





“Marketing potential of the Sino-Russian bilateral agricultural export market”

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MARKETING POTENTIAL OF THE SINO-RUSSIAN BILATERAL AGRICULTURAL EXPORT MARKET

Abstract

China and Russia are important agricultural countries in the world. Expanding exports and increasing sales of agricultural products play an important role in the economic development of both countries. To understand the current situation of agricultural exports of the two countries and formulate strategies to expand the marketing of agricultural products, this paper uses the UN Comtrade Database 2009-2018 on Chinese and Russian bilateral agricultural export sales and other trade data to calculate the EM_{jm} (expansion margin) and P_{jm} (price margin) of agricultural exports, Q_{jm} (quantity margin), to analyze the types, prices, and quantities of exported agricultural products. The results show that China exports to Russia mainly labor-intensive types of agricultural products such as processed agricultural and horticultural products, accounting for 87.46% of total agricultural exports on average. The increase in exports is mainly due to the continuous increase in the prices of exported agricultural products. Russia exports to China mainly land-intensive types of agricultural products such as animal products, grains, oilseeds and fat products, which accounted for an average of 79.07% of total agricultural exports. The increase in exports was mainly due to the continuous increase in types and quantities of agricultural products to develop the export potential of agricultural products and expand sales. In addition, China should expand the types and quantities of agricultural products exported, and Russia should increase the added value of agricultural products and raise the export prices of agricultural products.

Keywords

agricultural exports, influencing factors, export quality, expansion margin, price margin, quantity margin

JEL Classification

D41, L66, M31

INTRODUCTION

China and Russia are important agricultural countries in the world. Both countries are each other's important agricultural product trading partners. The total agricultural product trade has been increasing year by year, reaching \$5.228 billion in 2018, an increase of 1.11 times over 2009. Expanding the export of agricultural products and increasing the sales income of agricultural products is the main goal of the two countries to develop agricultural product trade. However, China's agricultural exports to Russia are smaller than imports, the trade deficit is obvious, and there is a growing trend. In 2018, the deficit reached \$1.192 billion; moreover, China's agricultural exports to Russia accounted for only 1.87% of China's total agricultural exports, and China's agricultural imports from Russia accounted for 3.23% of China's total imports, both of which accounted for China's total trade with Russia. Thus, a smaller ratio is observed. The export sales of agricultural products are not in line with the rapid development of economic cooperation between China and Russia, and the export sales are not commensurate with the huge agricultural product sales markets of the two countries. In terms of promoting agricultural products



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marketing, the two countries have relatively big cooperation prospects. Thus, it is crucial to analyze the export structure of bilateral agricultural products between China and Russia through statistical data, conduct research on the types, quantities, and prices of agricultural products that affect the export volume, and make suggestions for expanding the export sales markets of agricultural products in two countries.

1. LITERATURE REVIEW

In recent years, bilateral agricultural product export trade between China and Russia has grown rapidly, and the agricultural products markets of the two countries are closely connected. The export status of agricultural products of two countries has become the focus of research and attention of scholars. However, the focus of studies is put mainly on the current situation and prospects of the import and export of agricultural products markets in the two countries, the structural characteristics of agricultural products import and export, and the impact of political factors on the agricultural products market. However, there is not much involved in the specific factors affecting the export of bilateral agricultural products and the market sales potential. Yin (2021) studied the status and prospects of import and export of agricultural products markets between China and Russia. It was believed that with the advancement of the construction of the “China-Russia-Mongolia Economic Corridor”, China and Russia will enhance the facilitation of trade such as strengthening transportation and trade port construction. Some results have been achieved. However, the agricultural products markets of the two countries are not large, the types and products traded are relatively concentrated, trade barriers are relatively prominent, and there is a lack of in-depth cooperation in the agricultural industry. In the future, the two countries should strengthen government and private agricultural cooperation, build international agricultural industrial parks to promote agricultural industry-wide cooperation, increase policy and financial support for agricultural production and trading enterprises, enhance the facilitation of agricultural products transactions, and promote the Chinese and Russian agricultural product sales markets, as well as continuous and rapid development. Li and Zhang (2020) researched the structure, total volume, and development trend of bilateral agricultural imports and exports between China and Russia. It was believed

that the eastern region of Russia borders – that is China’s northwest and northeast regions – make agricultural land use. With great potential, the two sides have inherent advantages in developing agricultural products markets. Expanding agricultural product markets and agricultural cooperation is one of the key areas of trade cooperation between China and Russia in the new era. For this reason, the bilateral cooperation in the expansion and development of the agricultural product market should be based on the modern logistics industry cooperation, built public logistics information platform, modern information technology to promote the construction of modern logistics network, and at the same time such a cooperation should continue to upgrade the technology in the development process, and constantly strengthen the bilateral sales and cooperation of agricultural products. Zhao (2019) analyzed the trade of agricultural products between China and Russia in the industry. It was stated that the agricultural products market is an important part of the trade exchanges between the two countries. The agricultural products of the two countries are complementary in terms of production capacity, trade types, and market demand. The two countries have great potential in tapping the agricultural product market. However, the import and export structure of agricultural products between the two countries is mainly a vertical industrial trade, with a low level. In other words, there are fewer types of agricultural products in the bilateral trade exchanges, and the development of agricultural trade is not sufficient. China and Russia should strengthen intra-industry transactions of agricultural products to promote the depth and breadth of agricultural production and sales cooperation. Wang and Zhang (2020) analyzed the structural characteristics of agricultural product sales markets. The data on 2003-2017 bilateral agricultural products export sales between China and Russia was used to calculate the dual margin of agricultural exports of the two countries and the expansion margin of agricultural exports to

the two countries. The changing trend of the intensive margin was analyzed and factors that affect the export market of agricultural products were studied. The results showed that the expansion margin has a greater impact on the sales of agricultural products in the two countries. China's intensive marginal contribution to Russian agricultural sales is greater than the expansion margin, and economic scale and production efficiency have a role in promoting the intensive marginal growth. When viewing the expansion margin in Russian agricultural sales to China, the contribution is greater than the intensive margin, and there is a trend of continuous expansion. Therefore, China should expand the types of agricultural products sold in the sales of agricultural products to Russia, encourage agricultural production enterprises to innovate, create and promote agricultural sales. Jiang and Huang (2019) used 2001-2016 data on world agricultural products and agricultural product trade between China and Russia to analyze the changes in agricultural exports and product structure of the two countries, calculate the explicit comparative advantage index RCA and the explicit complementarity index TCI to analyze the agricultural product trade between the two countries. The results showed that Chinese and Russian agricultural products markets are complementary in terms of resource endowment and market demand. Competitiveness and complementarity exist in the specific agricultural trade exchanges, but the complementarity is greater than the competition, which is conducive to the cooperation and development of the agricultural product sales markets of the two countries. China and Russia are recommended to strengthen the construction of transportation roads and storage infrastructure, formulate policies to promote trade facilitation and expand cooperation in agricultural product sales. Sun and Tong (2019) conducted statistics on agricultural product trade data between China and Russia from 2010 to 2017. The scale and development trend of the agricultural product market of the two countries, as well as the proportion and structure of agricultural product import and export trade, were analyzed. The VAR model was used to study the impact of Russian green trade barriers on China. The trade volume of agricultural products exported to Russia has an impact. The results showed that green barriers have a depressing effect on China's

exports of Russian agricultural products, especially in the short term. China should establish a sound agricultural product production management system and legal system, strengthen coordination and communication between the two parties, and sign a mutual recognition agreement on agricultural product exports to reduce the impact of green barriers on agricultural products exports. Concerning the influence of political factors on the export and sales of agricultural products of the two countries, Zhang (2020) believes that the Ukrainian crisis has led to the implementation of economic sanctions on Russia by the United States and the European Union, putting the development of the Russian economy, especially technology-intensive and capital-intensive industries, into a difficult situation. However, Russia's agriculture has developed rapidly, gradually getting rid of its dependence on imported food, and also making agricultural products an important export product second only to energy and military equipment. Now, trade frictions between China and the United States have occurred. China needs to resolve the diversification of agricultural imports to ensure food supply security. Strengthening cooperation with Russia in the agricultural field has become an important choice. For a long time, China and Russia have had a good foundation for cooperation in the fields of agricultural product trade and agricultural industry investment. In the next step, the two countries need to strengthen cooperation to achieve complementary advantages and common development. Liu et al. (2018) stated that after the Western countries imposed economic sanctions on Russia in 2014, due to the decline in oil prices in the international market and the depreciation of the ruble, the Russian economy significantly declined. Since then, Russia restricted the import of agricultural products from the Western countries and the export sales of domestic agricultural products, stimulating domestic agricultural production, but this did not immediately provide Russia with sufficient food security. The prices of domestic agricultural products in Russia have risen significantly, and consumption even accounts for 40% of total household expenditures. The agricultural cooperation between Russia and China has been for a long time, but the scale of agricultural product sales between the two sides has always grown slowly. Until 2017, the agricultural product trade between the two sides

accounted for less than 5% of the total trade, mainly due to the high tariffs and other trade barriers between the two countries. Russia does not have a stable policy environment for foreign enterprises to invest in agricultural production, the types of agricultural products trade are few, and the level of agricultural science and technology cooperation is not high. Therefore, the two countries should strengthen cooperation in agricultural production and sales, and increase the proportion of sales in total trade. Liu et al. (2018) studied the agricultural product market in China and Russia from different angles and obtained valuable results.

Russian scholars have also conducted research on the advantages of Russian agricultural production and export from aspects such as the export structure of advantageous agricultural products and the endowment of resources such as land. Uzun et al. (2019) believes that Russia's agriculture has been stable since 1999 due to the government's import substitution policy. Growth, the food trade balance has steadily improved, and the share of imported food in the retail market is declining. Russia has become one of the world's major exporters of wheat and vegetable oil, and the growth of agricultural production has turned to export-oriented. In order to further develop agriculture, the Russian government should pay attention to the reclamation of unused land and adopt new technologies to increase the relatively low yields of crops and livestock. Change the land allocation and agricultural support system that is now strongly biased towards large farms and agricultural production bases, support the development of small farms more, encourage them to participate in the food value chain, and broaden the scope of agricultural development. Deppermann et al. (2018) conducted a comprehensive assessment of the crop production potential of Russia and Ukraine. It is believed that Russia and Ukraine are countries with large untapped agricultural potential in terms of abandoned agricultural land or agricultural production. Through estimation and analysis of the total amount of available abandoned land and potential production output, compared with the current production situation, it is estimated that by 2030, cereal production may increase by 64%; oilseed production may increase by 84%; each accounted for the global output of these crops. 4%

and 3.6%. In addition, the use of intensive production is more efficient, and the crop production potential of Russia and Ukraine can save about 2,100 hectares of farmland on a global scale, and reduce the global average crop price by more than 3%. Benesova et al. (2017) analyzed Russia's exports on a global scale and the degree of trade liberalization, and believed that Russian food exports have advantages over Asia and the CIS countries. Moreover, with the development of economic transformation and trade liberalization, the classification structure of Russian food exports has advantages. It is constantly changing, and there are fewer and fewer ancient species, and the common ones are concentrated in a few categories; from the perspective of comparative advantage, grain, fish and vegetable oil are important parts of Russia's exports.

However, the specific factors of the growth of Sino-Russian agricultural exports have not been studied yet. The questions are: which of the three factors affecting sales (type, quantity, and price of agricultural exports) plays a leading role and contributes more? What are the different factors affecting bilateral agricultural products trade in different periods? What are the differences in types of agricultural products? Therefore, this study is aimed to analyze the bilateral agricultural product export structure between China and Russia, study the growth model of agricultural product exports from the perspective of changes in types, prices, and quantities, and their contribution to the export of agricultural products of the two countries.

2. METHODOLOGY

This study uses the ternary marginal analysis framework proposed by Hummels and Klenow (2005) to study the export structure of agricultural products between the two countries from the perspective of expanding margins and intensive margins (which can be decomposed into price margins and quantity margins) and analyze the ternary margins to the export of agricultural products of the two countries.

The calculation formulas for the extended margin and the intensive margin are as follows:

$$EM_{jm} = \frac{\sum_{i \in l_{jm}} P_{rm} X_{rm}}{\sum_{i \in l_{rm}} P_{rm} X_{rm}}. \quad (1)$$

$$IM_{jm} = \frac{\sum_{i \in l_{jm}} P_{jm} X_{jm}}{\sum_{i \in l_{rm}} P_{rm} X_{rm}}. \quad (2)$$

Among them, EM_{jm} represents the expansion margin of agricultural exports of country j to country m , IM_{jm} represents the intensive margin of agricultural exports of country j to country m , P_{rm} represents the price of agricultural exports, X_{rm} represents the quantity of agricultural exports, r represents the world, and l_{jm} represents the set of types of agricultural products exported by country j to country m , l_{rm} represents the set of types of agricultural products exported by the world to country m , $l_{jm} \in l_{rm}$. The larger the expansion margin, the more abundant the types of agricultural products exported from country j to country m . Intensive margin can be decomposed into price margin and quantity margin:

$$IM_{jm} = P_{jm} Q_{jm}. \quad (3)$$

$$P_{jm} = \prod_{i \in l_{jm}} \left(\frac{P_{jm}}{P_{rm}} \right)^{W_{jm}}. \quad (4)$$

$$Q_{jm} = \prod_{i \in l_{jm}} \left(\frac{X_{jm}}{X_{rm}} \right)^{W_{jm}}. \quad (5)$$

Among them, P_{jm} represents the price margin of agricultural exports of country j to country m , and Q_{jm} represents the quantity margin of agricultural exports of country j to country m .

g_m is used to denote the export growth rate, and the growth rate of agricultural product export market share of country j to country m can be expressed by the following formula:

$$g_m = g_{em} + g_p + g_q. \quad (6)$$

Among them, g_{em} , g_p , and g_q represent the growth rate of the expansion margin, the price margin, and the quantity margin, respectively. The contribution rate of the three to the export trade of agricultural products can be expressed by the following formula:

$$C_{em} = \frac{g_{em}}{g_m} \cdot 100\%. \quad (7)$$

$$C_p = \frac{g_p}{g_m} \cdot 100\%. \quad (8)$$

$$C_q = \frac{g_q}{g_m} \cdot 100\%. \quad (9)$$

3. DATA USED IN THE STUDY

At present, since there is no unified standard for the definition and classification of agricultural products, this study draws on previous research methods and adopts the traditional HS classification of chapters 1-24, 41, 43, 50, 51, 52 and other products representing agricultural products. Chunlai Chen. (2006) classified agricultural products into five categories: grain and oilseed oil products, horticultural products, animal products, processed agricultural products, and textile raw products. The scope of agricultural products involved in each category of agricultural products and the corresponding HS codes are as follows: cereals and oilseeds include HS10, 1201-1208, 1507-1515; horticultural products include HS06-09, 1209-1214, 13, 1401-1403, 1801 -1802, 2401; animal products include HS01-05, 1501-1506, 1516-1518, 1520-1522; processed agricultural products include HS11, 16, 17, 1803-1806, 19-23, 2404-440, 2905, 1950, 3301, 3501-3505, 380910, 3823060; textile raw products and agricultural products include HS1404, 5201-5203, 4101-4103, 4301, 5001-5003, 5101-5103, 5301-5330. This study uses the United Nations Commodity Trade Statistics Database 2009-2018 world trade data and agricultural trade data between China and Russia.

4. RESULTS

4.1. General overview of agricultural products market

The total trade volume of bilateral agricultural products markets between China and Russia increased from \$2.477 billion in 2009 to \$5.228 billion in 2018, an increase of 111.06% and an average annual growth rate of 8.65%. Among them, China's



Figure 1. Agricultural trade between China and Russia, 2009–2018

imports of agricultural products from Russia increased by 149.22%, and exports increased by 69.58%. The growth rate of China’s imports of agricultural products from Russia was significantly greater than the growth rate of exports. From the perspective of the trade balance between China and Russia, from 2016 to 2018, China’s agricultural trade with Russia was in a trade deficit for three consecutive years, and the deficit was increasing rapidly, from \$73 million in 2016 to \$1.192 billion in 2018. The dollar increased by 16.33 times. From the perspective of trade status, during the sample period, the market share of Chinese agricultural products in Russian agricultural products showed an overall upward trend, while the market share of Russian agricultural products in China showed a trend of the first decline and then increase. The market share of Russian agricultural products in China was smaller than that of Chinese agricultural products in Russia (Figure 1).

4.2. Agricultural product export structure

Figure 2 shows that China’s agricultural exports to Russia are mainly labor-intensive, and labor-intensive agricultural products mainly include hor-

tical products and processed agricultural products. These two types of agricultural products accounted for 85% of China’s agricultural exports to Russia from 2009 to 2018. Among them, China’s export of horticultural products to Russia was \$474 million in 2009, \$934 million in 2018, an increase of 97.05%, and the average annual growth rate reached 7.82%. The proportion of all agricultural exports in 2009 was 39.87% and increased to 46.29% in 2018, which is the largest increase in exports. Processed agricultural products exported were \$526 million in 2009 and \$856 million in 2018, an increase of 62.74%, with an average annual growth rate of 5.57%. The proportion of all exported agricultural products shows a trend of first increasing and then decreasing.

Corresponding to the absolute advantage of labor-intensive agricultural products in the export of agricultural products, the export of land-intensive agricultural products only occupies a small share. Land-intensive agricultural products mainly include cereals, oil and fat products, and textile raw products. The two types of agricultural products accounted for 2.25% of China’s agricultural exports to Russia, and they accounted for 0.41% in 2018, showing a clear downward trend.

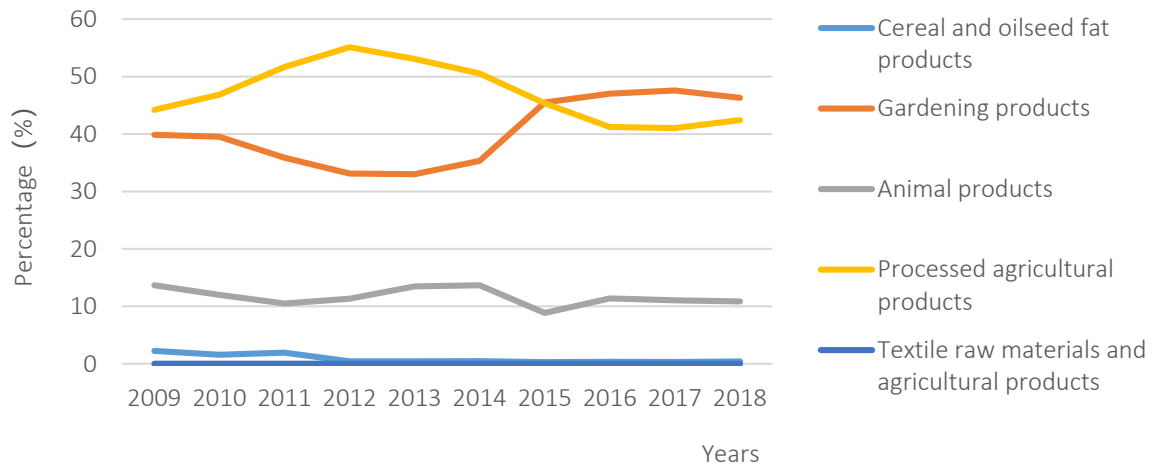


Figure 2. The proportion of China's exports of various agricultural products to Russia

Figure 3 shows that the agricultural products exported by Russia to China are mainly animal products, cereals and oilseeds, and processed agricultural products. Among them, the export value of animal products in 2009 was \$672 million and in 2018 it was \$1.298 billion, an increase of 93.15%. It is Russia's largest agricultural product category exported to China; however, the overall export proportion has shown a downward trend. Exports accounted for 92.78% of total agricultural exports, which dropped to 51.29% in 2018, a decrease of 41.49%. At the same time, exports of cereals and oilseeds, and processed agricultural products have achieved rapid growth. In 2009, Russia's exports of these two types of agricultural products to China reached \$33 million, and in 2018 it was \$1.202 billion, an increase of nearly 36%. The proportion of Russian agricultural products exported to China: 4.59% in 2009 and 47.49% in 2018. This shows that through the development of the past 10

years, new changes have taken place in the marketing of agricultural products. With economic development, new changes have appeared in the Chinese agricultural product market. The demand for agricultural products has changed from a large demand for primary agricultural products, such as animal products, to a rapid increase in the demand for processed agricultural products, cereals, oilseeds and fat products, and other processed agricultural products. On the other hand, the agricultural products exported by Russia show a trend of diversification. The competitiveness of agricultural products continues to increase. Horticultural products and textile raw materials always account for only a small share of Russian agricultural exports to China. In 2009, these two types of agricultural products accounted for 2.63% of Russian agricultural exports to China, and in 2018 they accounted for 1.21%, showing a declining trend.

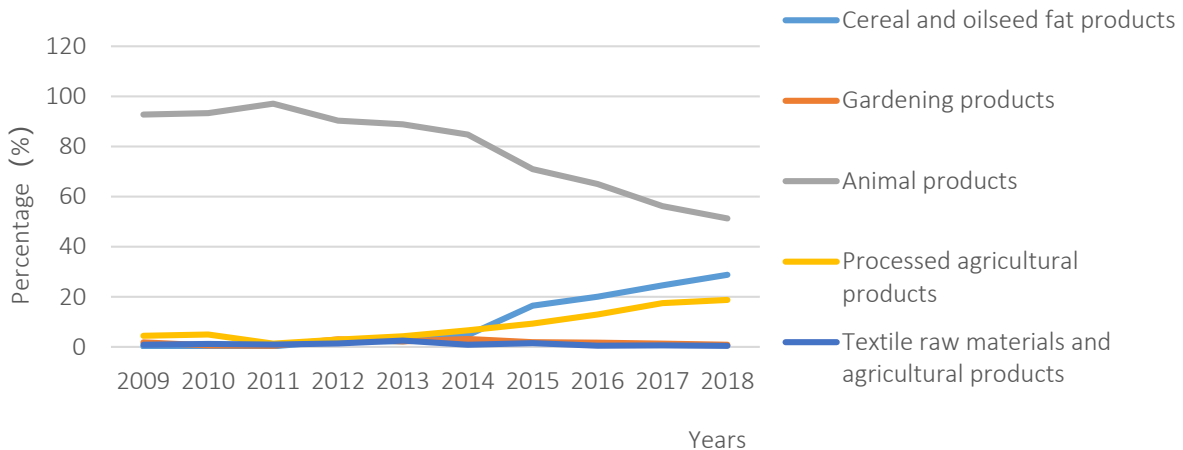


Figure 3. The proportion of Russia's exports of various agricultural products to China

5. DISCUSSION

5.1. The overall structure of agricultural export

Table 1 shows that the expansion margin of China’s agricultural exports to Russia from 2009 to 2018 maintained a relatively stable state. This shows that the types of China’s agricultural exports to Russia did not increase or decrease significantly. China’s exports to Russia are advantageous agricultural products that always maintain an advantageous position. At the same time, the expansion margin of Russia’s agricultural exports to China has generally maintained a relatively rapid growth trend, from 0.25 in 2009 to 0.564 in 2018, an increase of 125.60%. This shows that with the rapid development of trade between China and Russia, China has become an important agricultural product sales market in Russia. However, the expansion margin of China’s agricultural exports to Russia has always been greater than that of Russia’s agricultural exports to China. This shows that the types of agricultural products exported from China to Russia are greater than those exported from Russia to China, and the variety of agricultural products exported from China is more diverse. In general, the maximum expansion margin of Chinese-Russian bilateral agricultural exports is only kept within 0.6, which is not high. With the rapid development of economic and trade exchanges between the two countries in the future, the types of agricultural exports from China and Russia will continue to expand significantly.

The statistics in Table 1 show that from 2009 to 2018, the intensive margin of China’s agricultural exports to Russia has generally shown a steady rise, from 0.046 in 2009 to 0.072 in 2018, an increase of 56.52%. This shows that China’s trade volume of Russian agricultural exports has shown steady growth. However, during the same period, the intensive margin of Russia’s agricultural exports to China showed a trend of volatility: declined at first and then increased. From 2009 to 2014, it showed a downward trend, from 0.015 in 2009 to 0.010 in 2014, a decrease of 50%. From 2014 to 2018, it showed an overall growth trend, from 0.010 in 2014 to 0.019 in 2018, an increase of 90%. This shows that Russia’s agricultural exports to China have experienced a process of decline at first and then growth.

The increasing demand for agricultural products has made China increasingly an important market for Russian agricultural exports. However, from the overall comparison of the intensive margin of agricultural exports between China and Russia, the intensive margin of agricultural exports from China to Russia is greater than the intensive margin of agricultural exports from Russia to China. This shows that the export volume of agricultural products from China to Russia in 2009-2018 is greater than the trade volume of agricultural products exported from Russia to China. In recent years, the trade volume of agricultural products between the two countries has shown an ever-increasing trend.

As an indicator to measure the volume of trade, the intensive margin can also be decomposed into

Table 1. The export expansion margins of China and Russia from 2009 to 2018

Source: UN Comtrade Database (2020).

China’s exports to Russia					Russia’s exports to China				
Year	Extended margin	Intensive margin			Year	Extended margin	Intensive margin		
		overall	Quantity margin	Price margin			Overall	Quantity margin	Price margin
2009	0.547	0.046	0.061	0.754	2009	0.250	0.015	0.008	1.875
2010	0.551	0.046	0.057	0.807	2010	0.240	0.014	0.008	1.750
2011	0.550	0.047	0.057	0.825	2011	0.268	0.012	0.007	1.714
2012	0.552	0.048	0.056	0.857	2012	0.269	0.011	0.007	1.571
2013	0.554	0.049	0.051	0.961	2013	0.318	0.010	0.006	1.667
2014	0.560	0.059	0.060	0.983	2014	0.386	0.010	0.006	1.667
2015	0.548	0.072	0.061	1.180	2015	0.541	0.013	0.008	1.625
2016	0.553	0.080	0.064	1.250	2016	0.518	0.015	0.011	1.364
2017	0.544	0.070	0.073	0.959	2017	0.541	0.014	0.012	1.167
2018	0.556	0.072	0.068	1.059	2018	0.564	0.019	0.018	1.056

the quantity margin and the price margin. Table 1 shows that the overall quantity margins of agricultural exports from China and Russia demonstrate a fluctuating upward trend. The difference is that the changing trend of the quantity margins of China's exports of Russian agricultural products does not coincide with the intensive margin, but continues with the overall intensive margin. The difference in the growth trend is that the quantity margin has experienced a process of decline at first and then increase. For example, the quantity margin first dropped from 0.061 in 2009 to 0.051 in 2013, a decrease of 19.61%; and then increased from 0.051 in 2013 to 0.068 in 2018, an increase of 33.33%. This shows that the growth of China's agricultural exports to Russia has little to do with the volume of agricultural exports. The changing trend of the volume margin of Russian agricultural exports to China is the same as that of the intensive margin, indicating that the changes in the volume of Russian agricultural exports to China are closely related to the changes in the volume of exports. The volume of agricultural exports has a greater impact on the volume of Russian agricultural exports.

Table 1 shows that the price margin of China's agricultural exports to Russia continues to rise and then declines. During the sample period, the margin of China's agricultural exports to Russia has shown a continuous growth trend until 2016, from 0.754 in 2009 to 1.250 in 2016, an increase of 65.78%. From 2016 to 2018, it experienced a pro-

cess of decline at first and then rise, but the overall trend showed a downward trend, for example, from 1.250 in 2016 to 1.059 in 2018, a decrease of 18.04%. The changing trend of agricultural export price margin and intensive margin is the same, which shows that China's agricultural exports to Russia are closely related to agricultural export prices. The export price margin of Russian agricultural products to China has shown a continuous downward trend, from 1.875 in 2009 to 1.056 in 2018, a decrease of 77.56%. This is different from the trend in that the intensive margin first declined and then increased during the statistical period. This shows that Russian agricultural exports to China are not closely related to the export price of agricultural products; the increase in the export value of Russian agricultural products to China is mainly due to the increase in the export volume of agricultural products.

5.2. Analysis on the type structure of exported agricultural products

Analyzing the bilateral agricultural products export structure between China and Russia, Table 2 shows that for different types of agricultural products, there are the same or different reasons for the growth of Chinese and Russian agricultural exports. The increase in Sino-Russian bilateral exports of cereals, oilseeds, and fat products is mainly due to the expansion of the marginal contribution of exports of such agricultural products in the two countries. That is, the increase in the

Table 2. The ternary margin and contribution rate of different types of agricultural exports of China and Russia

Source: UN Comtrade Database (2020).

Ternary margin	Year	Cereals, oilseeds and fats		Gardening products		Animal products		Processed agricultural products		Textile raw products and agricultural products	
		China	Russia	China	Russia	China	Russia	China	Russia	China	Russia
Extended margin	2009	0.240	0.2	0.630	0.167	0.296	0.259	0.662	0.352	0.143	0.125
	2018	0.417	0.64	0.611	0.611	0.389	0.407	0.725	0.662	0.125	0.375
	Contribution rate	0.024	0.213	-0.127	0.326	0.129	0.195	0.052	0.109	0.074	0.429
Quantity margin	2009	0.033	0.001	0.102	0.001	0.011	0.100	0.058	0.005	0.001	0.001
	2018	0.002	0.014	0.091	0.001	0.038	0.078	0.087	0.018	0.004	0.005
	Contribution rate	-0.026	0.007	-0.025	0.001	0.022	-0.003	0.017	0.007	0.005	0.006
Price margin	2009	0.970	1	0.627	3	1.545	0.884	1.241	0.75	1.000	1.057
	2018	1.500	1.029	1.110	1	0.921	0.526	1.046	0.869	0.500	0.321
	Contribution rate	0.002	-0.222	0.152	-0.327	-0.151	-0.191	-0.070	-0.117	-0.079	-0.435

types of products is related to the export of cereals and oilseeds, and fat products. The main driving force for the growth of China's exports of horticultural products to Russia is the price margin, that is, the increase in the prices of such products promotes the increase in trade volume. The main driving force for the growth of Russia's horticultural exports to China is the expansion margin. Thus, it relies on increasing exports. The types of agricultural products to expand the sales of such agricultural products.

The driving force for the growth of China's export of animal products to Russia is the expansion of the margin and the number of margins. Exports increase by expanding the types of agricultural products and the number of agricultural products. The main driving force of the growth of Russia's animal exports to China is only the expansion of the margin. Export value is increasing by increasing the types of exported agricultural products. The main reason for the increase in bilateral exports of processed agricultural products between China and Russia is the expansion of the expansion margin and the expansion of the quantity margin between the two countries. The changes in China's export trade of textile raw products and agricultural products to Russia are mainly due to the expansion of the quantity margin. The increase in the number of exported agricultural products increases the export sales of such agricultural products. The main driving force of the changes in Russia's textile raw materials and agricultural products export trade to China is the expansion of the margin. It mainly relies on expanding the types of agricultural products exported to increase the export value of such agricultural products. In summary, the increase in China's exports of cereals, oilseeds and fat products, animal products, and processed agricultural products to Russia is mainly due to the increase in the expansion margin. The increase in sales of China's ex-

ports of horticultural products to Russia is mainly due to the increase in the price margin. As a result, the growth of textile raw products and agricultural products is mainly due to the marginal increase in quantity. At the same time, the increase in the trade volume of agricultural exports from Russia to China is mainly due to the expansion of the marginal growth.

The analysis of the quality of agricultural products exported by China and Russia shows that such a quality is different. The prices of cereals, oilseeds, and horticultural products that China exports to Russia have seen price increases. It can be considered that the export quality of these agricultural products has improved, while the prices of animal products, processed agricultural products, and textile raw products have all declined in price and quantity. The rising phenomenon shows that in the export trade of these three kinds of agricultural products, China is expanding the export quantity by lowering the export price, and the product quality has not been fundamentally improved. Among the agricultural products exported by Russia to China, the export prices and quantity of cereals, oilseeds and fat products, and processed agricultural products have both increased, indicating that the quality of these types of agricultural products has improved. The export of animal products and textile raw products and agricultural products has seen price declines and quantities. The phenomenon of rising indicates that the increase in the trade volume of such agricultural products is realized by lowering the prices of products. The decline in prices of horticultural products and the fact that the export volume remains unchanged indicates that the export competitiveness of such agricultural products in the Chinese market has declined. Merely taking marketing measures to reduce prices did not increase the export volume of products.

CONCLUSION

The marketing of export agricultural products is affected by many factors, so different indicators are chosen to reflect the different purposes of actual studies. Based on the factors that affect the marketing of agricultural products, this study creatively selects three indicators to reflect the current situation of bilateral agricultural export marketing between China and Russia, including EM_{jm} (expansion margin), P_{jm} (price margin), Q_{jm} (quantity margin), and specific contribution rate. The analysis results

show that different agricultural products in the bilateral agricultural export sales between China and Russia, including technology-intensive agricultural products and land-intensive agricultural products, have different degrees of impact on agricultural product sales at different times by the types, prices, and quantities of agricultural products exported. This paper also puts forward suggestions on how to increase the export volume of agricultural products of the two countries and fully develop the potential of the bilateral agricultural export market. In the context of the comprehensive strengthening of economic cooperation between China and Russia, this study provides an important basis for the Chinese government to formulate an effective agricultural product export policy.

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