

Study on industrial manufactured goods trade potential between Chinese and the five Central Asian countries under the Belt and Road policy background

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Abstract: After China announced "The Belt and Road" strategy, which has aroused strong repercussions in the world, and the relevant countries on this strategy have very high expectations. Five Central Asian countries are one of the core areas of "The Belt and Road" strategy. This article use date derived from the bilateral trade present situation of the manufactured goods of China and the five Central Asian countries to study the potential trade in manufactured goods between China and Central Asia five countries. Firstly, we use the index method. The analysis results show that Chinese and the five Central Asian countries trade of manufactured goods has a good degree of trade integration, but also has a strong advantage in export competitiveness. However, in terms of trade complementarity in addition to Kyrgyzstan are not ideal. Then, the variables such as population, railway transportation, border, whether it belongs to the Shanghai cooperation organization and whether it belongs to the WTO organization of the import country and export country are added into the gravity model .The text uses the above model to collect data for empirical analysis, and then use the regression model to calculate the trade potential. The results show that the trade of manufactured goods between China and the five Central Asian countries is in the stage of trade expansion, and has a certain space for development. Finally, according to the results of the analysis, the paper gives some suggestions to promote the development of trade in manufactured goods between China and five Central Asian countries.

Keywords: Belt and Road Initiative; Five Central Asian countries; Manufactured Goods; Trade potential; Gravity model

1. Introduction

Central Asia has always been an important place for China to reach the European continent. Since the independence of the five Central Asian countries, China has actively developed relations with five Central Asian countries, and has achieved remarkable results. The industrial base of the five Central Asian countries is weak, so a large number of its manufactured goods are imported. But the trade of manufactured goods between China and five Central Asian countries is not active, and its trade volume accounts for only about 1% of China's total import and export volume. With the implementation of the "Chinese Belt and Road Initiative" strategy, China must accelerate the development of trade with Central Asian countries. Therefore, manufactured goods, as China's dominant products, play a more important role in the bilateral trade relations between China and the five Central Asian countries. What is the potential of China's industrial trade with five Central Asian countries? And how to increase the scale of trade in manufactured goods between China and Central Asian countries? These problems are perplexing Chinese government and enterprises. The purpose of this study is to expand the gravity model to analyze the China and Central Asia industrial manufactured goods trade potential, and put forward targeted recommendations, which provides reference for China and five Central Asian countries of the industrial manufactured goods trade.

2. Related literature review

Bi Yanru (2010) estimates the trade potential of China and the five Central Asian countries, and she makes an empirical study on trade complementarity index and gravity model. The results show that the five countries in Central Asia have close trade relations with China, but China does not attach much importance to the trade relations with five Central Asian countries; The gravity model results show that Chinese economic growth can help to GDP growth in the five countries of Central Asia; five Central Asian population has a negative effect on China export products; the border that has a positive effect on both sides of the outlet; spatial distance has a negative impact on bilateral trade; whether it belongs to the members of the SCO had no obvious effect on both sides trade. Yang Lizhuo, Liu Xuejiao and Yu Wence et al. (2015) study the problem of trade complementarity between the China and Central Asian countries under the Belt and Road background. They measured the trade complementarity index and selected Kyrgyzstan, Kazakhstan and Afghanistan as the sample. In this study, we analyzed the trade complementarity of various commodities under the SITC classification standard from 2005 to 2013, and the intra industry trade complementarity between China and Central Asian countries. The results show that there are obvious differences in the trade complementarity between China and the Central Asian countries in terms of trade complementarity and intra industry competitiveness. They chose the trade complementarity index as a measure, and selected Kyrgyzstan, Kazakhstan and Afghanistan as samples. In the study, they analyzed the trade complementarity of various commodities under the SITC classification standard from 2005 to

2013, and the trade complementarity between China and Central Asian countries. The results show that there are obvious differences in the trade complementarity between China and the Central Asian countries, as well as the competitiveness of the industry. Zhu Zhiming, Ding Haiyan and Chen Xiaolin (2015) studied the relationship between the economic growth of the five Central Asian countries and China OFDI under "Belt and Road Initiative" policy. In the study, they used the traditional C-D function, and cited the economic data from 2003 to 2013 to make empirical regression analysis. The results showed that Chinese OFDI helpful effect on Kazakhstan, Tajikistan and Turkmenistan's economic growth, but in Kyrgyzstan, Uzbekistan's economic growth has no significant help, and based on the results of the analysis are given in different countries investment advice.

3. Analysis on the competition and complementarity between China and the five countries in Central Asia

The RCA (1989) was first proposed by the Balassa, which can be used to measure the competitive advantage of a certain country (region). For the calculation results of RCA rules are as follows: RCA value is higher than 2.5, which indicates that the export competitiveness is very strong; the RCA value between 1.25 and 2.5, which indicates a relatively strong export competitiveness; the RCA value between 0.8 and 1.25, which indicates that the export competitiveness; RCA value less than 0.8, which indicates that export competitiveness is not enough. The export competitiveness of China and the five Central Asian countries are showed in Figure 1.

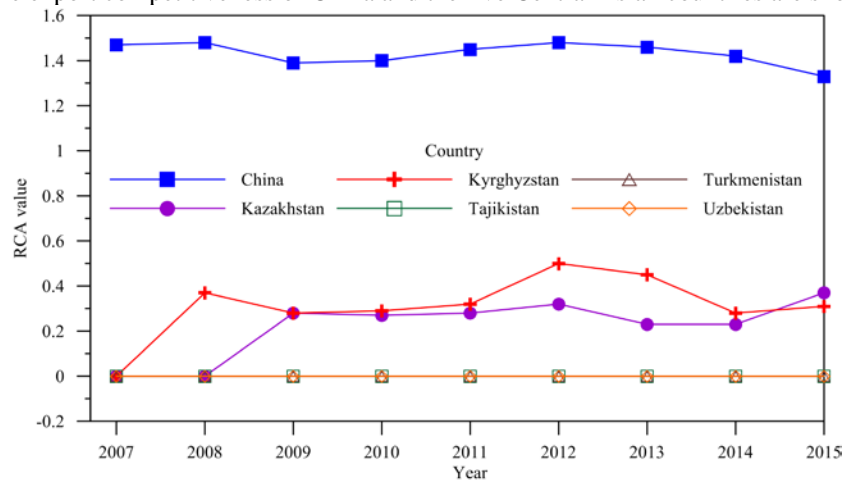


Figure 1 RCA value of manufactured goods in China and five Central Asian countries

Data source: China Statistical Yearbook and UN Comtrade

Can be seen from Figure 1, China industrial manufactured goods' RCA indicates that the export competitiveness of its products are relatively strong, and the five Central Asian countries industrial manufactured goods' RCA values were less than 0.8, which indicates that the product export competitiveness is relatively weak, furthermore some countries do not even export of manufactured goods.

The trade competition index is also known as the export specialization index, which is abbreviated to TC. The index is to calculate the value of a country's net exports of certain products and the export value of the product and the ratio of the value of imports, which is one of the main indicators to measure the international competitiveness of products. The numerical range of TC is between -1 and 1. When the TC value is between 0.5 to 1, which indicates that the product export competitiveness is strong, while the TC value is between 0 to 0.5, which indicates that competitive advantage is relatively weak, While 0 shows its export competitiveness and the international average is roughly the same, below 0 indicates that the lack of competitiveness. China and the five Central Asian countries respective industrial manufactures trade competition index see Figure 2.

As can be seen from Figure 2, the TC value of China's manufactured goods has been in the range from 0 to 0.5, which indicates that China's competitive advantage of manufactured goods is weak. The TC value of the industrial products of the five Central Asian countries is below 0, which indicates that China's exports of manufactured goods to the five Central Asian countries have trade advantages.

The degree of trade combination index refers to the degree of interdependence between the commodity importing countries (regions) and the exporting countries (regions). When the trade association index is equal to 1, this shows that the level of trade between the two countries in the general state, that is not very loose, not very close; When the index is less than 1, it shows that the trade between the two countries is below the average level, that is to say the relationship is relatively loose; When the index is greater than 1, this shows that the trade between the two countries is beyond the general level, that is to say the relationship is very close.

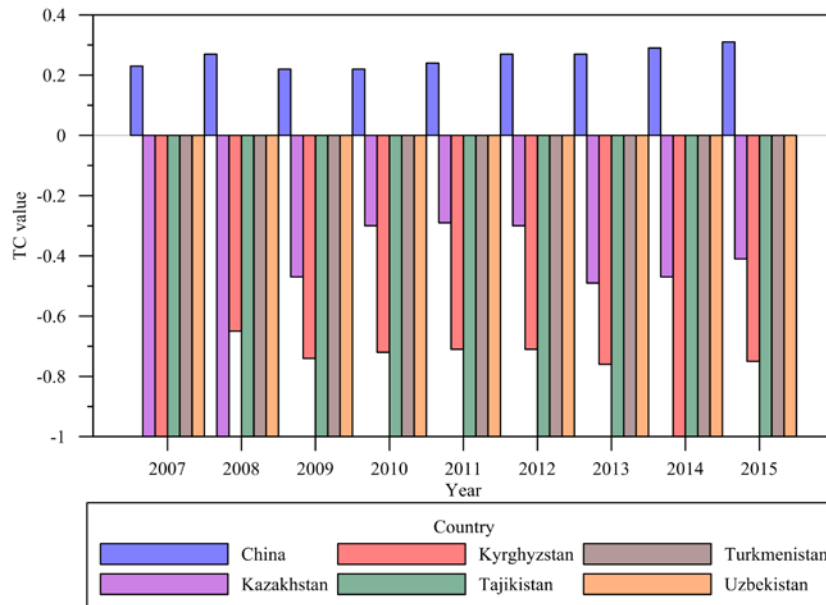


Figure 2 TC value of manufactured goods in China and five Central Asian countries
Data source: China Statistical Yearbook and UN Comtrade

This study from the UN Comtrade website query to the five Central Asian countries with the rest of the world's manufactured goods import trade data as well as the world's total imports, at the same time from China statistical yearbook query to China to the five Central Asian countries and China's total import and export of manufactured goods exports data, Finally, according to the formula, we calculated the trade complementarity index between China and the five Central Asian countries from 2007-2015, the details are shown in Figure 3.

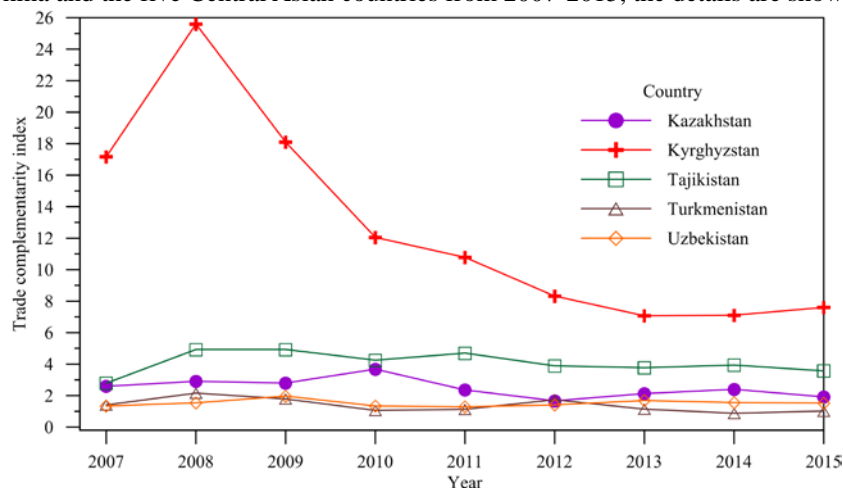


Figure 3 Trade complementarity index between China and five Central Asian countries
Data source: China Statistical Yearbook and UN Comtrade

As can be seen from Figure 3, the trade value of manufactured goods between China and five Central Asian countries is greater than 1 in most years, this shows that China and the Central Asian countries trade in manufactured goods is very close. This is mainly because the five Central Asian countries in addition to the mining industry, the rest of the industrial base is very weak, and its domestic market there is a huge demand for manufactured goods. China as the world's largest manufacturing country to provide the industrial manufactured goods with the advantage of geographical location quickly entered the five Central Asian markets, and the formation of the current close trade relations.

The trade complementarity index TCI is the dominant comparative advantage index. This index is used to indicate the close relationship between different countries (regions) of the trade in goods. The decision rules of TCI exponent calculation results are as follows: $TCI > 1$ showed that bilateral trade complementarity is strong; the larger the value of TCI, which indicates that the higher degree of I in export product category and K imported product categories; TCI is less than 1, which indicates that the two sides of the trade complementarity is poor, and the degree of deviation from the export import I of product categories and K in production the higher the product category. China and the five Central Asian countries trade in manufactured goods trade complementarity see Figure 4.

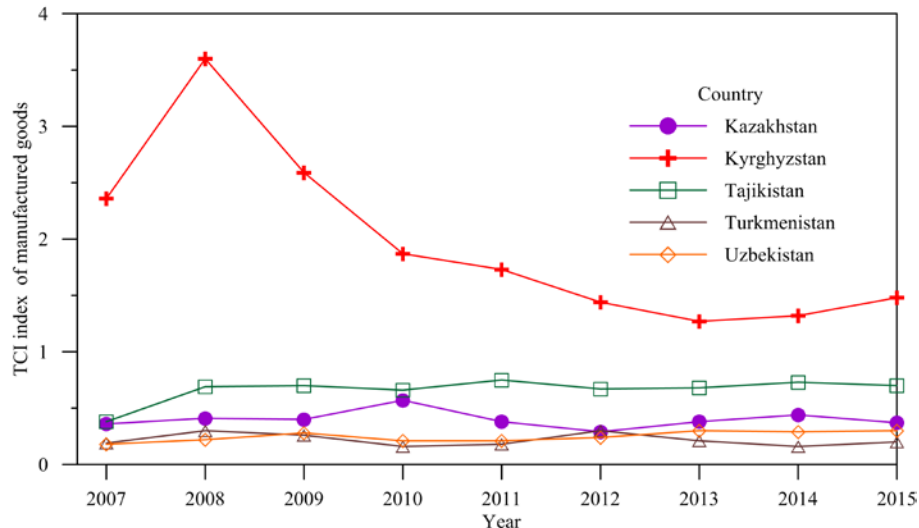


Figure 4 TCI index of manufactured goods between China and five Central Asian countries

Data source: China Statistical Yearbook and UN Comtrade

As can be seen from Figure 4, Kyrgyzstan and China's trade complementarity is strong, while the other four countries and China's trade complementarity is weak.

4. Model construction and research hypothesis

In recent years, the gravity model has been applied more and more to the field of international trade, especially in measuring the potential of international trade. The gravity model is often used to predict the trade potential between the two countries and analyze the status quo of trade between the two countries. In this paper, we will calculate the trade potential of China to five Central Asian countries from level of the Industrial product. This study analyzes the factors that affect the trade potential of each other, so as to develop effective response and improvement measures. On the basis of gravity model, we introduced the variables such as population, railway transportation, border, whether it belongs to the Shanghai cooperation organization and whether it belongs to the WTO organization of the import country and export country into the gravity model. According to the viewpoint above mentioned, this study will use the econometric model to test twelve assumptions (detailed information can be seen below).

5. Empirical test

This paper chooses the four major industrial manufactured goods of China and five Central Asian countries (n.o.s. chemicals and related products, according to the classification of raw materials manufactured goods, machinery and transport equipment, miscellaneous products trade) as research object, and the five types of industrial manufactured goods' import and export volume has accounted for the total bilateral import and export of manufactured goods more than 90%. The data used in this paper is the panel data, the time span is from 2007 to 2015, and the cross section is the five Central Asian countries, namely: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan. The import and export trade data of China and five Central Asian countries on industrial manufactured goods come from the United Nations commodity trade database (UN COMTRADE); Gross domestic product (GDP) and GDP per capita are the nominal values, and the data are derived from the world bank's world development index Indicators (World Development); The added value of industrial output accounted for the proportion of GDP, and the volume of railway special purchases for the Spring Festival goods trade accounted for the proportion of GDP data source is also in the world bank's world development indicators database; The distance variable is the distance between the capitals of the five Central Asian countries and Beijing, and the data from the <http://www.indo.com/distance/> website; Common boundary variable data from People's Republic of China map; SCO and WTO variable data were derived from the official website of the Shanghai cooperation organization and the World Trade Organization official website.

The estimation method of panel data model has a great influence on the result, so it is necessary to determine which method to use in the end. In general, the main methods used are fixed effects model, random effects model, etc. The data were input into STATA12.0 software for regression analysis, and then Hausman test, the final results show that Prob>0.05 in the Hausman test. Then the results reject the null hypothesis, so the model uses random effects regression model. The results of the random effects regression model suggest that the overall regression value of Prob was <0.05, which indicated that the model was significant. $R^2 = 0.9701$, which shows that the model can explain 97.01% of the manufactured goods trade information between China and the five Central Asian countries. Therefore, the final regression model will answer the twelve assumptions test.

Table 1 Validation results summary

Serial number	Research hypothesis	Research conclusion
1	The nominal GDP of the importing country is positively related to the total import and export volume of a certain kind of manufactured goods	Establish
2	The nominal GDP of the exporting country is positively related to the total import and export volume of a certain kind of manufactured goods	Establish
3	The total population of the importing country is positively related to the total import and export volume of a certain kind of manufactured goods	Establish
4	The total number of exporting countries is negatively related to the total import and export volume of a certain kind of manufactured goods	Establish
5	The proportion of imports of manufactured goods to GDP is a negative correlation with the total import and export volume of industrial products	Establish
6	The proportion of added value of manufactured goods to GDP in the exporting countries is positively related to the total import and export volume of a certain kind of manufactured goods	Not set
7	There is a positive correlation between the annual freight capacity and the total import and export volume of a certain kind of manufactured goods	Establish
8	The annual freight capacity of domestic railways is positively correlated with the total import and export volume of a certain kind of manufactured goods	Establish
9	The distance between the two countries is negatively correlated with the total import and export volume of a certain kind of manufactured goods	Establish
10	Whether the two countries share a common boundary is positively correlated with the total import and export volume of a certain industrial manufactured goods	Establish
11	Whether or not it belongs to the Shanghai cooperation organization is positively correlated with the total import and export volume of some industrial products	Establish
12	Whether or not it belongs to the WTO organization is positively correlated with the total import and export volume of a certain kind of manufactured goods	Not set

As can be seen from Table 1, in addition to the sixth and the twelfth assumptions are not established, the rest of the research hypothesis is established. Now we analyze the reasons for the failure of the sixth and twelfth assumptions as follows: From the perspective of China's GDP structure, China's economic structure has undergone tremendous changes between 2007-2015 years. The proportion of the third industry in China is rising rapidly, and in 2012 for the first time exceeded the proportion of the second industry, which indicates that during this period China's industrialization process has come to the end. Although the output value of the second industry is growing, but its growth rate is lower than the third industry, which led to a decline in the proportion of China's GDP industry in the second industry. The proportion of industry in GDP also showed the same trend, so the research results of the proportion of manufactured goods accounted for GDP in the exporting countries do not accord with the Sixth Research hypotheses.

From the perspective of organizational design of WTO, its core rights are in the hands of the western developed countries led by the United States. For developing countries, it is subject to multiple restrictions in the western developed countries under the WTO framework. For example, China's market economy status has not been recognized by Western countries. Therefore, the WTO framework as a whole is for the western developed countries, which is not conducive to the promotion of trade between the third world countries. Therefore, it is also a negative influence on the trade between China and the five Central Asian countries, which is the reason why the twelfth hypotheses are not established. Since this study involves 12 variables, in order to simplify the whole process, we need to carry out the principal component analysis of all variables, and the results of the principal component analysis decipher that there are a total of 4 components with a characteristic value of more than 1, which means that the 12 variables can be extracted from the 4 principal components. The cumulative variance of the 4 principal components is 86.49%, which indicates that the 4 principal components can explain the information of the whole model of 86.49%.

In order to determine the validity of principal component analysis, we performed SMC and KMO tests on the results. The test results reveal that the SMC values of the other variables in the SMC test results are higher than 0.8, except for the railway capacity of the exporting countries. From the results of KMO test we can see, only such variables KMO of value including the export of the country population, imports of manufactured goods accounted for the proportion of GDP and the export of industrial manufactured goods accounted for the proportion of GDP more than 0.6, and whether belong to the WTO KMO value exceeds 0.5, while the overall KMO value < 0.5, which indicated that the main component analysis results can not be accepted. Therefore, we should reject the results of principal component analysis, while the trade potential between China and five

Central Asian countries cannot be studied using principal component analysis.

6. Trade potential measurement

We will export data into the regression model in the calculation of industrial manufactured goods in theory, and the theoretical results are compared with the actual export volume, so we can compare the results to estimate the trade potential. In the comparison between theoretical value and actual value, this paper will refer to Wang Jing (2015), in which the trade potential can be divided into the following categories: great potential, potential development and potential reconstruction of the three types. When the ratio of the two is not more than 0.8, this shows that the trade potential is huge, which shows that the two sides have great potential in the trade of manufactured goods; When the ratio between the two is between 0.8-1.2, indicating the potential for trade development, which also shows that the two sides in the trade in manufactured goods, there is still some room for improvement; When the ratio of the two is more than 1.2, it indicates that trade belongs to potential re-establishment, which means that both sides need to open up new growth points in the trade of manufactured goods. China and the Central Asian countries in the trade of manufactured goods in 2007-2015 all belong to the potential development. If you want to continue to enhance the total bilateral trade of manufactured goods, the five Central Asian countries must guide consumers to change their ideas, and increase their demand for Chinese industrial manufactured goods, so that they can promote the export of industrial manufactured goods growth.

7. Conclusions

The purpose of this study is to evaluate the trade potential of the manufactured goods between China and five Central Asian countries. In this paper, two methods are used: the index method and the gravity model, finally, the following conclusions are obtained: First, China and the five Central Asian countries in the trade of manufactured goods in a stable stage of development. The industrial base of the five Central Asian countries is weak, so they have a great demand for manufactured goods. China's manufactured goods have strong export competitiveness, so China has the ability to continue to participate in the Central Asian market competition. Second, there is a difference between China and the five Central Asian countries in the trade of manufactured goods. In addition to Kyrgyzstan, the other four countries and China's trade complementarity are poor. Third, bilateral trade of manufactured goods between China and the five Central Asian countries has certain potential. Judging from the results of the trade potential, the trade of manufactured goods between China and the five Central Asian countries is in the opening stage.

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