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THE IMPACT OF THE TRANS-CASPIAN INTERNATIONAL TRANSPORT ROUTE ON GLOBAL LOGISTICS IN THE CURRENT GEOPOLITICAL SITUATION

ТРАНСКАСПИЙ ХАЛЫҚАРАЛЫҚ КӨЛІК МАРШРУТЫНЫҢ ҚАЗІРГІ ГЕОСАЯСИ ЖАҒДАЙДАҒЫ ЖАҺАНДЫҚ ЛОГИСТИКАҒА ӘСЕРІ

ВЛИЯНИЕ ТРАНСКАСПИЙСКОГО МЕЖДУНАРОДНОГО ТРАНСПОРТНОГО МАРШРУТА НА ГЛОБАЛЬНУЮ ЛОГИСТИКУ В УСЛОВИЯХ СОВРЕМЕННОЙ ГЕОПОЛИТИЧЕСКОЙ СИТУАЦИИ

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ABSTRACT

In the current geopolitical and humanitarian climate, changes are taking place in the configurations of international transport corridors, including the reorientation of export and import flows in the China-Europe-China direction. In this context, freight transportation via the Trans-Caspian International Transport Route (TITR) is becoming increasingly relevant. From a trade and economic perspective, the TITR, as an alternative route, primarily allows for the diversification of trade routes and improves transport accessibility for Kazakhstan, Azerbaijan, and Georgia. This offers opportunities to deliver goods more quickly compared to the route through the Suez Canal and to bypass the transport corridor through Russia. Thus, the TITR presents an attractive alternative for investors and governments seeking to bolster trade and promote overall economic growth.

Kazakhstan is one of the most influential states in the Caspian region, holding significant strategic importance due to its geopolitical position, abundant natural resources, and transit potential. Kazakhstan's advantageous geographical location along the TITR provides all the prerequisites for active investment in the development of the transport corridor in the region. It should be emphasized that Kazakhstan currently serves as a major transit country for large volumes of cargo between China and Western Europe.

TITR that passes through the territories of Kazakhstan, Azerbaijan, and Georgia. Specifically, it provides a detailed analysis of freight logistics from 2015 to 2023 and evaluates Kazakhstan's potential role in the development of the TITR as a Central Asian hub in the global supply chain between China and Europe.

Түйінді сөздер:
Көлік дәлізі1, Транскаспий халықаралық көлік бағдары2, орта дәліз3, Орталық Азия хабы4, транзиттік әлеует5, өткізу қабілеті6, жүк тасымалдау логистикасы7, жүк тасымалдау көлемі8, контейнерлік тасымалдау көлемі9.

ТҮЙІНДЕМЕ

Қазіргі геосаяси және гуманитарлық жағдайларда халықаралық көлік дәліздерінің өзгерістері, соның ішінде Қытай – Еуропа – Қытай бағытындағы экспорттық және импорттық ағындардың қайта бағдарлануы орын алуда. Осыған байланысты Транскаспий халықаралық көлік бағыты (ТХКБ) бойынша жүк тасымалы барған сайын өзекті бола түсуде.

Бұл ретте сауда-экономикалық тұрғыдан ТХКБ баламалы бағыт ретінде бірінші кезекте сауда маршруттарын әртараптандыруға және Қазақстан, Әзірбайжан және Грузия үшін көліктік қолжетімділікті жақсартуға мүмкіндік береді, бұл Суэц каналы арқылы жеткізумен салыстырғанда жүктерді тезірек жеткізуге және Ресей арқылы көлік дәлізін айналып өтуге мүмкіндік береді. Осыған байланысты ТХКБ сауда мен жалпы экономикалық өсуді қолдауға ұмтылатын инвесторлар мен үкіметтер үшін тартымды нұсқа болып табылады.

Қазақстан өзінің геосаяси жағдайына, бай табиғи ресурстарына және транзиттік әлеуетіне байланысты маңызды стратегиялық маңызы бар Каспий өңіріндегі ықпалды мемлекеттердің бірі болып табылады. ТХКБ бағытына қатысты Қазақстанның тиімді географиялық жағдайы өңірдегі көлік дәлізін дамытуға белсенді инвестициялау үшін барлық алғышарттарды береді. Қазіргі уақытта Қазақстан Қытай мен Батыс Еуропа арасындағы транзиттің үлкен көлемі өтетін ел болып табылатынын атап өткен жөн.

Бұл зерттеуде Қазақстан, Әзірбайжан және Грузия аумағы арқылы өтетін ТХКБ учаскесіне басты назар аударылады, атап айтқанда, 2015-2023 жылдардағы жүк тасымалы логистикасына егжей-тегжейлі талдау жүргізілді, Қытай – Еуропа – Қытай бағыты бойынша жаһандық жеткізу тізбегінің Орталық Азия хабы ретінде ТХКБ дамуын іске асырудағы Қазақстанның әлеуетті рөліне баға берілді.

Ключевые слова:
Транспортный коридор1, Транскаспийский международный транспортный маршрут2, Средний коридор3, Центрально-Азиатский хаб4, транзитный потенциал5, пропускная способность6, логистика грузоперевозок7, объем грузоперевозок8, объем контейнерных перевозок9.

АННОТАЦИЯ

В текущих геополитических и гуманитарных условиях происходят изменения конфигураций международных транспортных коридоров, в том числе переориентация экспортных и импортных потоков в направлении Китай – Европа – Китай. В этой связи грузоперевозки по Транскаспийскому международному транспортному маршруту (ТМТМ) становятся все более актуальными. При этом с торгово-экономической точки зрения, ТМТМ как альтернативный маршрут в первую очередь позволяет диверсифицировать торговые маршруты и улучшить транспортную доступность для Казахстана, Азербайджана и Грузии, что дает возможности быстрее доставить грузы по сравнению с доставкой через Суэцкий канал и обойти транспортный коридор через Россию. В связи с этим ТМТМ представляет собой привлекательный вариант для инвесторов и правительств, стремящихся поддерживать торговлю и экономический рост в целом.

Казахстан является одним из влиятельных государств в Каспийском регионе, имеющее важное стратегическое значение из-за своего геополитического положения, богатых природных ресурсов и транзитного потенциала. Выгодное географическое положение Казахстана относительно маршрута ТМТМ дает все предпосылки для активного инвестирования в развитие транспортного коридора в регионе. Следует подчеркнуть, что Казахстан в настоящее время является страной, через которую проходят крупные объемы транзита между Китаем и Западной Европой.

В данном исследовании основное внимание уделяется участку ТМТМ, который проходит через территорию Казахстана, Азербайджана и Грузии, в частности проведен детальный анализ логистики грузоперевозок за 2015-2023 гг., дана оценка потенциальной роли Казахстана в реализации развития ТМТМ в качестве Центрально-Азиятского хаба глобальной цепи поставок по направлению Китай – Европа – Китай.

INTRODUCTION

Relevance: In the context of the global digitalization of transport processes and the development of international transport relations, there is a growing need to establish stable transport links between various participants in international economic relations. The Central Asian region serves as a key transport and transit hub through which Chinese goods are delivered to Western markets.

With the implementation of China's Belt and Road Initiative, the Middle Corridor – Trans-Caspian International Transport Route (TITR) is receiving increasing attention (Chankov, G., 2023). The geopolitical changes in Eurasia that followed the pandemic have significantly influenced the directions of economic development in the Central Asian Caspian region. Geostrategically, the Caspian region represents a connecting point for the main east-west and north-south transport axes linking Europe to Asia. In the current context of the military conflict between Russia and Ukraine, the imposition of sanctions on Russia, and the unstable situation in the Red Sea affecting commercial shipping, there has been a sharp increase in demand for alternative cargo delivery routes (Felix, 2024). The TITR, as one of these routes, promises economic benefits in terms of trade and goods turnover in the China–Europe–China direction, bypassing Russia and creating opportunities for both China and Iran.

The TITR is one of the promising transport corridors connecting China with Europe. It passes through China, Kazakhstan, the Caspian Sea, Azerbaijan, Georgia, Turkey, and continues through the Black Sea to Europe (“TITR” Association, 2023). This route is used for both rail and maritime container transportation.

For the countries located along the corridor, the TITR plays a more significant role than merely serving as a bridge between China and Europe. From a trade and economic perspective, the TITR primarily facilitates the diversification of trade routes and improves transport accessibility for Kazakhstan, Azerbaijan, and Georgia (World Bank Report, 2023). The most frequently cited argument in favour of this approach to implementing the TITR development project is Kazakhstan's strategic geographical and geopolitical position.

According to SWP experts, Kazakhstan noticeably stands out among Central Asian states for its foreign policy, making it a key player in the Caspian region. The country is the first partner in Central Asia to conclude an 'Enhanced Partnership and Cooperation Agreement' with the EU and is included in the list of 'Middle Powers of the World,' countries that play an important role in the global political and economic arena. The Ukrainian conflict has provided Kazakhstan with a new impetus in terms of diversification; new transport routes are being developed, and investments are being attracted to the transport sector. The country relies not only on China's 'Silk Road' but also on the EU's 'Global Gateway' strategy, asserting its role as a 'Bridge between East and West' (Euractiv, 2024).

Kazakhstan, being the key country in the 'Agreement on the Caspian Sea' (“TITR” Association, 2023), the 'Agreement between the Government of the Republic of Kazakhstan and the Government of the People's Republic of China (PRC) on the Development of TITR, 2023' (Legal information system Adilet, 2023), the 'Enhanced Partnership and Cooperation Agreement (EPCA) with the EU', and the 'Roadmap for 2022-2027 aimed at improving the effectiveness of TITR' (“TITR” Association, 2023), has intensified diplomatic negotiations and encourages other Asian countries to use the TITR. Moreover, Kazakhstan’s favourable geographical location relative to the TITR route provides all the prerequisites for active investment in the development of the transport corridor in the region. By 2030, Kazakhstan, together with its neighbouring countries, plans to modernize all transit corridors to improve transport connectivity between

Asian and European countries (International Road Transport Union, 2022). The key role in this is played by the Middle Corridor – the 'Trans-Caspian International Transport Route' (Euractiv, 2024).

The TITR. is a key focus of the 'Development Concept for the Transport and Logistics Potential of the Republic of Kazakhstan, 2022', along with other transit routes through Kazakhstan. According to the aforementioned strategic agreements and concepts, Kazakhstan continues to explore the challenges and opportunities for the development of the TITR.

The object of this study is the Trans-Caspian International Transport Route – Middle Corridor. The subject of the study is the investigation of the role of Kazakhstan, Azerbaijan, and Georgia in the development of the TITR.

The main objective of this article is to assess the potential role of Kazakhstan in the development of the TITR as a Central Asian hub facilitating cargo transportation along the China-Europe-China route.

The main findings and recommendations of the study, the implementation of which will contribute to the socio-economic development of Kazakhstan, Azerbaijan, and Georgia, enhancing competitiveness and effectively utilizing transit potential, are presented in the concluding section of this article.

MATERIALS AND METHODS OF RESEARCH

The research methods are based on the analysis of data from the official statistics of the International Association "Trans-Caspian International Transport Route", NC Kazakhstan Temir Zholy JSC (KTZ), and the planning, reporting, and program documents of "The Union of Transport Workers of Kazakhstan 'Kazlogistics'" .

The study of transport corridors incorporates various methods and approaches aimed at analysing the efficiency, safety, sustainability, and other aspects of transport infrastructure. In this research, methods for collecting and analysing data on freight flow—such as freight volume, container transport volume, delivery time, and throughput capacity—have been utilized. Additionally, statistical methods for determining route congestion have been applied.

LITERATURE REVIEW

This review is based on existing literature from the past 10 years and provides an overview of the political, economic, and infrastructural aspects related to the TITR. The literature search was conducted through databases such as Scopus, Google, Google Scholar, World Bank, and others. In total, around 50 sources of literature were reviewed.

The data sources include various government documents, World Bank documents, European Bank for Reconstruction and Development (EBRD) documents, Asian Development Bank Institute documents, United Nations Economic and Social Council (UNESC) documents, as well as scientific articles and other press sources. Notable documents studied include the World Bank's "Middle Trade and Transport Corridor: Policies and Investments to Triple Freight Volumes and Halve Travel Time by 2030" (World Bank Report, 2023), the "Belt and Road Initiative (BRI)" and analytical documents such as the "ERAI Eurasian Rail Alliance Index", the EU strategy "Global Gateway", the "Concept for the Development of the Transport and Logistics Potential of the Republic of Kazakhstan, 2022", and "Kazakhstan on the Path to Sustainable Development 2023: The View of Young Experts" (Kosherbayeva, 2024), among others.

To expand the research base, working papers like "Logistics Policy Analysis and Network Model Simulation for Cross-Border Transport in the Trans-Caspian Transport Corridor", "Middle Corridor—Policy Development and Trade Potential of the Trans-Caspian International Transport Route", and "Corridor Developments for Transforming Central Asia", published by the Asian

Development Bank Institute, were also reviewed. These documents provide a comprehensive analysis of the corridor's potential, with a particular focus on political aspects and a broader view of the situation in the countries involved in the TITR.

The information search revealed that scholars from various countries have shown particular interest in the topic of the TITR. Their studies primarily explore the corridor's impact on the political and economic situations of the countries it traverses. These studies aim to identify "bottlenecks" that hinder the optimal functioning of transport and transit logistics, as well as to develop strategies to address these challenges (Chankov, 2023; Albayrak & Çelik, 2022; Vasa, & Barkanyi, 2023; Muratova, Sadri, Medeubayeva, & Issayeva, 2023; Nuretin & Guo, 2023).

Since 2022, numerous scholarly publications have highlighted the increasing strategic relevance of the TITR in both geopolitical and geo-economic contexts, recognizing its potential as an alternative corridor for trade between China and Europe (Kenderdine, & Press, 2022; Valiyev, 2023; Hussain, 2021; Larçon, & Vadcar, 2022). Several studies stand out for their in-depth analysis and forward-looking assessments of the TITR's development prospects (World Bank Report, 2023; Palu, Hilmola, 2023).

Beyond official records, the study draws upon journalistic sources that shed light on the evolving trade and economic opportunities within the TITR framework across its member states (German think tank, 2024; Mami, 2024; "Middle Corridor vs. sea route", 2024).

An integrated system of international road and rail corridors links the member states along the Eurasian route, supporting the efficient flow of cargo between East and West. Before the escalation of hostilities between Russia and Ukraine, the northern corridor-traversing China, Kazakhstan, Russia, Belarus, Poland, and Germany-served as the principal conduit for rail freight between China and Europe, handling nearly 90% of transit container volumes. During this period, the TITR remained a secondary option for long-distance trade, primarily due to its complex border procedures, reliance on intermodal logistics, and various operational constraints. Transit times were approximately threefold longer than those of the Northern Corridor and broadly comparable to maritime shipping durations (Euractiv, 2024).

The outbreak of the conflict in Ukraine significantly disrupted the established overland trade corridor between Asia and Europe that passed through Russian territory, prompting a marked shift towards alternative transit routes-most notably, the TITR. In light of growing concerns over security, trade diversification, and regional freight circulation, the strategic imperative to reroute China-Europe-China transit flows while circumventing Russia has gained considerable relevance. Furthermore, the escalation of attacks on commercial vessels in the Red Sea has intensified interest in strengthening Central Asia's overland trade infrastructure, thereby accelerating the development of the TITR corridor. Functioning as a multilateral and multi-modal transport corridor, the TITR establishes a logistical link between the ferry terminals of the Caspian and Black Seas and the railway infrastructures of China, Kazakhstan, Azerbaijan, Georgia, Turkey, and various European nations (Figure 1) (Mami E., 2024).

A notable distinction between the TITR and the conventional Eurasian corridor lies in its pronounced orientation towards freight flows not only destined for the European Union, but also for Turkey. The route encompasses maritime links to Istanbul and rail connections extending into Asia Minor. The intensification of trade among TITR member states has emerged as a principal driver of rising demand, reflected in a 37% growth in interstate commerce and a 28% increase in trade volumes with the European Union (Valiyev, (2023). The most substantial gains are anticipated to originate from strategically positioned economic nodes-namely ports, transport terminals, and railway junctions—through which the broader regional benefits are expected to diffuse into surrounding areas (Table 1) ("TITR" Association, 2023).

Figure 1. Directions of Cargo Flows along the TITR

Note – compiled by the authors based on ("TITR" Association, 2023)

Table 1. Strategic economic centres, ports и nodes along MC

Country	Major economic centers	Network junctions	Sea ports
Kazakhstan	Mointy, Zhatyk, Beinu	Dostyk, Shalkar, Arys	Aktau,Kuryk
Azerbaijan	Baku, ShamakhiꞴashal, Gabala, Sheki	Yevlak Ganja	Alyat
Georgia	Tbilisi, Rustavi, Gori	KashuriKutaisi	Poti, Batumi
Note – compiled by the authors based on (World Bank Report, 2023)			

Projections by the World Bank indicate that, under a scenario of enhanced operational efficiency, the volume of freight transported via the TITR across the Caspian Sea could increase threefold by 2030 relative to 2021, reaching an estimated 11 million tonnes. Of this figure, approximately 4 million tonnes are anticipated to result from rising demand for containerised cargo transport (Valiyev, (2023).

A review of recent scholarly assessments indicates that the TITR is currently facing operational constraints, which must be addressed if the corridor is to evolve into a pivotal logistics pathway between China and the European Union. These limitations are largely attributable to insufficient infrastructure at critical transit points, as well as broader capacity challenges within specific segments of Kazakhstan, Azerbaijan, and Georgia (see Table 1). Accordingly, the foremost priority for these states is to upgrade their transport infrastructure to ensure seamless, reliable, and well-coordinated logistics operations. Although the TITR is frequently discussed in the context of enhancing trade connectivity between China and the EU, the World Bank emphasises that its development also plays a vital role in diversifying global supply chains-particularly for Kazakhstan, Azerbaijan, and Georgia (Valiyev, (2023).

One of the principal challenges in advancing the corridor's utilisation lies in fostering effective collaboration among all transit countries involved. Kazakhstan assumes a central role in this process, acting as the secretariat of the international association known as the Trans-Caspian International Transport Route, and overseeing coordination among the participating stakeholders ("TITR" Association, 2023). The operational framework of the TITR is supported by members of the International Trans-Caspian Transport Consortium, which includes KTZ Express (Kazakhstan), ADY Container, ACSC Logistics, and Alliance Logistics (Azerbaijan), as well as GR Logistics & Terminals (Georgia).

In pursuit of greater operational efficiency along the TITR, a strategic document entitled the «Roadmap for 2022–2027» was formally endorsed in 2022 by Azerbaijan, Georgia, Kazakhstan, and Turkey. This framework sets out priority areas for investment and outlines coordinated measures aimed at enhancing the corridor's performance. A particularly notable milestone in this regard was the signing of a trilateral agreement in 2023 - «On the Creation of a Joint Logistics Operator» - between Kazakhstan, Azerbaijan, and Georgia, marking a significant step towards institutional integration and streamlined management (“TITR” Association, 2023). Furthermore, on 14 October 2023, a bilateral agreement was concluded between the Government of the Republic of Kazakhstan and the Government of the People’s Republic of China, reaffirming their commitment to the continued development of the TITR (Ministry of Economy of the Republic of Kazakhstan).

In parallel, a number of key international stakeholders-including the World Bank, the European Union, the European Bank for Reconstruction and Development, the Asian Development Bank, and other multilateral financial institutions, alongside bilateral partners-have formally expressed their commitment to supporting the corridor through technical assistance and targeted investment initiatives (World Bank Report, 2024). The TITR has already attracted the participation of major global logistics operators, such as Rail Cargo Group (Austria), Maersk (Denmark), Nurminen Logistics (Finland), and Rail Bridge Cargo (the Netherlands) (Mami, 2024). Notably, the European Union has pledged €10 billion towards the development of the Trans-Caspian Corridor.

Turkey is eager to promote the TITR to strengthen economic ties with Central Asia and establish it as an attractive trade route. China has also shown significant interest in developing the TITR, particularly within the framework of the Belt and Road Initiative. By strengthening ties with both Central Asia and the South Caucasus, China aims to expand trade and economic opportunities with Europe, thereby enhancing the security and reliability of its trade connections (Kosherbayeva, 2024).

According to the latest research from the European Bank for Reconstruction and Development, the investments needed for modernizing the TITR infrastructure are estimated at approximately €18.5 billion, highlighting their scale and potential impact. In a baseline scenario, the volume of transit containers via the TITR could increase from 18,000 TEU in 2022 to 130,000 TEU by 2040. With investment projects and measures ensuring uninterrupted connections, the volume of transit containers on the TITR could reach 865,000 TEU by 2040 (Dornier Group, 2022) Priority investments are focused on the restoration and modernization of rail and road networks, the expansion of rolling stock, the enhancement of port throughput capacity, and improvements at border crossing points for multimodal logistics centres and auxiliary network connections between participating countries (“TITR” Association, 2023).

This review demonstrates that the TITR is garnering significant attention from scientists, strategic development planners, and industry experts from various countries, where the development of the corridor as an alternative route is actively discussed. Despite differing approaches across studies, there is a common consensus that the TITR is vital for facilitating trade along the China-Europe-China route.

RESULTS AND DISCUSSION

In this research, data from the Association «TITR - Trans-Caspian International Transport Route», JSC NC «Kazakhstan Temir Zholy» (annual activity reports), and internal reports from the «Union of Transport Workers of Kazakhstan «KAZLOGISTICS» were used to conduct a comprehensive analysis of the potential and capabilities of the TITR.

Since regular multimodal transport services via the TITR operate according to approved comprehensive tariff rates, the participating countries in the TITR project review and approve these rates annually for the upcoming freight year. Freight rates are categorized based on the type of transportation, including wagon shipments, universal container transportation involving feeder vessels through the ports of Baku (Alyat, Govsan), and the transportation of loaded universal containers via ferry (“TITR” Association, 2023).

The TITR spans approximately 9,400–11,000 km, which is about 3,000 km shorter than the «Northern Corridor» (5,400 km) (“TITR” Association, 2023; «Dornier Group», 2022). The route consists of around 4,250 km of railway lines and approximately 500 km of maritime routes. For example, the route from China (Lianyungang) to Kazakhstan (Aktau/Kuryk) through Azerbaijan, Georgia, and Turkey (Istanbul) is 9,400 km. According to ERAI data and the Ministry of Transport of the Republic of Kazakhstan, the average transit time for freight transportation via the TITR in 2022 was 53 days, which is twice as long as the northern alternative routes. Significant delays occur at sea crossings, even with excess port capacity (World Bank Report, 2023). However, following the trilateral agreement between Georgia, Kazakhstan, and Azerbaijan on the establishment of the TITR Logistics Company, cargo transit along the route now takes 18 to 23 days [3]. Efforts are underway to further reduce this transit time to 10-15 days by improving transport and transit infrastructure and increasing throughput capacity between Asia and the European Union.

Currently, the TITR's capacity stands at 5.8 million tonnes per year, which is significantly lower than that of the Northern Corridor (“TITR” Association, 2023). According to data from the UNECE (United Nations Economic and Social Council, 2024) and the World Bank, Tables 2 and 3 provide the throughput capacities of key nodes in the countries participating in the TITR.

Table 2. Railway capacity analysis

Country	Standard of railway gauge	Railway Network Length	Throughput Capacity
Kazakhstan	1520 mm	16,000 km	240,000 TEU (Altynkol-Aktau line)
Azerbaijan	1520 mm	4285 km	20 freight trains/day
Georgia	1520 mm	1443 km	27 million tons
Note – compiled by the authors based on the United Nations Economic and Social Council, 2022			

The two ports in Kazakhstan along the TITR route—Aktau and Kuryk—have a combined estimated capacity of 24 million tonnes per year. Based on the actual cargo volumes for 2022, it can be concluded that these ports are not overloaded and still have significant spare capacity (Table 3). For example, the total capacity of the port of Aktau is estimated at 18 million tonnes per year, yet it operated at only a 26% utilization rate in 2022. In the container segment, the port’s capacity is estimated at 130,000 TEU per year, with a utilization rate of just 34% (World Bank Report, 2023).

Table 3. TITR port pass capacity analysis

Country	Ports	Port capacity, million tons per year/ TEU per year	Level of port utilization in 2022 in general/container segment
Kazakhstan	Aktau,	18 million tons per year total/130,000 TEU per year	26% overall/
	Kuryk	6 million tons total / 5,000 TEU per year	less than 30% overall/
Azerbaijan	Alyat	15 million tons per year/nd	42% overall, 52% in the container segment
Georgia	Poti	13 million tons total / 650,000 TEU per year	86% overall 55% in the container segment
	Batumi	20 million tons total / 200,000 TEU per year	22% overall, 54% in the container segment
Note – compiled by the authors based on based on a World Bank document (World Bank Report, 2023)			

Although the capacity of the TITR has not been fully utilized, issues related to border crossings, transshipment, and coordination have led to significant delays in transportation, causing a shift back to alternative corridors. These capacity constraints are primarily caused by administrative challenges, such as paperwork and insufficient digitalization, as well as inadequate infrastructure at key nodes, including a shortage of vessels (World Bank Report, 2023).

According to data from the International TITR Association, the corridor's potential is estimated at 300,000 TEU. However, the current capacity of the TITR, considering the distribution of capacities of Azerbaijani ports towards Kazakhstan, is 80,000 TEU, and towards Turkmenistan, it is 31,000 TEU. Key bottlenecks are identified in the Akhalkalaki/Kars sections and at the port stations in Azerbaijan (“TITR” Association, 2023).

In 2023, despite the total route capacity of 5.78 million tonnes, the TITR was only utilized at 48% of its potential. Specifically, container transport, with an existing capacity of 80,000 TEU, was utilized at just 26% (Figure 2, Table 4).

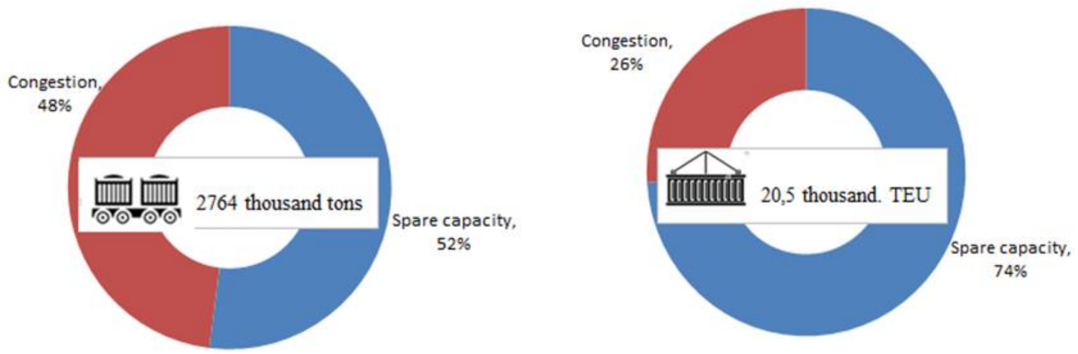

Figure 2. Analysis of TITR Load for 2023

Note – compiled by the authors based on data from the International «TITR» Association (“TITR” Association, 2023)

Despite the challenges of low infrastructure efficiency, operational inefficiencies, and high costs that limit the full potential of the TITR, the corridor presents significant opportunities for the economic development of its participating countries.

Most of the countries along the TITR are major exporters of raw materials, such as oil-producing Kazakhstan and Azerbaijan. For these nations, it is strategically important to improve the competitiveness of their exports by adding value and promoting industrial development. This would help them compete with the anticipated increase in import flows.

In 2023, the transit cargo volume along the TITR increased significantly, reaching 2.764 million tonnes, an 86% year-on-year rise compared to 2022 (Table 4). This marked a record for cargo volume along the corridor and demonstrated its potential to meet the growing demands of global trade. However, container traffic during the same period saw a 40% decrease. According to the World Bank, much of this additional cargo was lost due to operational inefficiencies and the high costs of using the corridor, leading to a shift back to maritime routes (“TITR” Association, 2023).

Table 4. Dynamics of Cargo Volumes on the TITR

Years	TITR freight volume				Number of TITR containers transported, 12 months/5 months	
	thousand. TEU	growth/ reduction. %	thousand tons	growth/ reduction. %	units	growth/ reduction. %
2015	4,9	-	nd	-	42	-
2016	7	43	nd	-	132	214
2017	9	29	1318	-	190	44
2018	15,2	69	1020	-23	1320	595
2019	26	71	759	-26	2764	109
2020	21	-19	784	3	3029	10
2021	25,2	20	586	-25	9023/3796	198/-58
2022	33,6	33	1485	153	nd/4534	19
2023	20,5	-40	2764	86	nd	-

Note: the table was compiled by the authors based on data from the International Association «TITR», UNECE

The number of containers transported in the first five months of 2022 showed a 20% increase compared to the same period in 2021. However, a comparison of the actual shipment volumes on the TITR with expert projections for 2017-2027, as outlined in, reveals that the actual figures for 2022 and 2023 fall short of the projected volumes of 38.4 thousand TEU and 46.6 thousand TEU, respectively.

Although container throughput along the TITR remained relatively modest in 2023- totalling approximately 20.2 thousand TEU-the handling capacity of the region's ports significantly exceeds this figure (see Table 3). In contrast, total cargo volumes transported via the corridor have demonstrated substantial growth, rising by 86% from 783.2 thousand tonnes in 2020 to 2,764.2 thousand tonnes in 2023 (see Table 5).

The export of goods from Kazakhstan has become increasingly dominant in the trade balance. In 2023, exports rose nearly 2.5 times compared to 2022. Among the most notable increases, oil transshipment surged by 53%, while ferry transportation also experienced a 12% growth. The total volume of transshipment through the seaports of Aktau and Kuryk via the TITR reached 1.74 million tonnes, marking an 85% increase compared to the same period in 2022.

Table 5. Dynamics of Cargo Volumes Transported by Rail on the TITR Route, Thousand Tonnes

Means of transport	Volume of transportation, thousand tons				Growth, drop %,		
	2020	2021	2022	2023	2021/2020	2022/2021	2023/2022
All in all, incl.	783,2	586,2	1484,8	2764,2	-25	153	86
container, thousand TEU	21,1	25,3	33,6	20,5	20	33	-40%
Export	341,8	135,2	891,1	2206,5	-60	559	148
Import	212,3	184,1	336,2	380,5	-13	83	13
Transit, incl.	229,1	266,9	257,5	177,1	16	-4	-31
Transit to third countries (in the west direction)	164,5	186,1	169,6	61,9	13	-9	-64
Third country transit (in the east direction)	64,6	80,7	87,9	115,3	25	9	31

Note – Table compiled by authors based on internal reports of the Transport Workers Union of Kazakhstan «KAZLOGISTICS»

In parallel with the expansion of export activities, import cargo volumes have witnessed a marked increase, rising by 82.6% in 2022 relative to the previous year. This upward trend is indicative of the growing engagement of European enterprises with the TITR. Nevertheless, the overall volume of east-west transit shipments has experienced a decline. According to the Ministry of Transport of the Republic of Kazakhstan, this downturn is largely attributable to reduced freight tariffs along the southern maritime route, which continues to facilitate approximately one-third of trade flows between the European Union and China ("TITR" Association, 2023).

In 2022, EU trade with Kazakhstan totalled €40.2 billion, a 74% increase from 2021. EU exports to Kazakhstan amounted to €10.4 billion, representing an 89% increase from the previous year, while imports from Kazakhstan reached €29.8 billion, a 70% rise compared to 2021. This resulted in a trade balance of €19.5 billion in favour of Kazakhstan, up from €12.1 billion in 2021 (Table 6).

Table 6. Dynamics of Goods and Services Trade between
the EU and Kazakhstan, Billion Euros

Years	Merchandise trade, billion euros			Trade in services, billion euros		
	EU imports	EU exports	Balance	EU imports	EU exports	Balance
2019	-	-	-	0,9	1,5	0,6
2020	12,6	5,9	-6,7	0,6	1,4	0,8
2021	17,5	5,5	-12,1	0,6	1,5	0,8
2022	29,8	10,4	-19,5	-	-	-
Note – data from the official website of the European Union						

The pronounced trade imbalance between the European Union and Kazakhstan is largely attributable to Kazakhstan's substantial exports of oil and gas. In 2022, mineral commodities constituted approximately 88% of Kazakhstan's total exports to the EU, with a reported value of €26 billion. By contrast, European exports to Kazakhstan exhibit greater sectoral diversity: machinery and transport equipment accounted for 50% of the total, followed by chemical products (20%), optical instruments (5%), plastics (4%), and textiles (3%).

In terms of services, EU exports to Kazakhstan reached €1.5 billion in 2021, a slight increase from €1.4 billion in 2020. On the other hand, Kazakhstan's services exports to the EU amounted to €0.6 billion in 2021, up from €0.5 billion in 2020.

These figures highlight the importance of enhancing the management efficiency of the TITR corridor. It is crucial to examine all factors influencing its development, consider market feedback, and create favourable conditions to attract a wider range of cargo flows and private sector investment. The TITR has the potential to serve as a Central Asian hub, facilitating cargo transportation in the East-West-East direction.

In parallel with the evolving geopolitical landscape, numerous countries engaged in the dialogue surrounding the TITR have initiated assessments of the potential advantages and risks associated with its implementation. Kazakhstan, in its capacity as the secretariat of the International Association «TITR», continues to examine both the challenges and strategic opportunities linked to the corridor's further development.

The study referenced in (Palu, & Hilmola, 2023) explores the implications of the TITR for bilateral relations between Finland and Estonia. In contrast, the authors of underscore Poland's strategic role in sustaining the current volume of rail traffic along the China-EU corridor, citing its advanced linear infrastructure and well-equipped container terminals as key enablers of uninterrupted freight movement. The World Bank's analysis concentrates on Kazakhstan, Azerbaijan, and Georgia, offering a comprehensive evaluation of their transport infrastructure and logistics capabilities, as well as existing constraints. Furthermore, the research presented in introduces a model of a global intermodal logistics network, which is employed to assess the TITR's operational impact from Kazakhstan's national perspective ("TITR" Association, 2023).

This study investigates Kazakhstan's prospective role in advancing the development of the TITR, positioning the country as a pivotal Central Asian hub for freight movement along the China-Europe-China axis. Unlike earlier research, the present analysis incorporates comprehensive throughput and capacity data for the TITR infrastructure covering the entirety of 2023. These empirical findings provide a robust foundation for investment rationale and highlight the corridor's operational feasibility and long-term growth potential. With appropriate capital allocation and targeted efficiency enhancements, the TITR holds the potential to reduce transit times by half and to triple trade volumes by 2030.

The substantial investments earmarked for transport infrastructure by 2030 are expected to significantly enhance the capacity of the existing network. This, in turn, would release additional throughput potential, enabling Kazakhstan, Azerbaijan, and Georgia to expand the volume of transit freight moving from China to Europe (see Figure 1).

The advancement of the TITR development initiative within the countries that have ratified the agreement "On the Establishment of a Unified Logistics Company TITR" has the potential to exert a transformative influence on global supply chains. By fostering greater operational coherence and resilience, this initiative could contribute to long-term stability in the face of rising freight volumes along the China–Europe–China corridor (see Figure 1):

– China (Lianyungang) – Kazakhstan (ports of Aktau/Kuryk) – Azerbaijan (ports of Alat, Govsan) – Georgia (Poti-Batumi) – Bulgaria (Burgas) and other EU countries.

– China (Lianyungang) – Kazakhstan (ports of Aktau/Kuryk) – Azerbaijan (ports of Alat/Govsan) – Georgia (port of Poti-Batumi) – Romania (Constanța) and other EU countries.

– China (Lianyungang) – Kazakhstan (port of Aktau/Kuryk) – Azerbaijan (port of Alat/Govsan) – Georgia (port of Poti-Batumi) – Turkey (Mersin) – Bulgaria and other EU countries.

Additionally, in the event of a resolution to the conflict in Ukraine, there will be an opportunity to route cargo flows through: China (Lianyungang) – Kazakhstan (Aktau/Kuryk) – Azerbaijan – Georgia (Poti-Batumi) – Ukraine (Odessa) – Poland and other EU countries.

In the current geopolitical situation, a fully operational TITR corridor will help safeguard China-Europe-China trade and supply chains from disruptions. From a trade and economic perspective, the TITR will primarily enable the diversification of trade routes and improve transport accessibility for Kazakhstan, Azerbaijan, and Georgia.

CONCLUSIONS

The main findings of the current study are as follows:

– conclusions are drawn from a comprehensive source analysis, offering a multifaceted evaluation of the current economic, political, and infrastructural conditions of the TITR.

– тhe study highlights the potential role of Kazakhstan in implementing the TITR development project, positioning it as a Central Asian hub facilitating cargo transportation along the China-Europe-China route.

– Using current data on freight volumes and the throughput capacity of key TITR nodes in Kazakhstan, Azerbaijan, and Georgia, a detailed analysis of the corridor's potential has been conducted.

To enhance the efficiency of the TITR and maximize the potential of the participating countries, clustering of the transport corridor is recommended. This study lays the foundation for future research on the TITR, including the exploration of various transportation modes—such as air, rail, pipeline, ship, and road. Future research will aim to identify the most efficient modes of transportation, with a focus on developing the most effective systems. Ultimately, Kazakhstan is poised to become a critical hub in global transportation routes and supply chain networks, connecting East, West, North, and South.

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