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A Gravity Model Study on the Impact of the "Belt and Road" Trade Facilitation on Agricultural Products Trade

Hongyi Sun

University of Southern California, Marshall School of Business – 3551 University Ave, Los Angeles, CA 90089

hongyisun2023@163.com

Abstract

In order to solve the problem that China's agricultural trade prospects in the "the Belt and Road economic belt" are unclear, this paper proposes a prediction system based on the stochastic frontier gravity model.This process examines the current situation of agricultural industry and the change of economic structure in China and the five Central Asian countries from three aspects of import and export. Model agricultural products and country models, and assess the agricultural potential of both sides in the current state. Comparative advantage index and market complementarity index are used to analyze competition and integration. Then, from the country level and product level of China's agricultural exports to the five Central Asian countries, the market analysis and market value calculation. The results show that in China's export market, the second type of agricultural products are mainly exported to the five Central Asian countries, accounting for more than 50%, and about 1/4% of the first and fourth types of agricultural products. ; The average export efficiency of China's agricultural products to the five Central Asian countries is 71.8%. The average import efficiency of agricultural products between China and the five Central Asian countries was

79.6%. This proves the reliability of the framework proposed in this paper for forecasting changes in China's agricultural and export markets through economic support.

Keywords: The Belt and Road; Agricultural products trade; Random frontier gravitational model; Trade efficiency

1 Introduction

Since the outbreak of the financial crisis in 2008, against the background of sluggish global economic growth, trade protectionism in the field of trade and investment has risen in the world, which has greatly restricted world economic growth. Compared with tariff barriers, "trade inefficiency", as a hidden market access barrier, has greater obstacles to trade. According to the WTO Global trade report, the global trade growth in 2014 was about 2.8%, and the trade growth rate was at a low level for many years[1]. According to the estimation of the Asian Development Bank, the transaction cost of trade facilitation accounts for about 1% - 15% of the value of international trade. As the world's largest foreign trade country, China's complicated trade procedures have also become the bottleneck of China's foreign trade growth. The opportunities and challenges of the "the Belt and Road" initiative for the development of China's agricultural exports are shown in Figure 1.

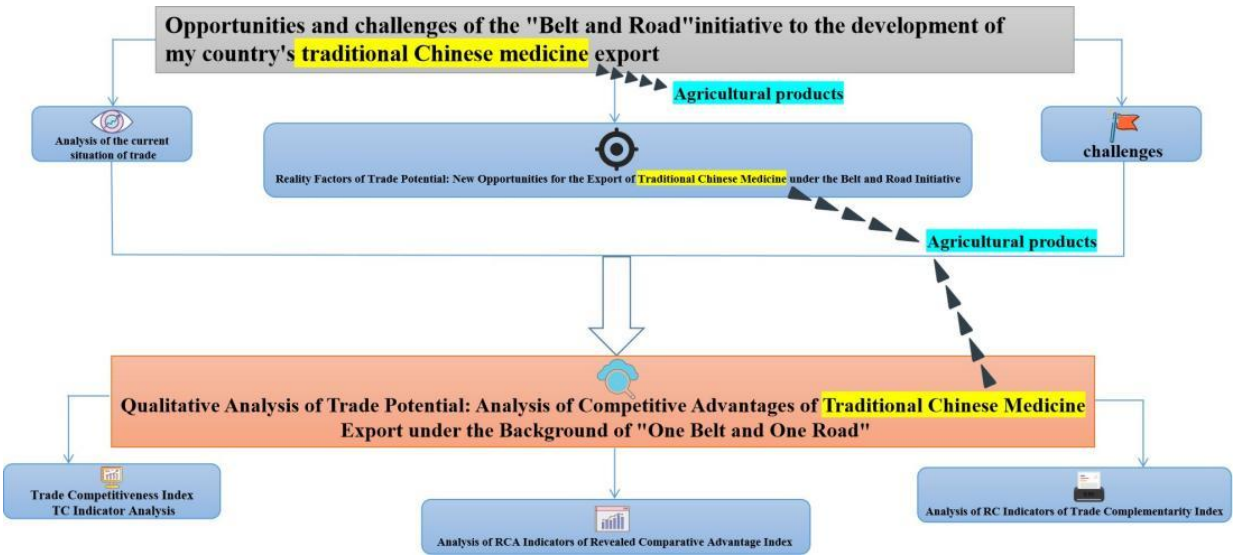


Figure 1 Opportunities and challenges of the "the Belt and Road" initiative to the development of China's agricultural products export

The COVID-19 pandemic has seriously hindered people-to-people exchanges and economic and trade cooperation among countries, and has had a profound and complex impact on the international community. However, economic globalization is an objective reality and historical trend[2]. Trade in cultural products has played an important role in promoting exchanges and cooperation between countries and opposing trade protectionism. The Belt and Road Initiative is China's plan to build political mutual trust, cultural inclusiveness and economic integration. It has been transformed from an initiative into a popular public good around the world. Countries along the Belt and Road have different historical backgrounds, rich and diverse cultures, and complex development environments and geopolitics. Therefore, there are considerable differences in trade facilitation among countries along the Belt and Road. How to take advantage of the high-quality development opportunities of the Belt and Road Initiative, expand the export of Chinese cultural products to countries along the Belt and Road, broaden the channels for the dissemination of Chinese culture, and achieve better connectivity is an important topic worth studying.

Among them, China's exports to B&R countries only account for 29.48 percent of total exports. In recent years, China's agricultural exports have been concentrated in the region, with limited economic growth potential. With the continuous promotion of the "One Belt and One Road" strategy, agricultural trade between China and countries along the "One Belt and One Road" will increase, and China's economy and agriculture will find new growth points. With the signing of the Free Trade Agreement of the World Trade Organization and the promotion of the "Belt and Road" construction, how to improve trade fairs is of great significance to improve the trade relations between China and countries along the "Belt and Road"[3].

No. 1 central document of 2019 pointed out that "it is necessary to ensure the supply of grain and other important agricultural products at home and make overall use of the international and domestic markets and resources". At present, China's grain cannot be fully self-sufficient. Driven by the long-term extensive agricultural growth mode, the output of grain and other major agricultural products is difficult to sustain growth. Therefore, the moderate import of agricultural products is not only conducive to ensuring food security, but also can effectively relieve the pressure of domestic agricultural resources and environment.

The concentration of China's agricultural product import sources has been high, and concentrated in the United States, Canada and other few countries. Under the current background of frequent Sino US trade frictions and increasingly intensified international

agricultural trade conflicts, promoting the diversification of agricultural product import channels will help to further safeguard China's food security.

Therefore, it is of great significance to fully study the agricultural export potential of countries along the Silk Road Economic Belt to expand China's economic development. Economic and geographical location, access to all foreign agricultural resources, as well as food security are important[4].

2 Literature review

Agricultural products are mainly concentrated in category 0 and category 2 products, with a small amount in category 1 and category 4 products. See Figure 2 for details.

Class 0 (including live animals, meat and meat products, molluscs, grains and grain products, honey, coffee, tea, cocoa, spices, etc.)

Category 2 commodities (including raw materials, including leather, rawhide, raw rubber, oilseeds, oily fruits, natural rubber, etc.)

Category 1 commodities (including beverages, tobacco and tobacco manufacturing)

Category 4 commodities (including animal oil, vegetable oil, grease and wax, etc.)

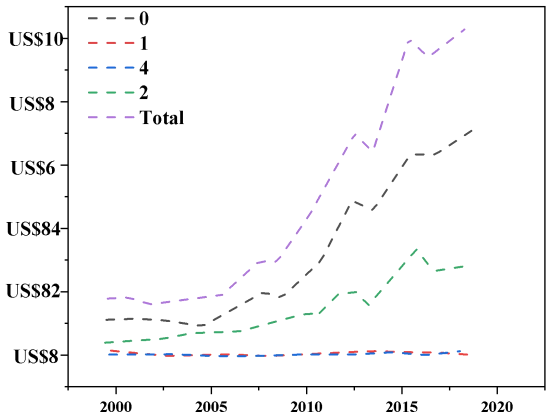


Figure 2 China's agricultural products export trade volume to countries along the "the Belt and Road" (USD billion)

Figure 2 shows that from 2000 to 2019, China's agricultural product exports showed obvious stages. From 2000 to 2006, the export trade volume has been maintained at about US $2 billion; From 2007 to 2012, China's agricultural product exports grew rapidly from US $2.246

billion to US $7.066 billion in 2013. Due to the "bonus of WTO entry" and the strong demand of emerging economies, China's agricultural product export curve to countries along the line has become steep. In 2014, affected by the international financial crisis, the trade volume fell back to US $6.384 billion. From 2015 to 2016, it continued to grow rapidly to US $10.099 billion. After a brief drop to US $9.370 billion in 2017, it reached US $10.252 billion again in 2019 [5].

According to statistics (see Table 1), Russia is the largest exporter of agricultural products to China, importing 2.276 billion US dollars, accounting for 22.2% of China's export trade with countries along the Belt and Road. Germany was a close second and the UK a wide third. Five Central Asian countries, Iran and Ukraine are in the lower category, while the periphery of Central Asia and India are in the middle category.

Table 1 Trade partners of China's exports to countries along the "the Belt and Road" in 2019

Export destination country	Export amount of agricultural products (USD million)	Proportion in export trade of countries along the the Belt and Road economic belt (%)
Russian federation	2275.82	22.2
Germany	2194.39	21.4
britain	1160.47	11.32
Italy	964.99	9.41
India	692.05	6.75
France	576.19	5.62
turkey	459.70	4.48
Pakistan	453.75	4.43
Saudi Arabia	315.66	3.08
Egypt	252.15	2.46
Iran	240.06	2.34
Kazakhstan	238.02	2.32
Kyrgyzstan	185.73	1.81
Ukraine	154.18	1.50
Uzbekistan	57.67	0.56

Tajikistan	18.89	0.18
Turkmenistan	12.08	0.12

Because of its simple form and can better explain the economic phenomenon in trade, the gravitational model has always been the basic model for studying international trade issues. Its original idea is derived from the law of gravitation, but it lacks a solid micro theoretical basis. Early scholars have made many criticisms on it[6] .

Subsequently, Deng, G and others gave the simplest theoretical derivation of the gravitational model based on the assumption of no friction and complete division of labor, thus promoting the scholars to explore its theoretical basis[7]. Sunge, R and others introduced the monopoly competition model into the international trade theory and deduced the model from the perspective of structure, H-0 theory and multilateral resistance. The gravitational model with theoretical basis has been widely used in China. Many scholars have studied the influencing factors of China's import and export trade based on the gravitational model[8].

When calculating trade potential, scholars usually compare the simulated value obtained by gravity model with the actual trade value. However, when the regression estimation obtained by the traditional gravity model is calculated, the result is only the average value of each influencing factor on the import and export trade volume, and some subjective trade resistance that is difficult to quantify or cannot be observed, such as policy factors and institutional level, is put into the residual term. The calculated trade potential is obtained on the basis of blurring the impact of these factors on the trade potential, and cannot truly reflect the trade potential between countries.

On the whole, the existing literature lacks of exploring the influence of institutional factors, investment level and other variables on trade resistance, but these factors have an important impact on import and export trade, and foreign scholars have conducted relevant research on this.

Liu, Y and others found that the improvement of the system level can significantly promote the trade between central and Eastern European countries and the EU, and its promotion effect on trade is equivalent to the impact of reducing tariff and non-tariff barriers[9] . In studying the impact of institutional quality on trade, Li, L and others found that the institutional level and institutional distance of both sides of trade have an important impact on the bilateral trade volume, and their impact is on the rise. Among them, the impact on agriculture and raw

materials exceeds the impact on manufacturing and service industries[10] .

In recent years, domestic scholars have gradually attached importance to the influence of institutional factors. Rosario, Z. D and others studied the export trade of Chinese cultural products from the perspectives of politics, economy and system, and the results show that institutional distance and cultural distance are the dominant factors[11].The gravitational model originates from the law of universal gravitation in physics, and its application in the field of international trade includes traditional gravitational models, extended gravitational models, and stochastic frontier gravitational models. With the expansion of international trade and the strengthening of the trend of world economic integration, trade facilitation has received widespread attention from scholars. There are two main methods for measuring the level of trade facilitation: one is to replace the trade facilitation indicator with a certain indicator, such as the Internet usage rate, air transport quality, customs clearance facilitation and other indicators as substitute indicators of trade facilitation; The other is to reflect the level of trade facilitation by establishing a comprehensive set of trade facilitation indicators. The latter is used by more scholars. The trade facilitation indicator systems established by domestic and foreign scholars are different, and the methods for determining the weights are also different, but the relevant research results consistently show that trade facilitation can reduce the transaction cost of bilateral trade and promote the growth of domestic and foreign trade flows. There are few literatures on the introduction of stochastic frontier gravity models. To sum up, there are few literatures on the impact of trade facilitation on the export trade of cultural products using measurement tools[12].

In order to make up for the above deficiencies, this paper establishes a trade facilitation index system and introduces the measured value of trade facilitation levels of countries along the “Belt and Road” into the gravity model. In view of the fact that the gravity model established in this paper contains a number of variables that do not change with time, and some non-time variables are dummy variables, such as whether to use a common language, whether the target country is a landlocked country, etc., at this time, using fixed effects to regress the equation may A missing variable problem occurs. Based on this, this paper uses the stochastic frontier gravity model instead of the traditional gravity model to separate the subjective factors that restrict trade from the random disturbance term, more clearly explore the factors that affect the non efficiency term of China's agricultural product trade, and supplement the current research on institutional factors, so as to avoid the bias of estimation results due to the omission of important variables.

3 Research methods

3.1 Traditional gravity model

Gravitational model has always been the most mainstream quantitative analysis method in the field of international trade research. From the existing literature, the most commonly used model is the gravitational model and its expansion form for trade issues. The standard expression is formula (1)

$$X_{ij} = \frac{A(Y_i Y_j)}{D_{ij}} \qquad (1)$$

In formula (1), X_{ij} is the total trade volume between country I and country j, A is a constant term, Y_i and Y_j are the GDP of country I and country j respectively, and D_{ij} represents the distance between country i and country j.

However, the traditional gravity model still has the following limitations with regard to the trade efficiency and potential issues currently studied:

First, the traditional trade gravity model usually studies the average level under the common influence of trade factors, while the purpose of this study is to reach the optimal level when some factors are certain;Second, in the traditional gravity model, many artificial constraints that may change with time are completely ignored; Third, the theory simply attributes the actual influencing factors to the unobservable residual term, which may lead to a large deviation in the estimation of trade potential[13].

3.2 Random gravity model

The stochastic frontier analysis method combines the stochastic frontier method with panel data to analyze the production technology efficiency. On this basis, the function form is improved, and the time-varying stochastic frontier model is also presented. When the OLS method is used to estimate the traditional gravity model, there are many unobservable factors, resulting in a large error in the estimated value. The maximum trade scale that can be achieved under the given economic scale, distance and other factors is essentially similar to the input-output function. Therefore, it is also feasible to analyze trade by analyzing production efficiency.

The stochastic attractive frontier model can predict the economic benefits that can be obtained for a given resource level (economic level, distance, population, etc.). Similar to stochastic frontier production model, stochastic frontier attraction model can be expressed by Equations

(2), (3), (4) and (5) :

$$T_{ijt} = f(x_{ijt}\beta)e^{(e_{it}-u_{it})} \quad (2)$$

$$T^*_{ijt} = f(x_{ijt}\beta)e^{(v_{it})} \quad (3)$$

$$TE_{ijt} = \frac{T_{ij}t}{T^*_{ijt}} = e^{(-u_{it})} \quad (4)$$

$$\ln T_{ijt} = \ln f(x_{ijt}\beta) + v_{it} - u_{it} \quad (5)$$

T_{ijt} and T^*_{ijt} are the bilateral trade volume of country i to country j respectively. x_{ij} is a 1 * k-order vector, which indicates the natural factors affecting the trade volume, such as GDP, per capita GDP, geographical distance, language and other factors, and is the parameter to be evaluated. Random frontier analysis divides the traditional residual term into random error term and trade non efficiency term. All unobservable variables are included in the trade non efficiency term U[14]. Where is the trade efficiency value, which is the ratio of the actual trade volume to the trade frontier volume. It can be judged whether the sample has trade efficiency according to the size of TE value. If TE = 0, it means that there is no trade inefficiency, if TE = 1, it means that trade friction reaches the maximum value. When TE $\in$ (0,1), it indicates that there is trade inefficiency. In order to study whether the sample efficiency value changes with time, it is assumed that $\eta > 0$ and $\eta = 0$ and $\eta < 0$ respectively indicate that the non efficiency level increases, remains unchanged or decreases with time[15].

3.3 Comparative analysis method

1. The theory of comparative advantage is an important theoretical basis for the generation of bilateral trade. The revealed comparative advantage index is also the most commonly used quantitative index for analyzing the comparative advantage of agricultural products. Its calculation formula is formula (6):

$$RCA_{xik} = \frac{\frac{X_{ik}}{X_i}}{\frac{X_{wk}}{X_w}} \quad (6)$$

The more the export volume of K products, the greater the proportion, and the more obvious the comparative advantage of the product. According to the research status of relevant fields, most scholars currently use the relationship between RCA value and trade competitiveness level, as shown in Table 2.

Table 2 Relationship between RCA value and trade competitiveness

RCA value	Level of trade competitiveness
>2.5	Extremely strong
(1`.25,2.5)	Stronger
(0.8,1.25)	secondary
<0.8	Weak

2. This paper measures the complementarity index in bilateral trade, and the specific calculation formula is shown in formula (7)

$$TCI_{ijk} = RCA_{xik} * RCA_{mjk} \qquad (7)$$

Among them, TCI_{ijk} uses the trade complementarity index of product K between country I and country J, RCA_{xik} uses the export ranking to measure the relative advantage of product K from country I to country J, and RCAmjik uses the import ranking. Measure K's level of imports from countries J and I. Relative disadvantages of similar products[16].

3.4 Data source

At present, many researchers have analyzed the regional scope of the "the Belt and Road economic belt" and put forward corresponding spatial definitions. This paper selects five countries in the Central Asian economic belt (Kazakhstan, Tajikistan, Kyrgyzstan, Turkmenistan and Uzbekistan) as important nodes along the line[17].

Control variables include whether the two sides of the trade share a common language, whether the borders are bordered, and whether the trade partner country is a landlocked country trade.The use of common language by both parties can effectively reduce communication costs, enhance emotional exchanges, and facilitate the achievement of trade. At the same time, language is one of the specific manifestations of culture, and the existence of a common language will also increase the import and export of language-related cultural products between the two sides of the trade, and promote the trade of cultural products. Two countries bordering the border, due to the handover of their borders, the two countries generally maintain long-term and relatively stable diplomatic relations and foreign trade relations, and the people in the border areas also tend to have the same language and customs, thus affecting the trade between the two countries. Cost and degree of demand for cultural products of trading countries. Whether the trade target country is a landlocked country is also

an important factor affecting trade costs. Although shipping takes a long time, shipping is famous for its cheapness. If the trading country is a landlocked country, the transportation is relatively inconvenient, and the products can only be transported by road, rail and air, and the trade cost will also be greatly increased[18]. The data on whether China and the target country use a common language, whether the target country is a landlocked country, and whether the border is bordered are also from the CEPII database. Culture plays a leading role in the joint construction of the "Belt and Road". Confucius Institutes and Confucius Schools are windows for Chinese and foreign language and cultural exchanges, and carriers of "soft connectivity" for China's education and cultural output, increasing foreign demand for Chinese cultural products, thereby driving The development of trade in cultural products. At the same time, considering that the establishment of various organizations can enhance exchanges between countries, help to achieve mutually beneficial trade conditions, and promote trade cooperation between the two countries, it is necessary to determine whether the trade target countries have established Confucius Institutes, whether they are members of the World Trade Organization, and whether they are members of the World Trade Organization. SCO membership and APEC membership are also introduced into the model's trade inefficiency as an important indicator of human factors. The above data comes from the official websites of member organizations in various countries, and the data on whether Confucius Institutes have been established in countries along the route come from the websites of Confucius Institutes/Hanban[19].

Human factors are variables that can be changed by human forces in the short term. The trade facilitation level is included as the trade inefficiency part of the model to explore the impact of trade facilitation level on the trade volume of cultural products. The trade facilitation index is calculated as above. In addition, artificial factors also include some dummy variables, such as whether the trade target country is a member of an organization and whether the trade target country has established Confucius Institutes locally. In addition, the extended gravity model is used to regression the variables of the stochastic frontier gravity model. At this time, the random shocks to the model are included in the random error term, so there is no trade inefficiency term.

4 Result analysis

4.1 Overall trade status of agricultural products between China and the five Central Asian countries

It can be seen from Figure 3 that before 2013, the import and export volume showed an upward trend as a whole. From 2013 to 2014, the growth rate may slow down due to the impact of the global financial crisis. As can be seen from the figure, it has reached US $730 million in 2019, with a 19 fold increase in trade volume. At the same time, although the import volume maintained an upward trend, there was a certain fluctuation. During this period, China has been in a favorable position with the five Central Asian countries[20].

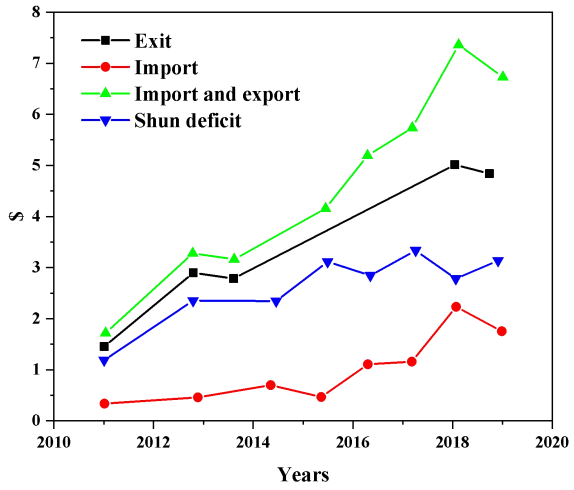
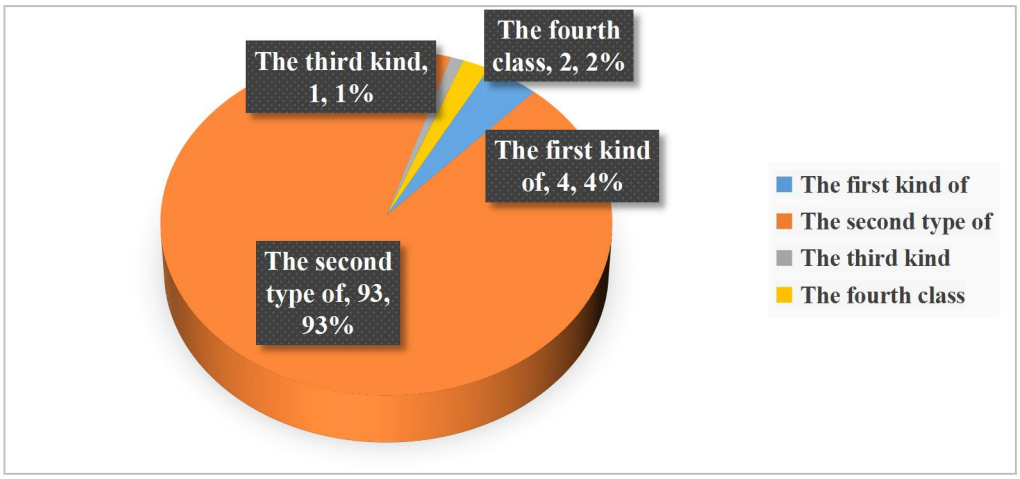
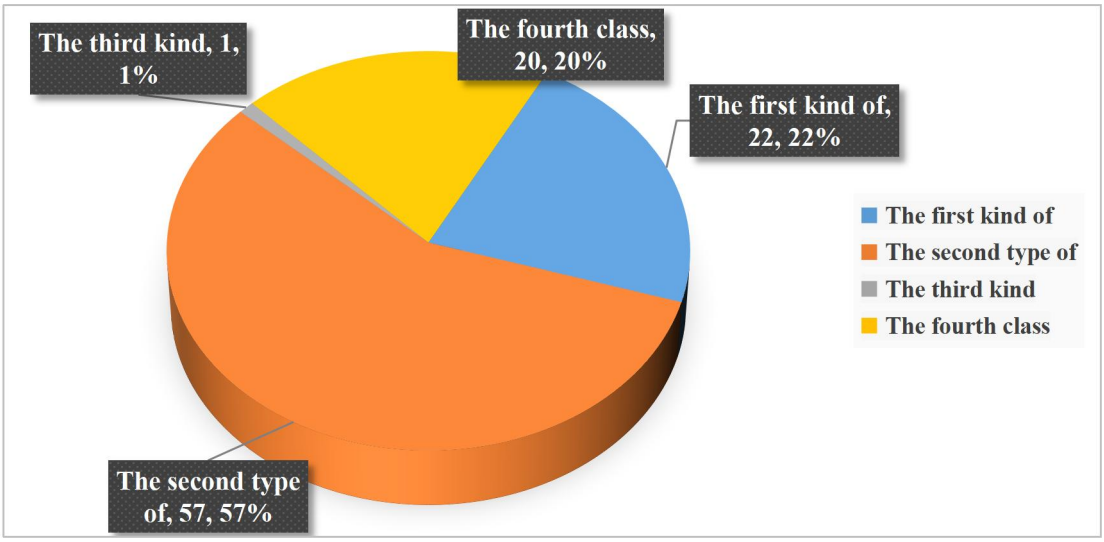


Figure 3 Overall bilateral agricultural trade between China and the five Central Asian countries

After analyzing the profit and loss of all products, it is necessary to further study the product market structure of China and the five Central Asian countries. From Figure 4(a) and (b), we can see the composition of raw materials and exports from China to the five Central Asian countries from 2013 to 2019. China is a major commodity supplier to the five Central Asian countries. The second, first and fourth categories of imported agricultural products are relatively few, and the third category of agricultural products is the smallest. The contribution level of the three agricultural products is very low.



(a) Import contribution rate



(b) Export contribution rate

Figure 4 Structure of agricultural products import and export commodities between China and the five Central Asian countries

4.2 Analysis of agricultural product trade index between China and five Central Asian countries

In order to analyze the current state of the agricultural industry, we must analyze the structure of the two sides of the economy and products, as well as the economic results.

1. Analysis on competitive advantage of agricultural products trade

This paper estimates the RCA of China and the five Central Asian countries for the classification of agricultural products to account for export competition among countries and agricultural products. In this paper, the average value of RCA from 2015 to 2021 was taken to

facilitate comparative analysis. Figure 5 shows the average value of RCA index of agricultural products in China from 2015 to 2021[21].

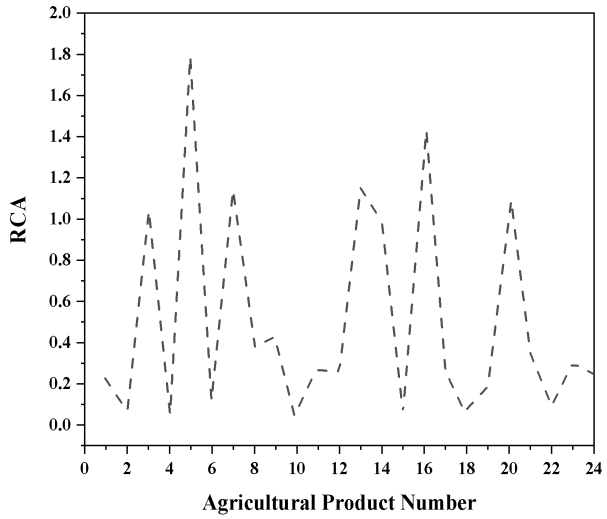


Figure 5 Average RCA index of China's classified agricultural products from 2015 to 2021

The following conclusions can be drawn from a broad analysis of Figure5.

First, the RCA of Chinese agricultural products is not more than 2.5, which means that there are no products that have strong competition among Chinese agricultural products;

Second, in the international market, China's agricultural products perform well, and many types of agricultural products have certain competitive advantages; Third, the relatively competitive agricultural products in China include 05 and 16.

2. Complementary analysis of agricultural products trade

To facilitate comparison, this paper identifies average TCI scores from 2015 to 2021.

(1) Further analysis of China-Kazakhstan agricultural trade

Figure 6 shows China's average TCI trade secret index from 2015 to 2021.

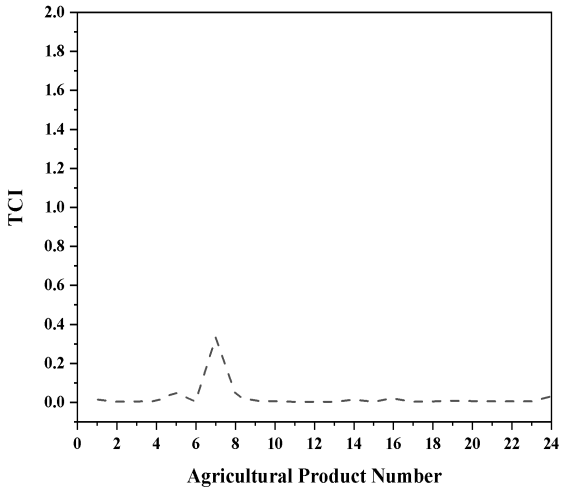


Figure 6 Average TCI index of classified agricultural products from China to Kazakhstan in 2015-2021

The following conclusions can be drawn from Figure 6:

First, in China's export trade of agricultural products to Kazakhstan, there are no products with strong complementarity

Second, relatively speaking, in China's agricultural trade with Kazakhstan, 07 products are highly complementary.

(2) Complementary analysis of China Kyrgyzstan agricultural products trade

The average TCI index of China's classified agricultural products to Kyrgyzstan from 2015 to 2021 is shown in Figure 7.

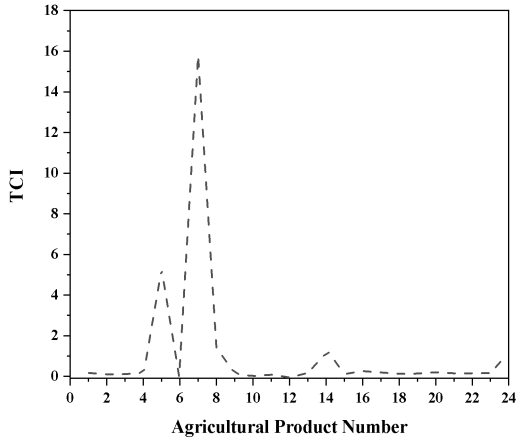


Figure 7 Average TCI index of China's classified agricultural products to Kyrgyzstan from 2015 to 2021

The following conclusions can be drawn from Figure 7:

First, in recent years, in China's agricultural trade with Kyrgyzstan, 05 and 07 products are highly complementary and prominent;

Second, in China's agricultural trade with Kyrgyzstan, the TCI values of 08, 14 and 24 are also outstanding.

(3) Complementary analysis of China Turkmenistan agricultural products trade

The average TCI index of China's classified agricultural products to Turkmenistan from 2015 to 2021 is shown in Figure 8.

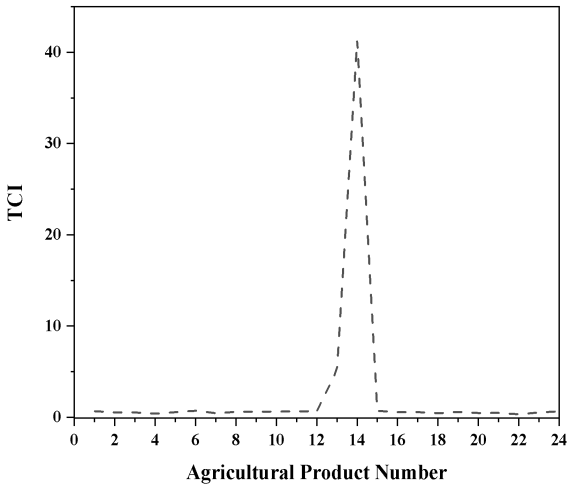


Figure 8 Average TCI index of China's classified agricultural products to Turkmenistan from 2015 to 2021

The following conclusions can be drawn from Figure 8.

First, in recent years, China and Turkey have completed trade in 14 important agricultural products.

Second, in the trade of agricultural products between China and Kyrgyzstan, 13 types of agricultural products are highly complementary and have grown in recent years[22].

4. Further analysis of China-Uzbekistan agricultural trade

Figure 9 shows the average value of TCI index of agricultural products in China and Uzbekistan from 2015 to 2021.

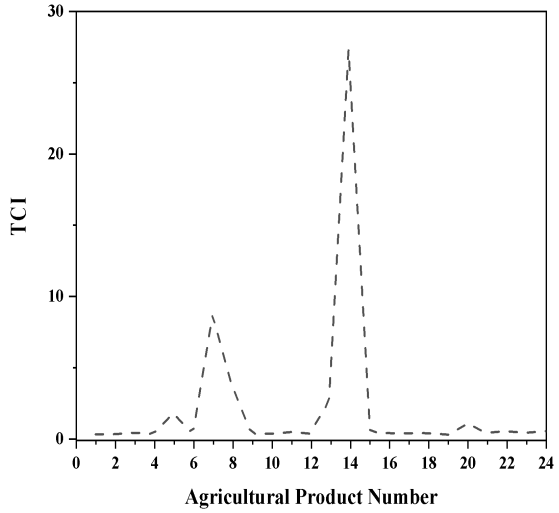


Figure 9 Average TCI index of China's classified agricultural products to Uzbekistan from 2015 to 2021

The following conclusions can be drawn from Figure 9:

First, in recent years, in China's agricultural trade with Uzbekistan, the complementarity of 14 products is strong and extremely prominent;

Second, in China's agricultural trade with Uzbekistan, products 05, 07 and 13 are also highly complementary and have been relatively stable in recent years.

(5) Complementary analysis of China Tajikistan agricultural products trade

The average TCI index of China's classified agricultural products to Tajikistan from 2015 to 2021 is shown in Figure 10.

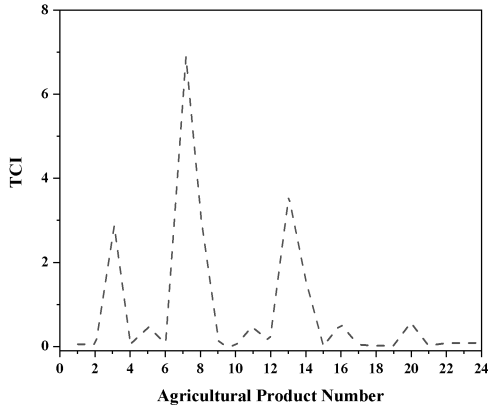


Figure 10 Average TCI index of China's classified agricultural products to Tajikistan from 2015 to 2021

The following conclusions can be drawn from Figure 10:

First, in recent years, in China's agricultural trade with Tajikistan, many products are highly complementary, such as 03, 07 and 08;

Second, the most prominent product with strong complementarity is product 07, but it has shown a downward trend in recent years. Product 08 also shows a downward trend;

Third, in recent years, in China's agricultural trade with Tajikistan, there are 13 and 14 products that are also highly complementary and have shown an upward trend in recent years.

4.3 Trade efficiency and potential analysis

According to the regression results (country level) of the stochastic frontier gravity model, the trade efficiency value of China's agricultural products exports to the five countries in Central Asia from 2005 to 2020 is obtained. As shown in Figure 11, the value range of trade efficiency is (0, 1). The larger the value of trade efficiency, the higher the trade efficiency of bilateral agricultural products.

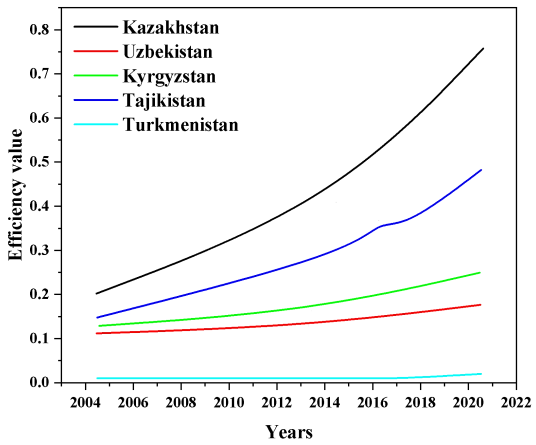


Figure 11 Change of agricultural product export trade efficiency between China and five Central Asian countries from 2005 to 2020

As shown in Figure 11, China is the country with the largest change and fastest growth in the value of Kazakhstan's agricultural exports, followed by Kyrgyzstan, Tajikistan, Uzbekistan and Turkmenistan, with Turkmenistan growing more slowly.

This can also be reflected in the variable selection and variable value of the random frontier gravity model. Turkmenistan has no land border with China, and the capital distance is the farthest between China and the five Central Asian countries. Moreover, Turkmenistan is the only country among the five Central Asian countries that has not yet joined the Shanghai

Cooperation organization, and the free trade agreement with China has yet to be implemented.

Based on the regression results of stochastic frontier attraction model (product level), the market values of seven major products exported from China to five Central Asian countries from 2005 to 2020 are presented. As shown in figure 12, the price range of the market is (0,1). The higher the market price, the more market segments of agricultural products on both sides of the agricultural market.

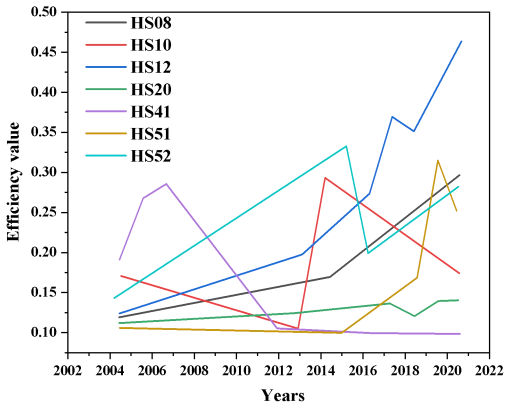


Figure 12 Trade efficiency value of seven major sub agricultural products exported by China to five Central Asian countries from 2005 to 2020

From Figure 12, we can see that among the seven major agricultural products in China's export trade to the five countries in Central Asia from 2005 to 2020, the trade efficiency values of the four major agricultural products, including HS08 edible fruits and nuts, hs12 oilseeds, hs51 animal coarse wool and its products, and hs52 cotton, show an obvious upward trend. Among them, the trade efficiency value of hs12 oilseeds has the fastest growth rate and the largest increase range; The trade efficiency values of hs10 grain, hs41 rawhide and leather, the two main sub agricultural products, respectively, began to decline after rapidly reaching the peak in the middle and early stages of the value taking period, showing an obvious downward trend; However, the trade efficiency value of other parts of HS20 plants shows almost no change in China's agricultural products export trade to the five Central Asian countries, and only shows a slow upward trend after 2016.

This paper compares the actual trade volume with the predicted trade volume, and divides the trade partner countries into three types according to the ratio of the two: potential reinvention, potential development and huge potential. The five Central Asian countries in this paper are slightly adjusted according to the following classification standards as shown in Table 3 (the classification standards in Table 3 are only for the research objects in this paper).

Table 3 Classification of trade potential of agricultural products between China and the five Central Asian countries

Category	Export potential	Import potential
Potential development type	Uzbekistan, Turkmenistan	Uzbekistan, Kyrgyzstan, Kazakhstan
Potential development type	Tajikistan, Kyrgyzstan	Turkmenistan
Huge potential	Kazakhstan	Tajikistan

On the whole, Uzbekistan has high trade efficiency in both export and import and export, and there is limited room for improvement. It needs to fully tap its trade potential. Tajikistan shows low trade efficiency in both export and import and export trade, while Kazakhstan's import efficiency is at a low level, which indicates that there are still relatively large obstacles in China's agricultural trade with these countries, and there is great trade potential. In future development, trade barriers should be removed as much as possible to improve its trade efficiency.

5 Conclusion

Firstly, the theoretical and practical significance of this study is demonstrated through theoretical analysis. Meanwhile, through the elaboration of the literature review of the predecessors in the relevant fields, the research methods and previous research experience in the relevant fields are analyzed, and the research method of this paper is determined as the random frontier gravity model. The following conclusions are obtained:

1. By studying the current trade situation, trade index and other relevant contents, the characteristics and problems to be solved of the current bilateral agricultural trade are found, such as the single trade structure, the unique competitiveness and complementarity of the two sides in a few agricultural products.

2. In the later part of the paper, through empirical analysis, we study the influencing factors, trade efficiency and trade potential of bilateral agricultural trade.

3. The results show that Uzbekistan has high trade efficiency in both export and import and export, and there is limited room for improvement. It needs to fully tap its trade potential. Tajikistan shows low trade efficiency in both export and import and export trade, while Kazakhstan's import efficiency is at a low level, which indicates that there are still relatively

large obstacles in China's agricultural trade with these countries, and there is great trade potential. In future development, trade barriers should be removed as much as possible to improve its trade efficiency.According to the previous status analysis and empirical research, the author puts forward targeted policy suggestions, and provides detailed and feasible suggestions for bilateral agricultural trade from policy borrowing, product strategy, regional cooperation.As the largest public good in the world, the Belt and Road Initiative embodies the desire of countries along the routes for exchanges among civilizations. It will not only facilitate trade among countries along the routes and provide greater impetus for their development, but also help promote the export of Chinese cultural products and provide a stronger driving force for China's development. Connectivity is the focus of Belt and Road cooperation. To properly balance the two markets and resources at home and abroad, we need to leverage the linkage effect of the Belt and Road Initiative, strengthen connectivity, open up pain points that are integrated into domestic and international economic cycles, and improve trade efficiency. In terms of policy communication, we need to enhance communication and coordination on economic and trade policies among countries to reduce delays caused by inconsistent production standards and complicated transit procedures. In terms of infrastructure connectivity, we should increase the construction of traditional infrastructure and new infrastructure, reduce transport costs in the process of trade, promote the use of information technology in international trade, and improve the efficiency of cross-border product circulation. In terms of unimpeded trade, China encourages cultural exchanges among countries by holding activities such as the China Digital Trade Summit Forum and the "Belt and Road" Famous Goods Exhibition. At the same time, the pilot Free Trade Zone will continue to promote cooperation and development with countries along the Belt and Road in performing arts, exhibitions and other fields. In terms of financial financing, we will give full play to the role of the Asian Infrastructure Investment Bank, fully mobilize the participation of private capital in countries along the belt and Road, and build diversified platforms for cultural trading, investment and financing. With regard to people-to-people bonds, we should respect the cultures and civilizations of different countries and ethnic groups, encourage international cultural and educational exchanges, strengthen communication among countries on cultural beliefs and values, and create a new path for the integration of diverse civilizations.

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