

## *Retraction*

# **Retracted: Risks and Strategies of China's Direct Investment in Central Asia from the Perspective of Big Data**

### **Advances in Multimedia**

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

### **References**

- [1] J. Huang, "Risks and Strategies of China's Direct Investment in Central Asia from the Perspective of Big Data," *Advances in Multimedia*, vol. 2022, Article ID 2557124, 10 pages, 2022.

## Research Article

# Risks and Strategies of China's Direct Investment in Central Asia from the Perspective of Big Data

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With the growth of Chinese economy and the improvement of its international status, Chinese enterprises foreign direct investment has ushered in new development opportunities. Although scale foreign investment continues to expand and has broad development prospects, it also faces huge risks that domestic investment has never had. China and Central Asia are highly complementary economically. Strengthening direct investment in the Central Asian countries can effectually drive China's economic development. Based on the quantitative evaluation and analysis from the perspective of big data, this paper uses a variety of methods to evaluate and explore the risks of China's direct investment in Central Asian countries, and gives some policy suggestions. The research shows that the motivation of Chinese foreign investment cooperation is different from the marginal industry transfer in the traditional international investment theory. The problem of country risks in Central Asia is prominent. Chinese government must rely on the build of the Belt and Road to strengthen intergovernmental communication and exchanges, and establish a good cooperation mechanism to deal with the increasingly prominent problem of country risks. Further we will improve trade facilitation and expand the trade openness of Central Asian countries to China. To avoid risks, Chinese companies should invest under the guidance of the government and establish a complete investment chain for large projects. At the same time, we also need to seize the opportunity of the development of digital economy, and gradually establish a scientific and efficient investment model to effectively avoid the risk of direct investment.

## 1. Introduction

Since the entry into the WTO, China has established cooperation and trade relations with more and more countries in the world, and the export-oriented economy continues to develop. Foreign direct investment plays an important role in international economic and trade cooperation [1]. Over the past decade, China's foreign direct investment has developed rapidly. In recent years, China has faced problems such as overcapacity, aging population and rising labor costs, while the world is also facing problems such as slowing economic growth. Taking advantage of the wave of regional cooperation, China has fully absorbed relevant experience and put forward the Belt and Road. The initiative is a new way to promote international economic and trade exchanges

and transnational investment, which has received extensive attention from the international community [2], and also brings new investment opportunities for the development of China's foreign direct investment.

With the deepening of world economic integration and closer economic ties, transnational direct investment has become the main form for enterprises to participate in overseas competition. China's foreign investment shows two characteristics: on the one hand, China's enthusiasm for the CIS and the Shanghai Cooperation Organization is increasing; on the other hand, the Belt and Road Initiative is constantly promoted, and China actively makes direct investment in countries along the route. According to the world investment report (2019), China's OFDI (foreign direct investment) reached the maximum in recent years in

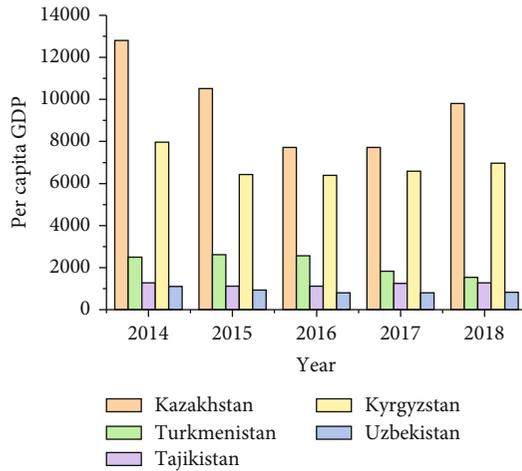


FIGURE 1: Distribution map of per capita GDP of five Central Asian countries from 2014 to 2018.

2018, with the total amount of OFDI reaching  $1.39 \times 10^{11}$  \$, ranking second only to the United States in the world. In recent years, China's foreign direct investment has shown an overall growth trend. It is expected that China's total OFDI will remain at the forefront of the world for some time to come [3]. It can be seen that China's foreign direct investment has made remarkable progress, both from the data and the actual development status, but there are still some problems in the investment. Specifically, in 2018, the total amount of OFDI flowing into developed countries in China fell by 27% year-on-year, to the lowest level since 2004. Foreign direct investment continues to stay at the bottom after the 2008 financial crisis, which has certain obstacles to coping with global crises such as poverty. Central Asia, located in the center of the Eurasian continent, is an important node of the "Silk Road Economic Belt". Central Asia is the abbreviation of Central Asia, which refers to the inland region in Central Asia. In a narrow sense, it is generally limited to the "five Central Asian countries". It is a transportation hub connecting Asia and Europe. It has always been a necessary place to enter the East, exit the West and go north and south. The ancient Silk Road passed through it. After the end of the cold war, as an important strategic buffer zone, the geopolitical significance of Central Asia has become more prominent. Figure 1 introduces the changes in the per capita GDP of the five Central Asian countries from 2014 to 2018. The abscissa represents the year, and the ordinate represents the per capita GDP, in US \$100 million. However, due to historical and development reasons, the economic development of Central Asia has always faced bottlenecks such as backward infrastructure, single economic structure and poor investment environment. Relevant data show that the investment risk level of most countries in this region is high.

After entering the 21st century, the information age has brought great changes to the society [4]. Big data has become a factor that can be seen everywhere in people's lives. As a basic information material, big data has gradually become an important factor of production in the contemporary

era. Figure 2 shows the global big data reserves and year-on-year growth rate from 2013 to 2021. It can be seen from the figure that the reserves of big data information resources are increasing year by year. Society pays more and more attention to data, especially in economic development, government supervision and social governance. The application of data is becoming more and more extensive. Big data can enable people to acquire new cognition and help create new value. At the same time, big data is also an important factor to change the market structure. The information that big data allows people to accept is becoming wider and wider. It is no longer limited to the analysis of causes and consequences, but to find the basic law of market development in the relevance of data and effectively improve the quality of data application. The growth rate of information assets also affects seriously the management of data. In order to establish the competitiveness of organizations in the information age [5], we need to formulate corresponding countermeasures corresponding to the actual situation of social science and technology, and effectively improve the quality of data processing with the help of the scale, transmission, diversity and other characteristics of big data.

Studying the risks and Strategies of Chinese direct investment in Central Asian countries from the perspective of big data has the following significance. The research conclusion of this paper can provide theoretical guidance for Chinese enterprises on how to deal with the risks of the host country in foreign direct investment. Enterprises must improve their awareness of risk prevention, establish evaluation, early warning and defense systems, and actively respond to risks. First, it is conducive to providing reference for the investment decisions of Chinese enterprises in Central Asian countries and enhancing the international competitiveness of enterprises. Enterprises need huge financial support to make foreign direct investment. If they only rely on domestic financing, it will restrict the financing ability of enterprises to a certain extent. Therefore, financing from the host country has become another way for enterprises to choose [6]. Second, it is conducive to helping Chinese enterprises carry out targeted investment activities in Central Asian countries and continuously improve investment efficiency. The market structure of big data industry segments of Chinese investment in Central Asian countries in 2021 is shown in Figure 3.

It can be seen that it is necessary to quantify the financial investment level of Central Asian state and behavior in-depth research on the risks and Strategies of Chinese investment in Central Asian countries based on the big data horizon theory [7]. The structure of the rest of this paper is shown as follows. The second part reviews the relevant work on direct investment and big data vision. The third part introduces the evaluation methods and models applied in this paper. The risk and strategy evaluation of Chinese investment in Central Asian countries is described in the fourth part. The fourth part summarizes the basic situation of China's direct investment in Central Asian countries, studies the possible risk factors, and then puts forward relative solutions and schemes for different risks. The fifth part summarizes the important results of this paper.

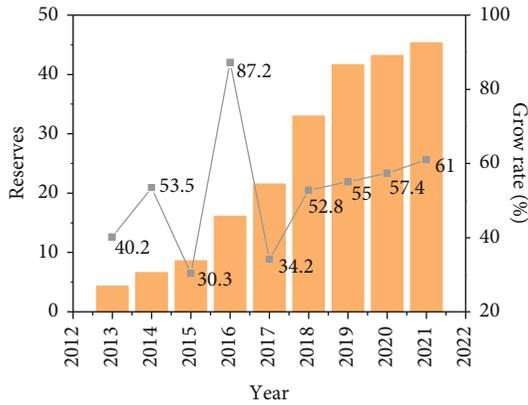


FIGURE 2: Global big data reserves and growth rate from 2013 to 2021.

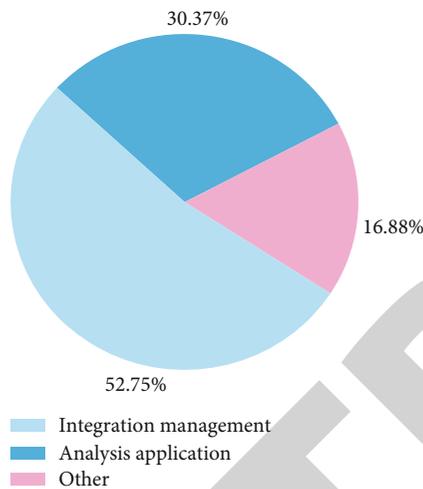


FIGURE 3: China's investment in Central Asia big data segment industry market structure (Unit:%).

**2. Related Work**

Based on current situation of Chinese enterprises' direct investment in the Central Asian countries and the changes in international trends [8], that combined with the research results of Liu Zhenlin and Zhang Xiaotao, and comprehensively considering the representativeness and stability of the indicators. This paper takes the analysis of the basic situation of large-scale projects, deposits and flows of investment in Central Asian countries as the starting point, which combined with authoritative evaluation indexes such as the degree of economic freedom. In order to make an in-depth exploration of the risks faced by Chinese enterprises' direct investment in the region.

For the research of investment location selection, some scholars analyzed from the perspective of investment influencing factors, and pointed out that the influencing factors mainly include market scale, labor force, resources, infrastructure development level, political environment and so on. Yun Tong [9] pointed out that the location selection

of OFDI in China is mainly affected by the investment motivation and the overall environment of the target country. Different scholars have different understanding of the key factors affecting location. Some scholars believe that the impact of signing bilateral investment agreements on OFDI should generally be analyzed in combination with the host country's system, which shows that bit can promote the investment activities of the signatory countries. Enkang Li and others [10] pointed out that signing bit has a substitute effect on the absence of the domestic system of the target countries. The worse the local institutional environment, the more significant the effect of signing bit on OFDI. Liu Junxia and others believe that when molecular investment promotes the conquest effect, the institutional environment has an obvious incremental effect [11]. If it is found that the institutional environment of the host country is less than the threshold, it can significantly promote OFDI, and if it exceeds this threshold, it is not significant. Yang Hongen and others pointed out that the promotion effect of signing bit between China and the host country on investment is obviously different due to the differences between the host countries [12]. Compared with regions with better economic development, signing bit has no significant effect on local investment promotion. Signing bit with regions with relatively backward economic development has a significant effect on investment promotion.

Pan Sukun found that communication infrastructure is a non negligible factor affecting China's investment location choice in developed countries along the line. At the same time, he pointed out that the quality of the system and the location choice of OFDI have a regulatory effect [13]. Li Jianjun believes that location selection is the first factor to be considered in China's investment decision-making, and uses panel data to analyze the impact of the institutional quality of the target country and the institutional quality distance between the target country and the home country on China's OFDI location selection [14]. The results show that the institutional quality distance has a greater impact on location selection. Erokhin [15] studied the impact of English capital and the official language capital of the target country on investment, and proposed that China's foreign language education should achieve universal English education and develop the homogenization strategy of multilingual capital alienation policy.

Liu Liangyan proposed that Central Asia is a must for China's silk economic belt [16]. However, the market development in these regions is not mature enough, and the national economic foundation is relatively weak. When China invests in and trade cooperation with these countries, it faces risks such as low investment security and unstable cost-benefit. For better implement the Belt and Road development strategy and deepen trade cooperation with Central Asian countries, China demands to establish a risk aversion mechanism, do a good job in the analysis of the investment environment and market risk assessment, always maintain the set investment expectations, and establish the corresponding market risk prevention awareness. At the same time, Ze He and others [17] believe that the Belt and Road Initiative has a very obvious regional color. In the future,

the implementation of this initiative will change the current territorial spatial pattern and new products will be born.

Shadrina Elena [18] believed that direct investment significantly promoted the bilateral trade between China and the five Central Asian countries and expanded China's exports and imports to the five Central Asian countries. Schindler Seth [19] also believes that China has a significant trade promotion effect on FDI in the Central Asian countries. Following this idea, Amirova Iroda [20] believes that China should increase the intensity and breadth of investment in the five Central Asian countries, pay attention to the coordination of regional advantages and factor endowments, and make full use of local resources, so as to make better use of OFDI to optimize the structure of products exported from Central Asia to China. This view coincides with Jiang Yuning, who also believes that the foreign trade between China and Central Asia is less competitive and has strong trade complementarity. We should make full use of the trade complementarity between the two places and the opportunities of building the "Belt and Road" and other favorable factors to further expand the potential and space of trade cooperation between the two places [21]. Based on this, Liu erhu and others directly pointed their research direction to the impact of the investment environment of the five Central Asian countries on the absorption of COFDI and global FDI, and proved that the investment environment has a significant effect on both.

In the trend of international trade globalization, different countries integrate into different regional economic integration, the direction of foreign trade will change, and the structure of foreign trade will change accordingly [22]. Wiener analyzed the impact of globalization on international trade, and believed that trade creation and trade transfer are the main factors of economic and trade cooperation changes in the process of globalization or regional economic integration. Wiener's analysis explains the new phenomenon of international economic and trade changes and expands the analytical means and ideas of international economic and trade cooperation. For two economies, if the cost of producing or providing certain goods or services in one economy is higher than that in the other, the economy will produce less or even no such goods and services, but import such goods or services from the other economy, thereby increasing consumer surplus and improving consumer welfare (see Figure 4), X, Y and Z represents different countries or business groups, respectively.

However, Cheng GUI is also aware of this problem, and believes that we should promote Chinese investment in Central Asian countries [23] from the aspects of deepening regional trade cooperation, scientifically selecting foreign investment industries, promoting financial cooperation, and strengthening policy guidance and technological innovation, so as to effectively promote the upgrading of China's industrial structure. In addition, through the quantitative risk evaluation of oil investment in Central Asia, Ma Haitao and others found that the policy and regulation risks are high risks, the economic risks, social and cultural risks and political risks are general risks, and the infrastructure risks are low risks [24]. Aliev Akmal-Alikhan's research shows

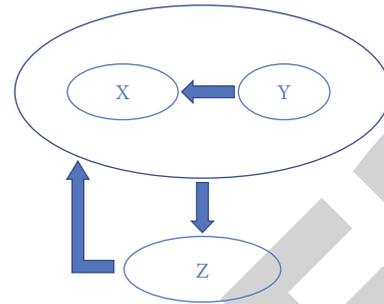


FIGURE 4: Schematic diagram of trade creation effect.

that trade-oriented investment is induced by a large number of bilateral intra industry trade in processing and capital products [25]. Yang Lijun's research shows that there are three problems in the five Central Asian countries: ethnic and religious conflicts, international risks and general instability in the country's internal affairs.

The investment in industry and mining is small, and it is still in the high-risk wait-and-see stage, and the investment in commerce and trade is less, which is basically in a negligible state. Although Central Asian countries hope to obtain technical and financial support from China, too concentrated investment will make Central Asian countries feel sensitive, and even once thought that China's investment will pose a threat after entering the country. Previously, in Kazakhstan's media reports, it was proposed that China's investment in energy projects is too much, which often affects investment, so investment projects should be adjusted appropriately. There are mainly two reasons for this: first, the overall economic development level of the five Central Asian countries is relatively low, with fewer opportunities for commercial projects and low profits; Second, the poor business environment leads to greater risks of direct investment in commercial projects. However, with the promotion of the construction of the "the Belt and Road", it is inevitable that trade investment will enter the actual operation. Therefore, it is of great significance to conduct a forward-looking evaluation and Research on the trade cooperation environment of the five Central Asian countries.

### 3. Research Methods and Models

With the development of China's economy, the scale of foreign investment continues to expand, and the number of countries investing continues to increase. In the process of foreign investment, more political risks will be encountered. Evaluating the political risks encountered is conducive to enterprises to predict the possible situation in advance, formulate relevant coping strategies, and improve the stability of operations. As a particularly influential risk in foreign investment, the quantitative evaluation of political risk is helpful to provide important reference value and significance for Chinese enterprises in making foreign investment and trade decisions. The political risk coefficient of the host country is based on the quantitative analysis model

proposed by Zhang Jing [26], two political risk insurance experts of SACE group. The data used in the model are WGI data from the world bank and HER jointly prepared by American Heritage funds and the Wall Street Journal.

The model divides political risks into three main categories: the risk of restricted foreign exchange, the risk of government expropriation and the risk of war violence. The index system constructed by the model: expropriation risk (EXP) includes legal system (RL) and property right (PR), government intervention (GI), political corruption (CC); Exchange restrictions (TRA) include regulatory quality (RQ), monetary policy (MP), freedom of investment (INV), and financial freedom (fin); Political violence risks (vio) include voice and accountability (VA), policy stability (PV), and the rule of law (RL). There are six data in total, including property voice and accountability (VA), political stability and future violence (PV), government intervention and government effectiveness (GI), regulatory quality (RQ), legal system (RL) and prevention and control of corruption (CC). The range of indicators is 0 ~ 100.

The rest of the data comes from American Heritage funds and the Wall Street Journal, which mainly uses four indicators, namely, financial freedom (FIN), financial freedom, monetary freedom (MP) and property rights (PR), with an index range of 0 ~ 100. Convert WGI and her indicators to a range of 0 ~ 5.

$$C = 5 - (B/20) \quad (1)$$

This model first calculates the sub risk, and then calculates the total risk by weighting

$$EXP = (RL \times 0.25) + (PR \times 0.25) + (GI \times 0.25) + (CC \times 0.25) \quad (2)$$

$$TRA = (RQ \times 0.25) + (MP \times 0.25) + (INV \times 0.25) + (FIN \times 0.25) \quad (3)$$

$$VIO = (VA \times 0.2) + (PV \times 0.6) + (RL \times 0.2) \quad (4)$$

$$RISK = 1/3 \times (EXP + TRA + VIO) \quad (5)$$

For environmental assessment, the more psopular methods are multi factor analysis, weighted grade method and principal component analysis, and there are many qualitative analysis methods. Therefore, this paper selects the coefficient of variation TOPSIS method to build the environmental assessment model of Central Asia direct investment cooperation, and makes quantitative analysis, which is convenient to draw more objective conclusions. Compared with the standard deviation, the advantage of the coefficient of variation is that it does not need to refer to the average value of the data. The coefficient of variation is a dimensionless quantity, so when comparing two groups of data with different dimensions or different mean values, the coefficient of variation rather than the standard deviation should be used as a reference for comparison. In addition, the previous literature is insufficient to study the dynamic trend of the investment environment. Therefore, this paper uses the Theil

analysis method to deal with the difference and change trend of the trade and investment environment in Central Asia, so as to provide reference suggestions for China's later in-depth cooperation in investment in Central Asian countries. The process of model processing and risk assessment is summarized in Figure 5.

C. L. Hwang and K. Yoon proposed TOPSIS method in 1981, which is the ranking method of approximation and ideal solution. It is a multi index and multi scheme decision analysis system. However, due to the absolute difference of the dimensions of the original data, the evaluation index is not accurate enough in practice. In order to solve this problem, the method of weighting the coefficient of variation is used to reduce the error and improve the measurement accuracy. The basic steps are as follows:

The decision matrix is constructed by combining the evaluation scheme set  $M_m$  and the evaluation index set  $D_n$ :

$$X = \{x_{ij}\} \quad (6)$$

Where  $X_{ij}$  represents the value of the  $j$ th indicator in the  $i$ th country.

Construct standardization matrix:

$$V_{ij} = \frac{x_{ij} - \min(x_j)}{\max(x_j) - \min(x_j)} \quad (7)$$

$$V_{ij} = \frac{\max(x_j) - x_{ij}}{\max(x_j) - \min(x_j)}$$

Construct weighting matrix:

$$r_{ij} = w_j \bullet v_{ij}, (i = 1.2.3 \dots m; j = 1.2.3 \dots n) \quad (8)$$

Calculate ideal solution

$$S_j^+ = \max_{1 \leq i \leq m} \{r_{ij}\}, j = 1.2 \dots n \quad (9)$$

$$S_j^- = \min_{1 \leq i \leq m} \{r_{ij}\}, j = 1.2 \dots n$$

Calculate the Euler distance of each country

$$Sd_i^+ = \sqrt{\sum_{j=1}^n (s_j^+ - r_{ij})^2}, i = 1.2 \dots m \quad (10)$$

$$Sd_i^- = \sqrt{\sum_{j=1}^n (s_j^- - r_{ij})^2}, i = 1.2 \dots m$$

Calculate the relative closeness level of each country

$$C_i = \frac{Sd_i^-}{Sd_i^+ + Sd_i^-}, i = 1.2 \dots m \quad (11)$$

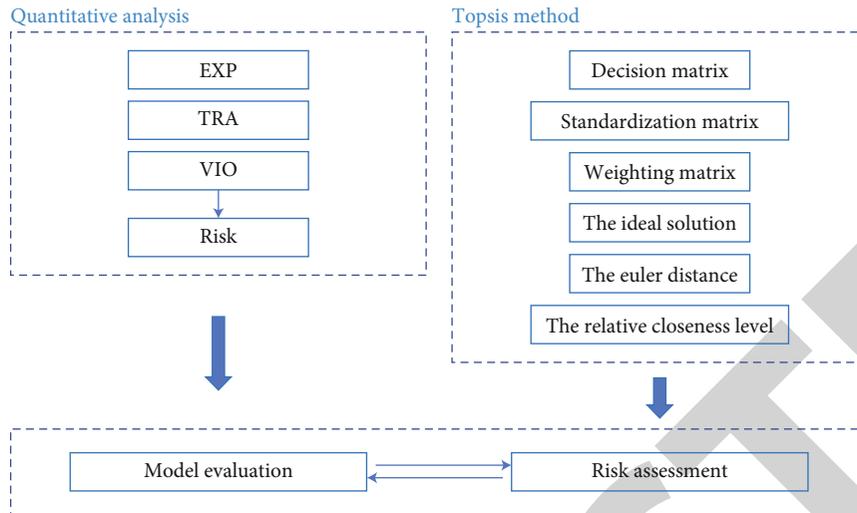


FIGURE 5: Schematic diagram of model processing and risk assessment.

## 4. Results and Discussion

**4.1. Analysis of Direct Investment.** Although the five Central Asian countries experienced social unrest in the early days of the founding of the People's Republic of China and the disintegration of the Soviet Union, they have maintained a relatively stable social state in other periods, and have completed the transformation from a planned economy to a market economy system, with a basically stable macro-economy. From 2008 to 2017, the level of business cooperation environment in the five Central Asian countries rose slightly in individual years. However, due to the numerous environmental factors affecting business cooperation, the process of environmental change needs to be gradual and stable, so the overall level is medium and has been in a continuous state. From the perspective of annual indicators, the C-value of the five countries is basically above 0.3, the average value of the five countries for many years is 0.42, and the business environment is at the upper middle level [27]. The overall business environment is in the process of phased and gradual improvement, thanks to the improvement of various policies and measures implemented by the Central Asian governments in recent years on all aspects of the business environment. For example, Kazakhstan has formulated and implemented the Kazakhstan 2050 strategy and actively implemented the business roadmap to 2020 to ensure the improvement of various soft and hard environments for economic and trade cooperation. Due to the differences in economic reform models and policies adopted by various countries and their respective resource endowments, the business cooperation environment of various countries has been greatly differentiated in recent 10 years. Kazakhstan has a high level of indicators, which once reached 0.65 in individual years. Uzbekistan and Kyrgyzstan are above the middle level, with their respective average levels above 0.4. Only Turkmenistan and Tajikistan have been hovering at a low level for a long time, with the average levels of indicators

being 0.35 and 0.29, respectively. This is because the five Central Asian countries cannot avoid the original social problems in the process of transforming from a planned economic system to a market economy after leaving the Soviet Union, such as low government efficiency, serious corruption, low judicial level, etc., coupled with high inflation, resulting in a low level of the overall business cooperation environment.

Since the Silk Road Economic Belt was put forward, 17 provinces in China have integrated the Silk Road Economic Belt into development based on their comparative advantages. Among them, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang have made great efforts to give play to their geographical advantages in the Silk Road Economic Belt, seize the adjustment opportunities of the country's foreign economy, and take the lead in developing economic and trade cooperation relations in the new era with the five Central Asian countries, as shown in Figure 6. The abscissa represents the gross domestic product (GDP) in US \$100 million, and the ordinate represents the classification.

In 2019, the countries of the Silk Road Economic Belt strengthened regional economic cooperation, reconstructed the industrial value chain of each country, optimized the economic and trade relations and structures among countries, expanded the space for economic and trade cooperation among countries, and made new progress in the construction of regional economic integration. There are 16 countries in the Silk Road Economic Belt, accounting for 28.07% of the four regional economic organizations. The land area is 3962.12 square kilometers, accounting for 56.36% of the four regional economic organizations. The total population is 3.147 billion, accounting for 74.45% of the four regional economic organizations. The total GDP is 13.42 trillion US dollars, accounting for 25.97% of the four major economic organizations. Compared with the other three economic organizations, the Silk Road Economic Belt has a large land area, a large population and sufficient

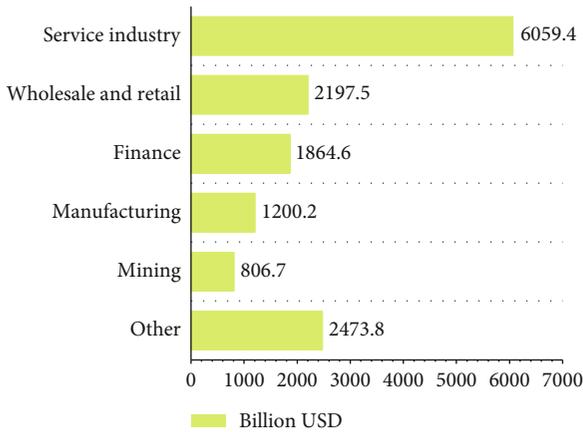


FIGURE 6: Industry distribution of China's direct investment in Central Asia in 2020.

economic development potential, and will become a new growth point of the international economy. From the perspective of the five Central Asian countries, the trade between China and the five Central Asian countries is highly complementary, the total trade volume is increasing year by year, the scope of trade is expanding day by day, and the trade structure is gradually optimized, which has driven the economic growth of both sides and improved the level and quality of foreign trade of all countries.

**4.2. Research on Risk Factors.** In recent years, the international environment has been changing, and the definition and content of political risk have also changed. The modern definition of political risk mainly refers to the change of the domestic political environment of the country that attracts foreign capital, or the change of the international environment of the foreign country that absorbs foreign capital, resulting in uncertainty about the operation of foreign-invested enterprises. The survey of multinational enterprises by international organizations shows that among the risks faced by agricultural enterprises in foreign investment, the impact of political risks continues to rise.

Since the outbreak of the COVID-19, the economies of all countries have been basically traumatized. Due to China's good epidemic control measures, the economic recovery is ahead of other countries, so the scale of foreign investment has not been significantly reduced, and shows a slight upward trend (Figure 7). An increase of 2.6 percentage points compared with 2019, and the completed turnover of US \$11.12 billion, a decrease of 7% compared with 2019, accounting for 58.4% of the total turnover in 2020. Figure 8 shows the distribution of China's investment share in Central Asian countries in 2020. China's foreign investment has developed rapidly, but compared with the operation in China, Chinese enterprises will encounter more risks in the process of foreign investment and trade, which are different from those encountered in domestic investment. Political risk is one of them. The political risks of the five Central Asian countries have a great impact on the agricultural investment of Xinjiang enterprises. Other con-

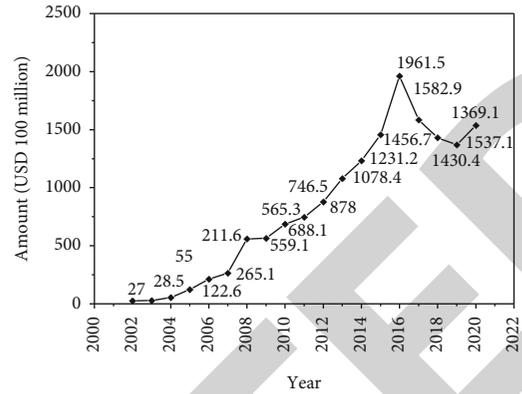


FIGURE 7: China's outward direct investment flows from 2002 to 2020.

ditions are the same, and the countries with high political risks are obviously less attractive to foreign investment. When investors face higher political risks, the uncertainty of investment will increase, and the possibility of causing losses to enterprises will also increase. In short, the occurrence of political risks will affect the business objectives of enterprises. When investing in countries with high political risks but abundant natural resources and high investment returns, enterprises should weigh the advantages and disadvantages of political risks and investment returns to maximize returns.

The construction of infrastructure and service system is directly related to the efficiency of goods import and export and international logistics transportation, which is a key factor affecting the efficiency of investment time. Although China is located in the core area of the "Belt and Road" strategic construction, with the support of various national preferential policies, it has basically built a diversified and three-dimensional hardware infrastructure system, such as international land transportation ports, international airports, oil pipelines and natural gas transportation pipelines, but due to the limitations of natural, climatic and geographical factors, There are still major deficiencies in the basic conditions for carrying out foreign economic and trade cooperation between China and Central Asian countries. Among the five countries in Central Asia, only China and Kazakhstan have achieved international railway intermodal transportation, but the railway transportation track design standards between the two countries are inconsistent. The import and export of goods need to be changed from the international standard railway transportation track to the international port wide gauge to reach China. The intermediate transition process not only increases the time and cost of cargo transportation, but also reduces the speed and efficiency of railway operation. Due to the limitations of natural conditions, some ports have become seasonal ports. The port infrastructure construction lags, and there are problems such as unreasonable layout and uncoordinated management, which seriously affect the efficiency of customs clearance. In terms of software services, countries have spent a lot of energy and time on the review of cross-border import

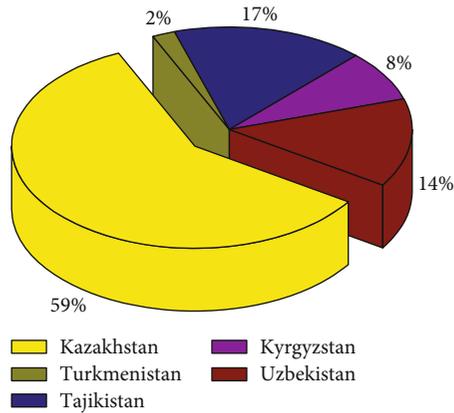


FIGURE 8: Distribution map of Chinese investment in Central Asian countries in 2020.

and export customs clearance documents and the handling of customs clearance procedures. The cumbersome requirements of import and export documents restrict the smooth investment activities and trade of both sides, resulting in customs clearance delays and increased investment costs. The obstacles in basic services make Xinjiang enterprises have more concerns about the investment in Central Asia, which is not conducive to the implementation of the “going out” strategy by Xinjiang enterprises, and also has an adverse impact on the planning, construction and deployment of the “Belt and Road” in Xinjiang.

**4.3. Exploration of Coping Strategies.** There are great differences in the level of trade cooperation among the five countries in Central Asia, and the regional stability in the change of differences provides a basic space for China to carry out trade cooperation with Central Asia, but it also provides a basis for risk consideration of trade cooperation. For class A countries with a good business cooperation environment, namely Kazakhstan, we should try our best to expand the scope and depth of business cooperation, increase the industry coverage on the basis of realizing the scale, and complete the expansion of business cooperation within the country. The scope can be extended to all fields, and the depth can be extended to the form of cooperative operation. At present, the economic and trade exchanges between China and Kazakhstan are mainly the export of various light and light industrial raw materials and the export of light industrial manufactured products. In recent years, the light industry trade between China and Kazakhstan mainly focuses on importing raw materials and selling finished products, mainly in the textile industry, leather industry, etc. Although its domestic light industrial production enterprises have a rapid growth rate, at present, Kazakhstan’s clothing, footwear and textiles are still mainly imported, and nearly 90% of foreign goods. This provides a great space for China to expand trade cooperation. For class B countries with medium business cooperation environment, from the perspective of enterprise risk reduction, they do not seek to expand in scope, and for each country, they should focus

on areas with obvious complementary advantages as far as possible, such as the import of mineral products and the export of manufactured industrial products, reduce the number and scale of cooperation forms in depth, and reduce the impact of uncontrollable risk factors, such as Uzbekistan, China’s main trade cooperation focuses on the import of agricultural and mineral primary products and the export of light industrial manufactured products. In recent years, the form of cooperation has gradually changed from cooperative operation to direct investment, but the amount of investment is small.

Explore the potential of China and the five Central Asian countries in agriculture, animal husbandry, labor and other aspects, promote the cooperation in the construction of breeding bases, agricultural machinery production, agricultural demonstration parks and other infrastructure, and improve the level of economic and trade cooperation in China’s agricultural field.

Popular communication is the social foundation of economic and trade cooperation between China and Central Asian countries. Based on the cooperation principle of “equal consultation, mutual benefit and win-win results, market operation, balance and sustainability”, China should give full play to the communication role of social organizations, non-governmental organizations, ordinary people and other subjects, comprehensively carry out people to people and cultural exchanges with Central Asian countries, vigorously publicize the spirit of the “Silk Road”, and enhance the confidence of both sides in strengthening economic and trade cooperation. If the two countries use a common language, it means that they have the same cultural origin, small cultural differences, similar laws and regulations, and a high degree of intimacy. This harmonious relationship can reduce the transaction costs and commercial risks of enterprises’ investment in the host country, and make up for the disadvantages of newcomers in emerging countries. Work with the five Central Asian countries to combat the three extremist forces, assist the five Central Asian countries to maintain social stability, and create a social environment conducive to bilateral trade cooperation. Thoroughly publicize the economic significance of economic and trade cooperation between China and the five Central Asian countries, focus on the development opportunities and people’s well-being brought by economic and trade cooperation to Central Asian countries, and improve the tolerance of the domestic people and groups of Central Asian countries for bilateral economic and trade cooperation. Improve the decision-making, management and coordination system of economic and trade cooperation, strengthen the coordination and communication between China and the five Central Asian countries, avoid vicious market competition, and improve the macro-control of economic and trade cooperation. Abide by the laws, regulations, customs and cultures of the five Central Asian countries, strengthen environmental protection in the field of economic and trade cooperation, properly handle the relationship with local residents, trade unions, groups and other groups and organizations, and enhance the acceptance of economic and trade cooperation between China and the five Central Asian countries.

## 5. Conclusion

This paper selects the data of China's direct investment in Central Asian countries, adds relevant control variables, and uses the international investment risk assessment model for reference to investigate the specific impact of various risk factors on Chinese enterprises' foreign direct investment and the corresponding avoidance measures. This paper shows that, based on the test results from the perspective of big data of Central Asian countries, China's investment in Central Asia is positively affected by the size of the host country's domestic market, the abundance of natural resources, industrial base and institutional environmental factors, and is negatively related to the growth rate of the host country's GDP, the proportion of labor and population, and the tightness of China's trade with the host country. The above results show that within the framework of the Belt and Road Initiative, the motivation for China's foreign direct investment is different from that of traditional developed countries. From the perspective of industry, China's foreign direct investment covers a wide range of sectors, including agriculture, processing and manufacturing, trade logistics, resident services, infrastructure and other diversified sectors. In particular, China's investment in infrastructure in developing countries has greatly promoted the industrialization and urbanization process of these countries. From the perspective of technological economy, some of the above industries are highly labor-intensive, but more industries have high capital and technology intensity, indicating that China has a higher level of foreign economic cooperation, more diversified investment objectives, which is also more conducive to the economic development and technological progress of the host country, and easier to achieve the goal of win-win cooperation.

Based on the above research conclusions, the constructive significance of this paper lies in: first, to guide the investment differentiation of enterprises that invest in Central Asian countries and optimize the investment structure. Although China's outward direct investment can promote the energy and environmental efficiency of Central Asian countries on the whole, different investment motives show a heterogeneous impact. Chinese enterprises should increase labor and market seeking investment motivation and reduce resource seeking investment motivation, that is, based on the current development stage of Central Asian countries, transfer China's investment industry from resource intensive to labor-intensive, which is conducive to promoting the transformation of the host country's economic development model; Second, enterprises carrying out foreign direct investment activities should establish a strong sense of social responsibility and abandon the pursuit of pure economic interests. Central Asia and Xinjiang, China belong to a large ecological environment system, and the sense of crisis cannot be lost. Third, the overall performance of the economic freedom index of Central Asian countries is poor, reflecting the prominent investment and business environment problems in the region. To get out of this dilemma, we must seize the opportunity of the development of digital economy, make rational use of digital technology and establish an effi-

cient investment model. At present, although enterprises have initially established a response system to the risks of foreign direct investment, and have produced certain results, they are still far behind the pace of foreign direct investment. Therefore, while vigorously developing foreign direct investment, we should effectively prevent and control risks, which requires the joint efforts of the government and enterprises.

## Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The author declares that he has no conflicts of interest.

## References

- [1] L. Chang, J. Li, K.-C. Cheong, and L. T. Goh, "Can existing theories explain China's outward foreign direct investment in Belt and Road Countries," *Sustainability*, vol. 13, no. 3, p. 1389, 2021.
- [2] A. Y. Battamo, O. Varis, P. Sun, Y. Yang, B. T. Oba, and L. Zhao, "Mapping socio-ecological resilience along the seven economic corridors of the Belt and Road Initiative," *Journal of Cleaner Production*, vol. 309, article 127341, 2021.
- [3] M. Becker, S. Böhn, J. Breuing et al., "The role of icodextrin in peritoneal dialysis: protocol for a systematic review and meta-analysis," *Systematic Reviews*, vol. 8, no. 1, p. 35, 2019.
- [4] T. Feng, X. Gong, Y. Guo et al., "Electricity cooperation strategy between China and ASEAN countries under 'The Belt and road'," *Energy Strategy Reviews*, vol. 30, article 100512, 2020.
- [5] J. M. Foggin, A. M. Lechner, M. Emslie-Smith, A. C. Hughes, T. Sternberg, and R. Dossani, "Belt and Road Initiative in Central Asia: Anticipating socioecological challenges from large-scale infrastructure in a global biodiversity hotspot," *Conservation Letters*, vol. 14, no. 6, article e12819, 2021.
- [6] T. Kenderdine and P. Bucsky, "China's belt and road rail freight transport corridors - the economic geography of underdevelopment," *DIE ERDE-Journal of the Geographical Society of Berlin*, vol. 152, no. 2, pp. 91-111, 2021.
- [7] K. Krul, P. Ho, and X. Yang, "Incentivizing household forest management in China's forest reform: Limitations to rights-based approaches in Southwest China," *Forest Policy and Economics*, vol. 111, article 102075, 2020.
- [8] S. Lan, M.-L. Tseng, C. Yang, and D. Huisingh, "Trends in sustainable logistics in major cities in China," *Science of the Total Environment*, vol. 712, article 136381, 2020.
- [9] Y. Tong, H. Zhou, and L. Jiang, "Exploring the transition effects of foreign direct investment on the eco-efficiency of Chinese cities: based on multi-source data and panel smooth transition regression models," *Ecological Indicators*, vol. 121, article 107073, 2021.
- [10] E. Li, M. Lu, and Y. Chen, "Analysis of China's Importance in 'Belt and Road Initiative' Trade Based on a Gravity Model," *Sustainability*, vol. 12, no. 17, p. 6808, 2020.
- [11] L. Junxia, "Investments in the energy sector of Central Asia: Corruption risk and policy implications," *Energy Policy*, vol. 133, article 110912, 2019.

- [12] J. Li and J. Xiang, "Evaluating and Optimizing Transnational Grid Construction Based on Input-Output Analysis under the Background of Global Energy Interconnection," *Polish Journal of Environmental Studies*, vol. 29, no. 5, pp. 3183–3191, 2020.
- [13] W. Li and O.-P. Hilmola, "Belt and Road Initiative and Railway Sector Efficiency—Application of Networked Benchmarking Analysis," *Sustainability*, vol. 11, no. 7, p. 2070, 2019.
- [14] X. Li, C. Liu, F. Wang, Q. Ge, and Z. Hao, "The effect of Chinese investment on reducing CO<sub>2</sub> emission for the Belt and Road countries," *Journal of Cleaner Production*, vol. 288, article 125125, 2021.
- [15] V. Erokhin, L. Diao, and P. Du, "Sustainability-Related Implications of Competitive Advantages in Agricultural Value Chains: Evidence from Central Asia-China Trade and Investment," *Sustainability*, vol. 12, no. 3, p. 1117, 2020.
- [16] L. Liu and M. Cheng, "Benefit and risk evaluation of inland nuclear generation investment in Kazakhstan combined with an analytical MGT method," *Industrial Management & Data Systems*, vol. 13, 2022.
- [17] Z. He, Z. Chong, Y. Yang, Y. Zhou, and Y. Liu, "Evolutionary investment network and the emerging energy power in Central Asia: from the perspective of cross-border mergers and acquisitions," *Journal of Geographical Sciences*, vol. 30, no. 11, pp. 1849–1870, 2020.
- [18] E. Shadrina, "Non-Hydropower Renewable Energy in Central Asia: Assessment of Deployment Status and Analysis of Underlying Factors," *Energies*, vol. 13, no. 11, p. 2963, 2020.
- [19] S. Schindler, M. K. Bayirbag, and G. Boyang, "Incorporating the Istanbul-Ankara high-speed railway into the belt and road initiative: negotiation, institutional alignment and regional development," *Journal of Geographical Sciences*, vol. 31, no. 5, pp. 747–762, 2021.
- [20] I. Amirova, M. Petrick, and N. Djanibekov, "Investment traps and resilience to shocks: an experimental study of central Asian collective water governance," *Irrigation and Drainage*, vol. 4, 2022.
- [21] Z. Shangguan, M. Y. Wang, and W. Sun, "What Caused the Outbreak of COVID-19 in China: From the Perspective of Crisis Management," *International Journal of Environmental Research and Public Health*, vol. 17, no. 9, p. 3279, 2020.
- [22] T. Sternberg, C. McCarthy, and B. Hoshino, "Does China's Belt and Road Initiative Threaten Food Security in Central Asia?," *Water*, vol. 12, no. 10, p. 2690, 2020.
- [23] C. Wang, M. K. Lim, X. Zhang, L. Zhao, and P. T. W. Lee, "Railway and road infrastructure in the belt and road initiative countries: estimating the impact of transport infrastructure on economic growth," *Transportation Research Part a-Policy And Practice*, vol. 134, pp. 288–307, 2020.
- [24] H. Wu, S. Ren, G. Yan, and Y. Hao, "Does China's outward direct investment improve green total factor productivity in the "Belt and Road" countries? Evidence from dynamic threshold panel model analysis," *Journal of Environmental Management*, vol. 275, article 111295, 2020.
- [25] A.-A. Aliev, T. Roberts, S. Magzumova et al., "Widespread collapse, glimpses of revival: a scoping review of mental health policy and service development in Central Asia," *Social Psychiatry and Psychiatric Epidemiology*, vol. 56, no. 8, pp. 1329–1340, 2021.
- [26] J. Zhang, "Oil and gas trade between China and countries and regions along the "Belt and road": a panoramic perspective," *Energy Policy*, vol. 129, pp. 1111–1120, 2019.
- [27] L. Zhou and G. Tong, "Research on the competitiveness and influencing factors of agricultural products trade between China and the countries along the "Belt and Road"," *Alexandria Engineering Journal*, vol. 61, no. 11, pp. 8919–8931, 2022.