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Current State of Logistics Development and Its Role in the China's Regional Economy

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ABSTRACT: In modern conditions logistics plays a particularly important role in the context of the development of the country, as it allows more effective development of other areas of economic activity of the country due to the speed and quality of movement of goods or people. This study examined this area in China in comparison with data from Kyrgyzstan. The main methods used during the study were analysis, historical method, forecasting, comparison. The study investigated the role of logistics in regional development, drawing on the experience of Kyrgyzstan and China. The objectives of regional development policy were shown at the beginning, emphasizing the importance of a balanced distribution of resources and economic activities between regions. Logistics becomes a key factor in achieving these goals, ensuring connectivity, economic growth, and efficiency in resource allocation. Furthermore, the paper analyzed the unique challenges and opportunities faced by Kyrgyzstan in the logistics sector. For this, the study also considered selected statistical data that can characterize this area. The paper also presented comparative data of China's logistics industry, demonstrating its complexity and crucial role in global trade. Assessing the country's experience, strategic ideas for improving the logistics industry in Kyrgyzstan were also presented, which included many diverse types of recommendations. The study brings new knowledge in the field of logistics for its development in the country, as well as provides an opportunity to assess the state of these areas in China and Kyrgyzstan.

Keywords: Macroeconomics, Transport, Infrastructure, Investment, Public Administration.

I. INTRODUCTION

The role of logistics in the development of a country is critical and multifaceted. This sphere embodies a system for managing the flow of material, information, and financial resources from the point of production to the final consumer. Its impact on the country's economy is evident in many aspects. This is how efficient logistics contributes to increased trade and integration into the global economy. Well-developed infrastructure facilitates faster and cheaper delivery of goods to foreign markets, making the country more attractive to investors and partners. It also has a good impact on the efficiency of production and distribution of goods. Optimized logistics processes help to reduce storage, transportation, and inventory management costs, which contributes to the competitiveness of domestic goods in the global market. All the above-described positive components of the field of logistics for the development of the country ensure its prominent role for the state. Nevertheless, there are still difficulties associated with the logistics industry in many countries. This includes Kyrgyzstan, which is characterized by problems with the development of appropriate infrastructure, lack of investment in the sector and inefficiency in the functioning of the relevant infrastructure. Thus, it is still relevant to analyses the state of the industry in the country. This paper also assessed its status in the People's Republic of China (China), as well as evaluated the experience of the country in the context of the development of the industry and the possibility of its application for Kyrgyzstan.

Many scholars have worked on the study of modern features of Kyrgyzstan's development. Thus, B.S. Dzhamankulov [1] considered the economic welfare of the country in the context of structural changes. The scholar noted that the country's weakness in certain sectors in the international arena is caused by the underdevelopment of production capacities of high value-added industries. Notably, improving infrastructure

and logistics can help address this type of constraint (as part of an integrated policy). From the standpoint of entrepreneurial activity on the economy of Kyrgyzstan was assessed by P.C. Dower et al. [2]. Ways and opportunities for logistics development in Kyrgyzstan were assessed by T.B. Esenaliev et al. [3]. The scholars believed that the most effective strategy for logistics development in the country was to establish logistics centers, which would be the think tank of all future operations. J. Temirbekov et al. [4] assessed the transport and logistics systems of freight flow management in Kyrgyzstan and gave their own version of its formation in the country. Nevertheless, the Kyrgyz literature pays rather little attention to the issues of optimization of the existing system, which also shows the relevance of this study. It is also worth considering the work by [5]. They analyzed the green efficiency performance of the logistics industry in China's 30 provinces from 2008 to 2017. The main conclusion of their paper is that the level of green efficiency is closely related to the geographical location.

This research examines the logistics sectors in China and Kyrgyzstan, emphasizing the vital role they play in both economic integration and national development. It provides Kyrgyzstan with insights to enhance its logistics business by contrasting the country's undeveloped sector with China's modern infrastructure. The study discusses issues like government assistance, technology adoption, and infrastructure development and provides useful suggestions for improving Kyrgyzstan's logistics effectiveness. By emphasizing the role that logistics play in national development, this comparative method adds to the body of knowledge already available on logistics and regional development. This study emphasizes logistics' critical role in supporting regional development and economic integration by focusing on its function in these processes. The three primary parts of the conceptual framework of this study are the following: economic and regional results, government policies and assistance, and logistics infrastructure and practices. The framework asserts that Kyrgyzstan's economic and regional growth would significantly improve with the implementation of advanced logistics methods and infrastructure, reinforced by supportive government policies. The hypotheses proposed are:

1) Increased trade volumes, lower company expenses, and an overall boost to economic growth are the ways in which improved logistics infrastructure contributes to economic growth.
2) Using sophisticated logistics technology, such as digitalization and automation, boosts efficiency in the logistics industry.
3) Robust governmental regulations and support systems, such as infrastructure spending and regulatory changes, have a good effect on the growth of logistics.
4) Kyrgyzstan's logistics industry is greatly enhanced by studying China's experience, which enhances regional integration and boosts economic output.
5) Better logistics encourages regional growth by making it easier for resources and economic activity to be distributed fairly across Kyrgyzstan's several regions.

Thus, the purpose of this paper was to assess the state of development of the logistics sector in China and Kyrgyzstan, and to show its role in the development of the regions. Research objectives were established:

1) To assess the situation of Kyrgyzstan's logistics industry at the moment, highlighting major issues and potential areas for development.
2) To examine how China's logistics industry has developed with an emphasis on infrastructure, technical innovations, and effective business practices.
3) To highlight key distinctions and prospective opportunities for knowledge transfer by contrasting the infrastructure and logistics methods used in China and Kyrgyzstan.
4) To pinpoint particular Chinese tactics and methods that Kyrgyzstan can successfully use to improve its logistics industry.
5) To offer practical suggestions on how Kyrgyzstan's public and private sectors might use and modify these tactics in order to boost economic development, cut expenses, and enhance logistical efficiency.
6) To estimate how these enhancements would affect Kyrgyzstan's long-term economic growth and regional integration.

This will make it possible to adopt effective methods of logistics system formation from China and make the Kyrgyz model more successful. In general, this will enable a more effective long-term strategizing for the country's development.

II. LITERATURE REVIEW

In the context of this study, a special role is played by the research that assessed the role of logistics in regional development. This component is the main subject under study, both by the authors of this paper and many other scholars. There are quite a lot of studies devoted to the impact of logistics on the regional development of the country in the public domain. Thus, this issue has been given a lot of attention in the work of L. Yao et al. [6]. Researchers assessed the opportunities for the development of the logistics industry on the example of the Yangtze River Delta and Pearl River Delta areas. They described the role of logistics development in the area to improve the quality of its economic condition and gave their own vision of how it should be shaped. From a regional perspective, the research was carried out by S.Y. Kim et al. [7]. They evaluated the relationship between the logistics industry and the economic growth of port cities in South Korea. Based on this, they concluded that the development of port logistics can significantly improve the development of such cities. Specifically, a considerable positive effect is formed on the employment side, reducing the unemployment rate in the region. Y.T. Mohmand et al. [8] investigated the relationship between transport infrastructure and economic growth using empirical data from Pakistan. Their results showed that there is no causal relationship between economic growth and transport infrastructure at the national level in the short run, but there is a causal relationship in the long run. Researchers have also described that infrastructure investment alone is not enough to stimulate economic activity in underdeveloped regions; it requires a comprehensive investment strategy that factors in social and technological development. This situation stays relevant for all underdeveloped countries: in such cases, the development of the logistics industry should be stimulated by government support.

The study of China's logistics development was carried out by J. Zhang et al. [9]. They emphasized the changes in logistics in China and the challenges in transport, customs and warehousing. Researchers noted that the lack of modern warehouses and computerized customs system, insufficient skill development among local workers, and deficiencies in the existing distribution system do not allow for sufficiently efficient development of the local logistics system. Thus, the scientists described the deficiencies existing in it and provided probable methods to solve them. The specific features in the context of the COVID-19 crisis were emphasized by W. Liu et al. [10]. The paper recognized the adverse impact of the crisis on the sphere and suggested selected methods to mitigate the effects. Specifically, it was supposed to find the possibility of achieving certain results using the latest technologies and certain components of public policy.

III. MATERIAL AND METHOD

Within the framework of this study, the objective was to find statistical data that could characterize the development of the logistics sector in countries that are studied. The sampling method used in the study is purposive. This approach is employed to select relevant data sources and stakeholders that can provide insights into the logistics sector in both China and Kyrgyzstan. The study centers on two main cases: Kyrgyzstan, which represents a growing logistics industry, and China, which represents a well-developed logistics sector. Specifically, the study focuses on major logistics centers in China, such as Shanghai, Jiangsu, and Zhejiang, and gathers data from strategic locations in Kyrgyzstan that have significant logistical activity. Specific individuals with relevant expertise and experience in the logistics sector are selected intentionally for interviews. The stakeholders include: 1) government officials; 2) logistics businesses; 3) industry experts.

The criteria for purposive sampling involve selecting stakeholders with relevant expertise in the logistics sector. Government officials understand policies, logistics business representatives have practical experience, and industry experts have specialized knowledge of trends and technologies. Their practical experience, diverse perspectives, and transparency in methodology enhance credibility. Additionally, cross-verifying information with secondary sources further validates the insights gathered in the study.

Although purposive sampling is useful for targeting specific stakeholders, but may introduce bias by excluding valuable insights from broader groups. Additionally, the study is heavily dependent on qualitative data from interviews, so it can be influenced by the subjective experiences of the participants and may not reflect the broader reality.

The study measures transport networks, digitalization, automation, AI, trade volumes, and GDP impact, and employs regional indicators to assess these factors. The logistics industries in China and Kyrgyzstan are examined using a combination of qualitative and quantitative data analysis techniques. The qualitative method involves collecting non-numerical data to understand participants' perspectives, experiences, and behaviors. The quantitative method involves collecting and analyzing numerical data to identify patterns and trends. It uses statistical techniques to evaluate measurable variables, enabling researchers to test hypotheses and make generalizations.

To find patterns and variances in logistics performance, quantitative data is analyzed with Microsoft Excel. Thematic analysis is used to gather insights and common themes about logistics practices and issues using qualitative data collected through book readings and interviews. Through the integrated study, the logistics landscape can be fully understood, and practical suggestions for enhancing the industry in Kyrgyzstan may be brought to bear. Through the use of a scientific approach that addresses both the strategic and operational elements of logistics development, the study's conclusions are guaranteed to be thorough and validated.

1. DATA COLLECTION

For China, a significant amount of information has emerged in the public domain on the topic. Thus, the paper provided a rather detailed review of the situation in Kyrgyzstan, while the conclusions for China were formed primarily based on qualitative characteristics. Thus, the study still used some statistical sources of information to describe the state of the logistics sphere in the country. The main among them was the statistical site of the National Statistical Committee of the Kyrgyz Republic [11], which provided data on the transport sector in the country. Information from the Statista statistical website was also used, namely in terms of the inflation rate in the country (to more plausibly show the growth of revenues of logistics companies) [12]. Data from this source also provided an estimate of the total value of social logistics goods in China in a given period [13-14]. Data regarding the inflation rate was also used and from the Macrotrends [15]. Information on freight volumes in China, on the other hand, was used from the CEIC [16]. All calculations were performed within the Microsoft Excel programmed.

2. RESEARCH DESIGN

The main approach that was applied in the study was systematic. It helped assess distinct factors characterizing the state of the logistics sector in Kyrgyzstan within the framework of their real interaction. The analytical method created a foundation for evaluating and comparison of the current logistics situations in Kyrgyzstan and China, whereas the historical method provided context by examining previous developments and their effects. Forecasting complemented these methods by predicting future trends using historical data and current analyses, providing a view on the logistics sector's development. Deduction helped to draw conclusions rooted in the context of established knowledge, confirming the insights gained from the other methods. The statistical methods measured logistics performance metrics, allowing objective comparisons. Abstraction, on the other hand, allowed ignoring certain factors affecting the development of the industry, but which are low weight. At the same time, qualitative analysis was applied at a time when individual factors could not be represented in any other way than through descriptive characteristics (Figure 1).

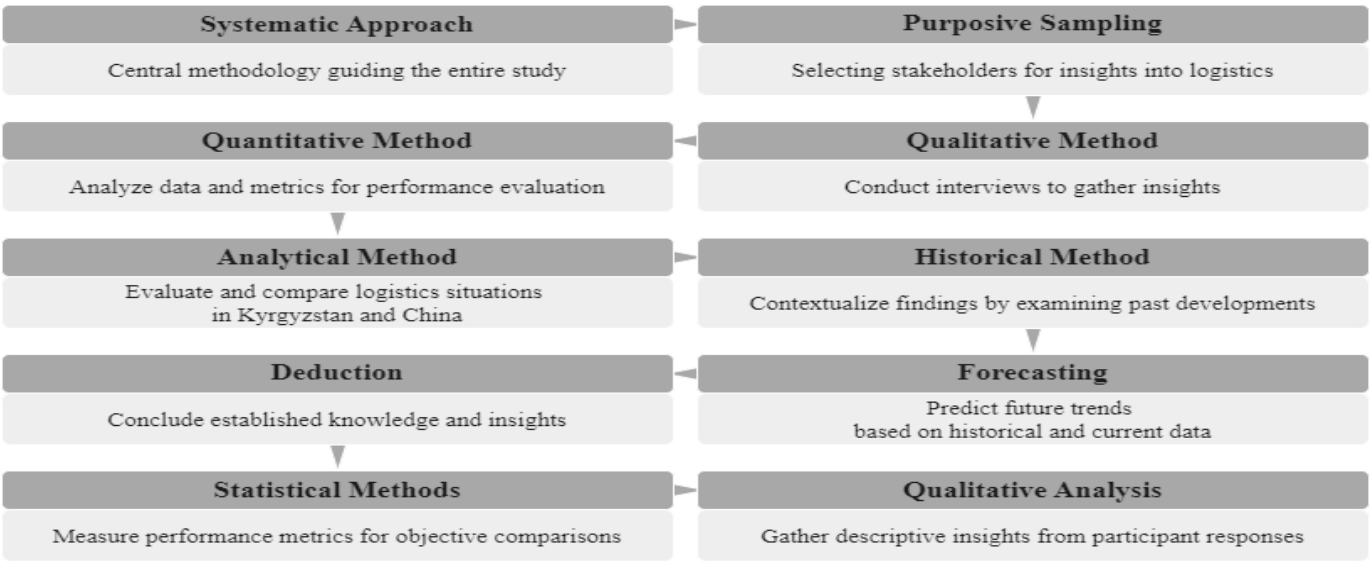

FIGURE 1. A flowchart of the proposed methodology.

[1] Source: compiled by the authors.

While all research methods are important and effective, some limitations may occur. For example, historical context may not encompass all relevant developments, and the dynamic nature of the logistics sector could limit accurate predictions. Abstraction could result in the exclusion of nuanced, which may affect the overall quality of the evaluation.

IV. DATA ANALYSIS

The main objective of regional development is to ensure a balanced distribution of resources, economic activities and population between geographical areas. Regional development policy is guided by three main objectives: promoting growth in specific regions to contribute to overall economic growth, maintaining employment and income stability throughout the economy, and achieving a balanced distribution of economic resources among regions. These objectives are in line with national development goals and aim to minimize economic, social and cultural differences between provinces within regions in any country. Regional development aims to harness the resources of different regions for economic growth, to strike a balance between population and resources, to integrate economic structures, to optimize urbanization and economic location, and to reduce disparities in wealth between regions. The development of logistics is one of the main components to achieve better results in terms of these objectives [17-19].

In general, logistics has quite a multifaceted impact on the regional development of a country. This is particularly true for countries whose territories are geographically difficult to live and develop (e.g., due to distances, as in the USA, or terrain, as in Japan). Effective logistics provides connectivity between different regions, making them more accessible to each other; it also contributes to a more even distribution of economic activity, investment and labor [20]. Regions with well-developed logistics infrastructure become more attractive for business, which contributes to their development; developed logistics allows for more efficient distribution of goods, which allows businesses to feel better about themselves in such territories. This component is especially important for enterprises that interact with external partners, especially for exporters.

The state of the logistics industry in Kyrgyzstan reflects the specific features of its geographical location. The mountainous terrain and lack of access to the sea present challenges for logistics development, but also create unique opportunities for transit trade and transport. Furthermore, poor transport infrastructure affects the efficiency of moving goods in and out of the country, resulting in higher costs and delays in deliveries. Because of this, the development of technological innovations in the field, improvement of infrastructure and strengthening of transport routes are still relevant for the country. To better understand the overall picture of the state of the industry, it is worth considering individual statistics. Thus, Figure 2 presents the data on the change in freight and passenger traffic in the country in 2006-2022.

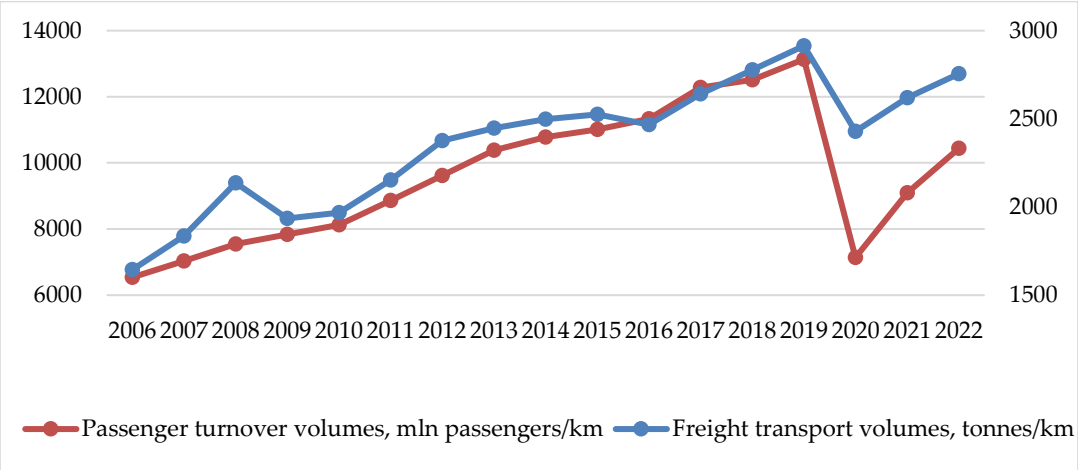

FIGURE 2. Data on changes in freight and passenger traffic in Kyrgyzstan in 2006-2022.

[1] Source: compiled by the authors based on [11].

As Figure 2 shows, the physical volumes of freight and passenger traffic in the country have been generally increasing since 2006. A significant decline occurred in 2020, primarily because of the COVID-19 crisis, namely

the restrictions imposed by states on the movement of both people and transport. The corresponding increase for freight traffic is at 67.6% and passenger traffic at 59.73%, which is quite high. It is worth considering such values also in terms of the income that enterprises receive. This information is provided in Figure 3.

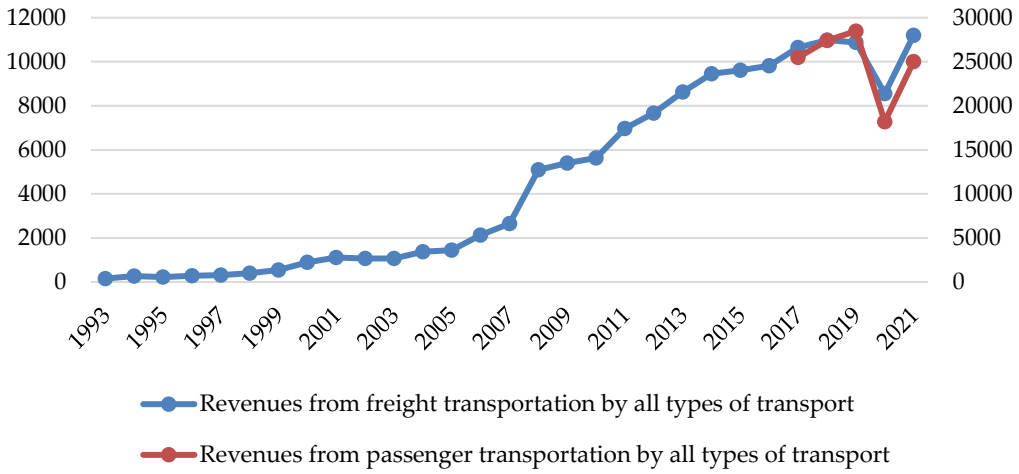

FIGURE 3. Data on revenues from freight and passenger transport in Kyrgyzstan for the period from 1993 to 2021, million kg.

[1] Source: compiled by the authors based on [11].

Note: data for 2022 were not presented within this figure. This is because the level of revenue from passenger turnover, according to the National Statistical Committee of the Kyrgyz Republic (2023), increased from 25,020 to 213,224 million kg, i.e., more than 8 times. Although this increase may have a logical justification (namely, the beginning of the war between Ukraine and Russia and the corresponding increase in human traffic through Kyrgyzstan), such a high increase looks more like a calculation or data transfer error. To confirm this value, it is worth waiting for next year's data and assessing whether it proves to be fair. Data on the website of the National Statistical Committee of the Kyrgyz Republic (2023) of passenger transport revenues are available only for the period from 2017.

As Figure 3 shows, the level of income of logistics enterprises in Kyrgyzstan has seriously increased over time. However, this increase is also due to the rise in inflation. The actual data of their income growth is presented in Figure 4.

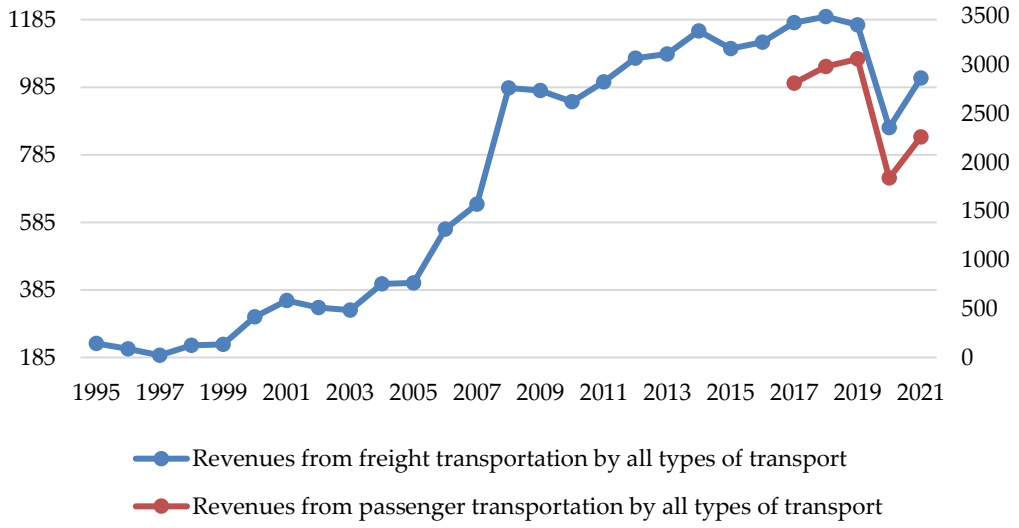

FIGURE 4. Data on income from freight and passenger transport in Kyrgyzstan for the period from 1993 to 2021, adjusted for inflation (in 1995 prices), million kg .

[1] Source: compiled by the authors based on [11].

As Figure 4 shows, companies' revenues from trucking have indeed increased, although not as much as one might think at first glance (from the data in Figure 3). Nevertheless, it also shows the gradual development of the field in the country, improving the real state of logistics over time. As for the decline during the COVID-19 pandemic, rates should be expected to recover in the coming years, with growth rates higher than in previous years. It is also worth considering some of the available data that can characterize the state of the industry in China. These are demonstrated within Figure 5 below (regarding the volume of value of goods in social logistics).

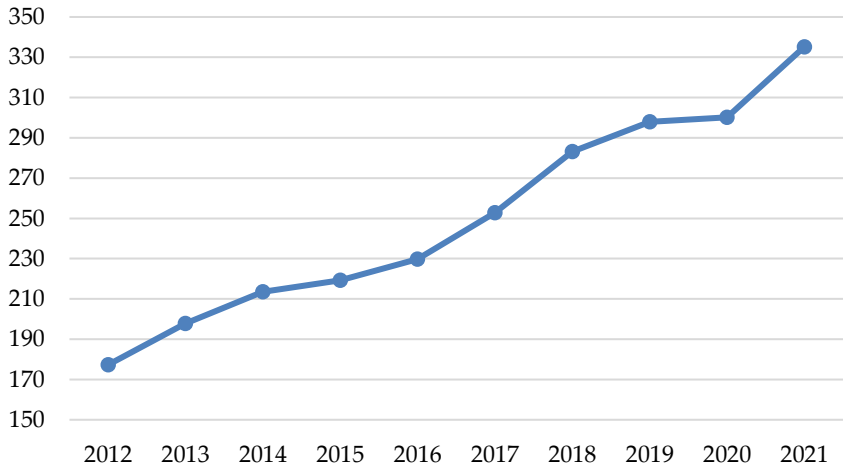

FIGURE 5. Volume of goods turnover in social logistics in China from 2012 to 2021, trillion yuan.

[1] Source: compiled by the authors based on [13].

As Figure 5 shows, the turnover volume of goods in social logistics in China is generally increasing over time, which may indicate the gradual development of the industry as a whole. Comparable conclusions can be drawn from the country's freight volumes, as presented in Figure 6.

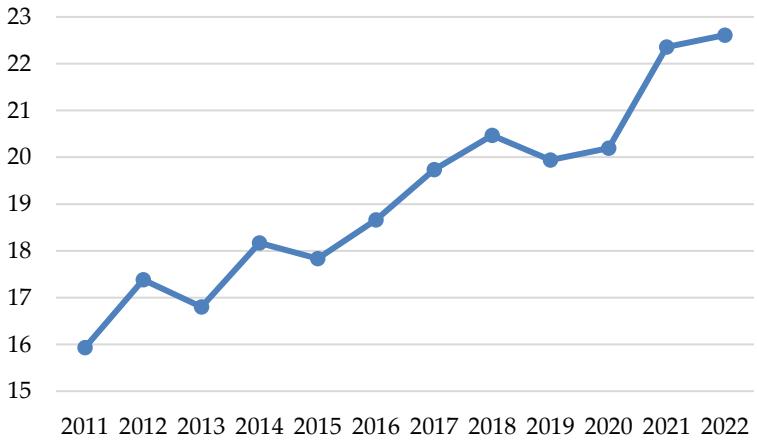

FIGURE 6. Freight volumes in China from 2011 to 2022, trillion tonnes/km [13].

[1] Source: compiled by the authors based on [13].

As Figure 6 shows, freight volumes in China have also increased between 2011 and 2022 (by about 50%), which generally indicates a positive performance of the industry. The state of Chinese logistics is a complex picture, influenced by a variety of factors and dynamics (Table 1).

TABLE 1. Data analysis results

	Findings
Resilience to Crises	The logistics sector has shown resilience during crises like COVID-19, allowing companies to adapt and find new supply routes.
Technological Innovation	Active adoption of the latest technologies has improved industry flexibility and quality, highlighting the importance of innovation.
Government Support	Government support is crucial for sustaining the logistics industry and addressing regional disparities.
Infrastructure Development	China has invested significantly in developing roads, railways, ports, and airports for efficient resource delivery.
E-commerce Impact	The booming e-commerce industry in China has led to innovative logistics solutions, including automation and drone delivery.
Recommendations for Kyrgyzstan	Kyrgyzstan should apply China's experience by prioritizing transport infrastructure and digitalizing logistics operations.
Workforce Development	Developing a skilled workforce is vital for improving supply chain quality; educational institutions should provide relevant training.
Customs and Logistics Management	Improving customs procedures and urban logistics management will enhance product delivery and reduce traffic issues.
Regional Cooperation	Direct interaction between Kyrgyzstan and China can simplify customs and trade corridors, boosting development.

[1] Source: compiled by the authors.

As Table 1 shows, the industry is critical to economic growth and global trade. Despite its impressive scale and dynamism, there are regional imbalances in the sector. Coastal regions such as the South Coast and North Coast, including cities such as Shanghai, Jiangsu, and Zhejiang, have developed logistics networks, allowing for higher levels of economic development; they also have a good level of infrastructure and are gradually being technologically improved. In contrast, inland and western regions face constraints arising from geographical remoteness, resulting in underdeveloped logistics capabilities [21].

Recent crises, such as COVID-19, have shown that the sector is quite resilient to external shocks (although it is worth mentioning that the data nature of the crisis itself allowed logistics companies to earn more as their services (to open up new supply routes) proved to be very relevant). The problems that existed at the beginning of the crisis became much less of an impact on the quality of the industry after the manufacturers began to actively adopt the latest technologies. In other words, the representatives of the industry showed considerable flexibility in terms of solving such issues. Innovation is still an important part of China's logistics sector. In modern conditions, the achievement of sustainable development also stays an urgent problem, due to which the application of technologies that reduce the negative impact on the external environment also remains relevant [22].

Government support plays a vital role to sustain the industry in the country. On its side, Strategies to address regional disparities include technological innovation, infrastructure development and interregional co-operation. As China moves towards high-quality development, these policies promote economic growth while minimizing regional differences. Overall, China's logistics sector is ready for a transformation embracing digital innovation and sustainable practices [23, 24]. Smart logistics, technology integration, and environmental initiatives will shape the future trajectory of the industry. If work on its well-being can be provided by both government agencies and interested entrepreneurs, it is likely that local logistics can achieve a considerable level of stimulation of economic development, industrial modernization and the formation of global linkages towards sustainable development. Recently, China has taken certain actions to improve domestic logistics operations in the country [25, 26]. Thus, China has invested significant resources in infrastructure development such as roads, railways, ports and airports, allowing for faster and more efficient delivery of resources. Furthermore, the country's booming e-commerce industry has led to innovative delivery methods and logistics solutions, including warehouse automation and drone delivery. China is also actively adopting technology in logistics processes, such as artificial intelligence, which can improve the efficiency of supply chain management and monitoring. Certain steps have been taken to improve customs procedures and urban logistics management (to ensure faster delivery of products and create conditions to be able to avoid traffic jams) [27].

Thus, the state of Kyrgyzstan's logistics industry could be significantly improved if the state authorities start applying China's experience for such purposes. Specifically, Kyrgyzstan should priorities investment in its

transport infrastructure, including roads, railways, and airports. Following China's example, Kyrgyzstan should also promote the digitalization of logistics operations. Increased adoption of technologies such as GPS, warehouse management systems and e-commerce platforms can improve efficiency and reduce costs. The development of a skilled workforce in logistics can also help, as it affects the quality of supply chain formation; educational institutions should offer programmers and training to equip people with the necessary skills for their future professions. The state should play a special role in these processes by introducing tax incentives, establishing clear rules for foreign investment and other types of support. Furthermore, direct interaction between Kyrgyzstan and China can be effective, given their geographical location. Simplification of customs procedures, reduction of delays at borders and simplification of trade corridors will encourage companies to use Kyrgyzstan as a transit route and, accordingly, will have a favorable impact on the level of development of this area.

V. DISCUSSION

Z. Khadim et al. [28] described the moderating role of logistics efficiency in economic growth in developing countries. The study showed the varying impact of logistics performance on economic growth in developing countries. The role of labor dominates in countries with lower logistics scores due to labour surplus and inefficient infrastructure, while the positive contribution of real capital is stronger in countries with higher logistics scores, reflecting the efficiency and value added of strong logistics infrastructure [29-31]. This once again demonstrates the role of development in this area for developing countries, especially for those that aim to improve their own value-added industries.

S. Sezer and T. Abasiz [31] investigated he role of logistics in regional development. Scholars have written about how logistics is becoming a key force in economic development and regional growth due to its inherent externalities. It allows to organize the internal workings of the business more efficiently even in territories where it is difficult to organize (due to geographical and other reasons). However, technological advances in operational aspects require well-educated people to manage logistics and related functions. This, in turn, requires increased investment in infrastructure and capacity building, which will contribute to economic growth. Thus, the very development of logistics as a sphere requires direct financial influences, which in the conditions of Kyrgyzstan can be realized primarily at the expense of the state and its support [32-34].

X. Li and F. Chen [35] studied the impact of logistics on economic development using data from China. The study analyses the spatial impact and spillover effects of integrated logistics industry development on regional economic growth in Guangdong Province using data from 2007-2019. Using spatial econometrics, the study found that the integrated development of logistics industry forms a spatial agglomeration and positively affects the regional economy. It also identifies significant spatial spillover effects on neighboring areas. Key findings (Table 1) include the importance of improved infrastructure and technology development to facilitate economic transformation and efficient logistics networks. And while the country's Guangdong province has strong development in certain areas, regions with poorer logistics capabilities need modernization to boost economic growth. For this purpose, it is worth developing technology, particularly financial technology, as well as reducing working capital costs and attracting new investment in the industry [36-38]. This is broadly in line with the information from the study above that the logistics industry in China is indeed very developed, but the level of development differs between regions of the country.

G.H. Cui and X.S. Li [39] examined the relationship between logistics and regional economic development in Jilin Province in their study. Scholars have observed that logistics development has a direct impact on the level of gross domestic product in a country and that there is a stable long-term equilibrium relationship between logistics industry development and economic growth. In the end, the scientists recommend that the state authorities pay attention to the development of the logistics sphere and to use the opportunities of this region to form an industrial base. Notably, the last point related to industry is also truly relevant for Kazakhstan, which makes the subsequent increase in the attention of the state authorities to the logistics sector quite relevant. Regional development in the country has also received attention from H. Chen and Y. Zhang [40]. Scholars have stressed that the importance of the logical sector is not only to stimulate economic growth, but to stimulate modernization and expansion within the sector itself, leading to the modernization of industrial structures. The paper investigates the impact of quality logistics development on the modernization of industrial structure through comprehensive indicators. The results obtained from such a review showed the need for collaborative regional growth, innovation strategies and careful management of foreign direct investment in the logistics industry. Thus, public authorities must ensure that there are sufficient opportunities for investment in the country, specifically in the logistics industry and its technological development, if they wish to make

improvements in particularly remote areas of the country. This correlates with the current state of development of this sphere in Kyrgyzstan, in which it is important to provide state support for the industry for its further development [41].

An extensive assessment of regional logistics development in China was carried out by W. Ran et al. [38]. Researchers conducted an empirical study based on data from 31 provinces in the country. They showed that spatially, the development of the logistics industry exhibited regional agglomeration: coastal areas exhibited higher logistics performance than inland areas. The eastern and northern coastal areas had the highest efficiency, and the Northwest had the lowest. Based on this data, they can make a correct assessment of the real efficiency of logistics by eliminating environmental impacts and adapt each individual regional policy to be as favorable as possible to logistics development. Y. Zhao et al. [42] investigated the impact of the logistics industry on advancing China's position in the global value chain. Researchers have described how the development of the logistics industry has a positive impact on a country's position in the global value chain. They also noted that this interaction was particularly relevant for developing countries. For China, however, according to scholars, it is worth focusing on building and improving logistics infrastructure, namely using market principles, improving enterprise operations, reducing logistics costs through technology, and introducing international management experience in the field [43, 44]. Scientists also consider the development of cooperation with other countries (within the framework of both separate trade agreements and separate initiatives, such as, e.g., the Silk Road International Cooperation Organization) and the introduction of new innovative technologies into the industry as relevant.

X. Wang and F. Dong [45] examined the relationship between the logistics industry and the components of sustainable development (from an environmental perspective). Researchers noted that a similar relationship existed between logistics growth and CO2 emissions. In this regard, scientists recommend investing in the latest technologies, which will not only achieve better results in terms of the development of the country's main industries, but also improve the state in achieving sustainable development goals. A comparable study was also conducted by H. Zhang et al. [46]. They were concerned with measuring logistics performance in China, considering technological heterogeneity and carbon emissions. Interestingly, scholars believe that logistics efficiency in China is low, although this statement may differ depending on the region considered: thus, eastern regions of China tend to have a higher level of logistics efficiency compared to central and western regions. This is primarily due to the location of the inhabitants in the country (which is more settled just to the east). Nevertheless, it is a bit incorrect to say that the logistics system itself is underdeveloped in the country due to the considerable number of features and innovations that are used in it.

Thus, it is possible to note several basic principles that allow for the active development of logistics in China, and which should be adopted by the state authorities of Kyrgyzstan (Table 2).

TABLE 2. The main principles of Chinese logistics for Kyrgyzstan to adopt

Principle	Recommendations for Kyrgyzstan
Collaborative Interaction	Foster interaction between government and entrepreneurs for effective logistics development.
Investment in Transport Infrastructure	Prioritize investment in transport infrastructure to overcome logistical challenges.
Adoption of Cutting-Edge Technology	Adopt advanced logistics technology to improve operational efficiency.
Strong Government Backing	Ensure strong government backing to support logistics initiatives.
Capacity Building	Focus on increasing capacity within the logistics sector.
Workforce Development	Develop educational programs to enhance workforce skills in logistics.
Streamlined Customs Procedures	Simplify customs procedures to facilitate trade and reduce bottlenecks.
Direct Engagement with China	Engage directly with China to strengthen trade and logistics relationships.
Road Map for Kyrgyzstan	Implement a strategic road map to enhance logistics operations and infrastructure.

[1] Source: compiled by the authors.

Although all of them must be produced in one way or another with the support of the authorities, but in this context interaction with entrepreneurs also plays a crucial role. They should be interested in the development of the industry and take an active role in it, otherwise any single wishes and actions of the state will be ineffective. The study offers Kyrgyzstan a road map for enhancing its logistics operations and infrastructure, with an emphasis on resolving issues like insufficient infrastructure, a lack of funding, and inefficiencies. It highlights how important it is to invest in transport infrastructure, use cutting-edge logistics technology, have strong government backing, increase capacity, and grow the workforce. In order to improve trade and logistics connections, streamline customs procedures, and establish effective trade corridors, the report also recommends direct engagement with China. Kyrgyzstan can improve its logistical capacities, draw in investment, and achieve long-term economic growth by putting these suggestions into practice. The findings provide a thorough plan for regional integration and economic growth in Kyrgyzstan.

VI. CONCLUSION

Thus, regional development plays a key role in achieving a balanced distribution of resources, economic activity, and population within a country. The objectives of regional development policy, which include promoting growth in particular regions, maintaining employment stability and achieving a balanced distribution of economic resources, are consistent with national development goals aimed at reducing economic, social and cultural disparities between provinces or regions. Logistics, as a fundamental component, has a multifaceted impact on the regional development of a country, especially in complex geographical conditions or large areas.

In Kyrgyzstan, the mountainous terrain and limited access to the sea pose logistical challenges, but they also offer opportunities for transit trade. Inadequate transport infrastructure affects both Kyrgyz and international movement of goods, resulting in increased costs and delays. Therefore, Kyrgyzstan should focus on technological innovation, infrastructure development and strengthening transport routes to effectively address these challenges. Analogous methodologies have already been applied in China: although its logistics industry has complex dynamics and regional imbalances, with coastal regions such as the south and north coasts leading the way in logistics, infrastructure and technology development, and inland and western regions facing constraints due to geographical remoteness, the system as a whole is becoming more stable and efficient in its functioning. This was particularly shown during the COVID-19 crisis when the country's logistics industry proved to be very efficient.

Thus, if all policy options are utilised and the Chinese experience is considered, Kyrgyzstan can make considerable progress in improving its logistics industry. It is relevant for the following research to examine the interaction between the logistics industry and other industries. Furthermore, it is possible to make comparisons not with China, but with other countries, e.g., the United States or the member states of the European Union.

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Author contribution

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Data Availability Statement

Data are available from the authors upon request.

Conflict of Interest

The authors have no potential conflicts of interest, or such divergences linked with this research study.

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