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On the Impact of the ASEAN Free Trade Agreement on Intermediate and Final Goods Trade in its Free Trade Zone

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Abstract: Against the background of economic globalization and the suspension of the WTO Doha Round, regional free trade area cooperation has flourished all over the world. This paper mainly examines the difference between the impact of FTAs on the trade of intermediate and final products, and explores the impact of free trade agreements on the formation of regional trade networks. Taking the China-ASEAN Free Trade Area (CAFTA) in the East Asian production network as the research object, this paper uses the gravitational model and introduces the dummy variable CAFTA to establish a regression model, and concludes that CAFTA will promote the development of intermediate goods trade and final goods trade, but the impact on the former is greater, mainly because the reduction of trade barriers has an amplifying effect on intermediate goods trade. The research conclusion provides a theoretical basis for China to further promote the construction of free trade areas.

Keywords: CAFTA, Gravity model, Intermediate products, Final product.

1. Introduction

Since the beginning of the 21st century, the complex world economic pattern, coupled with the emergence of the financial crisis in the United States, the European debt crisis, and Sino-US trade frictions, has made the global political and economic situation turbulent. In this context, the process of building a multilateral free trade system based on the WTO framework tends to be slow, while the regional trade mechanism represented by the free trade area (FTA) is progressing rapidly, and most of the WTO members have joined one or more free trade agreements, and as of March 2018, China has signed alliance agreements with many neighboring countries, and is one of the countries that have signed more alliance agreements. The signing of the Freedom League Agreement also has a series of impacts on the human development of the Chinese economy. The China-ASEAN Free Trade Area (CAFTA) is the largest treaty signed by China so far, which affects the ties of all parties, and maintaining a good alliance will lead to the common development of the bilateral economy and mutual benefit.

In theory, the signing of free trade agreements can promote regional economic integration and promote trade between the contracting countries. According to relevant data, the total export volume of China and ASEAN in 2002 was 54.78 billion US dollars, and by 2014, the total transaction volume between the two sides soared to 480.29 billion US dollars. The establishment of CAFTA will help accelerate economic exchanges between China and ASEAN and promote the economic development of both sides. And as far as China is concerned, the establishment of the China-ASEAN Free Trade Area can enhance China's international status and accelerate exchanges and ties between China and ASEAN countries. However, it has to be said that with the increasing economic competition between countries, CAFTA is also facing great challenges, in order to make the China-ASEAN Free Trade Area continue to develop for a long time and bring higher economic effects, then the two sides should take a series of measures to maintain friendly exchanges in political and economic aspects. In order to promote CAFTA to further position itself in the leading position in the world economy, it is necessary to find and solve the problems in its development process in a timely manner, so that the trade cooperation between member countries will be closer.

At the 16th China-ASEAN Summit, Chinese leaders made it clear that if the road of China-ASEAN cooperation and friendship is to go longer and have a greater positive impact, we should continue to adhere to the following principles: First, we must strengthen the gradual strategic mutual trust and harmonious coexistence between the two sides, and second, we must attach special importance to friendly cooperation between the two sides. Good economic relations are based on friendly political relations, and only when the two sides maintain good cooperation can they have a longer and longer term.The economic cooperation between China and ASEAN is mainly reflected in the following three aspects: one is bilateral personnel exchanges, the second is bilateral trade exchanges, since the completion of the free trade area, the number of trade between the two sides has broken through year by year, and there will be unlimited possibilities in the future, and the third is investment cooperation between the two sides, China also needs to attract investment, with bilateral trade exchanges in many aspects, correspondingly increase the total amount of investment between the two sides in many aspects.

2. Literature Review

Since the beginning of the 21st century, under the background of economic globalization and the suspension of the WTO Doha, regional trade agreements have gradually emerged from many agreements. Free trade agreements were signed between member countries, and trade exchanges

between countries gradually formed a regional trade network. In recent years, with the continuous changes in the international situation, the breadth of issues and the depth of commitments on PTAs/RTAs among member countries have been deepening, and it is of great significance to study the relationship between free trade agreements and free trade areas.

2.1. The impact of free trade agreements on regional trade networks

Since Tinbergen (1962) developed the model of trade gravity, Tinbergen found that the level of intra-trade trade in the European Economic Union is higher than in other regions than in other regions [1]. After Tinbergen established the gravitational model, several scholars used the gravitational model to study whether free trade agreements have a greater impact on trade issues within regional economic integration, but they have not reached accurate conclusions. Veeramani and Saini (2011) conducted simulation experiments and concluded that the trade effect created by free trade areas is higher than that of countries that have not signed free trade agreements, and it is inferred that free trade agreements will generate benefits for free trade areas [2]. Bouet et al. (2012) pointed out that the implementation of FTAs will increase the economic growth and closer trade between Asian and Latin American countries, create greater economic effects, and will benefit the countries in Asia and Latin America that have signed agreements[3], with Latin America benefiting more from free trade agreements. However, since then, many scholars have conducted research on the same topic, but have not reached a consistent conclusion, and there are big differences.

With the progress of the times, the detailed analysis of regional trade agreements between countries has gradually deepened the study of the impact of regional trade agreements on free trade areas. Gao Jiang, Sheng Bin (2018) concluded that with the "deepening research" of trade agreements, it will largely promote the intermediate and final goods trade of products, especially the intermediate goods trade, and at the same time, the promotion effect of value chain trade is greater than that brought by traditional trade [4].

2.2. CAFTA's trade effects study

With China's accession to the WTO, Chinese scholars have gradually paid more attention to international trade and signed many free trade agreements, among which the China-ASEAN Free Trade Agreement (CAFTA) signed between China and ASEAN is a typical free trade agreement. Chen Wen (2009) used gravitational models to study that the signing of CAFTA promoted import and export trade between China and ASEAN, promoting the economic development of both sides, but also bringing non-economic benefits [5]. Jiang Guan and Huo Qiang (2015) have concluded that in the China-ASEAN free trade area, the trade effect brought by the export economy is significantly higher than that of the import economy, which is more favorable to China's economic development, but at the same time, the study found that the trade effect brought by the signing of free trade agreements gradually shows a decreasing trend [6]. Feng Yaqin (2019) concluded that the GDP of countries in the China-ASEAN Free Trade Area has a great impact on the trade of the free trade area[7], and the level of GDP will affect the promotion of bilateral trade, the higher the GDP, the greater the impact.

Promote national economic development by signing agreements between countries to reduce tariff expenditures and reduce the impact of trade barriers, Feng Fan (2018) concluded that the decline in tariffs on intermediate goods will lead to enterprises being more inclined to choose imported intermediate goods when choosing products, thereby creating higher trade effects, and then intermediate goods trade will occur more frequently [8]. Medalla (2011) concluded that due to the existence of rules of origin in the China-ASEAN "10+1" FTA, the frequency of occurrence of each rule in different FTAs varies, and the rules of origin of final products impose procurement restrictions on intermediate goods used in production, so that these intermediate goods may be located in different sectors [9]. Qiu Zhaoyi and Li Shujuan (2014) studied the impact of CAFTA signing on intermediate and final goods trade between member countries through the use of gravitational models, and the results showed that the agreement would promote these two types of trade, but to a greater extent on the former [10].

3. Empirical Analysis

3.1. Model setting

Inspired by the regional production network covered by CAFTA -- the Southeast Asian regional production network has been on the rise since the signing of the FTA, this paper uses the Gravity Model to compare the impact of CAFTA on the import and export trade of China and ASEAN countries, and examine the difference in its impact on the trade of intermediate goods and final goods. The gravitational model is based on Newton's law of universal gravitation (the greater the mass of two objects, the greater the gravitational force between the two objects; The farther apart the two objects, the smaller the gravitational pull between the two objects) developed. First extended to the field of international trade by Tinbergen (1962)[1], his research found that the farther apart the two countries, the smaller the bilateral trade flow, and vice versa, the greater the trade flow. Because the length of the distance determines the level of transportation costs; The effect of the economic aggregate of the two countries on trade flows is exactly the opposite of the effect of distance on trade flows, and the larger the economic aggregate, the greater the bilateral trade flows, because the economic aggregates reflect the potential supply and demand capacity of both trading parties.

Based on the gravitational model, this paper introduces the dummy variable CAFTA to construct the following regression model:

$$\ln INT_{i,j,t} = \beta_0 + \beta_1 CAFTA_{c,j,t} + \beta_2 lnGDP_{c,t} + \beta_3 lnGDP_{j,t} + \beta_4 ln\left(DIS_{c,j} * Oil_t\right) + \beta_5 ln(POP_{c,t}/POP_{j,t}) + \varepsilon_{c,j}$$

$$\ln FIN_{c,j,t} = \beta_0 + \beta_1 CAFTA_{c,j,t} + \beta_2 lnGDP_{c,t} + \beta_3 lnGDP_{j,t} + \beta_4 ln\left(DIS_{c,j} * Oil_t\right) + \beta_5 \ln(POP_{c,t}/POP_{j,t}) + \varepsilon_{i,j}$$

Where, the subscripts c, j, and t represent China, ASEAN countries, time, β is a constant term, ε is a random error term, ln indicates that the natural logarithm of the variable is taken. INT and FIN respectively indicate the import and export trade volume of intermediate and final products in the China-ASEAN Free Trade Area. CAFTA is a dummy variable, if the trading partner is a member of CAFTA and the time is after its agreement is signed and takes effect (that is, after the signing of the trade agreement between China and ASEAN in

2002), CAFTA takes 1, and in other cases, CAFTA takes 0. $GDP_{c,j,t}$ represents the gross domestic product of the trading country and the trading partner in t years. According to the results of Tinbergen (1962), GDP reflects the potential supply and demand capacity of both sides of the trade, and the larger the economic aggregate, the larger the bilateral trade flow, and vice versa, the smaller the trade flow. $DIS_{c,j}$ indicates the distance between the capitals of the trading parties. Gravitational models show that distance between two countries has a negative effect on trade, and the farther apart the two countries are, the smaller their bilateral trade flows are because they lead to an increase in the transaction costs of trade. Oil_t indicates the international crude oil spot price in t year, and the distance between the trading parties is multiplied by the crude oil price of the current year as the distance variable of the model, which can more accurately reflect the influence of distance factors. $POP_{c,j,t}$ represents the population size of each country in t years. The population ratio of the two sides of the trade reflects the difference in labor levels between the two trading sides, and the larger the ratio reflects the greater the difference in labor between the two sides, according to David Ricardo's theory of comparative advantage, the difference in labor level has an important impact on the trade between the two sides.

3.2. Data description

The data on trade in intermediate and final products are described above. The trading countries of the China-ASEAN FTA are selected from China, Malaysia, Indonesia, Thailand, the Philippines, Singapore, Brunei, Vietnam, Laos, Myanmar and Cambodia; INT and FIN are derived from the UN Comtrade database. The distance between trading parties (DIS) is expressed using the distance between the two capitals, and the specific data is derived from the CEPLL database. Oil data comes from the EIA database. GDP and POP data are sourced from the World Bank database. The prices involved are based on the indicators published by the World Bank and are uniformly adjusted to 2000 prices. The CAFTA research sample period is from 1998 to 2021, which shows that the object of the study sample involves CAFTA member countries, and the research sample period includes the beginning and end of the establishment of CAFTA, which is more conducive to comparing the impact of the entry into force of CAFTA on the trade of intermediate and final goods of the production network in Southeast Asia. Data analysis was performed using stata17.

3.3. Related tests

In order to avoid pseudo-regression in the model regression equation, This paper adopts the LLC (Levin, Lin & Chut) approach to the model $LnINT_{c,j,t}$, $LnFIN_{c,j,t}$, $LnGDP_{c,t}$, $LnGDP_{j,t}$、$Ln(DIS_{c,j} * Oil_t)$, $Ln(POP_{c,t}/POP_{j,t})$ the panel unit root test was performed, and the test results were shown in Table 1 below. From the results of Table 1, it can be seen that the original values are all homogeneous monointegration within the level of 5%, so there is no need for cointegration testing.

Table 1. Panel unit root test

Variable sequence	t-statistic	p-value	Conclusion
$LnINT_{c,j,t}$	-5.70502	0.0000	steady
$LnFIN_{c,j,t}$	-5.85224	0.0000	steady
$LnGDP_{c,t}$	-6.92038	0.0000	steady
$LnGDP_{j,t}$	-3.69259	0.0001	steady
$Ln(DIS_{c,j} * Oil_t)$	-4.90515	0.0000	steady
$Ln(POP_{c,t}/POP_{j,t})$	-2.48205	0.0065	steady

Note: CAFTA does not perform unit root testing

3.4. Empirical results

The regression results are shown in Table 2, from which it can be seen that the coefficients of both models are significant at a significance level of 5%. The difference lies in their different coefficients, indicating that CAFTA, GDP, geographical distance and other factors have different degrees of impact on the trade of intermediate and final products, and the following is a specific analysis.

First of all, the CAFTA coefficient of intermediate product trade is 0.630351, and the CAFTA coefficient of final product trade is 0.609330, which shows that since the establishment of CAFTA in 2002, China-ASEAN intermediate product trade and final product trade have increased by 63.0351% and 60.9330%, which has a significant positive impact on it. There are following reasons. on the one hand, tariffs have decreased, according to the CAFTA agreement, China's average export tariff to six of ASEAN member countries has been reduced to 0.6%, and at the same time, the average tariff on ASEAN's exports to China has been reduced to 0.1%; On the other hand, transportation is becoming increasingly convenient, and the main transportation roads between China and ASEAN countries have becomebasically accessible. The signing of the China-ASEAN Maritime Agreement provides strong support for the construction of the China-ASEAN maritime interconnection network. Moreover, the establishment of CAFTA has a greater impact on the trade of intermediate products, 2.1021% higher than the impact on final products, because the weakening of non-tariff barriers and tariff barriers promotes China-ASEAN intermediate goods trade, and the development of final product trade also drives intermediate goods trade. Moreover, an increase in trade in intermediate goods itself will lead to an increase in trade in other intermediate goods.

Secondly, the coefficients of intermediate product trade and final product trade $LnGDP_{c,t}$ are 0.391589 and 0.609060 respectively, and the final product coefficient is greater than the intermediate product coefficient, because in the past two decades, the scale of China's intermediate and final product trade has increased significantly; The proportion of final product exports accounted for the main share, maintained at more than 50%, and structural changes have undergone structural changes, initially completing the transformation and upgrading from consumer goods exports to capital goods exports. Intermediate goods trade and final product trade

ASEAN countries $LnGDP_{j,t}$ coefficients are 1.048464, 1.036660, respectively, indicating that the GDP of each country has a positive pulling effect on bilateral trade, as China's largest foreign trade partner, the more prosperous its economy, the more production activities, the greater the production demand, which promotes the increase in bilateral trade.

Furthermore, the coefficients for $Ln(DIS_{c,j} * Oil_t)$ for trade in intermediate and final products are -0.135634 and -0.266775, respectively. This shows that for every 1% increase in geographical distance between China and ASEAN countries, intermediate and final products on both sides decreased by 0.135634% and 0.266775% respectively. The degree of inhibition of trade between intermediate products and final products is roughly the same as that of distance, for the following reasons: first, in the international production process, intermediate products and final products will be exchanged across borders, which will lead to an increasecosts in transportation; Second, in order to ensure the timeliness of intermediate and final products, additional transportation costs are incurred.

Finally, the coefficients of $Ln(POP_{c,t}/POP_{j,t})$ for intermediate and final product trade) are -0.074520 and -0.076601, respectively, indicating that bilateral trade volume is negatively correlated with labor difference. The coefficient shows that for every 1% increase in the labor population gap between China and ASEAN countries, the bilateral trade volume of intermediate and final products will decrease by 0.074520% and 0.076601% respectively, because China and most ASEAN countries are in the developing country stage, and the difference in factor endowments affects the bilateral trade volume. Factor endowment refers to the number of different production factors in a country, labor, capital, etc., when the difference of bilaterallabor force increases, the trade volume will decline. The elasticity of trade in intermediate goods to labor differentials is 0.002081% smaller than that of trade in final products. This is because intermediate goods are usually designed to meet the needs of specific buyers, and the final product does not have this characteristic, and heterogeneous intermediate products are less sensitive to factor endowments than homogeneous end products.

Table 2. Regression results

	$LnINT_{c,j,t}$	$LnFIN_{c,j,t}$
$LnGDP_{c,t}$	0.391589***	0.609060***
$LnGDP_{j,t}$	1.048464***	1.036660***
$Ln(DIS_{c,j} * Oil_t)$	-0.135634**	-0.266775**
$Ln(POP_{c,t}/POP_{j,t})$	-0.074520***	-0.076601***
$CAFTA_{c,j,t}$	0.630351**	0.609330**
C	-32.19050***	-38.40686***
R-squared	0.916740	0.867312

Note: ***， ** represent significant within the 1% and 5% levels, respectively.

4. 4. Conclusion and Enlightenment

4.1. 4.1. Conclusion

This paper analyzes the different impacts of CAFTA on China-ASEAN intermediate goods trade and final goods trade through gravity model, and concludes the following: First, the signing of CAFTA has promoted the growth of China-ASEAN intermediate and final goods trade, indicating that it has made remarkable achievements in reducing trade barriers and promoting trade exchanges between the two sides; Second, the impact of CAFTA on intermediate trade is greater than that of final goods trade, mainly because the reduction of trade barriers not only drives intermediate goods trade, but also further promotes intermediate goods trade. The development of intermediate trade can not only promote the economic growth of China and ASEAN, but also enhance the competitive advantage of China's regional production network in Southeast Asia; Third, the impact of distance on trade with intermediate goods is lower than that of final goods trade, mainly because the final goods are more time-sensitive than intermediate goods and require higher transportation costs; Fourth, labor level (i.e. factor endowment) has little impact on intermediate goods trade, because intermediate products are heterogeneous products and have a significant locking effect.

4.2. Enlightenment

In order to promote global economic development, reduce international trade barriers, and study the impact of FTAs on free trade areas, this paper draws the following enlightenments: First, openness and cooperation is the only way for global common development, and the Doha Round and traditional trade issues are still important means and effective ways for traditional trade, especially in the post-epidemic era, social contradictions have increased, and there are corresponding risks in international trade exchanges. Second, whether CAFTA or other free trade agreements, there is still a lot of room for revision in the part of the free trade agreement that has an agreement on trade in intermediate goods at this stage. From the above conclusions, it is clear that trade in intermediate goods has great potential compared to trade in final products. It was therefore suggested that the section on trade in intermediate goods in free trade agreements could be more refined. Third, the construction of transportation networks between trading countries affects the trade of free trade areas. The distance between trading countries and the construction of transportation between trading countries have an impact on international trade. Therefore, in order to better build a free trade area, interconnection is very important, and the construction of sea, land and air integration between trading countries can reduce the bilateral time and space distance, reduce cost construction, and better promote product trade. Fourth, through the study of CAFTA, we find that at present, developed countries are still the main force in promoting economic development and lowering trade barriers, and appropriate trade agreements play a significant role in promoting the trade of developing countries, providing opportunities for developing countries to participate in international trade, and accelerating the process

of global economic integration.

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