

# Research on Trade Potential of Agricultural Products between China and Russia

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## Abstract

With the construction of the "Belt and Road" and the continuous development of the "double cycle", the economic and trade relations between China and Russia have become increasingly close. In recent years, the trade of agricultural products between China and Russia has been developing rapidly and complementing each other. Although the agricultural trade between China and Russia is highly complementary, the trade structure shows some irrationalities. Based on the gravity model of China-Russia agricultural trade, the analysis shows that China's GDP has a large impact in China's agricultural exports to Russia; Russia's national income per capita has a negative impact on the average production level of Russia's major crops (soybeans and corn); and the geographic distance between Russia and China and Russia's GDP have little impact. For China's imports of agricultural products from Russia, China's GDP has a significant positive effect; Russia's national income per capita has a negative effect; and the geographic distance between Russia and China, Russia's GDP, and the average production level of Russia's major agricultural products (soybeans and corn) have little effect. Based on the estimation results, the potential value of China-Russia agricultural trade is calculated, and the results show that the agricultural trade between China and Russia has a "huge potential type". In order to further expand China-Russia agricultural trade and promote the development of bilateral trade, the Chinese and Russian governments need to work together. Continue to improve the infrastructure of China and Russia to save the transportation cost of agricultural products, China should also further increase the support of the agricultural industry, and accelerate the pace of China's agricultural opening.

## Keywords

China-Russia Agricultural Trade; Gravity Modeling; Trade Potentials.

## 1. Introduction

Since China's accession to the WTO in 2001, the scale of China's agricultural trade has been expanding, with increasing international competitiveness and visibility. This is not only due to China's vast arable land area and favorable climatic conditions, but also to the fact that since its accession to the WTO, the Chinese Government has made important commitments in the area of agriculture, such as significantly reducing tariffs on imports of agricultural products, drastically reducing the market access regime, and taking new steps towards the expansion of opening up of agriculture. China's agricultural trade is not only characterized by strong production dynamics, but also by growing consumption; prior to 2011, the United States was the world's largest importer of agricultural products, but since 2011, China has surpassed the United States as the world's largest importer of agricultural products, and since 2015 has firmly established itself as the world's fifth largest exporter of agricultural products. China's share of world agricultural trade is significantly higher than that of the United States. It has risen from 3.2% in 2001 to 8.5% in 2020, ranking second in the world's agricultural trade.

Russia is the largest country in the world in terms of land area. Agricultural land accounts for 12.9% of its territory, amounting to 220 million hectares. Russia has favorable natural conditions for agricultural development and black soil resources, which are excellent conditions for the development of modern agriculture. In recent years, Russia's investment in agriculture has been constantly strengthened, which has led to the rapid development of agricultural production in Russia, and the export of agricultural products and foodstuffs has become a new driving force for Russia's economic development. Nowadays, Russia exports food to more than 130 countries and became the world's largest food exporter for the first time in 2016.

China and Russia are important trading partners, and agricultural products account for a large proportion of bilateral trade. In recent years, the construction of "One Belt, One Road" and "One Belt, One Union" have strongly boosted trade between the two countries. According to the data of the General Administration of Customs, China has been the largest trading partner of Russia for ten consecutive years, and Russia is also the tenth largest trading partner of China [1]. China-Russia trade in agricultural products has also developed rapidly, turning into a new driving force for trade between the two countries. For China, as the secondary and tertiary industries continue to expand, the number of people engaged in agriculture will continue to decline, and as China's economy develops, land and labor costs will continue to rise, leading to a decline in the overall quantity and quality of agricultural land resources. On the other hand, the demand for high-quality and diversified agricultural products will increase as the consumption capacity and level of the Chinese population continues to rise. The quality and variety of some domestically produced agricultural products are no longer able to meet current consumer demand and will need to be supplemented through the import route.

From the Russian side, Russia's natural conditions hinder the development of Russian agriculture to a certain extent. For example, Russia's high latitude, the conflict between water and heat is serious, and the integration of natural conditions for agriculture is poor, especially in the northeastern part of the country where the natural conditions are harsh. And the recent outbreak of the Russian-Ukrainian conflict is a serious impact on Russia and the world trade in agricultural products, has now imposed a number of economic sanctions on Russia, in addition to a portion of the Russian financial institutions to move out of the Universal Association of Banks and Financial Communications payment system, the United States has announced the termination of imports of crude oil, natural gas and coal from Russia. In addition, the European Union announced a program to reduce its dependence on Russian natural gas by 2/3. This has caused a great deal of harm to Russia's trade environment.

China and Russia are not only geographically close, with a long border of 4,374 kilometers, which is conducive to the transportation of goods, but also the two countries, because of the differences in natural conditions, agricultural products are highly complementary, all of which provides an opportunity for the development of trade in agricultural products between Russia and China. And the global economy was hit by the new Crown Pneumonia epidemic in 2020, when bilateral trade between Russia and China was still growing positively [2]. This shows that China-Russia economic and trade relations can jointly face the hidden threats of the external world and have good prospects for development.

This paper analyzes the factors affecting agricultural trade between China and Russia and its development potential, which is of great practical significance for expanding the scale of trade between the two countries, improving the scale effect of agricultural trade, and optimizing the structure of agricultural trade between China and Russia.

## 2. Research Status and Development Trends

Domestic scholars have mainly studied China-Russia agricultural trade from the perspectives of geographic factors and national policies. Some scholars have discussed the influence of geographic factors on the potential of China-Russia agricultural trade from the perspective of geographic location. Zhou Lanlan and Kang Chengwen (2021) point out that Heilongjiang Province has regional advantages in agricultural trade with Russia, and the construction of "One Belt, One Road", "China-Mongolia-Russia Economic Corridor" and "Dragon River Silk Road Belt" will provide a good opportunity for the trade between Heilongjiang Province and Russia. The construction of "One Belt, One Road", "China-Mongolia-Russia Economic Corridor" and "Dragon River Silk Road Belt" will create new opportunities for agricultural trade between Heilongjiang Province and Russia. It also proposes to improve the technical level of products, optimize the structure of export trade, shape the brand effect, improve the industrial chain of agricultural products, and improve the efficiency of trade; Li Nan and Sun Ying (2020), from the point of view of the geographical position of Russia's Far East is in the cold zone, the climate is very cold, and it is unsuitable for the cultivation of crops, propose that China and Russia jointly produce agricultural products, develop the collective economy, and guide and promote the development of joint ventures; Cong Shufeng, Li Xueyuan and Li Meng (2020), from the perspective of the new crown epidemic that has hit Russia's agricultural economy hard, propose to promote the construction of a rural network collection system in Heilongjiang Province and strengthen the cultivation of cross-border e-commerce professionals; Wang Meng and Sun Ying (2020), from the perspective of the stabilization of the political relationship between China and Russia in recent years, and in combination with the natural advantages of Heilongjiang, propose to improve the testing standards of agricultural products, expand the range of agricultural products available for export and make them more suitable for the export of agricultural products. for export, expanding and diversifying the range of agricultural products available for export, as well as promoting technical cooperation in agricultural research between Russia and China; Qiao, Hazel, and Zheng, Yan (2021), taking into account that the limitations of hardware infrastructure such as transportation between Russia and China and the deficiencies of some software infrastructure also affect the advancement of cooperation between Russia and China, suggest that through policy communication, optimizing the structure of investment, letting more capable development institutions participate in the cooperation between Russia and China in agriculture, and doing a good job of publicity. and do a good job of publicity, so that China-Russia agricultural cooperation is built on the basis of people-to-people communication [3]; Wang Meimei (2021) used OLS regression with the relevant data of China's agricultural trade from 2012 to 2018, and used three methods of regression test for the model's robustness to draw conclusions, and then proposed to improve the level of agricultural science and technology, increase the output of agricultural products to deepen the cooperation, establish a China-Russia agricultural cooperation mechanism, reducing trade barriers, simplifying customs clearance procedures and other measures[4].

At present, domestic scholars have conducted a lot of in-depth scientific research on promoting China-Russia agricultural trade and assessing the development potential of China-Russia agricultural trade, which provides a solid research foundation for this study. However, the literature on the potential of China-Russia agricultural trade has seldom studied from the perspectives of the per capita national income and the output of major agricultural products of the two countries, and has not systematically explored the impact of these two on the scale of China-Russia agricultural trade[5]. This study examines the prospects of agricultural trade between China and Russia in the context of further promoting the construction of "One Belt, One Road" and "Double Cycle", and systematically explores the differences and complementarities of agricultural products between China and Russia, taking into account

economic factors, the average production of major agricultural products in the two countries and geographic factors[6]. It systematically discusses the differences and complementarities of agricultural products between China and Russia, and the possibility of strengthening cooperation between China and Russia in agricultural production, and on this basis, puts forward reasonable suggestions for further expanding the scope and scale of agricultural trade between China and Russia[7].

### 3. Analysis of China-Russia Agricultural Trade Potential

#### 3.1. Agricultural Trade Potential Measurement Methodology and Modeling

##### 3.1.1. Methodological Note on the Measurement of Agricultural Trade Potential

The gravity model is based on Newton's physical law of gravitation, which states that the attraction between two objects depends on mass and distance, and that the attraction between two objects is directly proportional to their mass and inversely proportional to their distance. Later, economists Tinbergen (1962) and Poyhonen (1963) proposed the gravity model of trade, specifying that the flow of trade between two countries is proportional to the size of their economies and inversely proportional to the distance between them. The classical form of the gravity model is:

$$T_{ij} = A \left( \frac{Y_i Y_j}{D_{ij}} \right) \quad (1)$$

Where, represents the size of agricultural trade between the two countries, is a constant, represents the total economic volume of the country, represents the total economic volume of the country, represents the distance between the two countries, the gravity model indicates that the trade flow between two countries is proportional to their economic volume and inversely proportional to the distance between them[8].

This study further extends the gravity model by adding two variables, the per capita national income of the country and the average production of the country's major agricultural products (soybeans and corn), to explore the main influencing factors affecting the volume of agricultural trade between China and Russia. Then, based on the estimated results of the gravity model, in order to calculate the values of the explanatory variables defined as ideal values, the actual values of the explanatory variables are input into the gravity model and then compared with the ideal values in order to assess the trade efficiency and analyze the trade potential [9].

##### 3.1.2. Parameter Selection and Model Construction

In order to better describe the impact on the scale of agricultural trade between China and Russia, this paper selects the countries that have a large scale of trade in agricultural products with China, are geographically close to each other, and are signatories to the "Belt and Road" and some important countries in ASEAN as the object of study, which are Russia, the United States, Canada, Egypt, India, Indonesia, South Africa, Malaysia, Morocco, and South Korea, and collects the relevant data of these ten countries during the fifteen-year period from 2006 to 2020, Russia, the United States, Canada, Egypt, India, Indonesia, South Africa, Malaysia, Morocco, and South Korea, and collected the relevant data of these ten countries in the fifteen years from 2006 to 2020. Because the level of per capita national income is an important indicator of a country's economic strength and people's living standards, which has a certain impact on trade; the average production of major agricultural products can also reflect to a certain extent the state of a country's agricultural development and the scale of the industry, which has an important impact on the study of the country's trade in agricultural products, and corn and soybeans have a large proportion in the trade of agricultural products of the ten

countries. Therefore, this paper in the traditional gravity model based on the new country (the above 10 countries) per capita national income, the country's average production of major agricultural products (soybeans and corn), and take the logarithm of the two sides, the extended gravity model is as follows:

Gravity model of China's agricultural export trade to ten countries:

$$\lg EX_{ij} = C_1 + \alpha_1 \lg GDP_i + \alpha_2 \lg GDP_j + \alpha_3 \lg PNI_j + \alpha_4 \lg D_{ij} + \alpha_5 \lg AO_j \quad (2)$$

Gravity model of China's agricultural import trade from ten countries:

$$\lg IM_{ij} = C_2 + \beta_1 \lg GDP_i + \beta_2 \lg GDP_j + \beta_3 \lg PNI_j + \beta_4 \lg D_{ij} + \beta_5 \lg AO_j \quad (3)$$

Where, represents the amount of China's exports of agricultural products to the country, represents the amount of China's imports of agricultural products to the country,,, is a constant, on behalf of China's GDP, on behalf of the country's GDP, on behalf of the country's per capita national income, on behalf of the distance between the two countries, on behalf of the country's production of major agricultural products.

The specific independent and explanatory variables are explained as follows:

(1) Gross Domestic Product: the higher the Gross Domestic Product (GDP) of a country, the more developed it is, and the more diversified and diversified its trade demand. The data is obtained from the World Bank.

(2) Per capita national income: the level of per capita national income is a comprehensive reflection of a country's level of economic development, economic strength and people's living standards. Data from the World Bank.

(3) Geographic distance between the country and China: Most studies on the geographic distance between two countries consider the geographic distance between the two countries as the distance between the capitals of the two countries. The greater the geographical distance between two countries, the higher the difficulty of transportation and communication, resulting in higher information and communication costs and higher costs of transportation of goods, thus making international trade more expensive and hindering trade. Data from CEPII official website.

(4) Average production of major agricultural products in the country (soybean and corn): the production of major agricultural products can, to a certain extent, reflect the state of agricultural development and industrial scale of a country, which has an important impact on the study of the country's agricultural trade. Data from the United Nations FAO database.

(5) Agricultural exports: Agricultural exports refers to the total value of agricultural products exported by a country to foreign countries during a certain period of time, and is used as an explanatory variable to examine the influence of the independent variables. The data comes from UN Comtrade database.

(6) Agricultural imports: Agricultural imports are the total value of agricultural products imported from abroad in a given period of time and are used as an explanatory variable to examine the magnitude of the effect of the independent variable. Data from UN Comtrade database.

### 3.2. An Empirical Test based on the Gravity Model

#### 3.2.1. An Empirical Analysis of China's Agricultural Export Trade Potential with Ten Countries

This study conducted an empirical analysis to investigate the significance of six factors affecting China's agricultural export trade using data from ten countries, namely Russia, the United States, Canada, Egypt, India, Indonesia, South Africa, Malaysia, Morocco, and South Korea, using fifteen years of trade data (2006-2020) between China and different countries. Regression analysis was conducted using Eviews.10 econometric model and the results are shown in Table 1 and Table 2.

**Table 1.** Regression results of Equation (3)

variant	Original estimates		Estimated results after deleting insignificant variables	
	COEF coefficient	P-value	COEF coefficient	P-value
$C_1$	-0.040	0.427	-0.061	0.000***
$lgGDP_i$	2.730	0.000***	2.822	0.000***
$lgGDP_j$	0.113	0.313	---	---
$lgPNI_j$	-1.093	0.002***	-0.832	0.005***
$lgD_{ij}$	-0.006	0.679	---	---
$lgAO_j$	-0.175	0.015**	-0.175	0.008***

Note: \*\*\* indicates significant at 0.01 level of significance.

$R^2 = 0.643$  after measurement through Eviews.10, the model is generally more favorable. See the regression results in Table 1, the geographic distance between China and the country and the country's GDP did not pass the significance test, and all the remaining variables passed the significance test. The coefficients are brought in to produce the following formula:

$$lgEX_{ij} = -0.061 + 2.822lgGDP_i - 0.832lgPNI_j - 0.175lgAO_j \quad (4)$$

By analyzing the influencing factors of agricultural export trade potential between China and ten countries, this paper concludes as follows:

(1) The geographical distance between China and the countries does not pass the significance test. In the current context of economic globalization, international transportation continues to develop and improve, and transportation efficiency continues to improve, it is possible that the impact of geographic distance on the trade of agricultural products between the two countries is declining, or that the distance between the two countries is less and less effective in hindering the trade of agricultural products between the two countries. Although the geographical distance between China and the country did not pass the test of significance, but can not be denied that the geographical distance of China's exports of agricultural products to the country's exports, in practice, the geographical distance between the two countries, if too large for China's exports of agricultural products on the scale of the more obvious obstruction, if the distance between the two countries farther away, then the cost of transportation will be increased, is not conducive to the development of bilateral trade in agricultural products. Because agricultural products and other trade commodities compared with a little special, freshness time is shorter, easy to rot, most need cold chain transportation, so the obstruction factors between the trading countries should be more obvious.

(2) China's GDP is positive through the significance test and is significant at the 1% level, indicating that the growth of China's GDP has a significant role in promoting China's agricultural

export trade to the country. The coefficient of China's GDP is 2.822, indicating that all other things being equal, for every 1% increase in China's GDP, China's agricultural trade exports to the country will increase by 2.822%.

(3) The country's GDP does not pass the test of significance. To a certain extent, it may be affected by the demand factor, which at the moment is also an important factor affecting the size of the import volume of agricultural trade imports of the importing country. If a country's GDP does not change significantly, but the domestic demand for Chinese agricultural products is strong, the country is equally likely to increase imports of Chinese agricultural products. But we still can not ignore the country's GDP growth to increase China's exports of agricultural trade to its role in promoting. If the country's GDP grows, it will improve the quality of life and purchasing power of the country's citizens, which will lead to an increase in the demand for different kinds of foreign agricultural products of higher quality, which will lead to an increase in the value of China's exports of agricultural products to China.

(4) The national income per capita of the country is negative through the significance test and is significant at the 1% level, indicating that it also has a significant hindering effect on the volume of agricultural exports from China to the country. The growth of national income per capita indicates the improvement of national living standard and the increase of disposable income, at this time, the Engel coefficient of the national family may decrease, the national demand for food and foreign agricultural products decreases, and turns to increase the consumption of other products, which affects its consumption preference. The coefficient of this variable is -0.832, indicating that when other conditions remain unchanged, every 1% increase in the country's per capita national income, China's exports of agricultural products to the country's trade will decrease by 0.832%.

(5) The coefficient of the average production of major agricultural products of China (soybean and corn) is negative and significant at 1% level of significance, indicating that China's agricultural trade exports to China are significantly negatively correlated with the average production of major agricultural products of China (soybean and corn). Because countries in the agricultural imports, the primary purpose is to protect the country's food security, and food security due to the country's main agricultural production is closely related. When the main agricultural products needed by the country's domestic production due to climate change and other factors and decline, this time in order to protect the safety of the country's agricultural products, will increase imports of related agricultural products through imports; and when the main agricultural products needed by the country's domestic production has increased significantly, the country's demand for the main agricultural products will be reduced, and even domestic oversupply phenomenon, this time the country will reduce the main agricultural products to the Imports. The coefficient of the average production of the main agricultural products of China (soybean and corn) is -0.175, which means that when other conditions remain unchanged, for every 1% increase in the average production of the main agricultural products of China (soybean and corn), the value of China's agricultural trade exports to China will decrease by 0.175%.

### 3.2.2. An Empirical Analysis of China's Agricultural Import Trade Potential with Ten Countries

The overall effect of the model is more satisfactory through the software measurement after  $R^2 = 0.649$ . See Table 2 for the regression results, the geographical distance between China and the country, the country's GDP and the country's average production of major agricultural products (soybeans and corn) did not pass the test of significance, while the rest of the variables passed the test of significance. Their coefficients were brought in to produce the following formula:

$$lgIM_{ij} = -0.070 + 3.122lgGDP_i - 1.834lgPNI_j \quad (5)$$

**Table 2.** Regression results of Equation (4)

variant	Original estimates		Estimated results after deleting insignificant variables	
	COEF coefficient	P-value	COEF coefficient	P-value
$C_2$	-0.012	0.779	-0.070	0.000***
$lgGDP_i$	3.022	0.000***	3.122	0.000***
$lgGDP_j$	0.022	0.847	---	---
$lgPNI_j$	-1.732	0.000***	-1.834	0.000***
$lgD_{ij}$	-0.017	0.160	---	---
$lgAO_j$	-0.150	0.005***	---	---

Note: \*\*\* indicates significant at 0.01 level of significance.

By analyzing the factors affecting the agricultural import trade potential between China and ten countries, the results are as follows:

(1) The geographical distance between China and the countries does not pass the significance test. With the improvement and upgrading of the global logistics system and means of transportation, distance may no longer be a critical factor in China's import of agricultural products, but in reality, the closer the geographic location of the two countries will make the logistics cost lower, which will promote China's import of its agricultural products.

(2) China's GDP passes the significance test, and its coefficient is positive and significant at the 1% level, indicating that the growth of China's GDP has a significant contribution to China's increase in its imports of agricultural products to the country. The coefficient of China's GDP is 3.122, and all other things being equal, for every 1% increase in China's GDP, China's agricultural trade imports to the country will increase by 3.122%.

(3) The country's GDP fails the significance test. To a certain extent, it may also be affected by the demand factor, the size of China's imports of agricultural products to the country is affected by China's domestic demand, if China's domestic demand for the country's agricultural products is strong, under the premise of the country's agricultural products supply is sufficient, China will also increase the imports of agricultural products to the country.

(4) The national income per capita of the country passes the significance test and is negative and significant at the 1% level, indicating that it also has a significant inhibitory effect on the amount of agricultural imports from China to the country. This result may be due to the collection of the sample size is small, so there is a result of error, but also may be related to the country's overall consumption level of nationals, if the country's overall consumption level of nationals is low, then the country's per capita national income growth will increase the consumption of nationals of agricultural products, which makes the country to the agricultural products to the domestic market for more sales, reducing the export of agricultural products to China. The coefficient of this variable is -1.834, indicating that when other conditions remain unchanged, every 1% increase in national income per capita, China's imports of agricultural products to China will decrease by 1.834%.

(5) The average yields of China's major agricultural products (soybeans and corn) do not pass the significance test. This result may be due to the fact that China's main demand for agricultural products from some of the ten countries is not the main agricultural products (soybeans and corn) of the ten countries. For example, in China's agricultural import trade with Russia, one of the ten countries, it is the HS-16 manufactured fish products that have been absolutely dominant for the last 15 years. Therefore, the main types of agricultural products

that China trades with the ten countries could affect this result, or it could be due to the error caused by the small sample size.

### 3.3. Measuring China's Agricultural Trade Potential with Russia

The trade gravity model is generally used to estimate the trade efficiency value, which is derived by comparing the actual bilateral trade volume with the ideal trade volume calculated by the gravity model. The classification of trade potential by Liu, Qingfeng and Jiang, Shuzhu (2002) is currently a more recognized classification method [10].

If the calculated trade efficiency value is greater than or equal to 1.2, it is called "potential remodeling type", because the trade potential of the two countries has already been fully developed, and only by re-creating the positive factors conducive to trade can the potential be enhanced;

If the calculated trade efficiency value is greater than 0.8 and less than 1.2, it is called "potential development type". At this point, there is still some room for trade development;

If the calculated trade efficiency value is less than or equal to 0.8, it is categorized as "huge potential type", at this time, if the obstacles between the two countries are eliminated, the trade conditions are good, the trade potential can be released [11].

In this paper, according to the above analytical method, the potential of agricultural trade between China and Russia in 2006-2020 is calculated.

The trade efficiency can be calculated through the trade potential and the actual trade volume, and the relationship between the parts is expressed by Equation (6):

$$E = A/P \quad (6)$$

which represents the trade efficiency, represents the actual trade volume, and represents the trade potential (i.e., ideal value).

Through formula (6), the trade efficiency of China's export to Russia and the trade efficiency of China's import from Russia are calculated respectively, as shown in Table 3 and Table 4 below:

**Table 3.** Measurement results of China's agricultural export trade potential to Russia

particular year	Exports (billions of dollars)	Export trade potential (billions of dollars)	Export efficiency
2006	8.37	28.79	0.291
2007	11.65	39.80	0.293
2008	13.21	45.23	0.292
2009	11.07	38.46	0.288
2010	14.44	49.88	0.289
2011	18.52	63.62	0.291
2012	18.39	63.45	0.290
2013	19.82	68.40	0.290
2014	21.91	75.49	0.290
2015	17.07	59.62	0.286
2016	18.58	64.66	0.287
2017	18.84	65.76	0.287
2018	19.48	68.20	0.286
2019	18.28	64.21	0.285
2020	13.93	49.62	0.281

Source: Measured from model estimates.

**Table 4.** Measured trade potential of China's agricultural imports from Russia

Year	Import value (\$ billion)	Import trade potential (\$ billion)	Import efficiency
2006	12.84	44.60	0.288
2007	14.34	49.98	0.287
2008	13.19	46.62	0.283
2009	12.84	45.73	0.281
2010	13.79	49.24	0.280
2011	16.75	59.74	0.280
2012	15.61	56.08	0.278
2013	15.65	56.47	0.277
2014	15.46	56.05	0.276
2015	17.03	61.62	0.276
2016	19.84	71.30	0.278
2017	21.24	76.34	0.278
2018	31.99	113.29	0.282
2019	35.83	126.35	0.284
2020	40.82	143.35	0.285

Source: Measured from model estimates.

As shown in Table 3, during the fifteen-year period from 2006 to 2020, the efficiency value of China's agricultural export trade with Russia is around 0.29, less than 0.8, and remains stable, indicating that China's agricultural export trade with Russia belongs to the "great potential type". Similarly, the results in Table 4 show that during the fifteen years from 2006 to 2020, the efficiency value of China's import trade from Russia is about 0.28, less than 0.8, and remains stable, indicating that China's import trade from Russia also belongs to the "great potential type".

As can be seen from Tables 3 and 4, there is a big gap between the actual trade and potential trade between China and Russia, whether it is China's agricultural exports to Russia or China's agricultural imports from Russia. This indicates that there is still much room for development and progress in agricultural trade between the two countries. In the future, if both sides can effectively solve the impact of trade inefficiency, continuously adjust and optimize trade and industrial structure, and seize the opportunity of the "Belt and Road" construction, the trade volume of agricultural products between China and Russia will further increase.

## 4. Suggestions for Countermeasures to Enhance the Potential of Agricultural Trade between China and Russia

### 4.1. Optimize the Structure of Agricultural Trade between China and Russia

As can be seen from the previous section, agricultural trade between China and Russia has a high degree of complementarity and great development potential. China's agricultural exports to Russia mainly include labor-intensive agricultural products, such as fresh fruits, aquatic products and vegetables. This represents a strong and stable market demand for fresh fruits, aquatic products and vegetables in China. Moreover, fruits, aquatic products and vegetables are characterized by short freshness period and easy damage during long-distance transportation. China, as a neighboring country of Russia, and the geographic proximity of the two countries will further enhance China's advantage over Russia in the trade of fresh fruits, aquatic and vegetables. Russia's agricultural exports to China are mainly resource-intensive agricultural products, such as seafood, edible oil and oilseeds, most of which are seafood. In terms of trade types, China should further increase its exports of aquatic and fishery products to Russia and

maintain its trade advantages in the three types of agricultural products, namely, fruits, aquatic products and vegetables, and it should also further give full play to the complementary advantages of agricultural products of China and Russia, increase imports of Russian nuts and their products and animal oils, and further expand Sino-Russian agricultural cooperation to reduce the over-concentration of trade in agricultural products between China and Russia, which brings about to reduce the trade risks brought by the excessive concentration of agricultural trade between China and Russia, and at the same time improve the level of agricultural trade between the two sides to achieve win-win and development [12].

#### **4.2. Saving Transportation Costs of Agricultural Products**

The empirical results show that the spacing between trading countries has a negative impact on the agricultural trade between the two countries. The distance between two countries directly affects the transportation cost of agricultural products, which in turn affects the development of agricultural trade between two countries. Although the distance between two countries cannot be changed, we can improve the external environment of agricultural trade between China and Russia by reducing the transportation cost of agricultural products. Improving the infrastructure between China and Russia will promote efficient and fast connections between different links or transportation nodes, which will help provide a more efficient industrial base for China-Russia agricultural trade cooperation. In particular, it should focus on strengthening the construction of China-Russia cross-border transportation network. China should accelerate the construction of China-Russia cross-border highway network, railroad network, and shipping corridors, make full use of advanced technology and construction advantages, take the form of joint establishment, promote the construction of China-Russia cross-border highway bridges, promote the process of Moscow-Beijing high-speed railroads and China-Harbin Railway and other infrastructure projects, accelerate the normalization of China-Europe liner trains, and expand the China-Russia freight routes, as well as Establish unified transportation standards to improve the level of logistics docking between the two countries [13]. At the same time, it should also improve the synergistic effect between various modes of transportation, expand the scope and types of agricultural trade, save the logistics cost of agricultural products, and promote the continuous growth of China-Russia agricultural trade.

#### **4.3. Increase Agricultural Industry Support**

The Chinese government should flexibly and fully utilize the preferential trade policies granted by the WTO to developing countries in agricultural trade, increase the support for China's agriculture, and narrow the gap between the current domestic policies and the WTO rules. At the same time, it should formulate scientific and reliable agricultural subsidy policies, optimize the structure and organization of the agricultural sector, and improve the efficiency of agricultural exports. It is necessary to raise the level of opening up of agriculture to the outside world to a certain extent, to strengthen support for basic agriculture and to promote trade cooperation in agricultural products. Government authorities can use some financial measures to support enterprises and individual farmers to improve the quality of agricultural products, and focus on the establishment of relevant projects in terms of trade in agricultural products, for example, they can open a pilot project of agricultural openness and cooperation in their jurisdictions, and open a pilot project of typical agricultural cooperation in foreign countries [14]. Focusing on agricultural trade programs, the formation of a new dominant position in the international competition between Russian and Chinese agriculture, focusing on technology, quality and services, accelerating the opening of Chinese agriculture to the outside world, and the development of advanced technological advantages in agricultural products with import substitution effects and export advantages.

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