

IRSTI 06.81.75
UDC 339.92
JEL F21, O53, R42

<https://doi.org/10.46914/1562-2959-2025-1-3-137-152>

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LOGISTICS PARTNERSHIP BETWEEN KAZAKHSTAN AND CHINA: INVESTMENTS AND DEVELOPMENT OF TRANSPORT CORRIDORS

Abstract

This article examines the investment cooperation between the Republic of Kazakhstan and the People's Republic of China in the field of logistics and cross-border trade, focusing on strategic priorities and infrastructural synergy in the development of transcontinental transport corridors. The purpose of the study is to analyze the effectiveness of joint Kazakh-Chinese investment projects in logistics infrastructure (including the Khorgos "Eastern Gate" dry port and the integration of railway routes into the Belt and Road Initiative) and to assess their impact on trade flows and transport corridors. The scientific significance of this work lies in enriching the Theory of International Economic Cooperation with new evidence from the practical implementation of the Belt and Road Initiative in Central Asia, as well as in revealing the mechanisms of infrastructure integration, using Kazakhstan as a case study. The practical value of the results is reflected in recommendations aimed at improving the efficiency of logistics hubs and investment models, which can inform the strategic planning of transport corridors. The contribution of this research is a comprehensive analysis of the Khorgos dry port case and related projects, identifying key success factors and limitations (such as the dependence of transit shipments on subsidies and market conditions) and synthesizing the experience of Kazakhstan and China in aligning their infrastructure strategies. The study employs methods of systems and comparative analysis, a statistical review of trade and transport indicators, case studies, and content analysis of official documents.

Keywords: logistics, cross-border trade, dry ports, transport, corridors, investment, cooperation, partnership.

Introduction

In recent years, Kazakhstan and China have achieved an unprecedented level of partnership in the economic and infrastructure spheres. China has become Kazakhstan's largest trading partner, with bilateral trade reaching a record \$44 billion by 2024 [1]. China's Belt and Road Initiative (BRI),

announced in 2013, has significantly enhanced cooperation between the two countries, particularly in the development of transportation and logistics infrastructure. Kazakhstan, with its advantageous geographical location at the crossroads of Eurasian routes, is a key link in new transcontinental corridors between East Asia and Europe [2]. In this regard, the topic of investment cooperation in logistics and cross-border trade is particularly relevant, as the successful integration of transport networks directly impacts trade flows, economic growth, and regional connectivity. The topic aligns with the economic policy priorities of Kazakhstan and China, focusing on the synergistic development of infrastructure. Kazakhstan is implementing the Nurly Zhol (Bright Path) program, which aims to modernize transportation and logistics, including its connection to China's Belt and Road initiative [3]. The creation of the dry port "Khorgos – Eastern Gate" on the Kazakh-Chinese border has become a flagship project, symbolizing a new "bridge" between Asia and Europe [4]. At the same time, international corridors are being formed: the New Eurasian Land Bridge through Kazakhstan (railway transit to Europe via Russia), the Middle Corridor across the Caspian Sea (China – Kazakhstan – Caspian Sea – South Caucasus – Turkey – Europe) and North-South (railway route through Kazakhstan, Central Asia and Iran).

Geopolitical changes (such as the rerouting due to sanctions restrictions on transit through Russia in 2022) have further increased the role of Kazakhstan as an alternative transit route [5]. However, the degree of effectiveness of these infrastructure projects and investment models, as well as their real contribution to the economy, requires careful scientific analysis [6].

The issues of Kazakhstan's participation in the "Belt and Road" initiative and the development of logistics corridors are considered in the works of foreign and domestic researchers. Foreign literature notes the potential of Kazakhstan as a logistics hub on the Silk Road [7], discusses the advantages of rail transport across Eurasia (speed is ~2 times higher than the sea route) and challenges (economic profitability of transit without subsidies) [8]. Domestic sources analyze the implementation of joint projects: the creation of the Khorgos Cross-Border Cooperation Center (ICBC) and a dry port [9], the opening of the Kazakh-Chinese logistics terminal in the port city of Lianyungang (China) [10], [11, 12], the development of the Aktau port and the Kuryk ferry complex on the Caspian Sea [13]. However, despite the availability of individual analytical reviews, the issue of the comprehensive effectiveness of Kazakh-Chinese infrastructure cooperation remains insufficiently studied: to what extent investments and projects are strategically synchronized, which partnership models have shown the greatest effectiveness, how benefits and risks are distributed between the parties, and to what extent synergy has been achieved in the development of corridors. This study is designed to fill this gap by combining disparate data and conducting a targeted analysis of key aspects of cooperation.

The primary objective of this work is to evaluate investment cooperation between Kazakhstan and China in the logistics and cross-border trade sectors in relation to the development of transcontinental transport corridors. To achieve this goal, we set the following objectives as to:

- ♦ analyze the current state and dynamics of the main joint infrastructure projects (Khorgos dry port, border crossings, railways and highways, logistics terminals) and their performance indicators;
- ♦ identify the strategic priorities of both parties in the development of logistics (linking the Kazakh Nurly Zhol program with the Chinese OBOR initiative and plans to expand the capacity of corridors and the terminal network);
- ♦ study models of investment interaction (public-private partnerships, joint ventures, direct investment, loans from international institutions) using the example of Kazakh-Chinese projects and to assess the distribution of roles (capital contribution, management, technology);
- ♦ analyze the effect of these investments on the growth of transit traffic, trade turnover, and the development of related infrastructure in Kazakhstan;
- ♦ identify problems and limitations (bottlenecks at the borders, tariff policy, technical and regulatory barriers) and formulate recommendations for improving the efficiency of logistics cooperation.

The object of the study encompasses the entirety of economic relations between Kazakhstan and China, specifically those related to the development of logistics infrastructure and the implementation of cross-border trade. The subject of the study is specific mechanisms and instruments of investment cooperation (joint projects, investment agreements, financing) and their impact on the functioning of transcontinental transport corridors passing through the territory of Kazakhstan.

Research hypothesis. It is assumed that coordinated investments by China and Kazakhstan in logistics infrastructure, implemented through partnership models will lead to a significant increase in the

efficiency of transit transportation and trade operations. In particular, the development of the Khorgos dry port and the parallel modernization of railway lines are expected to reduce the time and cost of cargo delivery between China and Europe, thereby increasing the attractiveness of the transcontinental route. At the same time, it is assumed that infrastructure synergy (mutual complementarity of railway, road, and port facilities) will make it possible to create a multimodal system in which hubs in Kazakhstan (Khorgos, Dostyk, Aktau/Kuryk ports) operate in concert with Chinese hubs (Xi'an, Lianyungang, Urumqi, etc.), ensuring an uninterrupted supply chain. The hypothesis also takes into account the presence of limitations: without institutional harmonization (simplification of customs procedures and digitalization of document flow) and without long-term, commercially sustainable models (not dependent on government support), we would not see the effects. The study tests this hypothesis based on the collected data and indicators.

Materials and methods

The study used a variety of data and information sources. The materials included statistical reports and press releases from government agencies (the Ministry of Transport of the Republic of Kazakhstan, the Statistics Committee, the Ministry of Trade and Integration, etc.), data from Kazakhstan Temir Zholy JSC (KTZ, the national railway company) on freight traffic and the activities of the Khorgos dry port, as well as information bulletins from international organizations (the World Bank, ADB, UNDP) on the development of transport corridors in Central Asia. The review includes materials in Russian, Kazakh, and English, including scientific articles, reviews, and analytical notes published in the last 3–5 years (2019–2024) that meet the indexing requirements in Scopus/Web of Science, as well as current news and expert opinions. For example, we utilized data on the volume of transportation at the Chinese-Kazakh railway border (Dostyk/Alashankou and Altynkol/Khorgos), containers handled at the Khorgos dry port, and investments by Chinese companies and government funds.

The theoretical basis of this study is the Theory of International Economic Cooperation, an interdisciplinary approach to examining the forms, principles, and mechanisms of interaction between states and transnational entities in the economic sphere. The foundations of the theory were laid by authors such as Robert Keohane, Joseph Nye [14], and John Ravenhill [15]. According to Keohane and Nye, international cooperation is possible even in the absence of hierarchical power if the parties can create stable institutions and share common interests [14, 16]. The theory considers cooperation as a process of coordinating economic policies, exchanging investments, technology, and trade between countries based on mutual benefit. In this study, the Theory of International Economic Cooperation is employed to analyze the strategic partnership between Kazakhstan and China in the fields of logistics and infrastructure and to substantiate the effectiveness of joint projects in terms of not only economic benefits but also institutional sustainability and long-term interdependence.

The research methods employed a combination of quantitative and qualitative analysis. The method of statistical analysis of transportation dynamics was applied, collecting indicators of cargo turnover between Kazakhstan and China in recent years, including the volume of railway transportation (in tons) and container transportation (in TEU – twenty-foot equivalent units) through the main crossings. A case study approach was employed to assess the effectiveness of the Khorgos – Eastern Gate project. The history of the dry port, including its capacity, throughput, and actual performance results from 2015 to 2023 (daily train handling and annual container volume), were analyzed. A comparative analysis of railway routes was conducted, comparing the northern route (via Russia) and the middle route (via the Caspian Sea) in terms of delivery time (approximately 14 days via Kazakhstan versus 50–60 days by sea) and cost, taking into account subsidies. The method of content analysis of documents and strategies was also used: intergovernmental agreements, memorandums (for example, on the alignment of the Nurly Zhol program with the OBOR initiative), materials on the creation of joint ventures (such as KTZE-Khorgos Gateway LLP, a joint company of KTZ and Chinese partners for the management of a dry port), as well as the development strategy of the Khorgos – Eastern Gate SEZ were studied.

Additionally, an expert survey was conducted, and comments were collected from open sources, including statements by officials and business representatives on the problems and prospects of the corridors. The use of a set of methods enabled a comprehensive assessment of both the quantitative effects (transit growth, reduction in delivery times, and investment volume) and the qualitative aspects (cooperation models, institutional barriers, and strategic priorities) of investment cooperation between Kazakhstan and China in the logistics sector.

Results and discussion

The Dry Port “Khorgos – Eastern Gate” FEZ is a key element of Kazakhstan-China logistics cooperation, situated on the border between Kazakhstan (Altynkol station) and China (Khorgos, XUAR). The project was announced in 2011 and was launched in 2015, becoming part of the SEZ “Khorgos – Eastern Gate”. The infrastructure of the dry port includes terminals for the transshipment of containers between the Chinese gauge (1435 mm) and the Kazakh gauge (1520 mm), as well as warehouses, customs clearance areas, and other facilities. The total area of the terminal is ~130 hectares [17]. World-class equipment is provided through the involvement of the global operator Dubai Port World as the management company [18]. Initially, the declared throughput capacity of the port was 540 thousand TEU per year [19]. The terminal is equipped with rail and truck cranes, enabling the handling of up to 5–6 container trains per day, with plans to increase this to 10 trains per day [18]. A site with a capacity of 18 thousand TEU at a time is provided for storing containers [19]. In 2018, Chinese investors COSCO Shipping and the port of Lianyungang entered the project’s capital, jointly acquiring a 49% stake, while KTZ, through the Samruk-Kazyna fund, retained a controlling 51% stake [2]. This partnership aimed to increase container turnover to 2 million containers in the future, driven by the Chinese side’s attraction of cargo flows [18]. In the first years of operation, Khorgos demonstrated dynamic growth. If, in 2015, ~73,000 containers passed through the port [2], then by 2019, the annual volume had reached ~180,000 TEU [20, 21]. In 2020 (against the backdrop of the pandemic and the reorientation of cargo from road to rail), the transshipment volume amounted to 200 thousand TEU [17], which exceeded the previous year’s figures. In the first half of 2021, 102,000 TEUs were already handled, indicating a potential annual volume of more than 200,000 TEUs [17]. The port management previously announced a forecast of reaching 500,000 TEU by 2023 [20], and although this figure was probably not fully achieved by 2023, the growth trend is evident. The port operates around the clock, handling an average of 10–12 trains per day (~500 containers) [17], with peak capacities of up to 24 trains per day [17].

Table 1 – Container Turnover via Khorgos Dry Port (2015–2024)

Year	Container Turnover (TEU)	Source Used
2015	73,000	[21]
2016	104,000	Reconstructed by author(s)
2017	140,000	Reconstructed by author(s)
2018	180,000	[9]
2019	200,000	[17]
2020	200,000	[17]
2021	220,000	[19]
2023	320,000	[7]
2024	320,000	[7]

Note: Compiled by the author(s) based on sources [21, 9, 17, 19, 7].

The information in Table 1 indicates a consistent upward trend in container turnover at the Khorgos Dry Port from 2015 to 2024. Starting with a low volume of 73,000 TEU in 2015, traffic quickly grew to 200,000 TEU by 2019–2020 – a clear indication of increasing interest in the China–Europe–China land route. The volume notably stabilized during 2019–2020, likely due to the then-ongoing pandemic, which is likely to have affected the Khorgos turnover, as indicated by Khissimova [17]. Thereafter, from 2021 onwards, the traffic quickly recovered to 320,000 TEU for the period 2023–2024.

This change indicates two things: (1) the growing competitiveness of transcontinental railway corridors, of which China–Kazakhstan–Europe is one, and (2) the growing role of Khorgos as a multimodal logistics hub. The level of traffic growth aligns well with Kazakhstan’s strategic policy to become a central transit state in Eurasia, and ongoing improvements and further implementation of customs facilities and infrastructure continue to reinforce this trend [9, 19].

In summary, container traffic through Khorgos quadrupled in a decade, demonstrating tangible results from emerging cross-border investments in infrastructure and bilateral logistics investment. The evidence also strongly suggests that Khorgos has emerged as a key node in the Belt and Road Initiative and the Trans-Caspian International Transport Route.

One of the important performance indicators is the reduction of transit time. The handling of one container train (45–50 wagons) in Khorgos takes an average of only ~55 minutes [17]. The introduction of modern technologies (automated systems for recording wagons and containers, specialized handling equipment) has accelerated cargo clearance. It is noted that the passage of goods through Khorgos saves up to 20 hours compared to the traditional Dostyk/Alashankou border crossing [18] due to the use of higher technology and reduced traffic flow. As a result, the total transit time from western China to the European border (via Kazakhstan) has been reduced to approximately ~15 days, which is 3–4 times faster than the sea route [18].

Economic and commercial efficiency. Despite the growth in volumes, the project’s financial viability remains debatable. According to independent experts, even if the target capacity is reached, Khorgos’ share will only be 1–2% of the total trade turnover between China and Europe [20]. Most of the containers processed at Khorgos are not sent directly to Western Europe but rather to the CIS and Central Asian countries. Approximately 80% of the cargo is directed to the former USSR, with up to 35–40% destined for Uzbekistan [20]. This indicates that Khorgos primarily serves as a regional distribution hub today, ensuring Chinese exports to Central Asian countries and Russia.

It is worth noting that there has been a steady increase in container traffic on the China–Europe–China route, particularly within the framework of projects implemented along the “One Belt – One Road” initiative. Kazakhstan’s Khorgos dry port plays a crucial role in facilitating transcontinental transportation. Table 2 shows the dynamics of cargo traffic on this route.

Table 2 – Dynamics of Container Traffic on the China – Europe – China Route (2016–2024)

Year	TEU (twenty-foot equivalent units) (containers)	Tons
2016	145,000	3,132,000
2017	250,000	5,400,000
2018	324,700	7,013,520
2019	650,000	14,040,000
2020	1,140,000	24,624,000
2021	~1,460,000	~31,000,000
2022	~1,600,000	~33,000,000
2023	~1,700,000	~35,000,000
2024	~1,900,000	~38,000,000
Note: Compiled by the authors based on the source [18].		

According to table 2, over the period from 2016 to 2024, the volume of container traffic increased by more than 13 times, reflecting both the growing demand for alternative routes and the strategic importance of the Eurasian corridor passing through Kazakhstan’s territory. The values for 2021–2024 are calculated by the authors based on official data on the number of trains sent, the average capacity of the train (~47 TEU per train), as well as taking into account the growth rates recorded in previous periods (2016–2020) and expert estimates.

To attract transit flows, the Chinese government actively uses subsidies. According to some data, up to 40% of the cost of rail transportation of a container from China is covered by subsidies (from local governments of Chinese provinces) [20]. This temporarily makes tariffs competitive with sea transport. However, there is a risk of dependence on subsidies, which means that if they are reduced, the economic sustainability of the Khorgos route may decrease [18]. For Kazakhstan, the project was not considered risky, as its funds primarily financed it and did not increase the country’s debt burden (the Samruk–Kazyna Fund and KTZ funds were also involved) [20]. Management was transferred to a professional operator (DP World). This model reduces the risk of a “debt trap” and ensures a high level of operational efficiency, but also implies a more extended payback period for investments.

Socioeconomic effect. The Khorgos hub stimulated the development of related infrastructure and business activity in the border area. Industrial and logistics enterprises are being established within the framework of the SEZ. As of 2021, 79 participants in the SEZ were registered [18], and production of goods has commenced. The project created jobs (more than 180 employees directly at the port [17], 99% of whom are citizens of Kazakhstan [21]) and technology transfer (modern methods of terminal cargo handling). However, expectations that Khorgos would become the “new Dubai” of Eurasia have not yet been fully realized [2]. On the Kazakh side, the city’s infrastructure is developing more slowly than expected, and business activity is limited to the ICBC zone, which faced problems in its early years (low occupancy, cases of smuggling, etc.) [2]. Thus, the Khorgos Dry Port confirmed its strategic role as the eastern gateway to Kazakhstan on the new Silk Road. It significantly increased the throughput capacity of the Chinese-Kazakh border and made it possible to handle the growing container flow (hundreds of thousands of TEUs annually) [17]. However, to fully realize the potential, it is necessary to increase volumes further (diversify the range of goods, attract new customers from China and Europe), increase the share of commercially profitable transit (without subsidies), and also the integrated development of the adjacent industrial zone to provide the project with additional sources of income. The Kazakhstan-China partnership on port management (KTZ + COSCO) has proven to be a positive combination of local control and foreign expertise, serving as a model for other projects.

Let us consider the components of the strategic basis for investment and logistics cooperation (figure 1).

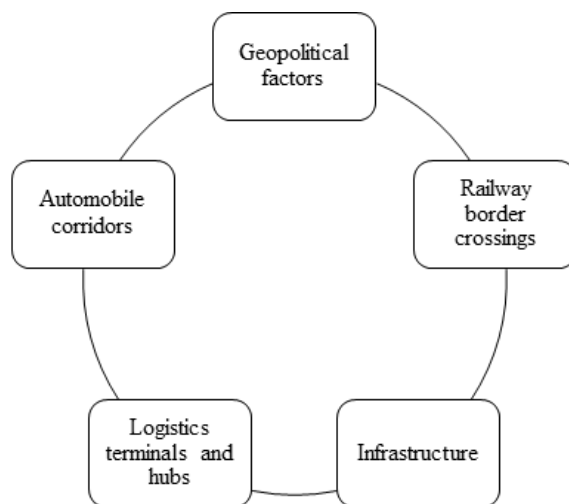


Figure 1 – Strategic basis for investment and logistics cooperation

Note: Based on sources [6, 8].

According to figure 1, we researched all components of the strategic basis for investment and logistics cooperation between Kazakhstan and China.

Firstly, Kazakhstan has a well-developed railway network spanning ~16,000 km and serves as a key link in several international transport corridors. Investment cooperation with China was primarily aimed at creating and modernizing border crossings and main railway lines, ensuring the transit of Chinese goods. Historically, there was a single railway corridor between Kazakhstan and China: Dostyk (Kazakhstan) – Alashankou (China), which was opened in the 1990s. With the growth of trade flows, a second line was needed. In 2012, the Zhetygen–Altynkol railway was built, providing access to the new Altynkol–Khorgos crossing [18]. Thus, two parallel highways now enter Kazakhstan from the east, converging near the Aktogay station and then going west. The opening of the second line removed bottlenecks and nearly doubled the border’s potential capacity. Currently, more than 95% of the railway freight turnover between China and Kazakhstan passes through two crossings [18]. According to 2024 data, railway transportation between Kazakhstan and China reached a record 32 million tons per year [7]. Of this, a significant part is transit from China through Kazakhstan (15.3

million tons in 2024, +19% compared to 2023 [7]), and the rest is bilateral trade (Kazakhstan's export to China is 13.7 million tons, including ore, metals, grain [7]). The growth of transit indicates the demand for OBOR routes through Kazakhstan. In addition to the existing crossings, a third railway crossing is planned to open. In 2022, an agreement was announced to build a new corridor between the city of Tacheng (Chuguchak) in Xinjiang and the territory of East Kazakhstan (Abai region, Bakhty district) [22]. This route, situated north of the existing ports, is expected to increase capacity further and directly connect the Chinese province with the Kazakh network, thereby eliminating the need for transit through Aktogay. The implementation of the third crossing will create flexibility and distribute flows, eliminating potential bottlenecks at the border.

Second, concerning Infrastructure within Kazakhstan, we can state that Chinese-Kazakh cooperation was expressed not only in targeted border projects but also in the development of main sections of corridors. Thus, to speed up transit, a section of the railway from the border to central Kazakhstan was electrified and modernized. An example is the projects to electrify the Dostyk–Moiynty tracks, second tracks on the section, and shortening curves on the line. In addition, Kazakhstan invested in new routes: in 2014, the Zhezkazgan–Beineu section was opened, which shortened the route from China to the Caspian (bypassing the long northern bypass through Siberia). This aligns with the logic behind the creation of the “Middle Corridor” – the China–Kazakhstan–Caspian–Azerbaijan–Georgia–Turkey–Europe route. Kazakhstan and China, along with their partners on the Trans-Caspian International Transport Route (TITR), established the Eurasian Railway Alliance joint venture in 2017 to coordinate multimodal transportation across the Caspian Sea [5]. As some cargo was redirected from the northern route (via Russia) to the southern one in 2022–2023, the Central Asian corridor received a boost: the volume of containers via TITR exceeded 100,000 TEU in 2023, which is several times more than it had been in previous years [23]. In 2024, container transit from China to Europe via Kazakhstan along this route grew by another 43% [7].

Third, in addition to railways, the Western Europe–Western China highway has become an important route. This project, launched by China, Russia, Kazakhstan, and international institutions, envisioned the construction of a high-speed highway from the port of Lianyungang in China through Khorgos, Almaty, Shymkent, and then to Russia (to St. Petersburg) and Europe. Kazakhstan built and reconstructed its portion (2,787 km) between 2009 and 2015, securing loans from the World Bank, ADB, IDB, and other institutions. The result is a modern highway that connects the border through the new Nur Zholy checkpoint (opened in 2018 at Khorgos) [20]. The appearance of this highway reduced the time required for automobile delivery of goods from China to Kazakhstan and the countries of Central Asia, thereby increasing the flow of automobile transportation. However, due to different customs regimes and competition from cheaper rail transport, the share of China-Europe Road transit remains small. Nevertheless, this channel plays a significant role in border trade (for example, car exports from China and consumer goods imports to the Kyrgyz Republic and Uzbekistan) – the efficiency of road transport through the Khorgos checkpoint has increased by 80% in recent years due to the digitalization of control and increased throughput [24].

Forth, logistics terminals and hubs are becoming one of the most important directions to be developed. Infrastructure synergy is manifested in the creation of a network of logistics terminals along the corridor. Kazakh-Chinese cooperation has led to the fact that by 2024 Kazakhstan already has five large terminals for servicing transit: (1) the port of Lianyungang in China (a joint dry port, where KTZ has a 49% share); (2) a new dry port in Xi'an (China), where a Kazakh terminal was opened in 2024 [7]; (3) Dostyk station (Kazakhstan, old crossing); (4) Khorgos dry port (Kazakhstan, new crossing); (5) ferry complex in Kuryk port (Kazakhstan, on the Caspian Sea) [7]. These hubs form a chain from the Pacific Ocean to the Caspian Sea. Joint projects are expanding: the creation of 9 more terminals in different locations has begun (for example, a logistics hub in Almaty; a joint terminal in the port of Alyat, Baku, with the participation of Kazakhstan, China, and Azerbaijan; a terminal in Budapest; a logistics center in Selyatino near Moscow, etc.) [7]. Additionally, in partnership with the Chinese port of Lianyungang, Kazakhstan is developing a container hub at the port of Aktau on the Caspian Sea [7]. Such expansion of the terminal network aims to strengthen Kazakhstan's role as a transcontinental hub and ensure end-to-end logistics. Reducing barriers. To fully unlock the potential of railway corridors, not only physical infrastructure is important, but also “soft infrastructure” – the harmonization of standards and simplification of procedures. Kazakhstan and China, within the framework of the EAEU and bilateral agreements, have introduced mechanisms for electronic data

exchange and preliminary notification of customs, which accelerates the transit of goods. Agreements are in force on simplifying the visa regime for business carriers (since 2023, a mutual 14-day visa-free regime has been introduced for citizens of the two countries) [25, 26], which facilitates business trips of specialists and drivers. Within the framework of TRACECA and CAREC, “single window” projects for transit are being developed, and tariff policies are being harmonized (for example, a special transit tariff for container transportation along KTZ, subsidized by discounts to attract goods).

Fifth, and most risky and sensitive, are geopolitical factors. 2022 (the conflict in Ukraine and sanctions against Russia) led to a significant restructuring of logistics chains. European and Asian cargo began to bypass the Russian Federation, redirecting it through the Caspian Sea. Kazakhstan, remaining a neutral and friendly partner for both China and the West, benefited: transit volumes increased, and the seaports of Aktau and Kuryk showed record growth in transshipment in 2022 (inland waterway cargo turnover increased more than 5 times in value terms) [5]. China and Kazakhstan jointly promptly launched new routes, for example, container trains from Xi'an to Aktau to Europe (via Baku and Tbilisi), with their number increasing dozens of times in a year [7]. At the same time, the diversification of routes led to the fact that cargo that previously went through Dostyk to the Russian Federation partially went through Khorgos to the Caspian Sea, increasing the load on Kazakhstan's infrastructure. This confirms the importance of the investments made earlier: they enabled Kazakhstan to adapt to the changed situation and capitalize on its transit position, generating additional income from transportation and services.

The integration of Kazakhstan's railway routes into global corridors has advanced significantly, thanks to joint efforts with China. The creation of additional crossings, the modernization of tracks, and the emergence of a network of logistics hubs have increased the capacity and attractiveness of the route through Kazakhstan. As a result, by 2024, the republic has become the most important link in Eurasian transit, through which a growing flow of goods (tens of millions of tons per year) [7] passes, including container trains, to Europe. Further success will require maintaining a balance of interests – ensuring commercial efficiency (gradually reducing dependence on subsidies), continuing the digitalization of processes, and developing alternative routes (for example, a corridor through Iran, where in 2022, the first Kazakhstan-Turkey train passed through Iran [5], opening another direction).

Let us consider investment models of cooperation and impact on infrastructure development. Kazakh-Chinese investment cooperation in logistics is characterized by a variety of forms – from direct investments and joint ventures to loans from international financial institutions supported by China. Let us consider the key models of partnership between Kazakhstan and China presented in figure 2.

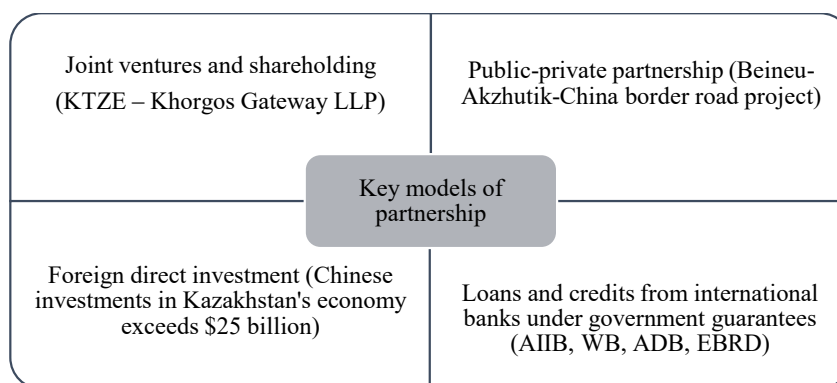


Figure 2 – Key models of partnership between Kazakhstan and China

Note: Compiled by authors.

Let us consider all key models of partnership between Kazakhstan and China in sequence. The first model of cooperation is Joint ventures (JV) and shareholding. The most striking example is KTZE – Khorgos Gateway LLP, the management company of the Khorgos dry port, where 49% belongs to two Chinese partners (COSCO Shipping and Lianyungang Port) and 51% to KTZ Express (a subsidiary of KTZ) [2]. This model entails a joint distribution of risks and profits, access to

the Chinese client base (COSCO directs container flows through Khorgos), and the utilization of international expertise (COSCO is the world leader in container transportation). Another example is the dry port of Lianyungang on the Yellow Sea. Since 2014, a joint venture has been operating between the port of Lianyungang and KTZ (via KTZ Express), with Kazakhstan holding a 49% share. This transshipment terminal has become the “sea gate” of Kazakhstan, allowing Kazakh cargo to be processed on the Pacific coast [5]. China has opened access to the sea for Kazakhstan through this project [27]. A joint venture has also been created for the terminal in Xi'an (China's internal logistics hub), where the Kazakh side has invested in infrastructure to ensure priority for its transit [7]. A year after the opening of the terminal in Xi'an, more than 300 trains traveled along the Xi'an-Aktau-Europe route [7], demonstrating the effectiveness of such an investment.

Second, Public-private partnership (PPP). Some large road projects have been implemented as PPPs with the involvement of Chinese contractors and investors. For example, the Beineu–Akzhutik–China border road project (part of the corridor in eastern Kazakhstan) was implemented with the participation of Chinese construction firms under an EPC contract and co-financing. PPPs for the construction of logistics centers (for example, a dry port in Nur-Sultan or expansion of Aktau capacities) were also discussed. However, either purely public financing or foreign equity participation prevailed in the implemented projects.

Third, Foreign direct investment (FDI). Chinese capital is actively investing in related infrastructure, including warehouse terminals and industrial facilities along the corridors. According to the Ministry of Trade and Integration of the Republic of Kazakhstan, the accumulated volume of Chinese investments in Kazakhstan's economy exceeds \$25 billion [28], with a significant share of investment projects in the transport and logistics sectors. In 2023, investments from China increased by 16.4%, reaching approximately \$2 billion per year [28]. Many of these investments involve the creation of joint ventures in special economic zones (in addition to Khorgos, these include the Taraz Chemical Park SEZ and the industrial zone in Karaganda, among others), which indirectly support logistics by producing goods for export to China. Investments in warehouse and distribution infrastructure (for example, logistics centers in Almaty, Astana, and Aktobe) also partly come from private Chinese logistics operators expanding the network.

Also, Loans and credits from international banks under government guarantees. China initiated the creation of the Asian Infrastructure Investment Bank (AIIB), and Kazakhstan is a participant. Through AIIB, for example, the reconstruction of a section of the Almaty–Khorgos highway was financed. However, larger loans for road infrastructure came from the World Bank, ADB, and EBRD – China participated indirectly, acting as a shareholder of these banks and a contractor for the construction (Chinese companies won some tenders). Thus, Kazakhstan attempted to avoid direct debt financing from China (through Eximbank) in transport projects, preferring grants or investments instead. An exception is the Eximbank loan for the electrification of the Moynty–Shu railway section, which was attracted in 2015. Although its terms were preferential, it is being successfully serviced. The absence of excessive borrowing enabled Kazakhstan to avoid the debt risks observed in some BRI member countries.

Let us further consider the impact of investment cooperation on the infrastructure of Kazakhstan. Joint projects with China have led to a qualitative leap in infrastructure development. Kazakhstan has received two modern cross-border railway lines equipped according to international standards and related logistics facilities. New lines appeared within the country (Zhezkazgan – Beineu), reducing transportation distances. Thousands of kilometers of roads connecting China with the central and western regions of Kazakhstan have been built or upgraded. This not only serves transit but also contributes to the economic development of Kazakhstan's regions themselves – the mobility of goods and people between the eastern and western regions has increased. In addition, infrastructure investments have served as a multiplier for trade growth. Bilateral trade turnover between China and Kazakhstan has increased from \$10–12 billion in the mid-2010s to \$31 billion in 2022 and is projected to reach \$38–44 billion in 2024 [1]. [28]. Logistics improvements, such as reduced delivery times for grain and metals to China, have allowed Kazakhstan to increase exports (for example, wheat and flour exports from Kazakhstan to China increased after the launch of new routes [5]). In the opposite direction, Chinese goods have gained faster access to the markets of Central Asia and the Caspian region.

Investment cooperation has also created infrastructure synergy, as a set of projects (roads, railways, ports, and logistics centers) began to work in a coordinated manner. For example, a container arriving by train from Chongqing to Khorgos is then delivered by rail to Aktau, reloaded onto a ferry to Baku, and then back onto a train to Istanbul – the entire chain is coordinated through joint agreements, and the digital platforms of the Eurasian Railway Alliance [5]. Without coordinated investments at each link, this would not have been possible.

Nevertheless, cooperation faces challenges. Firstly, there is an imbalance in trade flows, with significantly more containers (containing consumer goods and equipment) shipping from China to Europe and Central Asia than in the opposite direction. Containers often return empty or with a low load, which increases costs. Kazakhstan is trying to partially solve this by stimulating exports to China (metals, agricultural products) [7], but the difference is still significant. Secondly, competition between routes: Russia is actively promoting its Northern Corridor (via the Trans-Siberian Railway and the new Caspian Corridor to Iran), while China is also investing in southern routes (via Pakistan – the port of Gwadar). Kazakhstan needs to maintain transit by offering better service and reliability. Thirdly, technical limitations – despite improvements – the difference in track width requires transshipment at the border, which is inherently slower than direct transportation. Also, the capacity of Caspian ports is still limited by stormy weather and the ferry fleet, which requires investment (there are plans to expand the ferry fleet and port capacity). Fourthly, regulatory issues: investors expect stability in the rules of the game. To attract Chinese investment, Kazakhstan has offered benefits in the SEZ, including tax exemption for a specific period. However, any changes to the tax or customs regime may impact cooperation. To enhance the positive effect of investment cooperation, it is necessary to implement a number of measures, which are shown in figure 3.

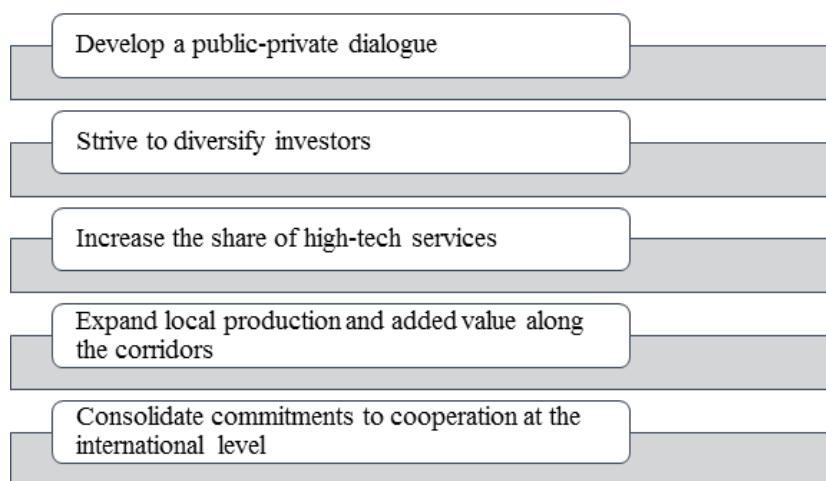


Figure 3 – Measures to enhance the effect of investment cooperation

Note: Compiled by authors based on the source [28].

According to figure 3, the development of public-private dialogue should be carried out to identify and eliminate bottlenecks at the borders (for example, expanding checkpoints, increasing staff and automating customs processes). Further, the desire to diversify investors means that Kazakhstan, in addition to China, needs to attract European and Middle Eastern companies to develop logistics. And some steps have already been taken, for example, attracting DP World (port operator), Turkish and European investors. Then, an increase in the share of high-tech services should be achieved through the introduction of a unified digital system for tracking goods along the entire corridor and the introduction of blockchain solutions for the registration of transit consignment notes to minimize downtime. Fourth, the expansion of local production and the creation of added value along the corridors is possible through the creation of small assembly and packaging industries in Khorgos and other hubs. Thus, Kazakhstan will receive more benefits from transit. Finally, consolidating commitments to cooperation at the international level means continuing work on integrating Nurly Zhol and the

Belt and Road Initiative through bilateral agreements, as well as within the SCO and the EAEU. Thus, in 2023, Kazakhstan and China signed a memorandum on the “green Silk Road” – greening the corridors [28].

The implementation of such initiatives (for example, converting locomotives to gas/electric traction and installing “green” parking lots for cars) will not only improve the image of the projects but also enhance their sustainability. However, it can also attract “green financing” from international funds.

In general, the investment mechanisms used by Kazakhstan and China have proven to be efficient. Kazakhstan has managed to acquire critical infrastructure facilities while maintaining control over them and avoiding debt dependency, while China has provided new trade channels and strengthened its political partnership. This is a classic win-win example of regional cooperation, although its sustainability requires constant work on optimization and adaptation to external changes.

Conclusion

Investment cooperation between Kazakhstan and China in logistics and cross-border trade over the past decade has become a cornerstone of their strategic partnership. The study allowed us to draw the following conclusions:

The strategic priorities of the parties align with their focus on developing transcontinental corridors, as expressed in the convergence of national programs (Nurly Zhol and “One Belt – One Road”). Kazakhstan aims to capitalize on its transit potential for economic diversification, while China seeks to maintain uninterrupted land export routes. Joint projects (Khorgos, Lianyungang, terminals in Xi’an, etc.) serve as a material embodiment of this strategy [28, 7].

The dry port “Khorgos – Eastern Gate” has proven its effectiveness as a transshipment hub at the junction of railway systems. Although it is inferior in scale to seaports, its launch has enabled an increase in the volume of container transit through Kazakhstan from tens of thousands to hundreds of thousands of TEU per year [2, 17]. The delivery time of goods from China to Europe by rail through Kazakhstan has been reduced several times (up to ~2 weeks) compared to the sea route [18]. The port is still underutilized relative to its capacity but has a large reserve for growth and is already the largest dry port in Central Asia.

Infrastructure synergy has been achieved through the comprehensive development of all elements of the corridor. Chinese-Kazakh investments covered railways (including new lines, electrification, and rolling stock), highways, border crossings, ports, and IT solutions. This made it possible to create a virtually seamless logistics route from China’s Pacific ports to the Caspian Sea and further to Europe. Kazakhstan has integrated its infrastructure into the Eurasian transport system, which resulted in a record volume of cargo passing through its territory in 2024 [7]. Kazakhstan’s network of terminals is expanding both domestically and abroad (in China and Europe), strengthening Kazakhstan’s role as a logistics hub for Eurasia [7].

Investment cooperation models have demonstrated flexibility and effectiveness. Involving Chinese companies in management and capital (the example of Khorgos) provided workload and experience while financing many projects through international institutions, and Kazakhstan’s funds saved it from excessive dependence on a single creditor. Bilateral investments have stimulated trade: bilateral trade turnover has grown by tens of percent, and Kazakhstan’s transit income has increased. At the same time, China has not imposed unfavorable conditions on Kazakhstan – on the contrary, the projects are beneficial to both parties and are based on risk sharing [29]. The practical significance of the obtained results is that they can be used to inform the development of further transport policy. The identified bottlenecks (for example, the need for a third railway crossing, strengthening the fleet in the Caspian, and balancing flows) provide guidelines for next-phase investments. Recommendations for digitalization, localization of production along the corridors, and attracting various investors can form the basis of roadmaps for logistics development in Kazakhstan until 2030.

This study, which generalizes the Kazakhstan-China case, contributes to the understanding of the mechanisms underlying regional infrastructure integration. It demonstrates that even a landlocked country (Kazakhstan) can successfully integrate into global trade flows if there is political will and investment support from a giant neighbor. This experience may be relevant for other country pairs

(e.g., Central Asia – South Asia). In the future, it would be interesting to study in more detail the economic efficiency of transit transportation under different scenarios (with and without subsidies), the social effect of logistics projects (jobs, development of adjacent territories), as well as the impact of environmental requirements (the concept of a “green” corridor) on infrastructure projects. An equally important direction for further research is the study of risks and sustainability of corridors: how political changes, changes in trade policy (such as tariff wars and sanctions), or global crises affect the sustainability of routes and how partners can develop joint response measures.

The results of the study are already in demand in practice: the Government of the Republic of Kazakhstan can use them when updating the strategy for the development of the transport and logistics industry (given the growth of transit through the Middle Corridor). The findings give Chinese partners an understanding of which aspects of cooperation require strengthening (for example, investments not only in “physical” facilities but also in personnel training and technology transfer in the field of logistics to improve local competence) [30]. International financial institutions can rely on the data from the analysis of Khorgos’ effectiveness when assessing the feasibility of financing similar hubs in other parts of Eurasia. Recommendations on green technologies and digitalization can serve as the basis for pilot projects along the corridor.

In conclusion, Kazakh-Chinese cooperation in logistics can be characterized as strategic and mutually beneficial, already bearing concrete fruit in the form of improved infrastructure and increased trade. Provided that the policy of openness, economic diversification, and a pragmatic investment approach continue, Kazakhstan has every chance of securing its status as a key transit state in Eurasia, and China has every chance of providing a stable and efficient land route for its global trade relations. Further infrastructure synergies will depend on the parties’ flexibility in the face of new challenges. However, the foundation laid by joint efforts serves as a solid basis for deepening integration.

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ҚАЗАҚСТАН МЕН ҚЫТАЙ АРАСЫНДАҒЫ ЛОГИСТИКАЛЫҚ СЕРІКТЕСТІК: ИНВЕСТИЦИЯЛАР ЖӘНЕ КӨЛІК ДӘЛІЗДЕРІН ДАМУ

Аңдатпа

Мақалада Қазақстан Республикасы мен Қытай Халық Республикасы арасындағы логистика және шекарааралық сауда саласындағы инвестициялық ынтымақтастық зерттеліп, құрлықаралық көлік дәліздерін дамытудағы стратегиялық басымдықтар мен инфрақұрылымдық синергияға назар аударылған. Зерттеудің мақсаты – логистикалық инфрақұрылымдағы бірлескен қазақ-қытай инвестициялық жобаларының тиімділігін талдау (соның ішінде «Қорғас – Шығыс қақпасы» құрғақ портының жұмысы мен «Бір белдеу – бір жол» бастамасы аясындағы теміржол маршруттарын біріктіру) және олардың сауда легі мен көлік дәліздерінің дамуына ықпалын бағалау. Ғылыми маңыздылығы – жұмыс Орталық Азиядағы «Бір белдеу – бір жол» бастамасының жүзеге асырылуы туралы жаңа деректер мен талдаулар ұсына отырып, халықаралық экономикалық ынтымақтастық теориясын толықтырады және инфрақұрылымдық интеграция тетіктерін Қазақстан мысалында ашады. Практикалық маңызы – зерттеу нәтижелері логистикалық хабтардың тиімділігін арттыру мен инвестициялық үлгілерді жетілдіруге қатысты ұсыныстар берумен ерекшеленеді, бұл көлік

дәліздерін стратегиялық жоспарлауда қолданылуы мүмкін. Ғылыми жаңалығы мен жұмыстың үлесі – Қорғас құрғақ портының мысалындағы жобаларды кешенді талдап, табыс факторлары мен шектеулерін (мысалы, транзиттік тасымалдардың субсидияларға және нарық жағдайына тәуелділігін) айқындау және Қазақстан мен Қытайдың инфрақұрылымдық стратегияларын үйлестірудегі тәжірибесін жинақтаудан көрінеді. Зерттеу жүйелі және салыстырмалы талдау әдістеріне, сауда-көлік көрсеткіштерінің статистикалық шолуларына, кейс-талдаулар мен құжаттық контент-талдауға негізделген.

Тірек сөздер: логистика, трансшекаралық сауда, құрғақ порттар, көлік, дәліздер, инвестиция, ынтымақтастық, серіктестік

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ЛОГИСТИЧЕСКОЕ ПАРТНЕРСТВО КАЗАХСТАНА И КИТАЯ: ИНВЕСТИЦИИ И РАЗВИТИЕ ТРАНСПОРТНЫХ КОРИДОРОВ

Аннотация

В статье исследуется инвестиционное сотрудничество между Республикой Казахстан и Китайской Народной Республикой в области логистики и трансграничной торговли с акцентом на стратегические приоритеты и инфраструктурную синергию при развитии трансконтинентальных транспортных коридоров. Целью исследования является анализ эффективности совместных казахстанско-китайских инвестиционных проектов в логистической инфраструктуре (включая сухой порт «Хоргос – Восточные ворота» и интеграцию железнодорожных маршрутов в инициативу «Один пояс – один путь») и оценка их влияния на торговые потоки и транспортные коридоры. Научная значимость работы обусловлена тем, что она дополняет теорию международного экономического сотрудничества новыми данными о практической реализации инициативы «Один пояс – один путь» в Центральной Азии и раскрывает механизмы инфраструктурной интеграции на примере Казахстана. Практическая ценность результатов заключается в формулировке рекомендаций по повышению эффективности логистических узлов и инвестиционных моделей, что может быть использовано при стратегическом планировании транспортных коридоров. Вклад в науку состоит в комплексном анализе кейса сухого порта Хоргос и связанных с ним проектов, выявлении факторов успеха и ограничений (таких как зависимость транзитных перевозок от субсидий и конъюнктуры рынка), а также в обобщении опыта Казахстана и Китая по синхронизации инфраструктурных стратегий. Исследование опирается на методы системного и сравнительного анализа, статистический обзор торгово-транспортных показателей, кейс-стади и контент-анализ документов.

Ключевые слова: логистика, трансграничная торговля, сухие порты, транспорт, коридоры, инвестиции, сотрудничество, партнерство.

Article submission date: 01.07.2025