Analysis on the Growth Factors of Agricultural Products Trade between China and RCEP

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Abstract

The signing of the Regional Comprehensive Economic Partnership (RCEP) will bring greater opportunities to all the RCEP menbers. This paper employs G-L index and selects the data of agricultural products trade between China and other RCEP countries from 1998 to 2019 according to SITC (Rev.3) so as to analyze the intra-industry trade situation of the agricultural products trade between China and other RCEP countries, and finds that the intra-industry trade of agricultural products trade between China and RCEP countries is remarkable. Then the article applies the simple CMS model to decompose the influencing factors of China's agricultural products export to RCEP. The results show that the structural change effect mainly plays a promoting role on export growth, while the promoting role of competitiveness effect weakens, and the interaction effect changed from inhibition to promotion.

Keywords: *Agricultural Product; RCEP; G-L index; CMS model;*

1. Introduction

The Regional Comprehensive Economic Partnership (RCEP), which includes a total of 15 countries, including China, Japan, the Republic of Korea, Australia, New Zealand and the ten members of the Association of Southeast Asian Nations, was formally signed on November 15, 2020, as a new type of free trade zone is an important force to promote global economic integration (Han Yonghui et al., 2021) [1]. As the largest free trade area in the world, the RCEP exported US $5.2 trillion in 2019, accounting for 30 percent of the world exports. China and the other RCEP countries have a sound trade foundation in agricultural products. During 2001 and 2019, the total import and export volume of agricultural products of all the RCEP member countries increased continuously. Imports increased from US $97.31 billion in 2001 to US $390.78 billion in 2019, an increase of 302%. Exports increased from US $77.13 billion in 2001 to US $30.089 billion in 2019, an increase of 290%. From a country-specific perspective, for example, China, Japan and ASEAN are important countries in traditional agricultural products trade. China and ASEAN enjoy booming trade in agricultural products, making them a large market for agricultural products consumption with great vitality and potential in the world. Japan is the largest export target country of agricultural products from China.

The current literature has studied the trade of agricultural products between RCEP and China, and it is believed that RCEP mainly plays a positive role in the trade of agricultural products, and it is also a great benefit to China's export of agricultural products (Wang Han, 2020; Lin Qingquan et al., 2021) [2,3]. Liu Yizhuo and Zhao Yifu (2017) employed the GTAP model to conduct a general equilibrium simulation analysis, and pointed out that the completion of RCEP had a significant impact on China's agricultural trade, and the differences among different industries would increase China's export of superior agricultural products and import of inferior agricultural products [4]. Sun Lifang and Chen Zhao (2018) calculated four agricultural product competitiveness indexes including MS, RSCA, CA and TC, and built a core competitiveness model of agricultural products with these four indexes as explained variables. They concluded that openness was the most influential factor affecting the competitiveness of agricultural products in China and other RCEP member countries [5]. Zheng Jian and Wang Xuemei (2019) used the stochastic frontier gravity model to analyze the trade potential and efficiency of agricultural products in RCEP

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member countries, and found that after considering the export volume of agricultural products, China had the greatest export potential of agricultural products to South Korea, Japan and Vietnam [6]. Xue Kun and Zhang Jiguo (2017) analyzed the impact of RCEP on agricultural products trade from the perspective of tariff reduction, and concluded that RCEP would expand the scale of China's import and export of agricultural products, and the entry of RCEP would have more prominent trade creation effect and trade diversion effect on the internationally competitive categories of China's agricultural products [7]. Lin Qingquan, et al. (2021) using the revealed comparative advantage, product similarity, similarity and trade complementarity index to compare China with the RCEP members of the international competitiveness of agricultural products, it is concluded that the international competitiveness of Chinese agricultural products is relatively inferior, however the signing of the RCEP will bring opportunities and challenges for China's agricultural products trade [3]. At present, literature studies on RCEP and agricultural products mainly focus on the international competitiveness of agricultural products and the impact of trade potential, less on the analysis of factors affecting the export growth of agricultural products. Taking this as a breakthrough point, this paper analyzes the growth factors of China's export of agricultural products to RCEP countries by building a simple CMS model.

2. The Status of China Agricultural Products' Trade with RCEP

2.1. The scale of trade in agricultural products between China and other RCEP countries keeps expanding

As shown in Figure 1, the total trade volume of agricultural products between China and RCEP countries showed an upward trend from 1998 to 2019. In 2019, China exported US $35.84 billion of agricultural products to RCEP countries, and imported US $62.27 billion. Compared with 2001, when China joined the WTO, the increase was 2.92 times and 7.99 times respectively. Among them, the total volume of agricultural trade showed a V-shaped development trend around 2009 and 2016. However, the trade frictions between China and USA in 2018 did not have a negative impact on the trade of agricultural products between China and RCEP countries, and the trade scale still maintained an upward trend, which also demonstrated the good resilience of the trade of agricultural products between China and other RCEP countries.

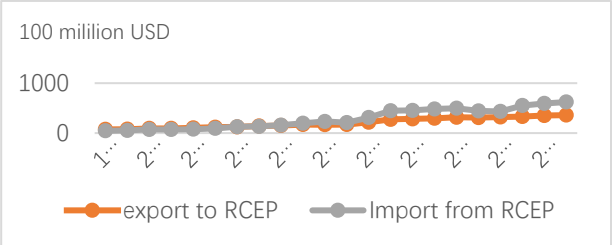

Fig. 1. Total volume of agricultural products trade between China and RCEP.

2.2. The structure of agricultural products' exports is unbalanced

2.2.1. China has an absolute advantage in category 2 of agricultural products imported from RCEP countries

China's imports of the four Categories of agricultural products from RCEP countries showed a general trend of fluctuation (as shown in Table 1), among which, the proportion of the category 2 of agricultural products showed a general trend of fluctuation and decline, from 61.55% in 1998 to 37.98% in 2019. However, the category 2 of agricultural products still maintained the highest proportion among the four categories of agricultural products, and reached the highest value in 2014, accounting for 71.56%. Category 0 and Category 1 agricultural products generally showed a fluctuating upward trend, in which the proportion of Category 0 agricultural products exceeded that of Category 2 for the first time in 2019, becoming the highest proportion of agricultural products. The proportion of the category 1 of agricultural products has been increasing, but the overall proportion in agricultural products is still small. The category 4 of agricultural products accounted for the third place, accounting for about 10% in the past decade.

China's imports of agricultural products mainly focus on rice, palm oil, livestock products, dairy products, fruit, vegetables, aquatic products. RCEP can increase the proportion of China's imports of competitive agricultural products from member countries, such as meat products imported from Australia and New Zealand, and tropical fruits imported from ASEAN countries, Japan and South Korea. The increase in imports of these agricultural products is conducive to promoting the upgrading of China's consumption.

Table 1. The proportion of various agricultural products in China's total imports from RCEP (%)

Year	Categor y0	Categor y1	Categor y2	Categor y4
1998	21.85	0.20	61.55	16.39
1999	23.59	0.31	61.30	14.80
2000	21.21	0.26	68.85	9.69
2001	24.37	0.25	65.91	9.47
2002	21.96	0.19	63.61	14.24

2003	19.85	0.14	60.77	19.24
2004	25.37	0.21	55.95	18.47
2005	23.12	0.25	59.76	16.86
2006	22.52	0.45	58.55	18.48
2007	19.83	0.56	55.31	24.31
2008	19.06	0.64	51.59	28.71
2009	26.87	1.02	47.62	24.49
2010	26.20	0.91	52.97	19.91
2011	22.92	0.81	56.63	19.65
2012	30.38	0.92	50.07	18.64
2013	34.31	0.95	51.34	13.40
2014	13.09	0.39	71.56	14.96
2015	42.64	1.91	43.53	11.91
2016	41.13	2.34	45.87	10.65
2017	38.54	2.38	48.02	11.07
2018	42.89	2.59	44.69	9.83
2019	49.03	2.86	37.98	10.13

2.2.2. China's export structure of agricultural products to RCEP countries is unbalanced

As shown in Table 2, the structural distribution of agricultural products exported by China to RCEP countries is unbalanced. Among the agricultural products exported by China to RCEP countries, category 0 agricultural products account for the largest proportion, accounting for more than 80% in all the years. The second agricultural products is category 2, accounting for more than 10%, and the category 4 is the smallest, accounting for less than 1%. China's export of agricultural products mainly excludes vegetables, fruits, aquatic products, livestock products, sugar, tea, and the signing of the RCEP will have a more prominent impact on the change of vegetable and fruit export.

TABLE 2. THE PROPORTION OF VARIOUS AGRICULTURAL PRODUCTS IN CHINA'S TOTAL EXPORTS TO RCEP (%)

Year	Category0	Category1	Category2	Category4
1998	81.46	4.32	13.32	0.91
1999	66.61	2.20	30.84	0.35
2000	81.04	1.88	16.82	0.25
2001	83.11	2.51	14.15	0.24
2002	84.51	2.27	13.04	0.18
2003	84.43	2.18	13.11	0.28
2004	85.23	2.28	12.08	0.40
2005	85.17	2.17	11.95	0.71
2006	85.12	2.12	12.18	0.58
2007	85.26	2.37	11.81	0.57
2008	80.07	2.58	13.84	3.51
2009	83.52	2.60	13.24	0.64
2010	84.40	2.41	12.59	0.60
2011	83.46	2.40	13.56	0.57
2012	83.18	2.66	13.56	0.59
2013	84.15	2.53	12.72	0.61
2014	83.34	2.67	13.46	0.54
2015	85.53	2.52	11.46	0.49
2016	85.90	2.60	11.01	0.50
2017	86.43	2.39	10.65	0.53
2018	85.38	2.37	11.51	0.74
2019	85.85	2.58	10.84	0.73

3. ESTIMATION OF INTRA-INDUSTRY OF AGRICULTURAL PRODUCTS TRADE BETWEEN CHINA AND RCEP

Intra-industry trade is the reflect of scale economy and diversified demand. The higher the Intra-industry Trade Index is, the higher the level of participation in international division of labor is. G-L index is used to measure the level of development of a country's intra-industry trade. The calculation formula is as follows:

$$GL_{\mathrm{i}} = 1 - \frac{\left|X_{\mathrm{i}} - \mathrm{M}_{\mathrm{i}}\right|}{X_{\mathrm{i}} + \mathrm{M}_{\mathrm{i}}} \tag{1}$$

Where, Xi represents the amount of China's agricultural trade exports to RCEP, and Mi represents the amount of China's agricultural trade imports from RCEP. The higher the value of GLi, the higher the degree of intra-industry trade.

As can be seen from Table 3, the G-L index of agricultural trade between China and RCEP countries remained above 0.5 in general from 2009 to 2019, indicating significant industrial trade. In terms of specific classification, the G-L index of Category 0, Category 1, and Category 4 of agricultural products has been rising continuously in recent years, and the trend of intra-industry trade has increased significantly. In particular, the G-L index of Category 0 and Category 1 of agricultural products has increased significantly. In 2019, the G-L index of Category 0 products is close to 1, indicating a very significant intra-industry trade.

TABLE 3. THE G-L INDEX OF AGRICULTURAL PRODUCTS TRADE BETWEEN CHINA AND RCEP.

Year	Category 0	Category 1	Category 2	Category 4	Total
1998	0.28	0.06	0.52	0.48	0.76
1999	0.33	0.15	0.95	0.05	0.80
2000	0.33	0.19	0.49	0.51	0.87
2001	0.36	0.14	0.44	0.56	0.86
2002	0.32	0.12	0.43	0.57	0.85
2003	0.32	0.09	0.42	0.58	0.89
2004	0.47	0.17	0.35	0.65	0.99
2005	0.41	0.20	0.35	0.65	0.97
2006	0.44	0.36	0.33	0.67	0.98
2007	0.42	0.42	0.31	0.69	0.93

2008	0.49	0.51	0.33	0.67	0.83
2009	0.57	0.65	0.37	0.63	0.90
2010	0.62	0.70	0.28	0.72	0.82
2011	0.62	0.71	0.25	0.75	0.76
2012	0.74	0.71	0.29	0.71	0.77
2013	0.80	0.76	0.26	0.74	0.76
2014	0.86	0.83	0.07	0.93	0.78
2015	0.84	0.96	0.31	0.69	0.82
2016	0.79	0.90	0.30	0.70	0.85
2017	0.86	0.75	0.23	0.77	0.75
2018	0.92	0.70	0.26	0.74	0.74
2019	1.00	0.68	0.28	0.72	0.73

4. EMPIRICAL ANALYSIS

4.1. Data selection

This paper selects the data of agricultural products trade from 1998-2019 according to SITC Rev.3. Construct the CMS model with the other members of the RCEP as a whole. According to the fluctuating trend of China's agricultural exports to RCEP countries, the data from 1998-2019 are divided into two stages :(1) 1998-2009, the stage of slow growth; (2) 2010-2019, the stage of rapid growth.

4.2. Model Construction

This paper constructs a simple single market CMS model. The CMS model will be decomposed in the first level, as shown in the formula:

The first level of decomposition:

$$\Delta q = \sum_i S_i^0 \Delta Q_i + \sum_i Q_i^0 \Delta S_i + \sum_i \Delta S_i \Delta Q_i \quad (2)$$

Δq represents the changes of agricultural products' exports from China to RCEP. $\sum_i S_i^0 \Delta Qi$ represents the structural change effect. $\sum_i Q_i^0 \Delta S_i$ presents the competitiveness effects. $\sum_i \Delta S_i \Delta Q_i$ presents the interaction effect.

4.3. Statistical Analysis

According to the fluctuation of China's export to RCEP in Figure 1, 2009 was selected as the cut-off point. As shown in Table 4, among the factors influencing China's export of agricultural products to RCEP, the structural change effect of 1998-2009 and 2010-2019 were both positive, with 49.81% and 60.51%, respectively. structural change effect plays a major role in promoting the growth of China's agricultural trade to RCEP countries, indicating that China's large-scale export of agricultural products to RCEP countries is mainly due to the expansion of agricultural market size in RCEP countries and the change of agricultural product import structure in RCEP countries.

Competitiveness effect shows great difference in the two stages. Competitiveness effect reflects the impact of the increase in the competitiveness of China's agricultural products on China's exports to RCEP members. During 1998-2009, the competitiveness effect reached 222.57%. However, during 2010-2019, the competitiveness effect was only 28.72%, indicating a decline in competitiveness.

The interaction effect was negative during 1998-2009, which had a inhibiting effect on China's export to RCEP countries, indicating that the structural change effect of China's export to RCEP countries was inconsistent with the structural change of RCEP countries' agricultural product import during this period. However, from 2010 to 2019, the value turned from negative to positive, which promoted the growth of agricultural product export trade and brought about an export growth of 1533.56 million US dollars. During this period, the structural change of China's agricultural product export to RCEP countries was consistent with the structural change of agricultural product import from RCEP countries.

TABLE 4. THE RESULTS OF CMS OF CHINA'S EXPORT TO RCEP FROM 1998 TO 2019.

Unit：million dollars

Influencing factors	1998-2009		2010-2019	
	Exports	Contribution rate	Exports	Contribution rate
changes in export value	1018.73	100%	14247.91	100%
structural change effect	507.45	49.81%	8621.83	60.51%
competitiveness effects	2267.33	222.57%	4092.51	28.72%
interaction effect	-1756.05	-172.38%	1533.56	10.76%

5. CONCLUSIONS AND RECOMMENDATIONS

In this paper, the RCEP member countries except China are analyzed as a whole, and the G-L index analysis shows that China's agricultural products export to RCEP countries are mainly based on inter-industry trade. By using simple CMS to analyze the influencing factors of China's agricultural products export to RCEP countries, the structural change effect is the main promoting factor, the competitiveness effect declines greatly, and the interaction effect turns from negative to positive.

In order to further promote the growth of China's agricultural exports to RCEP members, we can start from the following aspects :(1) Make full use of the advantages of tariff reduction and trade facilitation brought by the RCEP agreement. After the signing of the RCEP, more than 90 percent of goods trade will achieve zero tariff,

which greatly improves the degree of trade liberalization between China and RCEP member states. (2) Tap the potential of cross-border e-commerce. In 2019, China's cross-border e-commerce transactions exceeded 10 trillion CNY, and cross-border e-commerce accounted for 33% of the import and export of goods. RCEP will help reduce the uncertainty of cross-border e-commerce and achieve regional coordination and consistency of e-commerce policies. It will be a very promising direction to expand the industrial layout of cross-border e-commerce in RCEP countries and reduce the operational risks of cross-border e-commerce. (3) Give full play to the role of small and medium-sized enterprises in participating in agricultural trade.

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