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The Importance of Logistics Center Application for Development of Goods Transportation and Research on Kazakhstan

Abstract

Object: The use of logistics centers in the transport sector is a new phenomenon for Kazakhstan, although the logistics sector is developing rapidly in Kazakhstan, as well as in the whole world. Hence, this study aims to review the commodity transportation sector in Kazakhstan, to review the current state of the logistics centers, to evaluate their performances, and to identify their problems and the reasons behind these problems.

Methods: We conducted structured interviews with the company officials on the logistics sector and the logistics centers. Results are analyzed with the NVivo package program. Our second question is to identify the relation between the logistics sector and Gross Domestic Product (GDP). Another subject is the changes in the data regarding the logistics sector and the relation between these changes and GDP. This relation is analyzed using the X11-ARIMA/88 method and time series.

Results: According to our long-term coefficients and error correction model findings, the effect of one period delay and trend of the X13_SA variable were found statistically significant in its relationship with the GDP variable. Also, the effect of one period delay and trend of the X14_SA variable was found statistically significant in its relationship with the GDP variable. In addition, the effect of one period delay and trend of the X18_SA variable was found statistically significant in its relationship with the GDP variable.

Conclusions: In conclusion, by successfully implementing logistics centers, Kazakhstan has proved its capacity to provide quality services for any goods in any direction and distance, in line with international standards, and showed that it can create an integrated complex that can provide barrier-free transportation.

Keywords: logistics, logistics center, transportation, transport sector, GDP, Kazakhstan, NVivo package program, X11-ARIMA/88 method, time series analysis.

Introduction

The economic growth of the world, especially the growth of the developed and developing countries, shows the importance of issues, such as the growing trade between Europe and Eastern and Southeastern Asia, and the creation of new intercontinental highways. Thus, Kazakhstan gained prominence as a country that sits in the nexus of main transportation routes connecting Asia and Europe. Kazakhstan's geographical location is paramount for trade. The main modes of transportation are railways and roads. United Nations classifies Kazakhstan as an intercontinental road transportation nation together with Russia, Azerbaijan, Georgia, and Turkey. Therefore, Kazakhstan uses its advantageous location to participate actively in the global transportation system and to strengthen its economy. The logistics infrastructure of the Republic of Kazakhstan is comprised of a railway network, a railroad network, inland waterways, and many logistics facilities. Among these facilities, there are railway stations, ports, airports, logistic service providers, maintenance service providers, passenger services, etc. The transportation system is an important part of the national infrastructure and has an important impact on the economic development of the country. Effective transportation and logistics networks can help to deepen the economic cooperation in Central Asia and Eurasia, and can provide an advantage in the integration of Kazakhstan into the global economy.

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Besides, Kazakhstan's advantageous location can provide a steady income by seizing opportunities provided by transit transportation. Therefore, this study aims to review the commodity transportation sector and the current state of the logistics centers in Kazakhstan, to evaluate their performances and to identify their problems, and the reasons behind these problems. The main question of this study is to learn that whether it is possible to create a logistics center in Kazakhstan which is capable of meeting both the demand of the national market and the expectations of the firms, and to determine its qualities if this is possible. Our second question is to identify the relation between the logistics sector and Gross Domestic Product (GDP). Another subject is the changes in the data regarding the logistics sector and the relation between these changes and GDP. For this, we conducted structured interviews with the company officials on the logistics sector and the logistics centers. Results are analyzed with the NVivo package program and X11-ARIMA/88 method, and time series.

Literature Review

We reviewed many resources for this study, mainly the works of Kazakh authors that worked on the individual aspects of the logistics system of Kazakhstan and its role in the global logistics system. This review provided a database that includes modern, relevant, and objective data and which enabled us to analyze the problems and outline our aims.

Syzdykbaeva and Raimbekov (2012) in their study titled "Economic Aspects of Development of Regional Transport and Logistics Complexes of Kazakhstan" analyze the transportation system of Kazakhstan and the present traffic. The authors concluded that the transport policy should be directed towards the development of joint transport and logistics infrastructure.

Syzdykbaeva et al. (2013) in their study titled "Development Effeciency Estimation of Transport Logistics Potential of Kazakhstan Regions" proposed a method that can be used to estimate the potential of the logistics system. So-called method is a tool to direct managerial decisions. It is based on analytical indices and methods that are used to identify priorities in the development of transport logistics. The presented methods show that efficiency can be increased by building transportation and logistics centers all around the country.

Erniyazova et al. (2014) in their study titled "Particularities of the Formation of Transport-Transit Cargo-Traffic in the Republic of Kazakhstan" described the conceptual nature of the formation of transportation and logistics systems in Kazakhstan, their objective preconditions and the practical experiences of other countries. The transit potential of the Republic of Kazakhstan is analyzed to identify opportunities and problems. The status of railway transport is analyzed in detail as this mode of transportation is the most promising one for Kazakhstan.

Önden et al. (2015) in their study titled "Logistics Center Concept and Location Decision Criteria" demonstrate that the decision to establish a logistics center provides cost advantages to both the economy and companies. The study discusses the concept of the logistics center, its features and history. Besides, they discussed the criteria of location selection, reviewed the existing literature, and grouped the criteria in a hierarchy.

Zhatkanbaev et al. (2015) in their study titled "Innovative Mechanisms in the Procurement Logistics of Kazakhstan" designate that in the field of supply logistics, modern innovations are popular in Kazakhstan. There are many documents on the logistics system and infrastructure of Kazakhstan, and their numbers are increasing every day. Procurement logistics can help us decide on what to and when to purchase. As logistics in Kazakhstan takes new directions, this field is gaining popularity, and every day many young people choose this field. State policies determine new strategies and use new methods to develop the logistics system. As the importance of supply logistics is revealed, the support of Kazakh citizens is increasing. There are many types of products to be transported, and there are various transport modes and routes. Of those routes, the major ones are Western China-Western Europe, Astana-Almaty, Astana-Oskemen, Astana-Aktobe, Atyrau; Almaty-Oskemen, Karaganda-Kyzylorda-Zhezkazgan, and Atyrau-Astrakhan routes. This enables Kazakhstan to establish international ties with other countries.

Rana's (2016) work titled "Transportation in Kazakhstan and its Economic Implications" describes Kazakhstan's current transportation system, infrastructure, and various problems in the logistics management system. He provides recommendations on how multimodal transportation systems and resources can be developed in Kazakhstan, how they can be used to increase the benefit, and how government policies can be used to develop more efficient and effective transport systems. This article is beneficial not just for transportation and logistics companies but also for researchers.

Çekerol and Gunyashev (2017) in their study titled "Evaluation of the views of the Kazakhstan logistics sector and the sector stakeholders on the logistics village using SWOT analysis" attempts to examine the failure of Kazakhstan to meet the logistics expectations. In the first part of their study, they provide general information about the concept of logistics, its development, modes of transportation, new applications in international trade and logistics. The second part deals with the concepts of logistics centers, and villages. They give examples from the world and discusses the history, today, and the future of the logistics sector in Kazakhstan. In the last part, they make a SWOT analysis on the potential of Kazakhstan in terms of establishing logistic villages/bases/centers. They conclude that the logistics sector in Kazakhstan is mainly working on land and rail transport, and PL (Party Logistics) applications are at the beginning level. At this point, they remark that the transportation infrastructure should be renewed and developed for the establishment of intermodal logistics villages/bases/centers in Kazakhstan.

Kushkunov's (2017) study titled "The Efficient Use of International Railway Transport Corridors in Kazakhstan" shows that the use of international transport corridors is extremely problematic for the national economy. Most importantly, physical barriers create problems in integrating Kazakhstan into the global transportation market. They propose theoretical solutions to this problem. The authors think that all these actions will help achieve the main goal, namely, the effective integration of Kazakhstan into international transport corridors.

He et al. (2018) in their study titled "Logistics Space: A Literature Review from the Sustainability Perspective" aims to present a literature review on the field of logistics, including data sources, research methods, and research theories, and to examine the impact of logistics from a sustainable development perspective. Research results provide important references to logistics researchers and logistics facility planners. It also plays a role in the development of new logistics development strategies and the promotion of sustainable development in logistics.

Viskova and Veremeenko (2018), in their study titled "Problems and Prospects in the Russian Market of Transport and Logistic Services" address problems and expectations in the Russian transport and logistics services market, analyze the development level of logistics services, the activity areas of 3PL operators, the impact of western companies' on the Russian logistics sector and key opportunities.

Bazarbekova et al. (2018) work titled "Review of Transportation Modes in the Central Kazakhstan Region, Central Asia" is a case study of Kazakhstan. This article aims to review the transportation sector in Kazakhstan, to evaluate the current conditions and performances of transportation systems, and to identify the problems and underlying causes. The article mainly addresses the current status and development of transport including issues such as institutional arrangements, legal and regulatory rules, the functioning of public transport systems, parking areas, and road network construction. Kazakhstan is located in the center of Eurasia and plays an important role in logistics in the famous "Contemporary Silk Road" between Asia and Europe. Statistics, data, and legal frameworks have been translated from Kazakh and Russian sources into English and adds value to this study. This article presents new perspectives on future studies on infrastructure and transportation modes in the Kazakhstan region and Central Asia.

Data

Kazakhstan's geographical location enables it to be a profitable bridge in transit and goods and passenger transportation between Southeast Asia and Europe. The main internal condition for the development of the transit potential of Kazakhstan is the state of transport infrastructure.

In recent years, the importance of transportation as national competitiveness and sustainable growth factor has increased dramatically. Since 2015, the share of the transport sector in the country's GDP is not less than 8 % (7.9 % in 2015, 8.3 % in 2016, 8.3 % in 2017). In the last decade, total investment in the development of infrastructure, transportation, and logistics assets and authorities is approximately 30 billion dollars (stat.gov.kz). In this period, more than 2 thousand km of railways were built, 6.3 thousand km of roads were rebuilt, the port capacity in the Caspian Sea was increased to 23.5 million tons, and 15 airports were restructured. Infrastructure constructions had, in general, a positive impact on Kazakhstan's performance in relevant international ratings. Kazakhstan's rank in the "Quality of Infrastructure" indicator in the World Competitiveness Index of the World Economic Forum has increased by 14 from 2011 to 2017. Kazakhstan rose from the rank 77 to rank 71 in the World Bank's Logistics Performance Index from 2016 to 2018. The "Nurly Zhol" State Program aims to reach the 40th place by 2020 (Myrzahmetova, 2018).

Kazakhstan's foreign trade turnover in 2018 amounted to $93.5 billion and is 19.7 % higher than in 2017 ($78.1 billion). In 2018, Kazakhstan's exports increased by 25.7 % to $60.9 billion, and imports increased by 9.9 % to $32.5 billion (Shuynshinova, 2019).

The logistics infrastructure of the Republic of Kazakhstan consists of railway and road networks, river roads, and transportation infrastructure facilities. These facilities are stations, terminals, ports, airports, service providers, logistics management companies, maintenance firms, transport workers, and passenger services (Myrzahmetova, 2018).

Table 1. Transported goods (all modes of transportation, between 2009–2018)

Indicators	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Transportation of freight luggage, mln. tons	2.104	2.430	2.965	3.222	3.498	3.745	3.728	3.723	3.916	4.104
Freight turnover, mln. ton/km	336,8	381,0	444,3	475,2	493,2	553,9	512,1	514,7	555,4	596,0
Note: Statistics Committee of the Republic of Kazakhstan. www.stat.gov.kz.										

Including the estimated traffic volume of individual entrepreneurs engaged in commercial transport, the volume of goods transported with all modes of transport reached to 4,104 million tons with an increase of 4.8 % compared to 2017. In 2018, the turnover rate reached 596.0 billion tons-kilometer, increasing by 7.31 % compared to 2017. Overall, from 2009 to 2018, 95 % growth in the total cargo traffic volume is observed (Table 1).

We examined Kazakhstan's performance over the last 12 years using the Logistics Performance Index published internationally by the World Bank. Besides, another aim of our research is to reveal the status of leading countries and make comparisons between countries through Logistics Performance Index reports. There are some performance indicators to measure basic logistics activities. International logistics covers many criteria such as transportation, payment systems, cargo consolidation, storage, distribution of customs gates in the country (Arvis et al., 2018). Therefore, it is difficult to measure a country's logistics performance with only one indicator. It will be more meaningful to determine whether the country has a good logistics performance index within the framework of some criteria. The World Bank aims to develop logistics reform programs to measure the competitiveness of the countries, thus, it has created the Logistics Performance Index together with business professionals and partners from the academic community.

Countries' Logistics Performance Index was first measured in 2007. Seven areas were determined while measuring (Erkan, 2014). These criteria are determined by in-depth interviews with senior managers working in international logistics companies. Logistics Performance Index and its sub-criteria are evaluated using a 5-point Likert scale (Arvis et al., 2018). The Logistics Performance Index values are calculated by taking the weighted average of the mentioned sub-criteria. In Table 2, Logistics Performance Index values for each sub-criterion for Kazakhstan and ranking by country are given. The World Bank Logistics Performance Index is an important indicator for countries to see their and other countries' logistics performances. Whereas Kazakhstan ranked 133 among 150 countries with a score of 2.12 in 2007, it ranked 71 among 160 countries with a score of 2.81 in 2018. Compared to 2007, Kazakhstan's ranking has increased drastically in 2018.

Table 2. Ranking and scores of Kazakhstan's logistics performance index and its sub-criteria between 2007–2018

KAZAKHSTAN		2007		2010		2012		2014		2016		2018	
	LPI Score	**LPI Rank**	**LPI Score**	**LPI Rank**	**LPI Score**	**LPI Rank**	**LPI Score**	**LPI Rank**	**LPI Score**	**LPI Rank**	**LPI Score**	**LPI Rank**	**LPI Score**
	Customs	139	1,91	137	1,86	129	2,10	126	2,05	116	2,19	120	2,65
	Infrastructure	79	2,38	57	2,66	29	3,29	73	2,60	85	2,70	86	3,25
Six key dimensions	**International shipments**	73	2,58	79	2,60	92	2,67	74	2,75	70	2,83	132	2,73
	Logistics competence	121	2,33	106	2,38	100	2,68	83	2,72	81	2,83	69	3,24
	Tracking & tracing	86	2,52	65	2,76	82	2,75	92	2,57	71	2,86	92	3,06
	Timeliness	65	2,66	81	2,55	84	2,73	90	2,58	83	2,78	50	3,53
Note: World Bank, Logistics Performance Index, 2007, 2010, 2012, 2014, 2016, 2018 https://lpi.worldbank.org/international/global													

Methods

Research Problem

Our study problem is to determine whether the logistics sector of Kazakhstan can build a logistics center that will meet the expectations of the companies and the country. Our second problem is to determine the relationship between the logistics sector and GDP.

The first problem was analyzed using qualitative data analysis. In this context, interview data are considered by coding on the texts as explained below. For the second problem, time series analysis was used to examine the relationship between sector data and GDP.

The Importance and Purpose of the Research

As in the whole world, the logistics sector is developing rapidly in Kazakhstan. Both for the companies and the state, it is imperative to plan the future of the sector from this day in terms of manageability. The sector stakeholders agree on developing a logistics center to provide the infrastructure services they need, to increase the efficiency of companies and to compete with international companies.

The most effective way to determine the location and features of a logistics center is to conduct a structured interview with the stakeholders. In this study, we interviewed with the firm officials about the logistics center as well as the general evaluation of the logistics sector. The information obtained was analyzed with the help of the NVivo qualitative research package program. Our study provides valuable information about the current situation of the logistics industry, the opinions of the companies about the industry, the predictions on the industry, the creation of the logistics center, and the expectations of the logistics center to be established.

Another dimension of the study is the analysis of the economic development of logistics sector data over time and the relationship between this development and GDP. This review is important to reveal whether the developments in the GDP and logistics sector correlate in the long term.

Scope and Model of the Research

This study is a qualitative research based on a structured interview with company managers. Besides, the relationship between logistics sector data and GDP is analyzed using a time series analysis model.

It covers the logistics sector in Kazakhstan as a research area. The scope of qualitative research is logistics companies operating in the country. Coverage for time series analysis covers 45 quarters from 2007Q1 to 2018Q1.

Limitations of the Research

The research is limited to logistics companies operating in Kazakhstan. It also evaluates the situation in 2018, the year of the interview with company managers. In terms of time series data, it is limited to variables received from the official statistics data center. Therefore, our findings only provide an evaluation only for the logistics sector and logistics center in this country, and only for 2018.

Data Collection Method of the Research

An interview form was prepared to get the evaluations of the company managers, and the statements of the managers were recorded per form. In this study, data from primary sources, secondary data from published statistics for the sector and GDP data were applied.

Results

Considering the scope and problem of the study; data is analyzed with two methods. First, we performed in-depth interviews with company officials to fully understand and analyze their firms' expectations, perspectives, and evaluations. The main steps of qualitative analysis are the creation of an interview form, entering the resulting data into the software, and analyzing the data. The first subtitle of this section is reserved for qualitative analysis of the interview data.

The second method of data analysis is the quantitative analysis of the relationship between the general economic data of Kazakhstan and the data of the logistics sector. In this section, we performed a time series analysis using the GDP variable, as an indication of the economic situation of the country and 18 variables, as an indication of the logistics sector. The study is based on investigating whether there is a long-term relationship between GDP and logistics variables at this stage. The second subtitle of this section is devoted to the quantitative analysis of the interview data.

Analysis of Interview Data with Logistics Companies

In this section, the responses of company officials are evaluated and interpreted. Then, the findings obtained by the coding method are evaluated.

It is possible to see that most of the enterprises included in the scope of the study in Table 3 are established after the 2000s. The oldest of them is the 6th company and was established in 1963. The number of employees of these enterprises is different. The 9th firm has 26 employees, 5th has 32, 3rd has 38, 10th has 45, 2nd has 54, 7th has 68, 8th has 84, 4th has 118, 1st has 248, and 6th has 540 employees. Thus, there are more than a hundred employees in the fourth, first, and sixth enterprises.

Table 3. Summary information for logistics companies

Firm No.	Foundation Year	Number of Employees	Target Countries	Transportation Modes
1	2013	248	Kazakhstan, Belarus, CIS, Uzbekistan, China, Kyrgyzstan, Turkmenistan, Tajikistan, Russia, USA, Asia, and Europe	Road, Railway, Airline, Seaway, Multimode
2	2007	54	Kazakhstan, Russia, Belarus, China, and Kyrgyzstan	Road
3	2000	38	UAE, China, Kyrgyzstan, Turkey, and Russia	Road
4	2008	118	CIS, EU, South-West Asia, Iran, and Turkey	Road, Railway
5	2003	32	Kazakhstan, Russia, Belarus, Kyrgyzstan, and Uzbekistan	Road
6	1963	540	Asia, Europe, the Near East, Iran, and Turkey	Seaway, Multimode
7	2008	68	Kazakhstan, Uzbekistan, China, Kyrgyzstan, Turkmenistan, Tajikistan, and Russia	Road, Railway, Airline, Multimode
8	2001	84	CIS, Russia, China, and Europe	Road, Railway
9	2005	26	China, Europe, Asia, and CIS	Road
10	2012	45	Kazakhstan, and CIS	Road, Railway
Note: Statistics Committee of the Republic of Kazakhstan. www.stat.gov.kz				

The major markets for these enterprises are Central Asian and CIS countries. Some businesses provide logistics services to the Near East, Europe, the USA, and the UAE. In terms of transportation type, some businesses offer various options, but road transportation is more common. All of these enterprises provide road transportation services. 1st, 4th, 7th, 8th, and 10th firms provide railroad transportation, 1st, and 6th firms provide maritime transportation, 1st, and 7th firms provide airways transportation, and 1st, 6th and 7th firms provide multi-mode transportation services.

Table 4. Statistics on coding according to the companies participating in the research

Interview File	Number of Codes Obtained with Open Coding	Number of Codes Obtained with Axis Coding	Number of Codes Obtained by Selective Coding
1	143	71	4
2	91	50	4
3	85	43	4
4	103	59	4
5	85	44	4
6	72	45	4
7	96	55	4
8	64	45	4
9	78	52	4
10	88	52	4
TOTAL	905	516	40
Note: compiled by authors on the basis of research			

Analysis findings for the interview data of each enterprise are summarized in Table 4. According to the obtained findings, 1st and 4th enterprises provided more codes with the open coding method. All selective code expressions were observed in all company interviews. Based on these findings, there are four selective codes for the evaluation of logistics centers. According to the determined coding system, the first selective code emphasized by the companies was about the logistics center. The least voiced selective code and sub-items were legal transactions and expectations from the state or government. According to the findings, the "Competition, Development of Firms and Quality" and "Evaluations about the logistics sector" codes were moderately expressed between the other two.

Analysis of the Relationship Between Logistics Sector Data and GDP of Kazakhstan

Analyzing the relationship between the GDP, which is the most important indicator of the Kazakhstan economy, and the logistics sector, and obtaining correct findings has an important role in assessing the feasibility of the planned logistics center. This study analyzes the long-term relationship between GDP and 18 variables which are considered as the main indicators of the logistics sector.

This analysis uses quarterly data between 2007Q1 and 2018Q1. In the first step, it is examined whether the data contains seasonality. Then seasonal correction is applied. In the second step, it is analyzed whether 18 variables included in the analysis have a long-term relationship with GDP.

Table 5. Variables included in the research

Variable Definition	Variable Name	Seasonal Adjustment	First Difference
All modes of transport — Transportation of freight luggage, thousand tons	X1	X1_SA	D1X1_SA
All modes of transport — Freight turnover, mln. ton/km	X2	X2_SA	D1X2_SA
All modes of transport — Transportation of passenger, thousand people	X3	X3_SA	D1X3_SA
All modes of transport — Passenger turnover, mln.passenger/km	X4	X4_SA	D1X4_SA
Railway transport — Transportation of freight luggage, thousand tons	X5	X5_SA	D1X5_SA
Railway transport — Freight turnover, mln. ton/km	X6	X6_SA	D1X6_SA
Railway transport — Transportation of passengers, thousand people	X7	X7_SA	D1X7_SA
Railway transport — Passenger turnover, mln.passenger/km	X8	X8_SA	D1X8_SA
Other land transports — Transportation of freight luggage, thousand tons	X9	X9_SA	D1X9_SA
Other land transports — Freight turnover, mln. ton/km	X10	X10_SA	D1X10_SA
Transport maritime — Transportation of goods, thousand tons	X11	X11_SA	D1X11_SA
Transport maritime — Freight turnover, mln. ton/km	X12	X12_SA	D1X12_SA
Pipeline transport — Transportation of freight luggage, thousand tons	X13	X13_SA	D1X13_SA
Pipeline transport — Freight turnover, mln. ton/km	X14	X14_SA	D1X14_SA
Air transport — Transportation of freight luggage, thousand tons	X15	X15_SA	D1X15_SA
Air transport — Freight turnover, mln. ton/km	X16	X16_SA	D1X16_SA
Air transport — Transportation of passengers, thousand people	X17	X17_SA	D1X17_SA
Air transport — Passenger turnover, mln.passenger/km	X18	X18_SA	D1X18_SA
Note: compiled by authors on the basis of research			

In Table 5, definitions and abbreviations of the variables are given. From here on, these abbreviations will be used.

The seasonality analysis of these variables is done graphically. We decided to use the X11-ARIMA/88 model for seasonality correction.

Table 6. Unit root test findings for series after the seasonal correction

1	2	Critical Values			Results	
		3	4	5	6	7
		1 %	5 %	10 %	T-statistic	P-value
X1_SA	Level	-4,180911	-3,515523	-3,188259	-1,504331	0,8131
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-6,115768**	**0,0000**
X2_SA	Level	-4,186481	-3,51809	-3,189732	-2,646397	0,2630
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-4,121239**	**0,0118**
X3_SA	Level	-4,180911	-3,515523	-3,188259	-0,76077	0,9616
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-5,762341**	**0,0001**
X4_SA	Level	-4,180911	-3,515523	-3,188259	-1,178601	0,9026
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-5,656947**	**0,0002**
X5_SA	Level	-4,186481	-3,51809	-3,189732	-3,194284	0,0991
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-4,860628**	**0,0016**
X6_SA	Level	-4,180911	-3,515523	-3,188259	-2,352986	0,3980
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-5,149663**	**0,0007**
X7_SA	Level	-4,180911	-3,515523	-3,188259	-1,201395	0,8979

1	2	3	4	5	6	7
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-5,441307**	**0,0003**
X8_SA	Level	-4,180911	-3,515523	-3,188259	-2,087807	0,5380
	I. Difference	**-4,192337**	**-3,520787**	**-3,191277**	**-6,291581**	**0,0000**
X9_SA	Level	-4,180911	-3,515523	-3,188259	-1,398713	0,8476
	I. Difference	**-4,192337**	**-3,520787**	**-3,191277**	**-5,045625**	**0,0010**
X10_SA	Level	-4,180911	-3,515523	-3,188259	-1,439201	0,8350
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-6,826861**	**0,0000**
X11_SA	Level	-4,180911	-3,515523	-3,188259	-2,282289	0,4343
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-7,307189**	**0,0000**
X12_SA	Level	-4,180911	-3,515523	-3,188259	-1,899952	0,6377
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-6,124752**	**0,0000**
X13_SA	Level	-4,180911	-3,515523	-3,188259	-2,728359	0,2308
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-6,228842**	**0,0000**
X14_SA	Level	-4,186481	-3,51809	-3,189732	-3,184854	0,1010
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-5,464475**	**0,0003**
X15_SA	Level	-4,198503	-3,523623	-3,192902	-3,474539	0,0557
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-7,10245**	**0,0000**
X16_SA	Level	-4,180911	-3,515523	-3,188259	-2,118206	0,5217
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-6,68176**	**0,0000**
X17_SA	Level	-4,186481	-3,51809	-3,189732	-1,238724	0,8894
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-4,299527**	**0,0074**
X18_SA	Level	-4,186481	-3,51809	-3,189732	-1,900772	0,6368
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-4,100801**	**0,0125**
GDP_SA	Level	-4,180911	-3,515523	-3,188259	-2,289936	0,4304
	I. Difference	**-4,186481**	**-3,51809**	**-3,189732**	**-6,274523**	**0,0000**
Note: compiled by authors on the basis of research						

After seasonality correction for 19 variables, the stability of the series was examined with the Dickey-Fuller test. Our findings showed that these variables are not stationary and complied with the I (1) process (Table 6). Findings also demonstrated that the data are suitable for cointegration analysis for the long-term relationship between logistics industry variables and GDP.

Table 7. Findings of cointegration test with GDP

	Hypothesis (No. of CE (s))	Eigenvalue	Trace	Prob.**	Max-Eigen	Prob.**
X1_SA	None	0,195437	11,05434	0,8721	9,350595	0,6880
X2_SA	None	0,244112	17,85016	0,3541	12,03407	0,4120
X3_SA	None	0,178165	10,81392	0,8856	8,437265	0,7807
X4_SA	None	0,176572	9,683388	0,9378	8,354028	0,7887
X5_SA	None	0,266736	21,26484	0,1685	13,34074	0,3013
X6_SA	None	0,274495	24,26790	0,0781	13,79815	0,2680
X7_SA	None	0,203542	12,51460	0,7751	9,785978	0,6417
X8_SA	None	0,208551	17,27941	0,3944	10,05729	0,6127
X9_SA	None	0,181290	10,67140	0,8932	8,601078	0,7647
X10_SA	None	0,179469	10,17202	0,9174	8,505534	0,7741
X11_SA	None	0,183425	15,82780	0,5064	8,713348	0,7535
X12_SA	None	0,161674	14,97926	0,5763	7,582989	0,8571
X13_SA	**None**	**0,370614**	**28,11757**	**0,0259**	**19,90946**	**0,0420**
	At most 1	0,173773	8,208107	0,2352	8,208107	0,2352
X14_SA	**None**	**0,357907**	**27,45892**	**0,0315**	**19,04994**	**0,0559**
	At most 1	0,177624	8,408978	0,2201	8,408978	0,2201
X15_SA	None	0,289204	25,84755	0,0504	14,67888	0,2117
X16_SA	None	0,311482	25,79534	0,0511	16,04817	0,1432
X17_SA	None	0,206043	11,50506	0,1823	9,921199	0,2172
X18_SA	**None**	**0,341591**	**27,32954**	**0,0327**	**17,97096**	**0,0793**
	At most 1	0,195586	9,358577	0,1594	9,358577	0,1594
Critical Value			25,87211		19,38704	
			12,51798		12,51798	
Note: compiled by authors on the basis of research						

Whether variables are long-term relationships with GDP was examined by the cointegration analysis method and findings are given in Table 7. According to the Johansen cointegration test, it was decided that X13_SA, X14_SA, and X18_SA variables have a long-term relationship with GDP.

Table 8. Long-term coefficients and error correction model findings for the relationship between GDP and X13_SA variables

Long-term coefficients			
	GDP_SA	X13_SA	Trend
Coefficient	1	-129,1273	-210232,5
Standard error		22,3115	8875,73
t-Statistics		-5,78747731	-23,68622074
Error correction results			
	D (GDP_SA)	D (X13_SA)	
Coefficient	-0,077926	0,005057	
Standard error	0,12837	0,00111	
t-Statistics	-0,6070421	4,555855856	
Note: compiled by authors on the basis of research			

Long-term coefficients and error correction model findings for the relationship between GDP and X13_SA variables are given in Table 8. According to our findings, the effect of one period delay and trend of the X13_SA variable was found statistically significant in its relationship with the GDP variable.

Table 9. Long-term coefficients and error correction model findings for the relationship between GDP and X14_SA variables

Long-term coefficients			
	GDP_SA	X14_SA	Trend
Coefficient	1	-254,1204	-173885,9
Standard error		44,6109	15102,5
t-Statistics		-5,69637465	-11,51371627
Error correction results			
	D (GDP_SA)	D (X14_SA)	
Coefficient	-0,108536	0,002153	
Standard error	0,11153	0,00048	
t-Statistics	-0,9731552	4,485416667	
Note: Compiled by authors on the basis of research			

Long-term coefficients and error correction model findings for the relationship between GDP and X14_SA variables are given in Table 9. According to our findings, the effect of one period delay and trend of the X14_SA variable was found statistically significant in its relationship with the GDP variable.

Table 10. Long-term coefficients and error correction model findings for the relationship between GDP and X18_SA variables

Long-term coefficients			
	GDP_SA	X18_SA	Trend
Coefficient	1	-1889,367	-144901,8
Standard error		376,485	20303,8
t-Statistics		-5,01843898	-7,136683773
Error correction results			
	D (GDP_SA)	D (X18_SA)	
Coefficient	-0,455922	0,000128	
Standard error	0,14068	0,000041	
t-Statistics	-3,2408445	3,12195122	
Note: Compiled by authors on the basis of research			

Long-term coefficients and error correction model findings for the relationship between GDP and X18_SA variables are given in Table 10. According to our findings, the effect of one period delay and trend of the X18_SA variable was found statistically significant in its relationship with the GDP variable.

Qualitative and quantitative analysis findings related to the logistics center are explained in detail in two subtitles of this section. In the qualitative analysis subtitle, the qualifications that the sector representatives should have in terms of supporting the development of the sector and the country's economy emerged from the logistics center. The fact that concepts such as logistics center, logistics, and logistics service come to the fore in almost all of the business interviews and that shows the sensitivity of the sector to the subject.

In the second subtitle, economic data and the relationship of variables with GDP are analyzed. Here, it was shown that only variables of pipeline transportation and airline transportation have a long-term relationship with GDP. In addition to the qualitative research findings, the success of the logistics needs to consider this information.

Conclusions

Regarding the development of logistics centers, the experiences of logistics centers in the world, which are located at the junction of two or more main transportation types and have an important place in large transit transportation, are examined. However, with a comprehensive analysis of the existing logistics infrastructure of the Republic of Kazakhstan, its potential to determine and maintain the flow of goods worldwide is identified. The country's logistics complex is represented by all types of transport: railway, road, pipeline, water, and air. The main share of the land transport network is highways and railways. Kazakhstan's railway system is the part of the five international transport corridors that provide goods transportation between Asia and Europe. Road transport also plays a very important role in the logistics infrastructure of the Republic of Kazakhstan. Kazakhstan is ranked ninth in the world in terms of surface area, and besides being an international transit corridor, the country's developing logistics infrastructure and cheap fuel prices, which is indispensable for road transportation, provides a great advantage to its transportation sector. However, the analysis of the state of Kazakhstan's logistics infrastructure showed that there are several significant problems in the effective use of the country's transit potential. First of all, there is the matter of developing a logistics system and services that meet the requirements of intercontinental transport links.

Overcoming these problems and ensuring integration into the world logistics system require some reforms in transportation-related areas and their institutional structures. Modern conditions require the modernization of the vehicle fleet and, accordingly, the technical and technological development of the logistics infrastructure.

To create a competitive logistics infrastructure, we must use the experiences of developed countries. In other countries (Germany, UK, USA, etc.), successful reforms related to the development of logistics infrastructure has been possible by drastically reducing state financing and attracting private capital. According to the experiences of foreign countries, the most effective method of reforming the logistics sector is the cooperation of the state and the private sector with a public guarantor and public-private partnership projects.

An efficient transportation system will surely generate income for the country's economy. Also, neighboring countries that are competitive in the global logistics system may be willing to transport goods through Kazakhstan via transit. Therefore, it is necessary to regulate the tariff and customs policy in the country. At the same time, attention and precautions should be increased in customs and goods control at border crossings.

To examine the relationship of the logistics sector in Kazakhstan with the Kazakhstan economy, we included 18 variables related to the sector and GDP variables into our study. The results showed that only three variables have a statistically significant long-term relationship with GDP. This result can be interpreted that the economic developments in the country have not been reflected in the sector at the desired level in terms of the variables examined. This is a finding that needs to be carefully scrutinized by both state authority and sector representatives.

Before taking concrete steps regarding the establishment of a logistics center, both the development of the sector and the country's economy should be analyzed in detail on a wider data set. This data set should include the country's general economic data, the status of the logistics sector in the relevant country and the world.

The analysis of the structured interview led to the following results:

1. The analysis made at the level of open coding showed that the interviewees used more than a hundred keywords. This result designates that the sector has a high interest in the logistics centers, they closely follow developments in this field and their level of knowledge is high.

2. The evaluation made at the axis coding level showed that the general dimensions that interviewees regarded important for the establishment of a logistics center. As a result of the analysis, the main objectives, principles, and values of the logistics center, operational policy, the services to be fulfilled, the vision and mission principles were determined.

3. In the level of selective coding, four main dimensions were determined.

a. The most important dimension according to enterprises was evaluations related to logistics centers under this dimension, businesses generally expressed their views on the human resources and personnel structure, clustering, logistics network and connections, features, and location of the center.

b. Other dimensions were;

- Competition, development of companies and evaluations about quality,

- Evaluations about the logistics sector,

- Legal proceedings and expectations from the government.

4. Results of the structured interviews showed that the enterprises have some thoughts on the functioning of the center, its position, duties, and responsibilities. It is considered that it will be useful to conduct new researches to reveal these thoughts in more detail and to obtain information that will contribute to the establishment of logistics centers. These researches can be in-depth interviews based on selective coding information, focus on group meetings, or structured questionnaires. Also, ensuring the participation of other stakeholders in new studies will be complementary for this research. In this sense, state/government officials, intermediate workers/employees working in the enterprise, firms from the sector, and local government representatives can be evaluated as stakeholders.

In conclusion, Kazakhstan, by successfully implementing logistics centers, proved its capacity to provide quality services for any goods in any direction and distance, in line with international standards, and showed that it can create an integrated complex that can provide barrier-free transportation.

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А.Д. Болғанбаев, Қ. Мырзабекқызы, Д.Н. Келесбаев, С.Т. Баймаганбетов

Тауар тасымалын дамытуда логистикалық орталықты пайдаланудың маңыздылығы және Қазақстан бойынша зерттеу

Аңдатпа

Мақсаты: Көлік өнеркәсібі саласында логистикалық орталықтарды пайдалану — бұл Қазақстан үшін өте жаңа құбылыс, дегенмен логистика секторы бүкіл әлемдегі секілді елімізде қарқынды дамуда. Сондықтан бұл зерттеу Қазақстандағы тауар тасымалдау секторына және логистикалық орталықтардың қазіргі жағдайына шолу жасауға, олардың қызметіне баға беруге және проблемалары мен осы проблемалардың себептерін анықтауға бағытталған.

Әдісі: Авторлар логистикалық сектор мен логистикалық орталықтар бойынша компания қызметкерлерімен құрылымдық сұхбат жүргізген. Нәтижелері NVivo пакеттік бағдарламасымен талданды. Зерттеудің екінші сұрағы бойынша — логистика секторы мен жалпы ішкі өнім (ЖІӨ) арасындағы байланысты анықтау. Зерттеудің басқа аспектісі — логистика секторына қатысты мәліметтердің өзгеруі және осы өзгерістер мен ЖІӨ арасындағы байланысты болып табылады. Бұл қатынастар X11-ARIMA/88 әдісінің көмегімен және уақыт кезеңімен талданды.

Қорытынды: Ұзақ мерзімді коэффициенттер мен қателерді түзету моделінің нәтижелеріне сәйкес, X13_SA айнымалысының бір кезеңдік кідірісі мен тенденциясының әсері ЖІӨ айнымалысымен байланысында статистикалық тұрғыдан маңызды болды. Сонымен қатар, X14_SA айнымалысының бір кезеңдік кідірісі мен тенденциясының әсері ЖІӨ айнымалысына қатысты статистикалық тұрғыдан маңызды болды. Сондай-ақ, X18_SA айнымалысының бір кезеңдік кідірісі мен тенденциясының әсерінің ЖІӨ айнымалысының мәнімен байланысында да статистикалық тұрғыдан маңызды деп табылды.

Тұжырымдама: Қазақстан бойынша жүргізілген зерттеулер нәтижесінде логистикалық орталықтарды табысты енгізе отырып, кез келген бағытта және қашықтықта, халықаралық стандарттарға сәйкес, сапалы тауарлармен қамтамасыз ету мүмкіншілігін дәлелдеді және бұл кедергісіз тасымалдауды қамтамасыз ете алатын интеграцияланған кешен құра алатынын көрсетті.

Кілт сөздер: логистика, логистикалық орталықтар, көлік, көлік өнеркәсібі, ЖІӨ, Қазақстан, NVivo пакеттік бағдарламасы, X11-ARIMA/88 әдісі, уақыт кезеңін сараптау.

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Важность использования логистического центра для развития грузовых перевозок и исследований в Казахстане

Аннотация

Цель: Использование логистических центров в транспортном секторе — совершенно новое явление для Казахстана, хотя сектор логистики быстро развивается как в Казахстане, так и во всем мире. Данное исследова-

ние направлено на обзор сектора грузовых перевозок в Казахстане и текущего состояния логистических центров, оценку их работы и определение их проблем, а также выявление причин возникновения данных проблем.

Методы: Авторы провели структурированные интервью с официальными лицами компании по вопросам логистики и логистических центров. Результаты проанализированы с помощью пакетной программы NVivo. Предметом исследования является определение взаимосвязи между сектором логистики и валовым внутренним продуктом (ВВП). Другой аспект исследования — это изменения данных, касающихся сектора логистики, и выявление взаимосвязи между этими изменениями и ВВП. Эта связь изучена с использованием метода X11-ARIMA / 88 и временных рядов.

Результаты: Согласно результатам наших долгосрочных коэффициентов и модели коррекции ошибок, влияния задержки на один период и тренда переменной X13_SA, был обнаружен статистически значимый факт – его взаимосвязь с переменной ВВП.

Выводы: В результате исследования Казахстан, успешно внедрив логистические центры, доказал свою способность предоставлять качественные услуги для любых товаров в любом направлении и на любые расстояния в соответствии с международными стандартами, а также было показано, что с его помощью можно создать единый интегрированный комплекс, обеспечивающий безбарьерную транспортировку.

Ключевые слова: логистика, логистический центр, транспорт, транспортный сектор, ВВП, Казахстан, пакетная программа NVivo, метод X11-ARIMA/88, анализ временных рядов.

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