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PUBLIC ADMINISTRATION OF THE TRANSPORT AND LOGISTICS SECTOR IN KAZAKHSTAN BASED ON THE DATA FROM THE GLOBAL LOGISTICS PERFORMANCE INDEX

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Abstract. *Currently, the transport and logistics sector of any country is a powerful tool for economic and social development in the hands of the state. In the context of expanding international cooperation, the transport and logistics sector requires further development and expansion of the capacity of the infrastructure, and there is also a need to revise the state regulation of existing objects of the transport and logistics system. This paper presents the data and results of a study of the logistics activities of some countries, according to the international rating compiled according to the World Bank reports on the Logistics Performance Index (LPI), and also identifies individual indicators of the state of the logistics infrastructure and transport condition. Algorithms for calculating the international and local index of logistics efficiency, the main criteria for the efficiency of the transport and logistics sector are considered. The analysis of the criteria for the logistics efficiency of Kazakhstan was carried out, the main gaps in the management of the country's logistics sector were identified, and certain proposals were made to improve the state of the transport and logistics sector of the Republic*

Keywords: *railway, transit potential, economic growth, public administration, World Bank, trade and economic relations*

Introduction

The development of transport and transport logistics today is very important for any state. The Republic of Kazakhstan has a great potential for development in this area, as it has a very favourable geographical location. Kazakhstan is a link between Europe and Asia, between the West and the East, connecting different cultures and economies, developing trade and economic relations. The country has a strong instrument that has not yet been fully implemented – the transit potential. Competent strategic management of the transport logistics system and the development of transport infrastructure will significantly increase the results of the country's transit potential. Since Kazakhstan is a country with a large territory but has no access to the sea, the strategy for the development of interregional transport flows should become a priority area for the development of the economic activity of the state (Beljatynskij et al. 2009, p. 313; Danchuk et al. 2019a, p. 145). At the same time, the state regulation of the transport sector should be constantly changed, coordinated, and analysed. An attempt to analyse the development of transport logistics was made by the World Bank in 2007 together with the University of Turku, Finland. The LPI (Logistics Performance Index) is a fairly well-known rating in the logistics sector and is a powerful benchmarking product for determining the position of a country and its transport and logistics complex in the international rank. The report is published every two years, most recently in 2018. This benchmarking tool is designed to help countries identify their strengths and weaknesses in the field of transport logistics. In the latest LPI-2018 ranking, the authors were able to see the results of 160 countries, which allowed analysing the problems and opportunities of each country (Chakrabartty 2020, p. 469; Kesavan and Deif 2021, p. 31-32; Kinra et al. 2020, p. 439; Poier et al. 2022, p. 917; Wolek et al. 2021).

Some researchers study the LPI index, mathematically calculating its significance and correctness (Beysenbaev and Dus 2020, p. 35-36), and at the same time developing proposals to improve the efficiency of the index. Other studies evaluate the logistics system of a certain country by analysing individual index criteria (Andriyanova 2018, p. 290), and compare and review the ratings of leaders and outsiders of the logistics rating for a certain period. Certain studies indicate that the rating is quite subjective, but still pay attention to the fact that the assessment of logistics according to the LPI system can help identify the main problems of the development of the logistics sector of the country, and countries within the Customs Union (Kurochkin 2013, p. 18). Some studies are aimed at analysing the competitiveness of the country as a problem in the economic policy of the state, and identifying factors affecting the competitiveness of the economy, and comparing countries as part of integration associations in the global competitiveness ranking (Mukhamediyev et al. 2018, p. 4184; Suchanek et al. 2019, p. 150). Some studies analyse the impact of the index on the example of the CIS countries and conduct factor analysis, considering factors such as transport, logistics, industry, communications, etc.

(Sharipbekova and Raimbekov 2018, p. 681; Tkachuk et al. 2021). Other scientific efforts are aimed at investigating the index as an area in the work on creating a stable connection between Europe and Asia (Acar et al. 2015, p. 9).

The object of the study is the transport, particularly railway complex, and logistics sector of the Republic of Kazakhstan. The subject of the study is the impact of the Logistics Performance Index on improving the efficiency of state management of logistics processes in the country. The purpose of the study is to investigate and analyse the impact of the LPI on the development of the transport and logistics sector, identify existing problems in this area, and develop proposals to improve logistics indicators for this index. This study is based on the methods of empirical research, as it is the result of a survey and comparison of data. The theoretical significance of the study consists in the investigation of the Logistics Performance Index and its impact on the position of a country in the international logistics ranking, identification of gaps in the Kazakh transport and logistics system and proposals to eliminate them.

Materials and Methods

The Logistics Performance Index consists of qualitative and quantitative indicators. LPI is summed up from six logistics criteria, according to the methodology of the World Bank. The index also shows the rating from two perspectives: international and domestic (International LPI and Domestic LPI). The assessment of the country's international index according to six specific criteria is carried out by its partners, that is, certain organisations and specialists abroad. Kazakh logistics specialists are working on the domestic index of the country. The domestic index considers more detailed data on the logistics processes of each state. The components analysed in International LPI were selected based on recent theoretical and empirical studies, and based on the practical experience of logistics professionals involved in international cargo transportation (Domnina and Zinina 2012, p. 85). These criteria include:

– efficiency of customs and border clearance;
– quality of trade and transport infrastructure;
– ease of organising international shipments at competitive prices;
– quality of logistics services;
– tracking the shipment of goods;
– timely delivery of goods (Zorina 2019, 53).

The description of the main LPI indicators is presented in Table 1.

Table 1. **Description of the main LPI indicators**

Indicator	Characteristics
Efficiency of customs and border clearance	The border crossing process and the customs clearance process, the simplicity and speed of customs clearance
Quality of trade and transport infrastructure	The quality of ports, railways, highways, the quality of information technology, the development of logistics infrastructure

Table 1. Continued

Indicator	Characteristics
Ease of organising international shipments at competitive prices	The possibility of organising international shipments at competitive prices
Quality of logistics services	The competencies of logistics operators who serve to guarantee the efficiency and safety of freight transport.
Tracking and tracing	The ability to identify and track the passage of goods in real-time
Timely delivery of goods	Delivery of cargo exactly on schedule

The Domestic Logistics Performance Index is estimated by a survey of professionals working within the country is conducted. An internal assessment determines the state of the logistics environment in the state itself, which gives an idea of the organisations operating in this country, describes the main logistics processes, gives more accurate information about time frames and distances. To calculate the Domestic LPI, 4 main criteria are used (Kazlogistics… 2021): infrastructure, services, border procedures and time, reliability of the supply chain. The methodology of the Index is a survey. The initial data for the first part of the survey (to determine the international LPI) is the respondents' assessment of eight important trading partner countries, which is determined by the volume of imports and exports to these countries. The scheme of the sample of countries for evaluation by the respondent is presented in Table 2.

Table 2. **Methodology for selecting groups of countries for survey respondents**

	Respondents from low-income countries	Respondents from middle-income countries	Respondents from high-income countries
Respondents from coastal countries	Five most important export partner countries + three most important import partner countries	Three most important export partner countries + most important import partner country + four random countries, one from each group of countries: a. Africa; b. East, South and Central Asia; c. Latin America; d. Europe without Central Asia and the OECD.	Two random countries from the five most important export partner countries and five most important import partner countries + four random countries, one from each group of countries: a. Africa; b. East, South and Central Asia; c. Latin America; d. Europe without Central Asia and the OECD + two countries randomly selected from the combined groups of countries a, b, c, and d.
Respondents from landlocked countries	Four most important export partner countries + two most important import partner countries + two countries with land bridges	Three most important export partner countries + the most important import partner country + two countries with land bridges + two random countries, one from each group of countries: a. Africa; b. East, South and Central Asia; c. Latin America; d. Europe without Central Asia and the OECD.	

Source: Constructed by the authors based on International Logistics Perfomance Index (2021)

The International LPI is a composite indicator of the six assessed criteria for the effectiveness of the transport and logistics sector of each country. The six main components of the indicator:

– Effectiveness of customs and border clearance, rated on a scale from "very low" (1) to "very high" (5).
– Quality of trade and transport infrastructure, rated on a scale from "very low" (1) to "very high" (5).
– Ease of organising international shipments at competitive prices, rated on a scale from "very low" (1) to "very high" (5).
– Quality of logistics services, rated on a scale from "very low" (1) to "very high" (5).
– Cargo tracking, rated on a scale from "very low" (1) to "very high" (5).
– Timeliness of cargo deliveries, rated on a scale from "very low" (1) to "very high" (5).

All six indicators have certain component loads, which are indicated in Table 3. The weight of the indicators is approximately identical; therefore, the value of the international index is close to the average value of the indicators.

Table 3. **Component load for International LPI**

Component	Importance
Customs	0.40
Infrastructure	0.42
Ease of international shipments	0.40
Quality of logistics services	0.42
Tracking and tracing	0.41
Timeliness	0.40

Source: Constructed by the authors based on International Logistics Perfomance Index (2021).

In the second part of the survey, respondents provide information about the state of the logistics complex in the country where they operate. Just as in the first part of the definition of the International LPI, in each question the respondent must choose one of the evaluation options – from 1 (worst) to 5 (best). In some questions, the respondent provides quantitative information. In Kazakhstan, the survey is conducted by the Union of Transport Workers of Kazakhstan "Kazlogistics" together with the business transport magazine "Trans-Logistics Kazakhstan".

Results and Discussion

The Logistics Performance Index is compiled based on a survey of international, national, regional, and other organisations in the field (operators, carriers, transport companies, freight forwarders), including individuals engaged in international transport logistics. The data of operators on the ground are supplemented with data from statistical agencies of countries, which gives a more complete picture of the situation with the logistics

sector of countries. However, many experts in the field of transport logistics note that this rating is not an absolutely accurate source for determining the rating of countries, as it is partly subjective. The study is based on the data of certain companies, but the opinion of consumers is not considered. In addition, the rating does not consider the peculiarities of each state separately, for example, the area of the country's territory, access to the sea, neighbouring countries, etc. Each time the index is analysed and the importance is given to new emerging problems. More developed and high-income countries are facing new-level threats, for example, a shortage of professional personnel in the field of logistics, countering cyber threats, and meeting the demand for environmental logistics services in connection with the fight against environmental pollution (Suchanek et al. 2018, p. 30-31; Stepanchuk et al. 2020, p. 894; Suchanek et al. 2021).

However, to bring the transport and logistics system to a high level, countries should work not on certain criteria, but on the system as a whole, that is, improve infrastructure, customs system, regulatory framework, and professional personnel. The development and simplification of transportation procedures, digitalisation and the introduction of modern technologies would allow increasing the turnover of international trade and the economic potential of partner countries (Danchuk et al. 2019b, p. 177; Ginters 2019, p. 170). The transport and logistics sector has a huge impact on international trade relations. The existence of several approaches to assessing the logistics efficiency of countries indicates that the state should pay due attention to the development of logistics, since logistics processes should be effectively correlated with the economic development of the country. The LPI index covers an overwhelming number of countries and is one of the most significant coefficients for assessing the logistics sector of countries.

The study considers the data of Kazakhstan according to 6 International LPI criteria. The World Bank's rating is topped by logistics complexes in Germany, Sweden, Belgium, Austria, Japan, the Netherlands, Singapore, Denmark, Great Britain, and Finland. The logistics systems of such countries as Gabon, the Central African Republic, Zimbabwe, Haiti, Libya, Eritrea, Sierra Leone, Niger, Burundi, Angola, Afghanistan are in the last places (Table 4). Kazakhstan has significantly improved its position in this ranking. In 2014, the Republic took 88th place, in 2016 the 77th place, and in 2018 it took 71st place. In 2018, the World Bank calculated the aggregated Logistics Performance Index for recent years, that is, from 2012 to 2018. The World Bank claims that this approach would correct the deviations in data for four statistical reports (2012, 2014, 2016, 2018). The weighted average estimation method was used to calculate the aggregated Index.

Table 4. **LPI of the top ten leading countries and member states of the Eurasian Economic Union (EAEU)**

Country	Year	LPI rank	LPI points	Customs	Infrastructure	International shipments	Quality of logistics services	Tracking and tracing	Timeliness
Germany	2018	1	4.20	4.09	4.37	3.86	4.31	4.24	4.39
Sweden	2018	2	4.05	4.05	4.24	3.92	3.98	3.88	4.28
Belgium	2018	3	4.04	3.66	3.98	3.99	4.13	4.05	4.41
Austria	2018	4	4.03	3.71	4.18	3.88	4.08	4.09	4.25
Japan	2018	5	4.03	3.99	4.25	3.59	4.09	4.05	4.25
Netherlands	2018	6	4.02	3.92	4.21	3.68	4.09	4.02	4.25
Singapore	2018	7	4.00	3.89	4.06	3.58	4.10	4.08	4.32
Denmark	2018	8	3.99	3.92	3.96	3.53	4.01	4.18	4.4
Great Britain	2018	9	3.99	3.77	4.03	3.67	4.05	4.11	4.33
Finland	2018	10	3.97	3.82	4.00	3.56	3.89	4.32	4.28
Kazakhstan	2018	71	2.81	2.66	2.55	2.73	2.58	2.78	3.53
Russia	2018	75	2.76	2.42	2.78	2.64	2.75	2.65	3.31
Armenia	2018	92	2.61	2.57	2.48	2.65	2.50	2.51	2.90
Belarus	2018	103	2.57	2.35	2.44	2.31	2.64	2.54	3.18
Kyrgyzstan	2018	108	2.55	2.75	2.38	2.22	2.36	2.64	2.94

Source: Constructed by the authors based on International Logistics Perfomance Index (2021) and G. Senir (2021, p. 202).

Data on Kazakhstan according to the criteria of Domestic LPI. The results of the Domestic LPI-2018 survey were identical to the International LPI-2018. The assessments of international respondents and Kazakh experts, in general, turned out to be similar in the main areas of development of the logistics sector. The results of Domestic LPI-2018 are presented in Table 5.

Table 5. **Logistics efficiency sub-indices LPI-2018 and Domestic LPI 2018, 2019**

	LPI-2018	Domestic LPI-2018	Domestic LPI-2019
Rating	71	77	81
Customs	65	81	70
Infrastructure	81	78	90
Ease of international shipments	84	86	88

Table 5. Continued

	LPI-2018	Domestic LPI-2018	Domestic LPI-2019
Quality of logistics services	90	91	84
Tracking and tracing	83	79	75
Timeliness	50	88	72

Source: Constructed by the authors based on International Logistics Perfomance Index (2021).

To achieve more significant results, Kazakhstan needs coordinated work of the state and participants of the transport and logistics system, active development of transport infrastructure, professional managerial and working personnel, improvement of the legislative framework, creation of a common state economic strategy. This rating (Figure 1) is able to show a general picture of the state of the logistics sector of the country and indicate the existing gaps in the work of public and private structures. One of the important indicators of the efficiency of the state in the field of transport and logistics of any country is the amount of logistics costs in the structure of the gross domestic product.

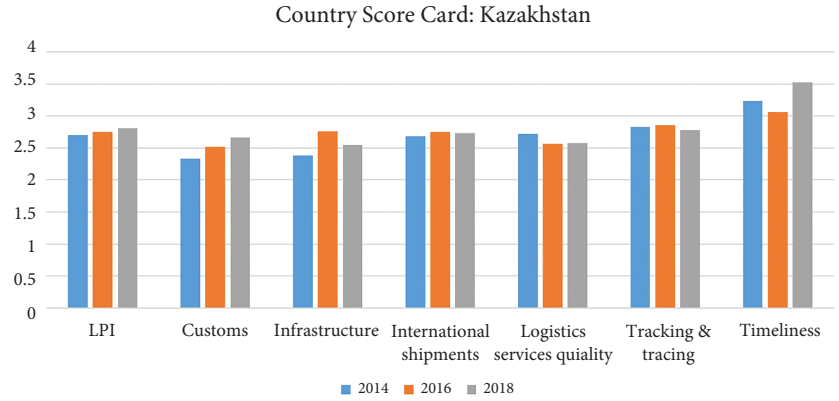

Figure 1. **Comparison of the Index and its components in Kazakhstan for three years: 2014, 2016, 2018**

In general, the authors note a tendency to increase the efficiency of indicators, however, based on these figures, and by analysing each criterion, it will be possible to identify the main gaps in logistics processes:

1. Efficiency of the customs clearance process. The efficiency of the work of customs authorities has improved its position, the stabilisation of relations within the common customs borders on the territory of the EAEU, and the improvement of the efficiency of the modernisation of checkpoints, the introduction of electronic preliminary information systems, declaration and document management – all this affects the improvement of Kazakhstan's indicators for this sub-index.

2. Quality of trade and transport infrastructure. The technical and operational condition of the railway and road network as a whole does not withstand modern transport loads, therefore, a negative trend according to this criterion persists in both international and Kazakh ratings. Institutional shortcomings and long-term reform of railway transport have led to a misunderstanding of interaction on this type of transport. In addition, the unsatisfactory condition of railway communications does not allow regulating the speed of delivery of goods in accordance with the requirements of customers. Updating the fleet of vehicles, accelerating the implementation of the digitalisation strategy everywhere, the possible integration of small carriers into larger organisations – all this will help to increase the low assessment of the quality of transport infrastructure.
3. Ease of organising international shipments at competitive prices. In general, the indicator remains at a similar level over the three years of comparison, but a slight decrease indicates the existing barriers in regulating this indicator. There is a precedent for changing the situation with this criterion. The checkpoint Nurly Zhol is a combination of high technical equipment, automation of control and registration systems, reduction of the time interval for customs procedures of cargo transport. It is possible to organise the organisational chain of international shipments using this example. However, cases with the lack of suitable transport for certain types of goods, attempts of corruption red tape and incompetence of individual transport service employees remain frequent.
4. Quality of logistics services. Compared to the data of 2016, this indicator improved its position by 0.5 points. Basically, this is associated with the expansion of the range of logistics services. In addition, the arrival of international multinational companies, which allows the introduction of advanced technologies in the transport and logistics market. However, just as in the previous criterion, the low level of competence of the employee negatively affects this criterion.
5. Tracking and tracing. The introduction of digitalisation products in the market of transport and logistics services and the improvement of the quality of technical capabilities have a positive effect on the evaluation of this criterion. The approbation of the system of "smart" electronic navigation seals helped to ensure the high safety of the goods, increased the speed of customs procedures, and provided monitoring of the movement of cargo along the entire scheme of its movement. Increasing the speed of digitalisation implementation would give positive results and help bring this criterion forward.
6. Timely delivery of goods. Violations of this indicator are happening less and less often, as the efforts of carriers to meet the expectations of customers are increasing every time. In addition, the entry into the market of international transport companies has a positive effect on increasing the speed of services of Kazakhstani carriers.

Conclusions

1. As a result, it can be concluded that improving the efficiency of public administration of the transport, especially railway sector, and logistics sector of the country is closely related to the overall level of development of the country. The national policy of logistics management should closely relate to investments in its development and the development of its components: infrastructure and its quality, human resources and competence of employees, monitoring the passage of goods and reducing barriers to the tracking, speed and timeliness of delivery, and the reduction of borders and simplification of customs procedures.
2. Improvements and changes at the level of public administration will be required to regulate the industry and its development. A comparative analysis of the components of the Logistics Performance Index of Kazakhstan for three years showed an improvement in the criteria, thereby increasing the chances of the Republic to approach countries with a high level of logistics development.
3. The ranking allows the national level to guide a set of government measures to improve the development of logistics performance in the real economy. In addition, the index of the Republic determines its place on the scale of integration of the Kazakh logistics system into the international one, identify existing gaps in the existing policy, strengthen monitoring of the provision of transport services, and take advantage of the existing potential to improve the quality of these services. To achieve more significant results, Kazakhstan needs coordinated work of the state and participants of the transport and logistics system, active development of transport infrastructure, professional managerial and working personnel, improvement of the legislative framework, creation of a common state economic strategy. The task of state regulation in the transport and logistics sector is to reduce logistics costs, which will have a positive impact on the national economy. Logistics costs can be reduced by improving the quality of transport services and transport and logistics infrastructure, increasing the level of professional personnel, speeding up the processes of customs operations. Furthermore, the reduction of logistics costs would have a positive impact on the demand for logistics services for consumers.

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