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Research on the Current Situation and Influencing Factors of China's Agricultural Exports to RCEP Member Countries

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Abstract: Agricultural trade has always been an important trade area between China and other RCEP members, and the formal landing of the RCEP agreement is bound to further promote China's agricultural exports to these countries. ASEAN, Japan and South Korea are China's main exporters, and Australia and New Zealand have great potential for agricultural trade. Based on the extended trade gravity model, the impact of influencing factors such as GDP, per capita GDP, geographical distance, population, agricultural land area, bilateral free trade agreements, tariffs and other influencing factors on China's export of agricultural products to other RCEP member countries was analyzed. The results show that GDP, per capita GDP, geographical distance, population size, and the establishment of bilateral free trade agreements have positive effects on China's export of agricultural products to other RCEP members. The primary weighted average tariffs and agricultural land area of other RCEP members have a negative impact on China's exports.

Keywords: RCEP, outlet,agricultural products, influencing factors.

1. Introduction

Nine years have passed since ASEAN launched the RCEP agreement in 2012, during which member countries have gone through multiple rounds of negotiations, and the RCEP agreement finally came into effect on January 1, 2022, which means that it has become the world's largest free trade agreement, bringing important opportunities for the development of global free trade and providing major benefits and convenience to China's foreign trade. In addition to China, the RCEP members are the 10 ASEAN countries, Japan, South Korea, Australia, and New Zealand, all of which have different degrees of trade ties with China, especially in agricultural trade. After the Belt and Road Initiative was proposed, China's agricultural exports to ASEAN continued to rise, accounting for 24.6% of China's total agricultural exports from January to July 2020. Japan and South Korea are also important export markets for China's agricultural product trade, with China's agricultural exports to Japan and South Korea accounting for 13.4% and 6.3% respectively; Australia and New Zealand are important import sources of China's agricultural product trade, and the proportion of China's agricultural products imported from Australia and New Zealand is 6.4% and 6.0% respectively (data from the Ministry of Commerce's "China Agricultural Products Import and Export Monthly Statistical Report"). Moreover, with the instability and complexity of Sino-US relations, China's agricultural trade with RCEP member countries or regions is bound to become increasingly close.

Existing studies have analyzed the agricultural trade of RCEP members mainly from the aspects of influencing factors and simulation predictions. Under the framework of RCEP, Liu Chenyang et al. explored the factors influencing China's three-dimensional margin on ASEAN aquatic product exports, namely China's gross domestic product (GDP) scale and fixed trade costs[1]. ZhiweiLu believes that RCEP is a modern, comprehensive, high-level and mutually beneficial agreement, which marks the official establishment of the free trade area with the largest participation population, the most diverse membership structure and the greatest development potential in the world. Global inflation expectations are rising, so potential risks remain a concern[2]. Xue Kun et al. used the GTAP model to study the impact of tariff concessions on China's macroeconomy and trade after the establishment of RCEP, and believed that RCEP would help improve China's terms of trade, and the more tariff concessions, the more obvious the benefits [3]. The research on agricultural trade between RCEP members has not been as comprehensive as the study of agricultural trade between other target countries or regions, and currently mainly focuses on competitiveness and complementarity, influencing factors, simulation prediction, etc., and scientific and in-depth analysis of these issues has laid a solid foundation for more in-depth discussion of agricultural trade of RCEP members in the future [4]. Based on this, this study studies the current situation and influencing factors of China's agricultural exports to RCEP member countries, and discusses the degree of influence of its influencing factors.

2. Current status of China's Agricultural Exports to RCEP Member Countries

2.1. The scale of China's exports of agricultural products to RCEP member countries

From 2004 to 2019, China's agricultural exports to other RCEP members showed an overall upward trend, of which exports to ASEAN, Japan, South Korea, Australia and New Zealand rose from US$2.11 billion, US$7.39 billion, US$2.12 billion, US$240 million and US$30 million in 2004 to

US$18.59 billion, US$10.35 billion, US$4.94 billion, US$1.03 billion and US$210 million in 2019. China's exports to ASEAN grew the most. It can be seen that China's agricultural exports to Japan and South Korea are relatively large, which are important agricultural export markets for China, mainly because Japan and South Korea relatively lack natural conditions for agricultural development and huge import demand. Before the Belt and Road Initiative in 2013, China's agricultural exports to ASEAN fluctuated slightly, but after the Belt and Road Initiative was proposed, China's trade relations with ASEAN have become increasingly close, and China's agricultural exports to ASEAN have shown a steady upward trend year by year[5]. In other RCEP countries that are not countries along the "Belt and Road", China's agricultural exports to them have not increased year by year after the "Belt and Road" was proposed, but have shown some fluctuations, especially China's agricultural exports to Japan from 2014 to 2019 are lower than in 2013.

2.2. Distribution of China's exports to RCEP member countries

From 2004 to 2019, the proportion of China's agricultural exports to ASEAN increased from 9.2% to 23.7%, and ASEAN has become one of the most important agricultural export markets for China. China's share of agricultural exports to Japan decreased from 32% to 13.2%, and with the diversification of China's export market, it remains an important agricultural export market for China, although the proportion of China's agricultural exports to Japan has declined[6]; The proportion of China's agricultural exports to South Korea changed from 9.2% to 6.3%, also showing a slight decline. China's agricultural exports to Australia and New Zealand account for a relatively low proportion and need to be further explored. According to the data in 2019, China's agricultural exports to other RCEP members accounted for 44.8% of China's total agricultural exports, which shows that RCEP members are China's extremely important agricultural export trading partners[7]. Among them, ASEAN, Japan and South Korea are China's main agricultural export markets, while the trade potential of Australia and New Zealand has yet to be tapped.

3. An empirical Analysis of China's Influencing Factors on Agricultural Exports of RCEP Member Countries

3.1. Model settings

Tinbergen et al. applied the gravitational model to study international trade, analyzed bilateral trade flows, and found that the size of bilateral trade between two countries is directly proportional to their economic aggregate, and inversely proportional to the distance between them [8]. We generally use gross domestic product (GDP) to express the size of a country's economy, the distance of geographical location acts on the trade of the two countries, the closer the geographical location of the two countries, the more convenient the trade, the more convenient the flow of trade between the two countries, the basic form of the trade gravity model is

$$T = A\frac{Y_{ij}Y_{ji}}{D_{ij}} \quad (1)$$

Equation (1) reflects that the volume of trade between the two countries increases with the size of the economy, but decreases with the increase of geographical distance. Yij represents the volume of trade between country i and country j, DISij represents the distance between country i and country j, and GDP i and GDP j represent the GDP of country i and country j, respectively. For better linear analysis, the model can be logized:

$$\ln Y_{ij} = \alpha_0 + \alpha_1 \ln(Y_{ij}Y_{ji}) + \alpha_2 \ln D_{ij} + \mu \quad (2)$$

In the formula, α_0 is constant, α_1, α_2 are regression coefficients, and μ are random error terms. Based on the existing research results, combined with the actual situation of agricultural trade of RCEP members, and considering factors such as data availability and operability, this study introduces a number of other important explanatory variables on the basis of equation (3) to establish an export gravitational expansion model:

$$\begin{aligned}\ln EXP_{ijt} = \alpha_0 + \alpha_1 \ln mygGDP_{jt} + \alpha_2 \ln DIS_{ijt} + \\ \alpha_3 \ln PGDP_{jt} + \alpha_4 \ln POP_{jt} + \alpha_5 \ln TARIFF_{jt} + \\ \alpha_6 \ln ARGILAND_{jt} + \alpha_7 \ln RCEP_{ijt} + \mu \quad (3)\end{aligned}$$

i represents China, j represents other RCEP members, t represents the year, EXP_{ijt} represents China's agricultural exports to other RCEP members, mygGDP $_{jt}$, $PGDP_{jt}$ represent the GDP of other RCEP members and the per capita GDP of member countries respectively, POP_{jt} represents the total population of other RCEP member countries, DIS_{ijt} represents the geographical distance between China and other RCEP members, $ARGILAND_{jt}$ represents the area of agricultural land of other RCEP members, $TARIFF_{jt}$ represents the weighted average tariffs on primary products levied by other RCEP members worldwide, and RCEP $_{ijt}$ indicates whether China has signed bilateral free trade agreements with other RCEP members.

3.2. Sample selection and data sources

3.2.1. Sample selection

This part selects the panel data of the 15 RCEP member countries from 2002 to 2021, and its data refer to the UN Comtrade database, and the RECP member countries other than China from 2002 to 2018 are: Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar, Cambodia, Japan, South Korea, New Zealand, Australia, and China's bilateral agricultural trade with these countries accounts for more than 70% of China's total agricultural trade volume, so it is strongly representative[9]。

3.2.2. Data Sources

China's agricultural exports to other RCEP members come from the "China Agricultural Products Import and Export Monthly Report" issued by the Department of Foreign Trade of the Ministry of Commerce, China's GDP and other RCEP members, per capita GDP of RCEP members, total population, agricultural land area, and weighted average tariff data of primary products are all from the World Bank, and the geographical distance data between China and other RCEP members are from the CEPII database. Whether or not China signs bilateral free trade agreements with other RCEP members comes from the China Free Trade Area Service Network[10].

3.3. Variable description

In order to analyze the influencing factors of China's

agricultural exports to other RCEP members, this study selects China's agricultural exports to other RCEP members as the explanatory variable. Among the explanatory variables, $lnmygGDP_{jt}$ and $lnPGDP_{jt}$ represent the GDP and per capita GDP of other RCEP members, respectively, and are used to measure the size of a country's economy. In general, the larger a country's GDP and per capita GDP, the stronger the country's purchasing power and spending power. Therefore, the larger the GDP of a member country, the more favorable it is for China's exports to other RCEP members. $lnDIS_{ijt}$ indicates the geographical distance between China and other RCEP members, in order to better deal with the distance variable that does not change over time in empirical research, this study draws on the methods of Jiang Dianchun et al., using the product of the distance between China's capital and the capital of various countries and the international oil price to measure the geographical distance [11]. Generally speaking, the greater the geographical distance between the two countries, the higher the cost of trade and the smaller the export value; Conversely, the closer the geographical distance between the two countries, the lower the cost of trade, and the greater the export value. $lnPOP_{jt}$ represents the population of other RCEP member countries. The smaller the population of a member country, the smaller the demand in the member's domestic market, which is less conducive to China's exports to it; Conversely, the more favorable it is for China to export to it. $lnARGILAND_{jt}$ represents the amount of agricultural land used in other RCEP member countries. Because China has a larger agricultural land area than other RCEP members, the larger the difference in agricultural land area, the smaller a country's agricultural land area, the more conducive to China's export of agricultural products. $lnTARIFF_{jt}$ said that the agricultural tariffs levied by RCEP member countries are limited to the availability of data, and this study uses the weighted average tariff of primary products to represent agricultural tariffs, in general, exports are inversely proportional to tariffs, that is, the higher a country's tariffs, the more unfavorable it is for China's exports to it. $RCEP_{ijt}$ is a dummy variable, representing whether bilateral free trade agreements are signed between China and other RCEP members, and if signed, it is assigned a value of 1, and vice versa of 0. Generally speaking, if the two countries sign a bilateral free trade agreement, the cost of trade will be reduced, which will facilitate the growth of the trade volume of the two sides, so the export volume is positively correlated with this variable.

3.4. Analysis of model results

In this study, the choices of fixed-effect model, mixed regression model, and random-effects model were tested before regression analysis of panel data. Firstly, the individual effects are tested, and the results show that the model has significant individual effects, so the mixed regression model cannot be selected. Then, the fixed-effect model and random-effect model were judged by the Haussmann test, and the fixed-effect model was finally selected,as shown in Table 1.

Table 1. Regression results table

Explanatory variables	coefficient	T statistic	P-value
lnmygGDP	1.354^{***}	4.85	0.002
lndis	0.156^{***}	5.12	0.005
lnpgdp	0.121^{***}	2.11	0.000
lnpop	0.513^{***}	2.43	0.006
lnargiland	-0.486^{***}	-4.56	0.004
lntariff	-0.102^{***}	6.30	0.002
rcep	0.108^{**}	3.51	0.025
cons	-76.347^{***}	-2.68	0.000

Note: *, **, **** represent significance levels of 10%, 5% and 1%, respectively.

Based on the above regression results, the export gravity model can be obtained:

$$\begin{aligned} lnEXP_{ijt} = -76.437 + 1.354lnmygGDP_{jt} + \\ 0.156lnDIS_{ijt} + 0.121lnPGDP_{jt} + 0.513lnPOP_{jt} - \\ 0.102lnTARIFF_{jt} - 0.486lnARGILAND_{jt} + \\ 0.108lnRCEP_{ijt} + \mu \end{aligned} \quad (4)$$

It can be seen from the table that all explanatory variables of the model passed the significance level test, and the specific analysis is as follows: the regression coefficient of mygGDP is 1.354, the sign is consistent with expectations, and it passes the test at the significance level of 1%, that is, for every 1% increase in GDP of other RCEP members, China's exports of agricultural products to other RCEP members increase by 1.354%, indicating that the larger the economic scale of RCEP trading countries, the greater the demand for foreign imports. The stronger the export supply capacity of China's agricultural products, the more agricultural products will be exported[14]. The regression coefficient of PGDP is 0.121, which is consistent with expectations, and passes the test at a significance level of 1%, that is, for every 1% increase in per capita GDP of other RCEP members, China's agricultural exports to other RCEP countries increase by 0.121%. The regression coefficient of population POP is 0.513, the sign is consistent with expectations, and it passes the significance test at the level of 1%, that is, for every 1% increase in the population of other RCEP member countries, China's exports of agricultural products to other RCEP members increase by 0.513%, which indicates that the greater the domestic population of other RCEP members, the greater their market demand for foreign agricultural products, and the more agricultural products China exports to them. The regression coefficient of agricultural land area ARGILAND is -0.486, the sign is consistent with expectations, and it passes the significance test at the level of 1%, that is, for every 1% increase in agricultural land area of other RCEP member countries, China's exports to other RCEP members will be 0.486% less agricultural products, which indicates that the more agricultural land area other RCEP member countries, the less demand for foreign agricultural products, so China exports less agricultural products to them. The regression coefficient of the weighted average tariff on primary products is -0.102,

which is consistent with expectations, and passes the significance test at the level of 1%, that is, for every 1% increase in the weighted average tariff of primary products of other RCEP members, China's exports to its agricultural products decrease by 0.102%, which indicates that the higher the tariffs imposed by other RCEP members on primary products, the less agricultural products China exports to them. The coefficient of whether China and other RCEP members signed bilateral free trade agreements is 0.108, which is consistent with expectations, and passed the significance test at the level of 5%, indicating that the conclusion of bilateral free trade agreements is conducive to China's agricultural exports to other RCEP members. The geographical distance passed the significance test at the level of 1%, but its coefficient is 0.28, and the sign is inconsistent with expectations, which may be due to the construction of modern transportation infrastructure and the rapid development of modern logistics, more and more agricultural products trade began to adopt new modes of transportation, and with the vigorous development of global cross-border e-commerce, agricultural product trade has also caught the express train of cross-border e-commerce, agricultural product trade between countries has become more convenient, and transportation costs are no longer simply dependent on the distance between the two countries. Therefore, the negative impact of traditional geographical distance factors on trade has not been realized.

4. Conclusion

This paper studies the current situation and influencing factors of China's exports to RCEP member countries qualitatively and quantitatively, and obtains the following two conclusions. First, RCEP member countries are the main countries of China's agricultural exports, of which ASEAN, Japan and South Korea are the main regions or countries for China's agricultural exports, accounting for more than half of China's exports, while Australia and New Zealand have less agricultural trade with China and have great trade potential; Second, by introducing variables such as the GDP of the trading country, the per capita GDP of the trading country, geographical distance, population, agricultural land area, tariffs, and whether the two sides signed the RCEP agreement into the trade gravity model, it is found that except for geographical distance, other variables are positively correlated, that is, these variables have a promoting effect on China's export of agricultural products to other RCEP member countries.

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