

Azerbaijan's Position in the East-West Transport Corridor, LPI Index and Container Transportation

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Abstract—As a result of large-scale investments in infrastructure to create the potential to increase the volume of transit cargo on various international transport corridors, there has been a recent increase in the volume of transit traffic through Azerbaijan. Such large-scale regional projects are the New Baku International Sea Trade Port Complex, the Baku-Tbilisi-Kars railway and the Astara-Astara railway. These infrastructure projects boosted volume of cargo (containers) transportation through East to West, North to South and especially China to Europe. In addition, these researches include Zangazur corridor perspectives, regional countries development indexes, import volume from China, automatization and Azerbaijan new “HUB” strategy. The article will also examine the Logistics Performance Index (LPI), its parameters and Azerbaijan's score for this index.

Keywords—Middle Corridor, Automatization, HUB strategy, Container, LPI index

I. INTRODUCTION

In the framework of ongoing recession in the world economy, deep economic reforms in recent years, the development of the non-oil sector, the creation of an export-oriented economic model and establishing a productive business environment, as well as result of large-scale investments in infrastructure to create the potential to increase the volume of transit cargo transportation on various international transport corridors of the country, positive expectations are being formed in transit cargo transportation through Azerbaijan.

One of the recent regional projects implemented by Azerbaijan is the New Baku International Sea Trade Port complex. From the day of starting operations, project was successful within first 3 years and the potential of port's handling capacity is 15 million tons of cargo per year, including 100,000 containers, new Port of Baku have experienced growth in current periods. In recent periods, the largest increase was recorded in the volume of fertilizers, oil and oil products with origin of Turkmenistan, the number of containers and auto vehicles transport between Turkey and Central Asia. The fertilizer terminal, the construction of which began this year with a capacity of 2.5 million tons and

a storage capacity of 120,000 tons, will play an important role in increasing the volume of cargo handling in the Port of Baku in the future. It should be noted that the total volume of cargo handling in Baku Port in 2020 was more than 4.8 million tons, and in the first 8 months of this year was about 3.9 million tons. In 2020, the number of containers in the TEU equivalent was 40,345 unit, the number of Auto vehicles was 43,218 and the number of railcars was 37,447. The improvement the potential of port attracts cargos from numerous locations and through the corridor, these transit cargo's creates adding value for owner of infrastructure and logistics companies. Ports are main connection line for all world.

II. MIDDLE CORRIDOR

Middle corridor which passes through Azerbaijan borders, integrates to the infrastructure projects and global logistics through right logistic solutions. So that, there have been marked improvement in transit containers in the middle corridor via the East-West corridor (both Turkmenistan and Kazakhstan directions).

The number of containers transported in Baku Port for 8 months of 2015-2021 was as follows:

Table 1

	2015	2016	2017	2018	2019	2020	2021 (8 months)
TEU container	13336	17108	15337	22887	35024	40345	26585

Source: Author's Research

As can be seen from Table 1, there is an increase in the number of containers. To compared with 2015, the number of containers in the TEU equivalent increased more than 3 times in 2020. In general, Middle corridor man source of cargos are Black Sea, Europe-Central Asia and reverse direction, at the

same time development of trade turnover in the China and corridor countries.

Thus, there have been serious improvement trade turnover Central Asia and Turkey and that growth continuing every year. For the information, in 2019 total TIR transport from Turkey to the Uzbekistan was 36606 and many of these auto vehicles didn't pass in Azerbaijan borders. The statistics of the TIR transportation through the Port of Baku seen in Table 2 and Table 2.1:

Table 2

Direction	2015	2016	2017	2018
On the Baku Port, total				
West to East	5 485	14 836	16 767	13 345
East to West	3 271	8 710	11 817	8 056
Total	8 756	23 546	28 584	21 401
On Turkey				
Turkey to Central Asia	5 407	10 084	9 404	5 979
Central Asia to Turkey	3 260	8 353	11 031	7 406
Total	8 667	18 437	20 435	13 385
Turkey to Uzbekistan	-	84	51	501
Uzbekistan to Turkey	-	39		1
Total	-	123	51	502

Table 2.1

Direction	2019	2020	2021 (first 8 month)
On the Baku Port, total			
West to East	22 954	24 626	14 653
East to West	10 717	18 592	10 607
Total	33 671	43 218	25 260
On Turkey			
Turkey to Central Asia	10 470	16 679	9 436
Central Asia to Turkey	6 203	11 931	6 667
Total	16 673	28 610	16 103
Turkey to Uzbekistan	259	4 620	1 263
Uzbekistan to Turkey	22	3 762	929
Total	281	8 382	2 192

Source: Author's Research

In General, if we examine the statistics, there have been growth in fertilizer products in open bulk forms. New fertilizer facilities build in Turkmenistan and at the same time Central Asia fertilizer potential on fertilizer products exports to the west is increasing. As a result, Port of Baku now building fertilizer terminal with total cargo capacity 2.5 million ton per year (in addition 120-thousand-ton storage

capacity). Fertilizer products statistics shows high potential and return in that products. The figures below show total fertilizer handling in last years:

Table 3

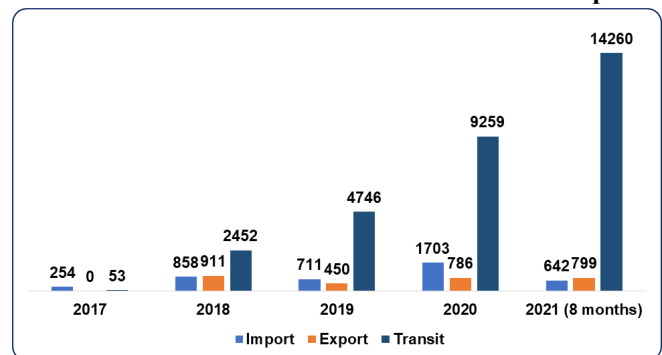
Indicator	2018	2019	2020	2021 (8 month)
Fertilizer products, ton	38 400	170 000	630 000	705 000

Source: Author's Research

Apart from Port of Baku, another Azerbaijan regional project was Baku-Tbilisi-Kars railway project. This project also succeeded, and it had positive progress recent years.

Information about Baku-Tbilisi-Kars railway container transportation is below:

Graph 1



Source: Author's Research

Azerbaijan transit potential were depending on Middle corridor countries welfare and economy. Middle corridor countries economy development statistics are below.

Table 4

Country	2015		2016		2017	
	GDP, in billions of US dollars	GDP per capita in US dollars	GDP, in billions of US dollars	GDP per capita in US dollars	GDP, in billions of US dollars	GDP per capita in US dollars
Turkey	864.3	11,006	869.7	10,895	859.0	10,590
Ukraine	91.0	2,125	93.4	2,188	112.2	2,641
Georgia	15.0	4,014	15.1	4,062	16.2	4,357
Bulgaria	50.6	7,056	53.8	7,549	59.0	8,334
Romania	177.7	8,969	188.1	9,549	211.7	10,807
Moldova	7.7	2,732	8.1	2,880	9.7	3,510
Turkmenistan	35.8	6,433	36.2	6,388	37.9	6,587
Kazakhstan	184.4	10,511	137.3	7,715	166.8	9,248
Kyrgyzstan	6.7	1,121	6.8	1,121	7.7	1,243
Uzbekistan	81.8	2,615	81.8	2,568	59.2	1,827
Tajikistan	8.3	978	7.0	807	7.5	849

Source: World Bank

Table 4.1

Countries	2018		2019		2020	
	GDP, in billions of US dollars	GDP per capita in US dollars	GDP, in billions of US dollars	GDP per capita in US dollars	GDP, in billions of US dollars	GDP per capita in US dollars
Turkey	778.4	9,453	761.4	9,127	720.1	8,538
Ukraine	130.9	3,097	153.9	3,663	155.6	3,727
Georgia	17.6	4,723	17.5	4,698	15.9	4,279
Bulgaria	66.2	9,428	68.6	9,828	69.1	9,976
Romania	241.5	12,399	249.7	12,890	248.7	12,896
Moldova	11.5	4,230	12.0	4,494	11.9	4,551
Turkmenistan	40.8	6,967	45.2	7,612	47.4	7,851
Kazakhstan	179.3	9,813	181.7	9,813	169.8	9,056
Kyrgyzstan	8.3	1,308	8.9	1,374	7.7	1,174
Uzbekistan	50.4	1,529	57.7	1,719	57.7	1,686
Tajikistan	7.8	853	8.3	891	8.2	859

As table above, transit potential growth is still developing, and total GDP volume is proof for that. Turkey is largest economy apart from other countries. Romania, Kazakhstan and Ukraine also have significant economy.

Map1



China’s influence on the East-West corridor transit on the long-term have positive contribution. Regional imports from China is shown as below:

Table 5

China export, in million US dollars	2015	2016	2017
Azerbaijan	439	346	387
Turkey	18,608	16,687	18,122
Ukraine	3,516	4,217	5,041
Georgia	769	745	913
Bulgaria	1,043	1,056	1,169
Romania	3,162	3,448	3,778
Moldova	100	77	98

Table 5.1

China export, in million US dollars	2018	2019	2020
Azerbaijan	516	617	618
Turkey	17,864	17,322	20,357
Ukraine	7,026	7,379	6,878

Georgia	1,103	1,400	1,276
Bulgaria	1,442	1,546	1,547
Romania	4,512	4,563	5,126
Moldova	109	120	146

Source: UN, Trade Statistics

From the Table 4 and Table 4.1, we could find out that biggest importer from China is Turkey and it followed by Romania and Ukraine. In Table 5, it shown the number of containers come from China to the Port of Baku:

Table 6

Indicator	2015	2016	2017	2018	2019	2020	2021 (8 month)
The number of containers comes from China (TEU)	83	107	248	2 321	5 941	5 660	7 736

Source: Author’s Research

Those statistics shows emerging logistics services Chinese products to transport East to West and even in 2021 West to East transportation (Turkey exportation to China) started.

In pandemics, China economy main content containers were in shortage and that problem is still continuing. Container shortage on sea transportation rose shipping prices sharply (approximately 5 times) which it shifted their demand on land transport (railway transportation). From that reason, there are escalation of cargo transport in middle corridor. However, high prices on containers are also decreasing Corridor countries import from China. As a result, those high prices inflicts China’s import and it includes Azerbaijan as well and it leads inflation on country economy. In long-term, China has opportunities to boost turnovers in corridor countries and even Europe transportation through Azerbaijan corridor which it considers their main goal

Azerbaijan Logistics Performance Index

In world, logistic sectors in developed countries not only satisfies in transition,as well as creating added value in order to make a contribution to the economy. If Azerbaijan achieves infrastructure goals to maximize our potential tranzit goods passes on country, it could bring limited income to the country(approximately 700-800 million US dollars). However, we could multiply that income by using value added services. Thus, the construction of a Free Trade Zone near the Alat settlement of Baku, which includes the transport and logistics industry, pharmaceutical cluster, facilities for the supply of oil for general use, as well as processing, packaging and labeling areas, has begun. It should be noted that the launch of this zone will make a positive contribution to the activities of the New Port of Baku. It also be noted that these projects are part of the central strategy ("hub" strategy)

established by President Ilham Aliyev to strengthen the non-oil sector of Azerbaijan. The new Baku Port will become a leading trade and logistics hub in Eurasia, located at the crossroads of Europe and Asia, near major markets such as China, Turkey, Iran and Russia. The share of the transport sector in GDP, shown in the table below, once again proves the importance of the development of this sector.

The share of the transport sector in the gross domestic product of countries

Table 7

The share of transport in GDP	2019	
	Million US Dollars	Percentage
Azerbaijan	2,905.9	6.0%
Belgium	28,642.6	5.6%
Germany	164,866.8	4.4%
France	120,055.2	4.6%
Korea	429,079.0	23.8%
Turkey	42,276.8	9.5%
Georgia	718.8	4.1%
Kazakhstan	2,324.8	1.3%
Turkmenistan	40,496.4	4.7%

Source: Author’s Research

If Azerbaijan's access to the world ocean was provided by Georgian ports as a bridge country, a new alternative emerges after this corridor and provides access to the Mediterranean Sea through Turkish ports (mainly Mersin), which creates additional logistics and transport opportunities. Relevant research will be conducted in the future to assess the development prospects of this area.

In order to achieve the identified goals, the following shortcomings in the development of the corridor need to be addressed:

Delay in digitization-- One of the modern challenges of the 21st century is the application of IT systems in any field and the production of devices based on new technologies. The application of modern information technologies in any field, including transport and logistics, is developing day by day. Currently, tracking of cargo transportation, automated transmission of documents in the system of delivery of goods from producer to consumer, and the introduction of new technologies have led to cost and time savings. If we look at the current state of the automation system along the middle corridor where Azerbaijan is located, we can see that there are some setbacks in this area. Although all transport and logistics entities along this corridor have internal systems, there are some problems in coordinating these systems on a common basis. It should be noted that the development of an automation system along the corridor will lead to attraction of additional cargo in this direction.

Lack of container vessels-- Although dry cargo vessels predominate in cargo transportation between ports in the Caspian Sea, the number of container vessels is insufficient. The low profitability of container transportation compared to dry cargo has reduced interest in this field. At present, the transported containers are mainly carried by dry cargo ships. Recent statistics on containers transported through the Baku Port show that the number of containers will increase in the future, which in turn will increase the demand for container vessels.

Azerbaijan’s Logistics Performance Index

The Logistics Performance Index (LPI) is a comparative analysis tool developed by the World Bank to identify the challenges and opportunities that countries face in their trade and logistics activities. In addition, the World Bank provides guidelines for improving performance in the logistics sector based on the results of the LPI. The 2016 edition of the LPI presents a comparison of 160 countries. The data were collected on the basis of research conducted among logistics professionals, organizations and operators engaged in business activities in foreign countries.

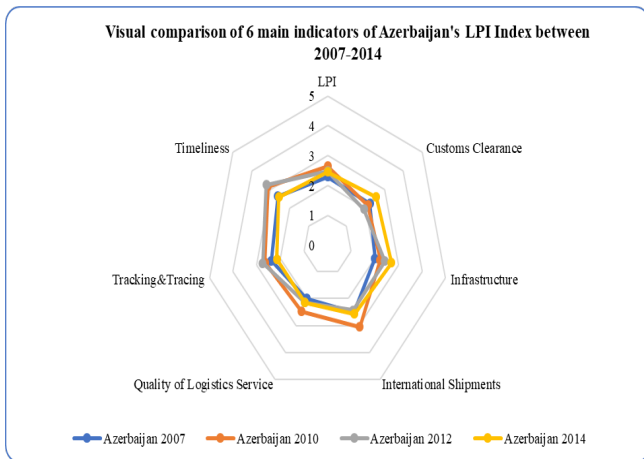
The components analyzed in the International LPI were chosen based on recent theoretical and empirical research and on the practical experience of logistics professionals involved in international freight forwarding. They are:

- The efficiency of customs and border management clearance (“Customs”).
- The quality of trade and transport infrastructure (Infrastructure”).
- The ease of arranging competitively priced shipments (Ease of arranging shipments”).
- The competence and quality of logistics services—trucking, forwarding, and customs brokerage (“Quality of logistics services”).
- The ability to track and trace consignments (“Tracking and tracing”).
- The frequency with which shipments reach consignees within scheduled or expected delivery times (“Timeliness”).

Based on this, a rating table is prepared for each country based on a general LPI based on a 5 score system.

The latest data on the logistics performance index of Azerbaijan is dated 2014. It shows that the country ranks 125th in the world with a score of 2.45 out of 5 points. Compared to global indicators, this indicator lags behind previous years. Thus, in 2012 it was 116th (LPI score: 2.48), in 2010 it was 89th (LPI score: 2.64), and in 2007 it was 111th (LPI score: 2.29). This process is described in the following graph:

Graph 2



Source: World Bank <http://www.worldbank.org/>

In 2014, Azerbaijan scored the highest score in the "Infrastructure" category (2.71 out of 5 points). He scored the lowest score in the "Logistics competence" and "Tracking & Tracing" categories and demonstrated a score of 2.14 points in both categories out of 5 possible points. Compared to previous years, there have been substantial improvements in the following categories:

- "Customs" - despite gaining 2.14 points in 2010 and 1.92 points in 2012, in 2014 it increased this figure to 2.57 points.
- "Infrastructure" - Increased from first three years scores of 2.42, 2.23 and 2 points to 2.71 in 2014.

In 2014, Azerbaijan scored low on the following indicators:

- "International shipments" - although in 2010 it scored 3.05 points, in 2014 this figure was 2.57.
- "Logistics competence" - 2.14 points in 2014 are the same as in 2012, but less than 2.48 points in 2010.
- "Tracking and Tracing" - the 2.14 score recorded in 2014 is the lowest since 2007 and is significantly lower than the 2.75 score in 2012.
- "Timeliness" - 2.57 points recorded in 2014 is the lowest since 2007. In 2012, Azerbaijan scored 3.23 points in this category.

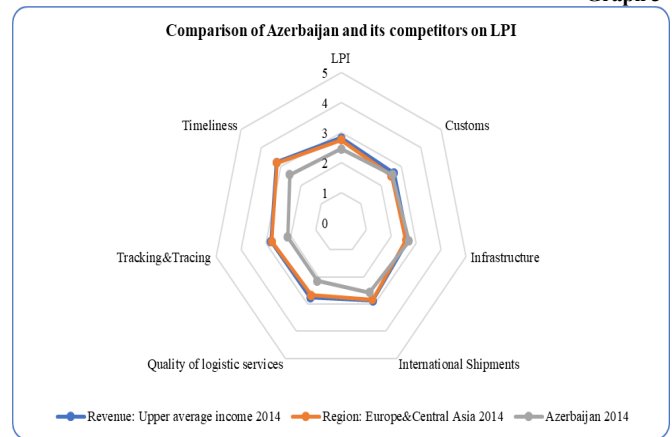
Azerbaijan's LPI score of 2.45 in 2014 led it to rank lower than its competitors in the following categories of countries.

1. Regional countries of Europe and Central Asia - LPI score: 2.76
2. Countries with the same income range (upper average income according to the World Bank classification) - LPI score: 2.82

The categories that show that Azerbaijan has a comparative advantage or is stronger than its competitors are

"Infrastructure" and "Customs". The country performed poorly on 4 other indicators. This process is described below.

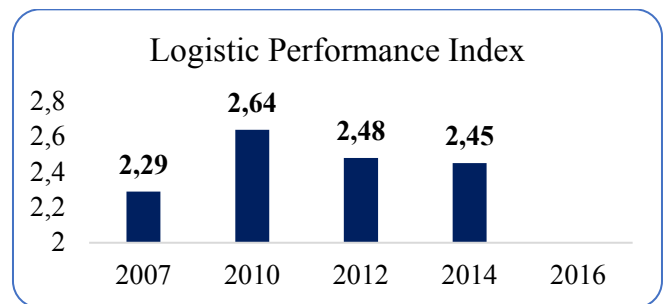
Graph 3



Source: World Bank <http://www.worldbank.org/>

The graphical description of the logistic performance index of Azerbaijan on years and 6 main factors is given below:

Graph 4



Source: World Bank www.worldbank.org/

Note: Azerbaijan's Logistic Performance Index (by years). Data for 2016 are not available.

The indicators of the Logistics Performance Index of Azerbaijan on 6 main factors are given in the following table:

Table 8

Year	Customs procedures	Infrastructure	International Shipments	Qualitative service	Tracking & Tracing	Timeliness
2007	2.23	2	2.50	2	2.38	2.63
2010	2.14	2.23	3.05	2.48	2.65	3.15
2012	1.92	2.42	2.43	2.14	2.75	3.23
2014	2.57	2.71	2.57	2.14	2.14	2.57
2016	-	-	-	-	-	-

Source: World Bank www.worldbank.org/

Note: Azerbaijan's Logistic Performance Index (by factors and years). Data for 2016 are not available.

CONCLUSION

Research shows that large-scale investment projects in which Azerbaijan has recently invested in transport and logistics infrastructure are exceeds their positive expectations. Azerbaijan's activities with the countries of the region aimed

at the development of the middle corridor have also had positive impacts and recently there has been an increase in the number of containers from China. In addition, there are still some problems in the automation system along the corridor, such as non-harmonization of tariffs, non-coordination of railway and port potential, which has led to the transportation of large potential cargo by other routes via bypassing Azerbaijan. Expansion of the capacity of the Baku-Tbilisi-Kars railway (especially on the Georgian-Turkish border), construction of a container terminal and specific terminals in the port (fertilizer) as the main infrastructure and parallel development of super infrastructure (digitization) will increase the attractiveness of the transit corridor through Azerbaijan.

At the same time, Azerbaijan's alternative access to world ocean through creation of Zangazur corridor will bring additional benefits to the current corridor while increasing the sustainability and reliability of the this corridor. Sustainability, reliability, time and price remain key factors for corridors.

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