

Research on China-Kazakhstan Trade under “The Belt and Road Initiative”—Based on the Perspective of Factor Endowment Theory

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Abstract. Kazakhstan has been kept an important political and economic cooperative partnership with China in Central Asia. Kazakhstan’s new economic policy “Bright Road” “highly agrees with the “the Belt and Road Initiative” advocated by China in 2013. In recent years, the bilateral economic and trade cooperation between China and Kazakhstan has been continuously developing. Based on this this paper primarily analyzes the comparative advantages of the two countries using data and regional revealed comparative advantage index (RCA). Furthermore it verifies the role of factor endowment theory in bilateral trade by analyzing the trade structure between China and Kazakhstan while at the same time comparing the differences between import and export product categories of the two countries. Finally this paper figures out the problems in the trade between China and Kazakhstan under the RCA and puts forward some applicable suggestions and specific measures.

1. Introduction

Under the background of China's "the Belt and Road Initiatives" and Kazakhstan's “Bright Road” economic strategy, we understand the current situation of bilateral trade between China and Kazakhstan by applying factor endowment theory ^[1,2]. In fact we can obtain accurately the complementarity between China and Kazakhstan in bilateral trade based on an analysis of the revealed comparative advantage index. By sorting out the trade situation between China and Kazakhstan in different periods and the trade structure between the two countries, we are intent to analyze the comparative advantages and to figure out the optimal trade and industrial structures contributing to release more potential to the bilateral trade cooperation and promote the development of the countries along the Belt and Road ^[3].

The focus of this paper was to interpret the development status of bilateral trade between China and Kazakhstan, to analyze the commodity structure of China-Kazakhstan trade and to work out the differences of factor endowment between the two countries, so as to put forward suggestions for bettering the development of bilateral trade.

2. Methodology

The total bilateral trade volume between China and Kazakhstan together with the import and export category data of the two countries has been used for overall analysis. The trade opportunity brought by the difference of factor endowment between the two countries was verified by comparing the differences between import and export products of the two countries.

In the empirical analysis, the import and export data between China and Kazakhstan in recent years were used to demonstrate that each country should concentrate on producing and exporting products that could make full use of its abundant factors and import products that needed to make

intensive use of its scarce factors. At the same time, this paper further demonstrated the factor endowment difference and trade difference between China and Kazakhstan with the use of RCA index.

3. Analysis on the current situation of bilateral trade between China and Kazakhstan

3.1 The scale of bilateral trade between China and Kazakhstan

According to the standard international trade classification rev.3 (SITC rev.3), the trade products between China and Kazakhstan can be classified into 10 production divisions, namely SITC0, SITC1, SITC2, SITC3, SITC4, SITC5, SITC6, SITC7, SITC8 and SITC9.

3.2 The period of rapid development of bilateral trade from 2002 to 2013

Due to the absence of formal regulatory treaties in the early stages, China and Kazakhstan frequently were faced with frictions in economic and trade exchanges. Finally the two countries were determined to establish the coordinating mechanisms step by step. In the early years of the 21st century, both countries have signed a plenty of trade agreements as follows: *Framework Agreement of the China-Kazakhstan Horgos International Frontier Cooperation Center*, *China-Kazakhstan Joint Communiqué*, and *China-Kazakhstan Joint Statement on the New Phase of the Comprehensive Strategic Partnership*. These agreements have created a sound environment for promoting the bilateral trade between China and Kazakhstan. In 2013, the China-Kazakhstan import-export volume reached \$28.595 billion, with an increase of 11.3% and 45 times that of 1998. On the other hand, Kazakhstan's export volume to China reached \$1.605 million, 37 times that of 1998. Moreover, the import volume from China reached \$1.255 million, with an increase of 61 times that of 1998. In addition to great trade volume increases, China-Kazakhstan trade cooperation has been expanding to the inland areas. What's more, the traded goods were increasingly diversified, ranging from daily necessities, food stuff, and clothes to some heavy industrial products, such as large mechanical products, industrial products, chemical products, electronic industrial products, and building materials. For Kazakhstan's part, it mainly exports to China energy resources as oil, natural gas and metals as well as minerals.

3.3 The period of "the Belt and Road Initiatives" construction from 2014 to present

On September 7, 2013, the president Xi Jinping of China delivered a speech at the Nazarbayev University of Kazakhstan, where he for the first time proposed the idea of the "The Silk Road Economic Belt". In his speech President Xi Jinping advocated mutual help and mutual development among countries along the Belt and Road region, and wished that Kazakhstan could serve as an "Inland Bridge" connecting to other regions. The President Nursultan Nazarbayev of Kazakhstan made an immediate and proactive respond, expressing that Kazakhstan would like to participate in the regional cooperation, and gain mutual development through strengthened coordination with China. In May 2015, President Xi Jinping paid another visit to Astana. The presidents of two countries decided to set up the connection of the "the Belt and Road Initiatives" and Kazakhstan's new economic policy of "Bright Road". At the Expo held by Astana in June 2017, several meetings have been arranged between President Xi Jinping and President Nazarbayev, and finally it turned out to be "The Silk Road Economic Belt" Initiative between two countries. In 2017, total trade volume between China and Kazakhstan reached \$18 billion, a year-on-year growth by 37.4%.

3.4 The structure of bilateral trade between China and Kazakhstan

Based on the trade structure, the difference in factor endowment between China and Kazakhstan can be clearly worked out.

3.4.1 The export structure from Kazakhstan to China

According to the data, it can be found that the categories of products exported from Kazakhstan are mainly SITC2, SITC3 and SITC6, with fossil fuels, lubricants and related materials of SITC3 which accounted for the highest proportion. In terms of the export products from Kazakhstan to China, they mainly concentrated on SITC2, SITC3 and SITC6. From 2010 to 2013, the export volume of products

of SITC3 has been increasing highly, reaching a peak of 62% in 2013. Despite the slight decline in the following years, products of SITC3 still played the major role in the export goods from Kazakhstan to China. The products of SITC0, SITC1, SITC4, SITC7 and SITC8 could be counted as zero. As a resource-intensive country, Kazakhstan is a typical exporter of raw materials and resources. In terms of mineral resources, China is situated at a disadvantageous position compared with Kazakhstan.

Table 3.1 Proportion of export products from Kazakhstan to China

	SITC-0	SITC-1	SITC-2	SITC-3	SITC-4	SITC-5	SITC-6	SITC-7	SITC-8
2010	0.101%	0.001%	14.293%	54.690%	0.000%	9.476%	21.384%	0.022%	0.013%
2011	0.026%	*	13.963%	59.200%	*	8.066%	18.636%	0.068%	0.028%
2012	0.282%	0.000%	15.229%	55.196%	8.662%	20.649%	0.015%	0.007%	0.000%
2013	0.276%	0.008%	9.507%	62.037%	0.001%	9.356%	18.115%	0.701%	0.004%
2014	0.692%	0.009%	12.585%	52.770%	0.072%	12.367%	20.089%	1.392%	0.018%
2015	0.907%	0.091%	7.48%	39.160%	0.226%	22.195%	29.494%	0.382%	0.055%
2016	1.591%	0.089%	12.424%	24.03%	0.539%	19.743%	19.743%	1.028%	0.072%

Data Source: The UN database (Note: * means the missing data)

3.4.2 The export structure from China to Kazakhstan

In terms of the export products from China to Kazakhstan, it can be found that China mainly exports products of SITC6, SITC7 and SITC8, and the proportion of these three kinds of products is above 15%. The products of SITC8 play a main role in the export from China to Kazakhstan, with a proportion above 50% in 2010. And the proportion of products of SITC6 and SITC7 reached 30% in different years.

Table 3.2 Types of export products from China to Kazakhstan

	SITC-0	SITC-1	SITC-2	SITC-3	SITC-4	SITC-5	SITC-6	SITC-7	SITC-8
2010	1.420%	0.001%	0.113%	0.685%	0.001%	3.348%	21.19%	22.07%	51.150%
2011	1.762%	0.003%	0.085%	0.906%	0.002%	3.758%	19.89%	28.42%	45.097%
2012	1.717%	0.002%	0.057%	0.707%	0.000%	3.840%	20.55%	31.42%	41.697%
2013	1.833%	0.002%	0.064%	1.178%	0.003%	3.781%	20.23%	29.01%	43.837%
2014	1.801%	0.016%	0.068%	1.542%	0.002%	3.438%	17.68%	26.99%	48.420%
2015	2.728%	0.008%	0.109%	1.276%	0.003%	4.449%	22.07%	30.55%	38.715%
2016	2.515%	0.085%	0.047%	0.135%	0.002%	3.818%	22.49%	26.02%	44.844%

Data Source: The UN database (Note: * means the missing data)

4. Calculation and analysis of factor endowment difference between China and Kazakhstan

4.1 Revealed comparative advantage analysis

4.1.1 The implication and calculation formula of revealed comparative advantage index (RCA)

RCA index is to reflect the competitiveness and specialization level of a certain product in the export trade competition of a designated region by calculating the ratios of the proportion of the export value of a certain product or service in the export of that country and the world export value of that product or service in the total export value of the world, with the formula is expressed as:

$$RCA_{ij} = (X_{ij} / X_{it}) / (X_{rj} / X_{rt}) \quad (1)$$

In the formula, RCA is the regional revealed comparative advantage index of the j-th commodity in country i; X_{ij} is the export value of the j-th commodity in country i ($X_{ij} > 0$); X_{it} is the export value of all commodities in country i; X_{rj} is the export value of the j-th commodity in region r; X_{rt} is the export value of all commodities in country r. If $RAC \geq 2.5$, the country's services are highly competitive; if $1.25 \leq RAC < 2.5$, the country's services are highly competitive; if $0.8 \leq RAC < 1.25$, the country's services are moderately competitive; if $RAC < 0.8$, the country's service competitiveness is weak.

4.1.2 Revealed comparative advantage of bilateral trade between China and Kazakhstan

Based upon the data of bilateral trade between China and Kazakhstan in 2013, 2014, 2015 and 2016,

We can use RCA formula to calculate the revealed comparative advantage between China and Kazakhstan. By comparing the RCA index of China and Kazakhstan, the difference in factor endowment between the two countries can be clearly seen. According to Table 4.1, it can be found that RCA index of products of SITC6, SITC7 and SITC8 is relatively high in China, which has obvious comparative advantages compared to Kazakhstan. Products of SITC6 and SITC8 are labor-intensive, while products of SITC7 are technology-intensive. As can be seen from table 4.2, RCA index of products of SITC2, SITC3 and SITC6 is relatively high in Kazakhstan, which has obvious comparative advantages compared to China. The products of SITC2 are non-edible raw materials other than fuel; the products of SITC3 are fossil fuels, lubricants and related substances, and the products of SITC6 are manufactured goods by material classification. The first two categories are resource-intensive and the latter is labor-intensive.

Compared with China, Kazakhstan has a strong comparative advantage in exporting products of SITC2 and SITC3. RCA index of products of SITC2 and SITC3 is basically above 1.25, have a strong level of trade competitiveness. In contrast, the RCA index of China appears to be small, and both are less than 0.8. Kazakhstan is characterized by its export of raw materials and resources such as rich mineral resources. Kazakhstan is rich in resources and has obvious endowment advantages of resource factors, while products of SITC3 in China has a relatively weak comparative advantage in export, thus the export products from Kazakhstan to China is mainly concentrated on resource-intensive industries.

Table 4.1 Revealed Comparative Advantage of China

	SITC-0	SITC-1	SITC-2	SITC-3	SITC-4	SITC-5	SITC-6	SITC-7	SITC-8
2013	0.413	0.147	0.163	0.094	0.052	0.507	1.341	1.430	2.339
2014	0.397	0.151	0.175	0.110	0.054	0.534	1.352	1.335	2.219
2015	0.423	0.166	0.178	0.140	0.053	0.533	1.339	1.298	2.113
2016	0.451	0.193	0.180	0.145	0.054	0.513	1.336	1.254	2.011

Data Source: The UN database

In terms of capital or technology-intensive products in SITC5, SITC7 and labor-intensive products in SITC8, China has obvious comparative advantages over Kazakhstan, which is in line with the characteristics of resource sharing and complementary industrial structure between China and Kazakhstan. Products of SITC7 and SITC8 in China have certain comparative advantages compared with Kazakhstan, but these competitive advantages in the international market are not obvious and can easily be replaced by other countries. From 2013 to 2016, RCA index of products of SITC7 in Kazakhstan was relatively low, with a weak revealed comparative advantage, and the index has not been significantly improved. Compared with the data in the two tables, it can be seen that China is situated at an advantage position compared to Kazakhstan in terms of labor-intensive and capital-technology-intensive products. Kazakhstan's advantage in resources enables it to have a strong competitiveness in mineral resources. The differences in factor endowments between China and Kazakhstan lead to the differences in products traded between the two countries, and also promote the great trade potential between the two countries.

Table 4.2. Revealed Comparative Advantage of Kazakhstan

	SITC-0	SITC-1	SITC-2	SITC-3	SITC-4	SITC-5	SITC-6	SITC-7	SITC-8
2013	0.449	0.210	1.230	4.714	0.100	0.342	0.804	0.044	0.027
2014	0.425	0.238	1.284	5.716	0.126	0.334	0.721	0.068	0.024
2015	0.482	0.161	1.459	4.505	0.090	0.352	1.113	0.042	0.061
2016	0.517	0.181	1.409	6.896	0.266	0.355	1.484	0.049	0.071

Data Source: The UN database

5. Conclusion

Based on the analysis of the trade situation between China and Kazakhstan, conclusions can be made as follows: In the context of economic globalization and the "the Belt and Road Initiatives", China has

been experiencing an economic growth and regional integration. As one of the five Central Asian countries, Kazakhstan plays an important role in the strategic development of regional trade in Asia. The facts show that since 1995 when China and Kazakhstan have started the cooperation, the two countries have obtained a plenty of achievements through the cooperation, which demonstrates the necessity and superiority of China-Kazakhstan economic and trade cooperation. Despite the achievements, China and Kazakhstan still face some problems demanding prompt solution.

The first problem is that the bilateral trade potential remains to be exploited. In this respect, it is important to expand the bilateral trade scale and keep enhancing the economic and trade relation. Our increasing energy demand can be well satisfied with the rich natural resources, especially oil and gas and mineral resources in Kazakhstan^[4]. This lays a solid foundation for the bilateral energy trade cooperation. In addition, it is necessary to accelerate economic restructuring, thus achieving competitive and complementary development. China should pay attention to accelerating the upgrading of industrial structure, enhancing diversity of products, so as to improve the level of export. China should strengthen the infrastructure construction of bilateral trade, especially the construction of railways, ports and airports, which aims at establishing advanced transportation and logistics network, effectively reducing transportation and labor costs, and enhancing market competitiveness^[5].

The second problem is that the trade structure between the two countries is unreasonable. The commodities traded between the two sides are mainly resource-intensive and labor-intensive products, while the proportion of capital-intensive and technology-intensive products is relatively low and trade in service developing very slowly, thus the trade structure requires immediate improvement^[6]. To this end, both two countries should actively adjust the structure of export products. Concretely speaking, it is necessary to adjust the export mode focusing on resource-intensive and labor-intensive products in the past and strive to increase the added value of products. What's more, China and Kazakhstan should take the "the Belt and Road Initiatives" proposed by China and the "Bright Road" new economic policy proposed by Kazakhstan as development opportunities, make full use of their own resources and advantages, and jointly promote the coordinated development of regional economic and trade development^[7].

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