logistics Performance Index, calculated by the World Bank, is one of the most useful benchmarking tools that enables to conduct comparative analysis of countries' logistics performance and competitiveness. These data represent logistics performance dynamics on various dimensions - from countries and regions to a certain service. Comparisons of indicators of different years create a holistic picture and help determine the vectors of development of the global economy.

LPI is the weighted average score of the six key components: customs, infrastructure, international shipments, logistics quality and competence, tracking and tracing, timeliness (The World Bank, 2018). The next step in the analysis of statistical information – the index of logistics of emerging markets, the potential attractiveness of domestic logistics markets for foreign investment has been assessed.

4. Empirical Findings

The Logistics industry provides a significant contribution to national economy of every country. The efficiency of logistics affects the productivity of other sectors' activities. In most cases it is defined by the average cost of logistics services. Furthermore, logistics industry could be an independent market sector where countries

with developed networks of global and regional transportation such, as The Netherlands in Europe and Dubai and Singapore in Asia become a logistics and trading hub (Oliveira and Gimeno, 2014). Calculating and benchmarking logistics performance on a global scale is a complicated task. Measuring speed, cost and simplicity of formalities (e.g. freight taxes) connected with border control agencies is possible due to data availability. Although the provided values are full and accurate, they cannot be pooled into a unified dataset because of structural differences of the national delivery chains (The World Bank, 2018).

Enterprises that operate on the global market face different logistics opportunities and challenges. Among the most common trends are as follows (Harrison *et al.*, 2012), manufacturing system configuration, from production for a warehouse (Make-to-Stock) to production to order (Make-to-Order), distribution system configuration, mergers and acquisitions of trading and distribution companies, quantitative measures, namely, reducing the number of suppliers, impact of e-commerce.

The LPI system demonstrates comparative characteristics, the sizes of which are reflected on a scale from 1 (the lowest score) to 5 (the highest score), which makes it possible to compare the performance of all countries.

According to the 2018 survey (The World Bank, 2018), Germany ranks the first place in spite of the loss of its position in 2012 (-3). Sweden, which compared to 2012, has significantly improved its position (+12), holds the second place. Austria has risen from the 22nd rank to the 4th in the past two years, Japan (+5) and Denmark (+8), compared to 2014, respectively, and Finland (+14). Belgium, The Netherlands, Singapore and the United Kingdom have demonstrated minor changes.

Despite different ranking positions all countries have improved their scores by an average of 0,06–0,45 points, which indicates enhancement of logistics performance in the assessed countries.

Analyzing the dynamics of LPI indicators in Ukraine from 2010 to 2018, we can state that the highest indicator the country was revealed in 2014 (the 61st place and 2,98 points), the lowest in 2010 (the 102nd place and 2,57 points). Even being involved in the military conflict, the country has demonstrated better scores than in 2010 when it took the 102nd position. A significant factor that deteriorates logistics performance of the country is ongoing military operation or armed conflict. Furthermore, logistics services in Ukraine are among the most expensive on an international scale. Logistics performance assessment (% of LPI top performers) of the countries based on 2018 performance values was conducted on SPSS Statistics platform.

As a result, we have obtained dendrograms of similarity of countries (Figures 1-3). Three groups have been defined using cluster analysis, the first group includes the countries with high LPI scores, the second comprises the countries with medium LPI

score and the third shows the worst performers on the LPI scale.

Figure 1. The breakdown of the countries, cluster 1

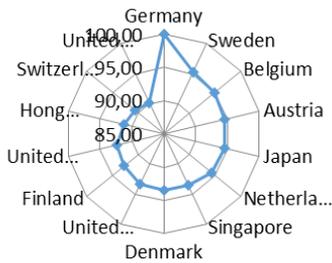
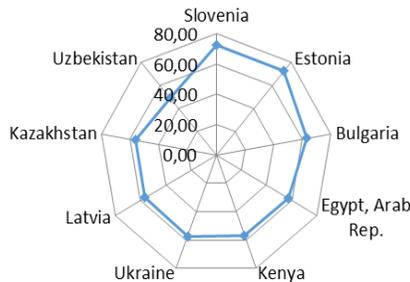


Figure 2. The breakdown of the countries, cluster 2



Figure 3. The breakdown of the countries cluster 3



Source: Own study.

The analysis demonstrates current state of logistics industry in high-income countries at the current stage. Countries with high rates of logistics performance have formed the first and second clusters. Ukraine belongs to the third cluster taking middle position within the group. The countries of the first two clusters demonstrate the diversity of forms of logistics entities in dynamic market conditions, which makes it possible to conclude about the high efficiency of this economic concept. The number of major operating logistics companies and operators in Ukraine is scarce, whereas their quantity is sufficient in developed western countries. International experience in this area suggests the most productive approach to transport sector development and this is the way to form the transport and logistics system of the country.

High level of transportation expenses (89%) compared to other logistics expenses (1% managing supply chains, 2% freight forwarding, 8% warehousing) determines the importance of transportation component in the whole logistics system structure (The World Bank, 2018).

The creation of major logistics hubs in Europe began not so long ago in the 1980s. One of the first hubs was located in the city of Ingolstadt (Bavaria). However, it took

several decades for a single example of the creation of a transport and logistics hub to prove the effectiveness of its existence. \$800 billion turnover of European distribution logistics market validates its efficiency, while third-party logistics market in Europe has an estimated annual turnover of \$130 billion. For instance, business activity of logistics hubs brings the Dutch economy 40% of revenue from the whole transport industry, French 31%, German 25% respectively (Bonyar, 2012).

A number of countries, such as Germany, which has the largest market share of transportation and logistics services with 33 operating transport and logistics hubs, serves as a good example of the network system implementation. German logistics industry is one of the largest national economic sectors. Establishment and maintenance of logistics hubs in Germany has a few key features: extensive government support through subsidising; long-term investments from the federal budget through Deutsche Bahn AG (German Railway Company); targeted incentives or grants; private investments and loans (Tityukhin, 2006).

Bologna Freight Village is one of the leading and the most important transport and logistics hubs in the world and one of the largest transport and logistics hubs in European Union. This center caters for approximately 35% of national freight traffic and 16% of international freight traffic. Its share capital amounts to 137.439,28€. Bologna Freight Village is also a home to various European innovative projects aiming to improve transportation facilities and introduce sustainable and environmentally-friendly logistics solutions (Quality of Freight Villages Structure and Operations, 2000).

Rotterdam is the largest port in Europe situated at the conflux of the rivers that pass through different countries. Its geographical features make Rotterdam a major freight hub suitable for transporting consignments to Central and Western Europe and the landscape enables road and rail connection. The Dutch government evaluates merits of the port of Rotterdam and sees a logistics hub as the national business center, where handling and transporting large volumes of cargo provides job opportunities to the vast majority of the local population (Port of Rotterdam, 2015).

Austrian government has ratified a strategy to develop multimodal connection to optimise logistics chains. Economic constraints on multimodal transport have been removed to enhance information flow and build network across the country. (Nikitenko, 2018).

Belgium has no state institutions that operate logistics hubs. Meanwhile there are non-governmental organizations subsidised by the government that assist investors in building and maintaining transport and logistics infrastructure. Currently, there are about 250 logistics hubs in Belgium, employing more than 20 thousand people (Tityukhin, 2006).

Therefore, in European Union large logistics hubs are usually subsidised by the government. At the same time, some logistics centers were formed using the principle of strategic public-private partnership. The EU has developed a common framework for logistics hub management where presence or absence of certain facilities and commodities depends on the size of the hub and its location and functional objectives.

Current stage of social-economic development in Ukraine compared to high-income countries hasn't fully used virtue of its geographical location and transit capacity. Thus, designing and optimising transport infrastructure strategy, attracting investors and implementing EU policies are prerequisites for increasing positions on international logistics markets.

Emerging Market Logistics Index (EMLI), developed by global research centre Travel Intelligence (the UK), estimates potential attractiveness of the domestic logistics markets for foreign investments. The Index examines three key dimensions: business fundamentals, international and domestic logistics opportunities. Table 1 below shows EMLI 2018 ranking of the countries.

Table 1. Emerging Market Logistics Index, 2018.

Country	EMLI	Rating
China	8.0	1
India	7.12	2
United Arab Emirates	7.01	3
Malaysia	6.63	4
Indonesia	6.5	5
.....		
Ukraine	4.2	35

Source: Agility Emerging Markets Logistics Index (2018).

It has been revealed, according to the EMLI rating as of 2018, China holds the leading position, the activities for the creation of transport and logistics hubs and the introduction of logistics services in this country are strictly controlled by the state. Ukraine takes the 35th place, which means that opportunities of logistics market in Ukraine depend on economic development.

Notwithstanding, logistics industry in Ukraine corresponds with high international standards. Although logistics market in Ukraine has relatively low pace of development compared to market leaders in the field, domestic logistics market consists of 40 companies. Most of them are powerful logistics operators on a global scale, namely: Kuehne and Nagel Ukraine, Raben Group Ukraine, Zammler 3PL, Ekol Logistics 4.0, FM Logistics, SAT, FIEGE Ukraine, GEFCO Ukraine, UPS, TNT, DHL, etc. They compete with domestic enterprises such, as: UVK (UVK Transport and Logistics Complex), TBN Logistic Ukraine, LLC "Rapid", "Nova Poshta" Express Delivery Company, "Autolux", "Gunsel", etc. Just-in-time delivery could become a promising segment on domestic logistics market. This field of logistics is

rapidly developing around the world; the output is the high demand of value-added logistics services.

A group of leading Transcarpathian transport enterprises established the Union of Ukrainian Transport Companies. The strategic direction of the association is to fully promote the integration of the national transport system into the international transport market, to promote the effective functioning of the national network of international transport corridors in accordance with international standards in the comprehensive service of international transport.

These issues were discussed at the meeting of the Heads of Customs Administrations of GUAM member states (Regional Organization established by Georgia, Ukraine, Azerbaijan and Moldova) held in December 2019 (Organization for Democracy and Economic Development, 2019). Sokyрко, the Head of Industrial and Logistics Research in CBRE Ukraine, in her report has noted: *“Following a period of 2015-2016 downturn, local operators gradually regained their market share. Ukrainian companies that currently dominate the market are Business Group, ZAMMLER, Logistic Plus, UVK and NP Logistic”* (Sokyрко, 2018).

Today logistics is an effective supply chain management tool aimed at increasing profits for all participants involved in the physical flow of products by optimising their logistics costs in a definite place at a definite time. According to the experience of high-income counties, the use of logistics systems can reduce overall logistics costs by almost 12-35%, transportation costs by 7-20%, waiting and operation costs by 15-30%, and it also increases cash flow velocity by 20-40% and shortens inventory costs by 50-200%. All this indicates to the fact that one of the important factors of economic growth is the formation of integrated transport and logistics systems covering individual countries and regions. Taking this into consideration, logistics is integrated into the most productive industries, such as the agricultural sector, engineering, and stimulating the development of agricultural enterprises by the state will contribute to the future development of the logistics market of Ukraine.

Logistics, as part of the value creation process, can ensure the security of production, supply, and marketing (Petrunenko *et al.*, 2020). Certain results of the study have been used as the framework for regional transport development project “Kharkiv region development strategy for 2021-2027”, action plan for a local community and structural subdivisions of Kharkiv Region administration that is responsible for coordination and implementation of the local government policies.

5. Discussion and Conclusion

Thus, the analysis of top logistics performers' experience has proven benefits of setting up similar logistics hubs in Ukraine regardless time consumption. Prospects for the relevant direction of development of the domestic economy, namely Ukraine's

transport system has all the necessary opportunities for effective work on the formation of large transport and logistics hubs, which include:

- Ukraine has a favourable geographic location that provides necessary conditions to create numerous transport corridors. This fact is especially important in the context of intensification of external relations between European countries, as well as between Europe and Asia.
- Ukraine has robust transport system comprising rail, sea, river, road, air and pipeline transport modes.
- Integration with the countries of Central and Eastern Europe, which is manifested in the development of relevant transport corridors (Lukyanova, 2018).

The conclusions based on the results of the study can be drawn regarding Ukraine's readiness to create new and improve existing transport and logistics systems. Ukraine ranked the 66th place in 2018 LPI report. An ongoing armed conflict is a considerable downside which influences domestic logistics efficiency and makes relatively costly Ukrainian logistics services even more expensive on international market. According to EMLI survey Ukraine takes the 35th position, which suggests relatively moderate share and activity of the domestic logistics market, its compatibility and inefficient transport facilities. At the same time it emphasizes domestic logistics market opportunities which explicitly depend on the national economy.

Thus, taking into account the fundamental importance, complexity and systemic nature of this problem in order to ensure the competitiveness of Ukrainian logistics, transport companies and the economy at the global level, the following steps should be taken, namely:

- Development of measures for the modernization of logistics infrastructure, which has remained since the 1990s, which aims not only to replace obsolete equipment and engineering structures, but their complex and systematic processing in accordance with new technologies for handling cargo flow;
- Ensuring price availability of logistics services for potential customers;
- Development and adoption of the concept of state policy in the field of transport and logistics management, which provides active assistance from the government to domestic enterprises in improving on the basis of modern approaches and best practices.

Developing new and implementing the existing (including approved) strategies and mechanisms of effective distribution network operation and logistics hubs maintenance in Ukraine will greatly benefit competitiveness of the domestic transport sector in particular and national economy in general. These issues are a promising direction for further scientific and practical research.

References:

- Agility Emerging Markets Logistics Index. 2018. Available at: <https://www.agility.com/wp-content/uploads/2018/03/Agility-Emerging-Markets-Logistics-Index-2018.pdf>.
- Bashtannyk, V., Buryk, Z., Kokhan, M., Vlasenko, T., Skryl, V. 2020. Financial, economic and sustainable development of states within the conditions of industry 4.0. *International Journal of Management*, 11(4), 406-413.
- Bonyar, S. 2012. International experience of creation of multimodal transport logistics centers. *Economics and State*, 3, 32-35.
- Bugarčić, F.Ž., Skvarciany, V., Stanišić, N. 2020. Logistics performance index in international trade: case of Central and Eastern European and Western Balkans countries. *Business: Theory and Practice*, 21(2), 452-459.
- Cabinet of Ministers of Ukraine. 2018. Order of The Cabinet of Ministers of Ukraine No 430th from 30.05.18. Approval of the National Transport Strategy of Ukraine by 2030. Available at: <https://www.kmu.gov.ua/npas/pro-shvalennya-nacionalnoyi-transportnoyi-strategiyi-ukrayini-na-period-do-2030-roku>.
- Genchev, E. 2019. Analysis of Logistics Sector in the European Union. In: T. Studzieniecki, M. Kozina and D. Skalamera Alilovic (Eds.), 33rd International Scientific Conference on Economic and Social Development, Managerial Issues in Modern Business, Book of Proceedings, Varazdin Development and Entrepreneurship Agency, Varazdin, Croatia, 836-843.
- Harrison, A. Skipworth, H., Van Hoek, R., Aitken, J. 2019. *Logistics Management and Strategy*, 6th edition, Pearson Switzerland, Zug, Switzerland, 496.
- Kovács, G., Kot, S. 2016. New logistics and production trends as the effect of global economy changes. *Polish Journal of Management Studies*, 14(2), 115-126.
- Kubiv, S., Bobro, N., Lopushnyak, G., Lenher, Y., Kozhyna, A. 2020. Innovative potential in European countries: Analytical and legal aspects. *International Journal of Economics and Business Administration*, 8(2), 250-251.
- Lukyanova, O. 2018. World experience and prospects for the development of the transport and logistics system of Ukraine. *Economics and Society*, 18, 166-172.
- Maslaric, M., Nikoličić, S., Mirčetić, D. 2016. Logistics Response to the Industry 4.0: The Physical Internet. *Open Engineering*, 6(1), 511-517. Available at: <https://doi.org/10.1515/eng-2016-0073>.
- Nagy, J., Oláh, J., Erdei, E., Máté, D., Popp, J. 2018. The Role and Impact of Industry 4.0 and the Internet of Things on the Business Strategy of the Value Chain –The Case of Hungary. *Sustainability*, 10(10), 3491.
- Nikitenko, P.G. 2018. Report of the Director of the Institute of Economics of the NAS of Belarus Academician Nikitenko P.G., at the II Belarusian Transport and Logistics Congress. Available at: <http://www.tc.by/exhibitions/Transport/news/315.html>.
- Oliveira, A., Gimeno, A. 2014. *Managing Supply Chain Networks: Building Competitive Advantage in Fluid and Complex Environments*. Pearson, New York, NY, 194.
- Organization for Democracy and Economic Development-GUAM. 2019. The Second Meeting of the Heads of Customs Administrations of GUAM. Available at: <https://guam-organization.org/vtoraja-vstrecha-glav-tamozhennyh-administracij-gosudarstv-chlenov-guam/>.
- Petrunenka, Y.V., Malinoshevska, K.I. 2020. Strategy, economic and legal foundations for the development of agro-industrial complex within the conditions ensuring of food security. *International Journal of Management*, 11(6), 463-475.

- Port of Rotterdam. 2015. The port that will take you ahead. Available at: <https://www.portofrotterdam.com/en/doing-business/why-rotterdam/the-port-that-will-take-you-ahead>.
- Quality of Freight Villages Structure and Operations. 2000. Final Report for Publication. Available at: <https://trimis.ec.europa.eu/sites/default/files/project/documents/fv2000.pdf>.
- Sadowski, A., Wařowska, K., Nowak, I. 2020. Logistics Development in European Countries: The Case of Poland. *European Research Studies*, 23(2), 500-514.
- Sokyrko, N. 2018. Logistic market of Ukraine: logistic operators to increase their part in the segments of warehouse logistics. CBRE Ukraine. Available at: <https://cbre-expandia.com/logistichniy-rinok-ukrayini-logistichni-operatori-naroshhuyut-svoyu-dolyu-v-segmenti-skladskoyi-logistiki/>.
- Tityukhin, N. 2006. Public-Private Partnership in the Development of the Russian Logistics Market: Unreal Reality. Available at: <http://loginfo.ru/issue/98/1271>.
- The World Bank. 2018. LPI Report. Trade Logistics improving in developing countries, but more needs to be done. Available at: <http://lpi.worldbank.org>.
- Winkelhaus, S., Grosse, E.H. 2020. Logistics 4.0: a systematic review towards a new logistics system. *International Journal of Production Research*, 58(1), 18-43.
- Yavas, V., Ozkan-Ozen, Y.D. 2020. Logistics centers in the new industrial era: a proposed framework for logistics center 4.0. *Transportation Research Part E: Logistics and Transportation Review*, 135, 101864. Available at: <https://doi.org/10.1016/j.tre.2020.101864>.