



RUSSIA'S NATIONAL LOGISTICS SYSTEM: MAIN DIRECTIONS OF DEVELOPMENT

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ABSTRACT. Background: The subject of this research is the formulation of recommendations for the improvement of the national logistics system of the Russian Federation. The aim of the work is to analyze Russia through 6 dynamic indicators across 11 years. It should be understood that state policies and measures take time to be implemented and carry certain costs with them, which precludes momentary full-scale development. Triage is needed to understand the critical sectors of the national logistics system that are the most underdeveloped at the current moment, with future resources already aimed at small-scale development and/or helping newly developed logistics areas function at a satisfactory level. By itself, logistics development is very important for any country in the current international market, with Russia having the potential to be a crucial transport link between East-West/West-East product and container flows.

Methods: Russia's country-level logistics system is analyzed by us through the use of the World Bank's Logistics Performance Index and its 6 indicators. Detailed observation allows the pinpointing of problematic areas and further development of group solutions and recommendations at the state level.

Results: Recommendations for national logistics system development grouped in a prioritized list with 2 different resulting scenarios. Division of measures is needed since resource scarcity may not allow wide full-scale eradication of all identified logistical bottlenecks at once. Approximate results of scenario implementation given through comparable estimates made by governmental bodies.

Conclusions: The developed scenarios with appointed integration conditions are aimed at the development of Russia's national logistics system for a better competitive situation in the international market.

Key words: Logistics Performance Index (LPI), Russia, international transport corridors, international logistics, infrastructure, state transport policy.

INTRODUCTION

Transport and logistics services facilitate international trade and play an important role in the growth and development of any economy. The quality and efficiency of logistics services can be important for international trade, as a weak logistics infrastructure and insufficiently developed operational processes can be some of the main obstacles to integration into international trade.

Logistics services link several industries within local economies. They also link the domestic economy with the international one and provide links between various

interdependent manufacturing sectors (agriculture, manufacturing, tourism, and so on). The economy is strengthened by efficient transportation and logistics systems since it is important for manufacturers to safely transport their goods in a cost-effective way with minimal time delays.

The continued growth of world trade and the desire of many countries to accelerate the pace of integration into the global trading system will depend not only on maintaining an open global economic system but also on increasing the number and effectiveness of supporting structures, such as country-level logistics systems.

Empirical studies suggest that transport infrastructure inefficiencies can have an adverse effect on trade. For example, in a study of air travel in South Africa [Dettmer et al. 2014], it was concluded that a more liberal market for air transportation services could reduce transport costs and facilitate further trade integration. A general view of logistics being a significant factor of international trade has been echoed in several studies, through export-import and logistics variables correlation analysis [Beysenbaev 2018], through international trade statistics and logistics variables panel data analysis [Luttermann et al. 2017] and through focused regional research [Edirisinghe 2013].

Thus, logistics efficiency plays an important role in economic growth and improving the country's competitiveness. Inefficient logistics increases overall costs and reduces the likelihood of global integration [Guner and Coskun 2012]. Evaluating the effectiveness of logistics requires the use of various indicators that characterize its efficiency and productivity. Macroeconomic criteria and indicators characterizing the efficiency of logistics or its individual components have different methodological approaches.

One of the most widespread among researchers is the Logistics Performance Index (LPI) developed and published biannually by the World Bank. It is based on a worldwide survey of global freight forwarders and express carriers. The LPI consists of both qualitative and quantitative indicators and measures the logistics efficiency of over 150 countries across 6 different areas: customs efficiency, logistics infrastructure, tracking and tracing ability, ease of international shipments, logistics services quality, shipment timeliness [Arvis et al. 2018].

The LPI and its indicators have been used in logistics research at an international level [Gogoneata 2008], at a regional level – in Sub-Saharan Africa [Shepherd 2016], and at a national level - in Singapore [Tan and Hilmola 2012]. Moreover, the LPI has been used in different governmental logistics initiatives, mostly as a benchmarking tool. The Finnish Ministry of Traffic and Commu-

nications has used the LPI as a dynamic comparative tool in its biannual Finnish State of Logistics Report [Solakivi et al. 2017], Oman uses the LPI as a benchmarking tool and as a target indicator within the framework of The Sultanate of Oman Logistics Strategy 2040 [Al-Futaisi 2015], similar to the Report of the Standing Committee on Transport, Infrastructure and Communities of Canada [Sgro 2019].

This precludes the use of the LPI as a tool for benchmarking country-level logistics systems against different countries, and as an instrument for prioritizing and choosing essential national logistics program directions in a systematic way.

ANALYSIS

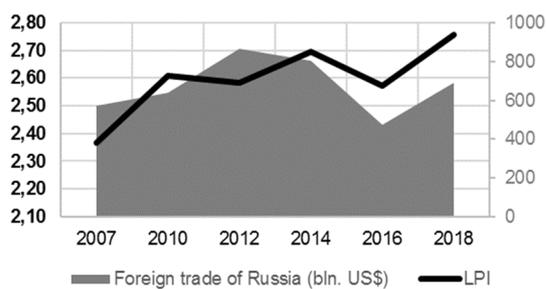
The Russian Federation is one of the main partners of the EU, APEC and the CIS [The Central Bank of the Russian Federation 2018]. Fuel and energy products prevail in the export structure, but Russia is also a major exporter of metal, machinery, equipment, chemical products, food products, and agricultural raw materials. Russia also imports machinery, equipment, textile products, pharmaceuticals, and food products.

Moreover, in a territorial sense, Russia is an important transit logistical link between China and Europe with a future project – the Belt and Road Initiative, predicted to develop this link even further [Titarenko et al. 2015]. Thus, the Russian Federation is a major participant in international trade, and the quality and effectiveness of Russia's logistics system are important for international trade.

In order to look at the problems in Russia's national logistics system and to create a systematic solution for its development, we have chosen the LPI as the primary research instrument.

First of all, we need to analyze the biannual LPI scores for the Russian Federation and compare it with the changes in Russia's foreign trade in 2007, 2010, 2012, 2014, 2016 and 2018 (years of LPI release) to determine

the relevance of the index to this study (Figure 1). A correlation analysis is not possible, due to the small number of data points – 6. That amount is an insufficient sample size for any significant Pearson's correlation (significant at $n \geq 25$) [Bonett and Wright 2000]. This means only a general overview of LPI scores and Russia's foreign trade volumes can be performed.



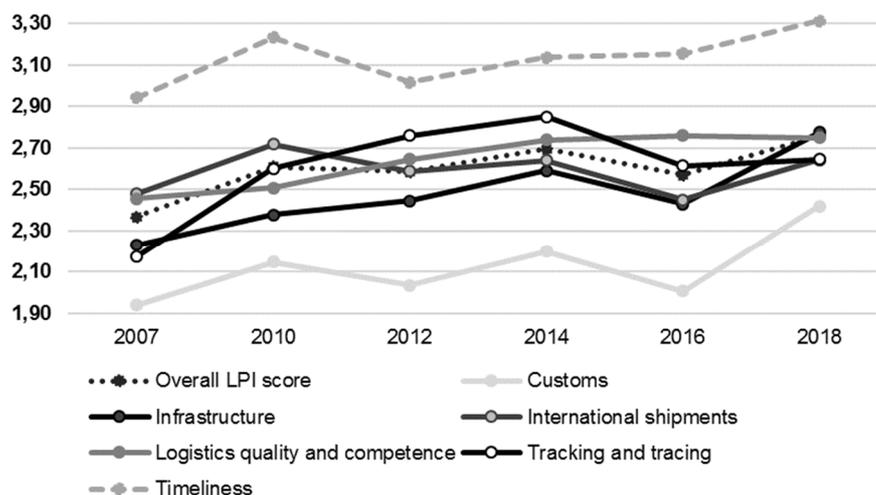
Source: Arvis et al. 2018; The World Bank

Fig. 1. Comparison of LPI scores and Russian foreign trade volumes (2007-2018)

As can be seen from the diagram, the dynamics of foreign trade and LPI scores for Russia are proportional for all observed periods except 2012 (there is a decrease in the LPI score for 2012, compared with an increase in foreign trade in 2012). It is assumed that this fact is associated with a change in indicator weights in all 6 areas of the LPI in 2014, since, firstly, before the 2014 release, indicator weights were distributed differently and the LPI methodology was only being formed and, secondly, 2014 marks the beginning of the parallel movement of the graph lines.

In this way, we can see that the LPI can be used in this study, being a widely used tool for benchmarking logistics aspects and being mostly comparable with foreign trade volumes through it also being a measure of logistics efficiency.

To begin with our analysis, it is necessary to look at all aspects of the LPI in detail over all published periods, as well as to identify positive and negative trends in Russia's logistics system (Figure 2).



Source: Arvis et al. 2018

Fig. 2. LPI indicator scores for Russia (2007-2018)

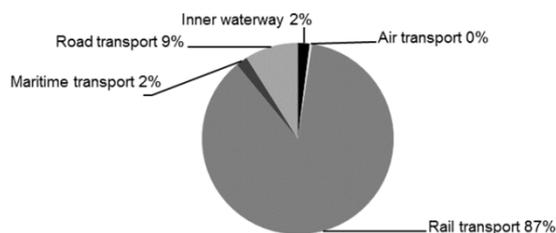
It is worth noting that the overall situation in the Russian Federation has improved, although not by much. Starting from 2007, over the course of 12 years, the Russian Federation has improved its performance by 0,39 points, rising from the 99th place to the

75th, from the third quartile of the LPI to the second.

Further, it is necessary to consider the current logistic potential of the Russian Federation, to identify the main bottlenecks and trace their relationship with the

corresponding indicator in the LPI and to develop recommendations that will increase Russia's position in this rating.

The least change can be observed for “International shipments”, which may reflect some difficulties with cargo clearance procedures, which, in turn, lead to higher prices. This dynamic may also be indicative of possible barriers that prevent cargo from being transported at competitive prices. This includes the strong monopolization of the country's railway network and the size of the country's territory, which forces the country to heavily depend on railway lines for cargo transportation, which is reflected in the fact that the railway transport type prevails over the rest (Figure 3).



Source: Sabelnikova et al. 2018

Fig. 3. Transport type distribution in Russia (2018)

The “Timeliness” indicator remains the highest-rated aspect of Russia's logistics system. This fact may indicate either proper logistical planning in the Russian Federation (the time of cargo delivery from the sender to the recipient is correctly calculated), or the overall high quality of the cargo delivery system, which is unlikely, given the rather low ratings given for the quality of transport infrastructure (“Infrastructure” indicator) in Russia. It is likely that, given the nature of the LPI calculation, wherein only respondents from within Russia or neighboring countries are chosen, LPI respondents have few comparison points.

The most dynamic change can be observed for “Infrastructure”, which probably indicates the implementation of measures to modernize

and develop the transport infrastructure of the Russian Federation in recent years. A more detailed analysis of infrastructure connected to international trade can be found in section 3.2.

A stable low rating can be observed for “Customs”, but it is necessary to note a sharp increase in the rating (2,42 in 2018 compared with 2,01 in 2016) in 2018. This fact can be related to the fact that the Customs Code Agreement of the Eurasian Economic Union (EAEU) from April 11th, 2017 entered into force on the 1st of January, 2018. The purpose of the Agreement was to ensure unified customs regulation in the Eurasian Economic Union, which includes establishing the procedure and conditions for the movement of goods across the customs border of the EAEU, their location and use on the customs territory of the EAEU or outside it, the procedure for performing customs operations related to the arrival of goods at the customs territory of the EAEU, their departure from the customs territory of the EAEU, temporary storage of goods, their customs declaration and release, other customs operations, the procedure for paying customs tariffs, special, anti-dumping, or countervailing duties, use and/or disposal of goods in the customs territory of the EAEC or beyond it. More precisely, this document introduced mandatory electronic declaration in the countries of the Customs Union, and also significantly simplified and accelerated the procedures and process of customs clearance.

The quality and supply of logistics services in the Russian Federation varies greatly and the assessment (“Logistics quality and competence”) is stably average, but it is possible to identify some trends in this area, namely: the lack of a formed and unified 3PL market and the absence of system integrators at the 4PL level.

Outsourcing of transport services occupies 22% of the market in Russia or about a fifth of the entire transport and logistics industry. For comparison, 3PL - suppliers occupy 65% of the European market and 48% of the Chinese [TransRussia 2018]. It is important to note that the unsaturated nature of the market means that international firms have every opportunity to advance into Russia. 3PL, as an industry, has only recently taken root in Russia.

Misconceptions regarding the type of services offered and the fact that many Russian companies transport goods themselves are also hindering the development of the industry. While domestic firms are struggling to meet international service standards, foreign firms are moving forward in the Russian logistics industry and occupying open niches.

Regarding the last two areas of the LPI: “International logistics” and “Tracking and tracing”, it is difficult to analyze these indicators at a country logistics level, since they are inextricably linked with others and the improvement of dependent systems could definitely affect the estimates. More competitive prices for the transport of goods directly depend on the quality of the logistics services provided within the country and the effectiveness of customs. At the same time, the ability to track cargo directly depends on two factors: the recipient’s access to a system that notifies them of the cargo status and the presence of a tracking system with the carrier. Due to the fact that the Russian Federation is not among the countries with a high share of the population cut off from the Internet due to extremely high cost of access [ITU 2018], it is logical to assume that low ratings for this aspect in LPI are a consequence of the lack of a tracking system among carriers, and this is also directly related to the quality of the logistics services provided within the country.

With regard to the integration of Russia’s logistics in international trade, we need to consider some international transport corridors separately. Bilateral movement of goods from Asia to Europe, from the Middle East to Scandinavia depends on the efficiency and functioning of these international transport corridors.

The Russian Federation is crisscrossed by several international transport corridors, with throughputs of hundreds of millions of tons of cargo per year. Three international transport corridors (part of the system of Crete, Helsinki or Pan-European corridors) pass through the territory of Russia, namely: I, II, IX, as well as the Northern Sea Route (NSR) along the Arctic coastline and part of the new International North-South Transport Corridor (INSTC).

The NSR passes through the Arctic waters of Russia, presenting a new way to transport huge cargoes by ship from Europe to Asia and vice versa. The shipping route had been mapped previously, but only recently has the technology become affordable enough and the environment safe enough to make the route viable option for container shipping. The NSR crosses the Barents, Kara, Laptev, East Siberian and Chukchi seas, comprises 40% less sailing distance and can reduce delivery time by up to 35% compared with the usual route using the Suez Canal [Furuichi and Otsuka 2013].

Corridor IX stretches from Helsinki in Finland to Alexandroupolis in Greece. The corridor follows the route: Helsinki - Vyborg - St. Petersburg - Moscow - Kyiv - Chisinau - Bucharest - Ruse - Dimitrovgrad – Alexandroupolis. The corridor includes railways, highways, ports in St. Petersburg, Kaliningrad, Vyborg, airports of the Leningrad and Moscow transport hubs, inland waterways, freight, and passenger terminal and is one of the longest Pan-European corridors.

Corridor II starts from Berlin in Germany and ends in Nizhny Novgorod in Russia, passing through Poland and Belarus. The corridor follows the route: Berlin - Poznan - Warsaw - Brest - Minsk - Smolensk - Moscow - Nizhny Novgorod. The development of the railway part of this corridor to the Far Eastern ports will significantly increase the size of international transit cargo transportation in the West-East traffic.

The Russian part of Corridor I that starts in Helsinki and ends in the Polish port of Gdansk, includes the seaport and airport in Kaliningrad, railways, and roadways from the border with Lithuania and from the border with Poland.

The INSTC is a proposed multimodal network of maritime, rail and road routes with a length of 7200 km for the transport of goods between Afghanistan, Armenia, Central Asia, and Europe [Hriday 2018]. The route mainly includes the transportation of goods from India, Iran, Azerbaijan, and Russia by sea, by rail, and by roadway. The purpose of the corridor is to expand trade relations between such large cities as Mumbai, Moscow, Tehran,

Baku, Bandar Abbas, Astrakhan, Bandar Anzali and others. 3000 km of the route pass through the territory of Russia. Russia's territory is officially entered through the route by the Caspian Sea, but the major scope of the INSTC is trans-Asian.

The Trans-Siberian Railway also plays a special role in Russia's transit system. It covers 9289 km and is the longest railway in the world, which mainly serves for the transportation of containerized cargo from China to Finland and Germany.

In the west, the rail connects with Scandinavia through Finland and with the EU through the Baltic countries. Far in the east, the corridor connects Russia with China, Mongolia, and Korea. In 2015, the world's longest cargo railway route Harbin — Hamburg from China to Germany via Russia was launched on the basis of the Trans-Siberian Railway, reducing the delivery time for goods to 15 days [Pomfret 2019].

Our study and several other researchers' studies [Filina 2004; Sakuleva and Metjolkina 2015] of container movement through the Trans-Siberian Railway indicate the following barriers to the further development of transport links along the railway:

- Delivery time fluctuation;
- Unreasonably high terminal processing rates;
- Rolling stock obsolescence;
- Lack of an end-to-end tariff rate applicable in all directions from the port of departure to the port of destination.

The problems of attracting goods for transportation through the Trans-Siberian Railway are complex. Their solution primarily concerns the development of a competitive end-to-end freight rate, as well as the efficient handling of transit cargo in ports and at border stations with the cooperation of various railway, customs, maritime and other agencies.

With regard to the INSTC, our own and other research [Cvetkov et al. 2014] note that the main disadvantages are:

- The absence of direct rail links between Russia and Iran and the slow operation of customs in Russian ports;
- Since its very conceptualization, the INSTC has not been able to ensure widespread participation of private investors. This is due to many reasons, including US sanctions against Iran. Sanctions played a role in preventing some Western companies from entering the Iranian market, but this in no way prevented them from participating in a multi-country project, which in itself was not the subject of any form of sanctions. Large companies fear that there are big risks associated with the return on investment in project development;
- The different railway gauge between Russia, Azerbaijan, and Iran, the lack of some sections of the project, especially in Iran.

The Pan-European corridors suffer from problems that are outside the interests and sphere of influence of the Russian Federation, although some can be found in the country, namely:

- Extremely low throughput of highways;
- Inappropriate quality of transport routes;
- Large sections of non-electrified railway tracks.

The main constraints to the improvement and creation of new Arctic transport routes and the development of the Northern Sea Route are:

- Low development level of coastal infrastructure along its routes and underdevelopment (often complete absence) of railway infrastructure;
- Unclear conditions for carriers for receiving permits for passage of vessels along the Northern Sea Route;
- The need to create uniform tariffs for the provision of services for all carriers throughout the Northern Sea Route;
- Lack of involvement of major global carriers in the activities of the Northern Sea Route, which leads to problems in drawing up the schedule of vessels along Arctic routes;
- Coordination of the work of all ports of the Northern Sea Route.

Thus, after the analysis, it is necessary to identify and collect the main recommendations for improving the rank of the Russian Federation in the LPI rating.

RESULTS

To begin with, two development scenarios should be developed, based on the analysis of assessments of various aspects of Russia's logistics in the LPI depending on available resources, because that tool is designed to identify priority areas for the development of various logistics subsystems. Scenario A is a high-priority recommendation list that uses minimum resources for maximum effectiveness in a situation of resource scarcity and budgeting, while Scenario B can be implemented after Scenario A or parallel to it, dependent on available budget and resources.

Scenario A

Scenario A is considered the most important and implies:

- Support for timely delivery at the current LPI level;
- Thorough development of the country's customs system.

As can be seen from the previous paragraph, on-time deliveries are consistently the strongest side of logistics in the Russian Federation, therefore development (in the framework of this scenario) is not required, only a strategy for keeping the current level is advised. The following recommendations can be implemented as part of this strategy:

- Investment into the support of the current logistics infrastructure, more precisely into the aging Trans-Siberian Railway;
- Reduction of freight rates in order to avoid a detour of Russian Federation territory through southern countries, such as Kazakhstan;
- Modernization of rolling stock.

In the framework of this scenario, it is also taken into account that all indicators, except “Timeliness” and “Customs”, are approximately at the same level, which indicates the need for improving and

developing the lowest-valued indicator (“Customs”) to achieve average scores.

Customs efficiency can be increased by:

- Improving customs regulation;
- Improving the level of training of customs personnel;
- Simplification, optimization, and computerization of processes related to certification and licensing in export-import operations;
- The development of free economic zones and the provision of preferences for more developed and actively developing countries.

Scenario B

Scenario B remains secondary and implies implementation and launch if scenario A goals are achieved or in parallel with it (if there are enough resources). In the framework of this scenario, the main recommendation that can be advised is the general development and support of a positive LPI score growth trend for “Infrastructure”, “Logistics quality and competence”, “Tracking and tracing”, and “International shipments”. To be more precise:

- Improvement of the investment attractiveness of the logistics industry in Russia;
- The accelerated formation of the 3PL-services market and the transition to the 4PL concept (creation of system integrators in the field of logistics, for example, large transport and logistics complexes in Yekaterinburg, Novosibirsk and/or Omsk);
- Improvement of the government regulation of the logistics industry;
- Creation of a system of reliable statistical reporting on logistics indicators;
- Improvement of the level of training for the logistics industry;
- Investment in the creation of new international logistics projects (The Belt and Road Initiative) and/or support of ongoing projects, for example, the INSTC.

It should be noted that several of the scenario recommendations correlate with the Russian Federation Transport Strategy 2030.

As part of its strategy, it is noted that one of the main problems of logistics in the Russian Federation is the low technical level and the poor state of infrastructure and production bases. Also, the document raises the problem of integration into international trade within the framework of restricting the access of domestic carriers to foreign infrastructure facilities with corresponding rising costs for owners of rolling stock and state prestige loss when conducting international trade.

CONCLUSIONS

In conclusion, if the development scenarios coincide with the development directions in the Russian Federation Transport Strategy 2030, then we can assume that the implementation of scenarios A and B will lead to similar results, namely:

- The total volume of freight traffic will increase from 12068,8 million tons in 2007 to 17858,0 million tons in 2030 (48%), cargo turnover will increase from 2,48 trillion ton-kilometers to 3,86 trillion ton-kilometers (55.6%).
- Transportation of goods in containers will increase by 2030 compared to 2007 by 6 times - up to 648 million tons. Goods transport by road will increase by 6.7 times (up to 361 million tons), by rail - by 5.6 times (up to 130 million tons), by maritime transport – by 5 times (up to 150 million tons), by inland water transport – by 17.5 times (up to 7 million tons). The cargo turnover of Russian seaports will increase in 2030 compared to 2007 by 2.3 times - up to 1025 million tons.
- The total international transportation of goods by Russian carriers, including the transportation of export, import and transit goods, as well as transportation abroad, will increase 1.6 times - up to 627 million tons.
- Transportation of transit goods through Russia will increase in 2030 compared with 2007 by 3.6 times - up to 100 million tons.

We believe these recommendations are implementable and reasonable and will lead to positive changes in Russia's national logistics system.

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NARODOWY SYSTEM LOGISTYCZNY ROSJI – GŁÓWNE KIERUNKI ROZWOJU

STRESZCZENIE. Wstęp: Celem pracy jest stworzenie rekomendacji poprawy narodowego systemu logistycznego Rosji. System ten został poddany analizie w oparciu o 6 wskaźników dynamicznych w okresie 11 lat. Należy wziąć pod uwagę, że wdrożenie pewnych rozwiązań na skalę państwową wymaga czasu oraz poniesienia określonych kosztów, co wyklucza obecnie rozwój w pełnej skali. Istotna jest prawidłowa ocena stanu aby określić, które obszary krytycznej narodowego systemu logistycznego są najbardziej niedorozwinięte w chwili obecnej jak również jakie określenie już przydzielonych zasobów na rozwój systemu logistycznego w mniejszej skali i w określonych obszarach.

Rozwój logistyki, w dobie obecnej międzynarodowej gospodarki, jest istotny dla każdego państwa. Rosja posiada potencjał do stanie się ważnym ogniwem transportowym pomiędzy Wschodem i Zachodem.

Metody: Narodowy system logistyczny Rosji został poddany analizie przy zastosowaniu 6 wskaźników zdefiniowanych przez Bank Światowy Bank. Pozwoliło to na wydzielenie problematycznych obszarów oraz wypracowanie planu rozwoju wraz z jego zaleceniami na poziomie państwowym.

Wyniki: Zalecenia dla rozwoju narodowego systemu logistycznego zostało zebrane na liście uwzględniającej ich priorytetowość dla dwóch scenariuszy wynikowych. Ze względu na małą dostępność możliwych zasobów konieczny jest ich podział i przydzielenie tylko do usunięcia części najistotniejszych wąskich gardeł.

Wnioski: Uzyskane scenariusze rozwoju wraz z warunkami integracji mają na celu rozwój narodowego systemu logistycznego Rosji w celu zwiększenia jej konkurencyjności na rynkach międzynarodowych.

Słowa kluczowe: Logistics Performance Index (LPI), Rosja, korytarze transport międzynarodowego, logistyka międzynarodowa, infrastruktura, państwowa polityka transportu

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