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Master's Thesis of Wei HUANG

**Analysis on the Reasons for the
Weakening Agricultural Trade
Relations between China and Japan**

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Analysis on the Reasons for the Weakening Agricultural Trade Relations between China and Japan

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Abstract

China-Japan Free Trade Agreement was put forward at the beginning of the 21st century, but until 2021, China-Japan FTA has never been reached. The reason is that Japan's cautious attitude towards agricultural trade cannot be ignored. In fact, before the successful signing of RCEP last year, the tariff barriers of agricultural trade between China and Japan were always high. The successful signing of RCEP seems to bring new hope to the agricultural trade between China and Japan. It has indeed eliminated or reduced the tariffs on some agricultural products between China and Japan, but in some sensitive agricultural products trade, such as grains, vegetables, pork or beef, Japan still insists on this high tariff barrier. Moreover, the more serious problem is that the agricultural trade relations between China and Japan have shown a weakening trend in recent years, and both sides are trying to establish more perfect and close agricultural trade relations with some Southeast Asian countries.

Based on this background and motivation, I try to analyze the reasons for the weakening of Sino-Japanese agricultural trade relations through this paper. First of all, I have found out the cooperation areas or countries in which the agricultural trade between China or Japan and those countries increased significantly from 2012 to 2019, and the changes in the import and export structure of agricultural trade for China and Japan. I found some new developed agricultural trade lines, such as China-Hong Kong, China-Vietnam, Japan-Thailand and Japan-Vietnam. During the period from 2012 to 2019, the import and export volume of agricultural products on these trade lines increased greatly, which greatly affected the development of agricultural trade relations between China and Japan. China intends to establish friendly trade relations with Southeast Asian countries, while Japan has increased its trade exchanges because of the competitiveness of agricultural products in Southeast Asian countries and its trade structure is more in line with import demand. Additionally, when studying the weakening of Sino-Japanese agricultural trade relations, I also found a new possible reason -- China's agricultural investment in some African countries, such as Mauritania. Mauritania's annual export of agricultural products to Japan has also increased, which has affected the agricultural trade between China and Japan to a certain extent.

Keyword : Agricultural trade, Revealed comparative advantage, Trade Intensity index, Trade complementarity index, China-Japan, Free Trade Agreement

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Table of Contents

Chapter 1. Introduction	1
1.1 Agricultural Issues in “China-Japan Free Trade Agreement”.....	1
1.2 Sino-Japanese agricultural trade relations improved?.....	2
1.3 Research Questions.....	5
1.4 Database and research methodology	6
Chapter 2. Literature Review	9
Chapter 3. Competitions between Countries and between Products	10
3.1 China Export Perspective.....	10
3.2 Japan Import Perspective.....	13
Chapter 4. Empirical analysis	18
4.1 Competition between China, Thailand and Vietnam.....	18
4.2 China’s Investment in Mauritania.....	26
Chapter 5. Conclusion	28
Bibliography.....	31
Abstract in Korean.....	34

Chapter 1. Introduction

1.1. Agricultural Issues in “China-Japan Free Trade Agreement”

With the development of economic globalization, more and more regional economic cooperation organizations have emerged. After the establishment of free trade zones, the flow of products, resources and even labor in the region has been greatly facilitated. With the continuous development of trade relations, the degree of regional integration will also be deepening. The free trade zone will bring many benefits to the economic development in the region. On November 15, 2020, 10 ASEAN countries and China, South Korea, Japan, Australia, Singapore, a total of 15 countries signed the Regional Comprehensive Economic Partnership Agreement (RCEP). Thus, the world's largest free trade zone was established.

In fact, among all the member countries participating in RCEP, only Japan has not signed a free trade agreement with China. China and Japan are the largest developing and developed countries in East Asia. Since the establishment of diplomatic relations in 1972, the economic and trade relations between the two countries have continued to develop, with adjacent geographical positions, complementary industrial structures and similar cultural customs, which have laid a solid foundation for the establishment of FTA between China and Japan. As early as 2002, China put forward the idea of establishing FTA for Japan, but until 2021, there was still no actual progress in the FTA process between the two countries.

Besides some political factors and territorial disputes, agricultural trade is also one of the main reasons hindering the smooth signing of China-Japan FTA. After the Second World War, Japan carried out a large-scale industrial revolution, and its economic level was greatly improved. However, its investment in agriculture gradually decreased, and the aging of agricultural population intensified. Japan's land area is small and resources are scarce. Japan has a total land area of about 37.8 million hectares, of which agricultural land is 4.55 million hectares by 2018, accounting for only 12% of the total area. Among them, the arable land is 4.14 million hectares, while the land under permanent crops is 278 thousand hectares. The agricultural land in Japan is decreasing year by year, from 4.55 hectares in 2012 to 4.14 hectares in 2018. At the same time, with the overall decline of agricultural land, both arable land and land under permanent crops are gradually decreasing. More than half of the country's land is not suitable for crop cultivation, and frequent natural disasters often affect the harvest of agricultural products. Various factors lead to

higher production costs and small supply of agricultural products, which cannot meet the domestic market demand, and the prices remain high for a long time and lack of competitiveness. In contrast, China has been a big agricultural country since ancient times, and its cultivated land area and agricultural population far exceed Japan's. China's total land area exceeds 960 million hectares, of which agricultural land accounts for more than half. According to the data of *Food and Agriculture Organization of the United Nations* (FAO), in 2018, China's grain land reached 528.5 million hectares, accounting for 56.1% of the total land area. The geographical advantage makes it convenient for Chinese agricultural products to be transported to Japan, saves the cost, occupies the commanding height of the Japanese market, and has a great impact on Japanese native agricultural products. In fact, since the 21st century, Japan's dependence on China's agricultural products trade has been very high.

In order to protect the domestic agricultural products market, the Japanese government implemented a series of trade protection measures. In May 2006, the "positive list" system was introduced, and only a few specific agricultural products were given preferential tax rates. In 2008, Japan substantially abolished preferential tariffs on Chinese aquatic products, the essence of which was to protect its fragile agricultural products market. It can be seen that once China and Japan reach an FTA agreement and the agricultural product market is fully liberalized, Japanese agriculture will be severely damaged and gradually shrink, and Japanese farmers will face the dilemma of losing all their money, which may lead to a series of social problems. Although the number of Japanese farmers is small, they have great political space and high status, and can control a considerable number of votes (Hu Yang, 2014). Their ability to influence politics should not be underestimated. All these has made the Japanese government have scruples about the construction of China-Japan FTA and have to consider it carefully.

Japan's cautious attitude towards agricultural trade is traceable. Looking at all FTA agreements signed by Japan, no matter which country or region Japan signed with, these agreements have avoided or focused on agricultural issues. For example, the FTA negotiation process between Japan and Mexico almost broke down because Japan was always unwilling to give up tariffs on pork and orange juice. Although agriculture is included in FTA negotiations between Japan and Singapore, Singapore basically does not produce agricultural products.

1.2. Sino-Japanese agricultural trade relations improved?

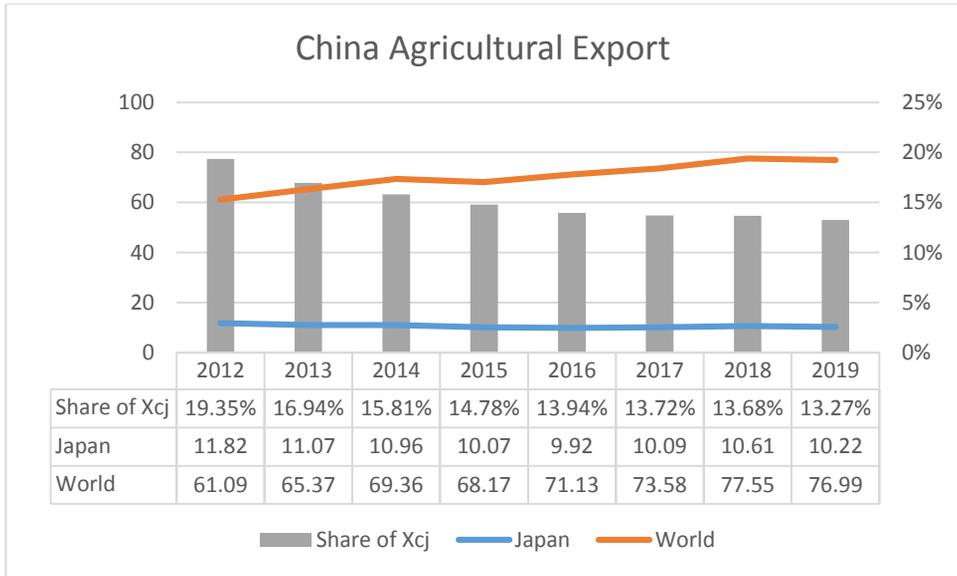
The signing of RCEP seems to bring new hope to the negotiation of FTA between

China and Japan. Under RCEP, Japan promised to cancel tariffs on more than 1,400 agricultural products tax items in China, accounting for about 60% of the total agricultural products tax items in China. Among them, 717 tax items were immediately reduced to zero, accounting for 29.3% of the total tax items of agricultural products, mainly unbaked coffee, tea, corn, edible sorghum, soybeans, sugar cane honey, chewing gum and so on. There are 318 tax items that have been reduced to zero in 11 years, accounting for 13% of the total tax items of agricultural products, mainly fresh frozen fish, frozen sweet corn, dried mushrooms, pears, peaches, coarse grains, caviar, canned peas and so on. There are 373 tax items that have been reduced to zero in 16 years, accounting for 15.3% of the total tax items of agricultural products, mainly tomatoes, broccoli, burdock, oranges, cherries, ginseng, canned abalone, canned sea cucumber, biscuits, garlic powder and so on. There are 5 tax items of zero reduction in 21 years, accounting for 0.2% of the total tax items of agricultural products, mainly fermented beverages, alcoholic beverages, animal hides, etc. In addition, the Japanese side did not reduce tariffs on its 1,032 sensitive agricultural products tax items, accounting for about 40% of the total agricultural products tax items, mainly cereals, vegetable oils, dairy products, beef, pork and so on.

From the perspective of tariffs, RCEP promoted the development of Sino-Japanese agricultural trade relations to a great extent, and eliminated some agricultural trade tariffs between China and Japan for the first time. However, it is not difficult to find that Japan has always maintained a low level of agricultural openness and a high tariff in the trade of important agricultural products such as cereals, vegetables, pork and beef. In fact, the agricultural trade relationship between China and Japan has not developed more closely in recent years.

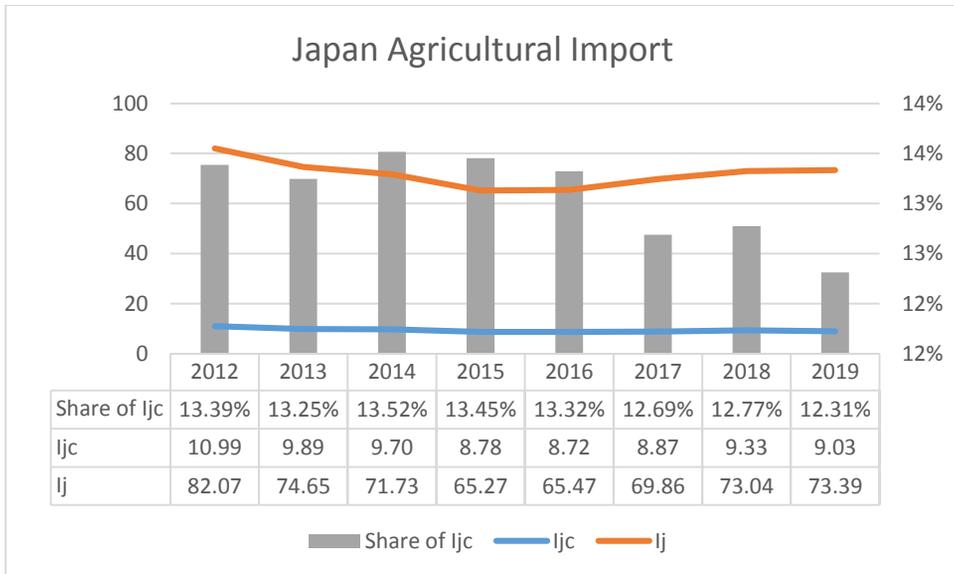
The agricultural trade between China and Japan is mainly manifested in China's agricultural exports to Japan and South Korea. From 2012 to 2019, China's export of agricultural products to the world has increased from 61.09 billion dollars to 76.99 billion dollars. Under the background of the growing export scale of China's agricultural products, China's export trade volume to Japan, however, has not always increased with the same scale. It is worth noting that, as important exporters of agricultural products in China, the trade volume of agricultural products exported to Japan is decreasing year by year.

Figure1-1 China Agricultural Export / billion USD



Even under the background of increasing total exports of agricultural products in China, the trade volume of agricultural products exported from China to Japan showed a downward trend, from 11.82 billion dollars in 2012 to 10.22 billion dollars in 2019. At the same time, the trade volume of agricultural products exported from China to Japan is gradually decreasing, from 19.35% to 13.27%, much larger decrease compared to that in the share between China and Korea.

Figure 1-2 Japan Agricultural Import / billion USD



When we look at the Japanese market again, first of all, the import trade volume of agricultural products in Japan as a whole shows a downward trend. And the trade volume of agricultural products imported from China is also decreasing year by year.

Accordingly, the share of agricultural products imported from China in Japan's total agricultural products trade also showed a downward trend, from 13.39% to 12.31%.

From the data, we can simply draw the conclusion that the agricultural trade relationship between China and Japan is gradually weakening. Both countries are each other's important agricultural trade partners, but their importance has shown a weakening trend.

1.3. Research Questions

In order to better promote the development of Sino-Japanese trade relations, we need to clearly understand the reasons for the weakening trend of Sino-Japanese trade relations in the past few years. There are usually three reasons for the reduction of trade between two countries: First, competition between countries. The reduction of agricultural trade between China and Japan may be due to China exporting more to other countries except Japan, or it may be due to Japan importing more agricultural products from other countries; Secondly, the competition between products. The agricultural trade structure between China and Japan has changed in recent years. Such changes may lead to China's main export of agricultural products that do not meet Japan's demand for agricultural products imports. This will also lead to a significant decline in Sino-Japanese agricultural trade; Finally, the combination of the above two factors. Compared with China, Japan has chosen another country or region with a more competitive trade structure, and established a new and close agricultural trade relationship with it.

Through a simple data survey, I found that China and Japan have a good trade foundation with some countries in Southeast Asia in terms of agricultural products trade, and have also signed many corresponding free trade agreements. My first research question arises here. Will the development of agricultural trade between China and Southeast Asia or between Japan and Southeast Asia bring some negative impacts on agricultural trade between China and Japan from 2012 to 2020? Then comes the second question, which agricultural products are the main influences, and how do they affect the agricultural trade relations between China and Japan? Here will be involved in the above-mentioned analysis of the causes of trade reduction. The reason why Japan chooses to import agricultural products from some countries in Southeast Asia instead of more from China is that there is a competitive relationship between China and Southeast Asian countries, and China is in a competitive weak position in some agricultural products markets in Japan.

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1.4. Database and research methodology

1.4.1. Agricultural product

The commodity trade data in this paper are from UN COMTRADE. Focusing on the export from China to South Korea and Japan, the data period is from 2012 to 2019.

Regarding the classification and statistical methods of agricultural products, I chose “The Harmonization System Code” (HS-Code) with 2007 version. Compared with “Standard International Trade Classification” (STIC), HS-Code classifies agricultural products in more detail, and can provide more accurate classification and direction when analyzing major agricultural products.

According to *HS CLASSIFICATION HANDBOOK* by WORLD CUSTOMS ORGANIZATION, the first 24 Chapters of HS-Code, Section I to IV, deal with agricultural products in the broadest sense.

Section I, Chapter 1 to 5 have covered animals and animals’ products.

Section II, Chapter 6 to 14 have covered vegetable products, whether or not edible, but excludes wood.

Section III, Chapter 15 has covered animal or vegetable fats and oils and products derived therefrom.

Section IV, Chapters 16 to 24 have covered beverages, spirits, vinegar and tobacco, along with products of the food industries not covered by previous Chapters.

1.4.2. Methodology

In this paper, I try to use the indicators of market share (MS) and trade competitiveness index (TC) to show the competitiveness of Chinese agricultural products in Japan and South Korea market, and compare the competitiveness of agricultural products in China, Japan and South Korea. After that, the change and development of the comparative advantage of China's main exported agricultural products from 2012 to 2020 are analyzed through revealed comparative advantage index (RCA). In addition to competition and advantages, I will analyze the dependence of Japan and South Korea on China's agricultural exports and the complementarity of agricultural trade between China, Japan and South Korea through trade intensity index (TII) and trade complementarity index (TCI).

The market share index will be used to measure the market share of China's main export agricultural products in Japan and South Korea. The higher the market share, the greater the competitive advantage of Chinese agricultural products in Japan and South Korea, and vice versa. For a period of time, if the market share shows a downward trend, it shows that the competitiveness of China's agricultural products in Japan and South Korea is constantly weakening. MS can be written as:

$$MS_{ik}^j = X_{ik}^j / \sum_j X_k$$

Where:

MS_{ik}^j - the market share of product k from country i in country j

X_{ik}^j - the export of product k from country i in country j

$\sum_j X_k$ - the total export of product k in country j

Trade competitiveness index is a relative value, which is the ratio of the difference between import and export of certain products in a country and the total value of import and export. Trade competitiveness index will be used to compare and analyze the competitiveness of agricultural products trade between China and Japan, and between China and South Korea. TC index can be written as:

$$TC_{ij}^k = \frac{X_{ij}^k - M_{ij}^k}{X_{ij}^k + M_{ij}^k}$$

Where:

TC_{ij}^k - comparison of competitiveness between country i and country j in product k

X_{ij}^k - the export volume of product k from country i to country j

M_{ij}^k - the import volume of product k from country i to country j

Revealed comparative advantage will be used to measure the advantages of agricultural products in China, Japan and South Korea. By analyzing the change

trend of RCA of China's main agricultural products from 2012 to 2020, this paper will try to find out the reasons for the reduction of China's share of exports to Japan and South Korea. RCA can be written as:

$$RCA_{ik} = \frac{X_{ik}/X_i}{X_{wk}/X_w}$$

Where:

RCA_{ik} – the revealed advantage of country i in product k

X_{ik} – the export of product k from country i

X_i – the total export of country i

X_{wk} – the world export of product k

X_w – the total export in the world

Regional revealed comparative advantage index can better analyze the changes of competitiveness of Chinese agricultural products in the whole market of China, Japan and Korea. RRCA can be written as:

$$RRCA_{ik} = \frac{X_{ik}/X_i}{X_{rk}/X_r}$$

Where:

$RRCA_{ik}$ – the regional advantage of country i in product k

X_{ik} – the export of product k from country i to the other two countries

X_i – the total export of country i

X_{rk} – the regional export of product k

X_r – the total regional export

Trade intensity index will be used to measure the importance of agricultural products trade between China and South Korea, and between China and Japan. TII index can be written as:

$$TII_{ij} = \frac{X_{ij}/X_i}{M_j/M_w}$$

Where:

TII_{ij} – the importance of the trade between country i and country j

X_{ij} – the export from country i to country j

X_i – the export of country i

M_i – the import of country i

M_w – the total import in the world

The trade complementarity index will be used to measure whether the agricultural

trade structure between China and Japan and South Korea is complementary. TCI can be written as:

$$TCI_{ij}^k = RCA_{Xi}^k \times RCA_{Mj}^k$$

Where:

TCI_{ij}^k – the trade complementarity index of country i and j in product k

RCA_{Xi}^j – the comparative advantage of export product k in country i

RCA_{Mj}^k – the comparative advantage of import product k in country j

Chapter 2. Literature Review

Zheng et al. (2018) made the empirical studies on trade complementarity between China and the Baltic States from 2002 to 2015. They used the STIC and focused on the products from STIC0 to STIC09. China's exports to Baltic States are mainly capital-intensive and labor-intensive products, but capital-intensive exports show a downward trend, while labor-intensive exports are gradually increasing. They used the theory of comparative advantage that put forward by Ricardo (1817) and the trade complementarity defined by Drysdale (1969). According to RCA's analysis, China's comparative advantage from 2002 to 2015 is mainly reflected in labor-intensive products, especially STIC7 and STIC8. The analysis of TCI makes a comparative analysis between China and different countries, and specifically analyzes the trade structure between the two countries. According to Tinbergen (1962) and Poyhonen (1963), who brought the gravity model into the trade field for the first time and formed the trade gravity model, Zheng also used an expanded gravity model, including the variable of whether the Baltic States join the Eurozone and whether China and Baltic States are members of WTO.

For the gravity model, Sohn (2001) has selected the different variables to analyze the Korea's trade patterns. Sohn also included new explanatory variables, such as the Trade Conformity Index and APEC membership and found that the TCI variable is very significant for Korea, especially in the heavy and chemical sectors. So these sectors can increase the bilateral trade volumes more by trading with those countries having complementary trade structures.

Shuai and Wang (2011) made the data analysis on the agricultural trade between China and United States in terms of 16 major agricultural products from 1997 to 2006. They used the revealed comparative advantage index, constant market share, trade intensity index, export similarity index and trade complementarity index to figure out the characteristics of the bilateral trade and change of the comparative

advantages and complementarity of the Sino-US agricultural trade from 1997 to 2006. Research shows that compared with the United States, China's comparative advantage of agricultural products is mainly labor-intensive products. After China's entry into WTO, China has exported more fruits, vegetables, tea, honey and sugar to the United States. Until 2006, the competitiveness of China's agricultural products showed a downward trend. As far as trade dependence is concerned, the United States is more dependent on the Chinese market.

According to Wu (2014), as of 2012, the competitive advantages of agricultural products in China, Japan and South Korea are relatively weak in the world. The international competitiveness of seven categories of agricultural products in China, Japan and South Korea from 2003 to 2012 was analyzed in detail through five indicators: revealed comparative advantage index, regional revealed comparative advantage index, competitive advantage index, net export index and export market share. Among various agricultural products (based on Rev.3), China, Japan and South Korea have obvious competitive advantages in international competitiveness in the two categories of "sugar, sugar preparations and honey" and "coffee, tea, cocoa, spices manufactures thereof", while other types have poor competitive advantages. It is worth noting that China's competitive advantage in "vegetables and fruit" is even better.

According to Nam and Li(2018), the competitiveness of agricultural products in China, Japan and South Korea was also analyzed, while they focused on the comparative advantages and trade cooperation of agricultural products among the three countries. As far as intra-industry trade is concerned, intra-industry trade between China and South Korea is the most active. Nam and Li also emphasized that China, South Korea and Japan's agricultural trade are highly complementary.

Chapter 3 Competitions between Countries and between Products

3.1. China Export Perspective

China has been promoting the development of agricultural trade from 2012 to 2019, aiming to reduce its own trade deficit and strengthen agricultural trade relations with various countries. Especially in the Asian market, China has close relations with many other Asian countries, and has established trade agreements with many countries. The establishment of close trade relations has created more opportunities for agricultural trade between China and these Asian countries. With the increasing

importance of regional cooperation in Asia, the establishment and development of trade cooperation is becoming more and more stable. At the same time, it is worth noting that China's promotion and adjustment of domestic agricultural development in recent years will also bring certain changes to the export structure of China's agricultural products. Changes in export structure will also have a certain impact on agricultural trade relations between the two countries.

3.1.1. China export more to other countries

Table 3-1 Share of Chinese export of agricultural products to different countries

	2012	2013	2014	2015	2016	2017	2018	2019
Japan	19.35%	16.94%	15.81%	14.78%	13.94%	13.72%	13.68%	13.27%
USA	11.64%	11.05%	10.56%	10.65%	10.23%	10.27%	10.50%	8.23%
Hong Kong	10.47%	11.70%	12.40%	12.91%	13.90%	13.28%	12.96%	12.40%
Rep. of Korea	6.65%	6.56%	6.88%	6.26%	6.48%	6.39%	6.68%	6.34%
Malaysia	3.50%	3.97%	3.88%	3.65%	3.62%	3.23%	3.11%	3.89%
Thailand	3.31%	3.87%	3.99%	5.44%	4.88%	4.17%	4.24%	4.75%
Vietnam	3.10%	3.47%	4.21%	4.92%	5.37%	6.13%	6.72%	6.96%
Germany	3.04%	2.88%	2.87%	2.76%	2.55%	2.47%	2.42%	2.61%

China mainly export animal products to Japan, the United States, Hong Kong, South Korea, and Germany, while the export of beverages and oils are located mostly in East Asia, Hong Kong, Malaysia and South Korea. Additionally, the exports of China's vegetables products to Japan, Vietnam, Hong Kong SAR, United States and South Korea are the highest.

From the perspective of agricultural products as a whole, I have listed 8 countries that are most important to China's agricultural exports. According to the share of agricultural products exported to various countries in China's total agricultural exports in 2012, Japan, USA, Hong Kong, South Korea, Malaysia, Thailand, Vietnam and Germany ranked in descending order. Of course, some changes have taken place in the trade development in recent years, but it is undeniable that these countries are also important partners of China's agricultural products trade and export up to now.

Among these countries, Vietnam, Hong Kong, Thailand and Malaysia show an upward trend in the share of agricultural products exported by China. Among them, Vietnam's share has the most obvious growth trend, from 3.10% in 2012 to 6.96% in 2019, which has doubled. Next is Hong Kong. The share of agricultural products exported from China to Hong Kong in China's total agricultural exports increased from 10.47% in 2012 to 12.40% in 2019. In 2019, Hong Kong became one of the regions with the largest export of agricultural products in China, second only to Japan. In addition, the share of agricultural products exported to Thailand has also increased

significantly. Malaysia's share also showed a slight increase.

3.1.2. China export more other agricultural products that not meet the demand of Japan

Table 3-2 Agricultural products with the largest export growth in China / million US dollar

Code	2012	2013	2014	2015	2016	2017	2018	2019	Increase
7	6905.65	7871.40	8226.46	9023.65	10545.99	11164.18	10518.06	10328.09	3422.44
8	3771.73	4171.87	4318.15	5161.49	5484.75	5336.54	5284.63	6229.02	2457.29
9	1942.99	2245.40	2452.62	2535.38	2981.02	2930.79	3285.92	3640.09	1697.10
21	2223.21	2464.52	2708.01	2977.37	3205.20	3259.70	3676.67	3975.85	1752.64

Table 3-3 China Major Agricultural Export to Japan

Commodity Code	2012	2013	2014	2015	2016	2017	2018	2019
3	17.69%	18.06%	18.24%	18.61%	20.25%	20.01%	19.24%	19.36%
7	11.76%	11.62%	11.88%	12.40%	13.03%	13.03%	12.71%	12.49%
16	29.50%	28.08%	26.82%	26.36%	25.08%	27.50%	28.29%	28.50%
20	16.02%	17.56%	16.31%	16.66%	16.25%	16.48%	16.25%	16.43%

Through the classification of agricultural products in HS2007, I analyzed the trade structure of agricultural products exported from China to Japan in more detail. From Tables 3-3, we can see that the agricultural products exported from China to Japan are mainly concentrated in four kinds of agricultural products: Chapter 3 “Fish and crustaceans, molluscs and other aquatic invertebrates”, Chapter 7 “Edible vegetables and certain roots and tubers”, Chapter 16 “Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates” and Chapter 20 “Preparations of vegetables, fruit, nuts or other parts of plants”.

China's exports of agricultural products have greatly increased, among which the most obvious increase is these four kinds of agricultural products. Among these four agricultural products, only Chapter 07 is one of the main agricultural products traded between China and Japan. Most of the agricultural products greatly increased by China do not meet the main demand of Japanese market.

Table 3-4 Agricultural products with the largest export growth / million USD

	Code	2012	2013	2014	2015	2016	2017	2018	2019	increased
Vietnam	7	443.98	810.34	1258.83	1476.54	1583.74	1959.79	2316.96	1862.76	1418.78
	8	445.85	480.81	553.95	822.82	879.85	1049.59	999.22	1423.31	977.46
Hong Kong	7	379.78	660.61	848.28	1009.42	1421.01	2000.40	2005.75	1635.04	1255.26
	9	73.46	98.36	142.32	159.62	428.13	299.97	353.67	539.17	465.71
	19	297.71	310.97	329.13	354.62	375.01	390.82	639.64	741.09	443.38
Thailand	20	139.34	164.20	170.33	168.08	209.21	256.51	361.49	564.96	425.62
	3	263.30	407.26	687.37	991.60	909.11	632.48	597.68	657.92	394.62
Malaysia	7	336.06	557.69	489.41	541.55	447.12	482.26	665.26	715.51	379.45
	7	411.09	581.90	586.83	696.07	719.22	672.73	589.79	774.05	362.96

I listed all the product codes and corresponding countries whose trade increased by more than 300 million US dollars from 2012 to 2019 among the four countries whose export share increased.

From Table 1-2, we can find that among these products with obvious increase in trade volume, the most obvious one is Chapter 07, “Edible vegetables and certain roots and tubers”, exported from China to Vietnam, and the other is also Chapter 07 exported from China to Hong Kong. From 2012 to 2019, both the growth of trade between the two countries exceeded \$ 1billion. Secondly, it is the Chapter 08, “Edible fruit and nuts; peel of citrus fruit or melons”, exported from China to Vietnam, and its growth in recent years is close to 1 billion US dollars.

Among the 4 countries, the growth of agricultural products exported to Hong Kong is more diversified. In addition to the most obvious growth of Chapter 07, there are 3 other agricultural products whose trade growth exceeds 400 million US dollars. Although the growth of them is less obvious than the growth of Chapter 07, it is also an important part of the growth of China's agricultural products export to Hong Kong.

At the same time, I also found that no matter which country, China's exports to its products of Chapter 7 have achieved obvious growth, but the growth rate is different. Actually, China try to export more to Southeast Asia and Hong Kong, no matter which country, China's exports to its products of Chapter 7 have achieved obvious growth. China's exports to these countries are increasing, but in fact, the trade volume of such products exported from China to Japan shows a decreasing trend. For this agricultural product with the largest increase in China's exports, China obviously tends to develop new markets, such as Vietnam and Hong Kong.

3.2. Japan Import Perspective

Japan's agricultural products depend on imports to a great extent, so Japan's agricultural trade deficit is very obvious, and it also has a great impact on domestic agricultural trade. In order to reduce the huge trade deficit, Japan issued a series of positive lists in 2017 and strongly supported the development of domestic agricultural industry. As Japan's imports of agricultural products decrease year by year, can countries that once had close agricultural trade relations with Japan maintain their agricultural trade volume with Japan at the same level? Obviously, it can't. More importantly, whether the relative importance of agricultural products exported by these countries to Japan has changed. This depends on the change in the share of agricultural products exported to Japan by various countries in the total agricultural products trade volume imported by Japan. Similarly, when Japan vigorously promoted the development of domestic agricultural products, did Japan have some changes in the import structure of agricultural products? And will these

changes also affect the agricultural trade between China and Japan? I will make further analysis and discussion below.

China maintains friendly trade relations with Asian countries. Similarly, Japan also maintains friendly trade relations with some Asian countries, especially Southeast Asian countries. Japan has signed economic partnership agreements with Thailand and Vietnam, which also laid a good foundation for friendly agricultural trade between them.

3.2.1. Competition between countries

Table 3-5 Increased share of Japanese agricultural import share of different countries

Country	2012	2013	2014	2015	2016	2017	2018	2019	Increase
Italy	1.17%	1.34%	1.50%	1.46%	2.14%	3.62%	3.99%	3.72%	2.55%
Spain	0.81%	0.92%	1.17%	1.29%	1.47%	1.56%	1.57%	1.68%	0.87%
Korea	2.86%	2.78%	2.89%	2.89%	3.15%	3.44%	3.39%	3.57%	0.71%
Vietnam	1.60%	1.79%	2.02%	2.07%	2.09%	2.26%	2.17%	2.20%	0.61%
Mexico	1.18%	1.31%	1.37%	1.47%	1.61%	1.56%	1.64%	1.79%	0.61%
Greece	0.05%	0.05%	0.04%	0.04%	0.05%	0.05%	0.15%	0.63%	0.58%
Lithuania	0.19%	0.09%	0.08%	0.48%	0.75%	0.72%	0.65%	0.52%	0.33%

I listed the seven countries whose share of agricultural products exported to Japan increased the most from 2012 to 2019. None of these seven countries were the major importers of agricultural products in Japan in 2012. . Combined with the table of Japan's major importing countries of agricultural products, I find that while the trade between Japan and the former major importing countries has weakened, the trade between Japan and other countries with low import of agricultural products has gradually increased in the past few years. Among them, the most obvious increase in import trade share is Italy. The share of Japan's agricultural products imported from Italy in Japan's total agricultural products import trade increased from 1.17% in 2012 to 3.75% in 2019.

Table 3-6 Decreased Japanese agricultural import share from different countries

	2012	2013	2014	2015	2016	2017	2018	2019	Decrease
USA	22.09%	20.73%	22.72%	22.10%	20.62%	20.38%	20.88%	19.26%	-2.83%
Netherlands	3.33%	3.40%	2.75%	0.96%	1.00%	0.97%	1.01%	1.00%	-2.33%
China	13.39%	13.25%	13.52%	13.45%	13.32%	12.69%	12.77%	12.31%	-1.07%
Germany	1.42%	1.23%	0.95%	0.83%	0.73%	0.76%	0.78%	0.90%	-0.52%
Canada	6.24%	6.17%	5.86%	5.69%	5.59%	5.64%	5.56%	5.78%	-0.46%
Malaysia	1.74%	1.46%	1.49%	1.44%	1.43%	1.37%	1.19%	1.28%	-0.46%

Looking at the changes in the share of agricultural products exported to Japan from 2012 to 2019, I listed the six countries with the most obvious share growth, which are the United States, the Netherlands, China, Germany, Canada and Malaysia in descending order of share growth. Among them, the United States, China and

Canada are the main partners of Japan's agricultural products import. The reduction of the share of these three countries shows that Japan intends to reduce the impact of these three countries on its agricultural imports and try to find more partners. Among them, the United States, which has the highest share of Japan's agricultural imports, has fallen the most. The share of the United States dropped from 22.09% in 2012 to 19.26% in 2019, with a significant decline. Japan has a strong dependence on the export of agricultural products from the United States, but in recent years, Japan has deliberately tried to reduce this dependence. Compared with the United States, China's share of Japan's agricultural imports is not so high, but it cannot be ignored. China's share decline is not as obvious as that of the United States, but it is also worth noting. From 2012 to 2019, its share declined by 1.07%.

Combined with the above three tables, observing the change of the share of each country in Japan's agricultural import trade, I find that in Japan's agricultural import, the competition between countries is mainly manifested in the reduction of the share of major exporting countries, the steady development of agricultural trade relations with other countries, and the continuous growth of new trading partners. Japan intends to reduce its dependence on the United States and China, which are major exporters of agricultural products, and then further develop agricultural trade cooperation with Italy, Spain, South Korea and other countries whose trade cooperation relationship is not very close before.

3.2.2. Competition between products

Table 3-7 Agricultural products with the largest change share in Japan

Code	2012	2013	2014	2015	2016	2017	2018	2019	Change
10	10.63%	11.48%	9.66%	9.12%	8.14%	7.75%	8.27%	8.14%	-2.49%
3	17.00%	15.78%	15.96%	15.70%	16.49%	15.97%	15.47%	14.99%	-2.01%
16	8.59%	8.57%	8.44%	8.64%	8.58%	9.65%	9.80%	9.74%	1.15%
2	12.05%	11.74%	13.39%	13.17%	13.92%	14.43%	14.24%	14.77%	2.72%

However, in terms of the types of agricultural products, most of the types of agricultural products imported by Japan have relatively stable changes in their share of total imports. I listed the four most changed agricultural products. Among them, Chapter 16 and Chapter 2 are the two most obvious agricultural products whose import share increased from 2012 to 2019, while Chapter 10 and Chapter 3 are the two most obvious agricultural products whose share decreased during this period. These four kinds of agricultural products are mainly imported from Japan, especially Chapter 3, which accounted for 17% of Japan's total agricultural imports in 2012, accounting for a very high share. After eight years of development, Japan's imports of agricultural products have shifted from Chapter 3 “Fish and crustaceans, molluscs

and other aquatic invertebrates” and Chapter 10 “Cereals” to Chapter 2 “Meat and edible meat offal” and Chapter “Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates”.

3.2.3. Agricultural product export from China to Japan

Table 3-8 China Agricultural Export Structure to Japan

Commodity Code	2012	2013	2014	2015	2016	2017	2018	2019
3	17.69%	18.06%	18.24%	18.61%	20.25%	20.01%	19.24%	19.36%
7	11.76%	11.62%	11.88%	12.40%	13.03%	13.03%	12.71%	12.49%
16	29.50%	28.08%	26.82%	26.36%	25.08%	27.50%	28.29%	28.50%
20	16.02%	17.56%	16.31%	16.66%	16.25%	16.48%	16.25%	16.43%

Through the classification of agricultural products in HS2007, I analyzed the trade structure of agricultural products exported from China to Japan in more detail. We can see that the agricultural products exported from China to Japan are mainly concentrated in four kinds of agricultural products: “Fish and crustaceans, molluscs and other aquatic invertebrates”, “Edible vegetables and certain roots and tubers”, “Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates” and “Preparations of vegetables, fruit, nuts or other parts of plants”.

Table 3-9 Export value change in major export agricultural products by China to Japan / million USD

Code	2012	2013	2014	2015	2016	2017	2018	2019	Change
3	1256.39	1131.23	1107.42	992.99	1118.95	1124.11	1153.28	1121.88	-134.51
7	1522.77	1451.07	1425.75	1364.95	1405.96	1446.07	1493.65	1416.45	-106.33
16	3314.96	2841.78	2671.27	2351.41	2238.78	2550.72	2700.70	2617.68	-697.28
20	1759.47	1612.88	1503.95	1403.21	1358.41	1380.15	1445.72	1450.29	-309.19

Table 3-10 Export value change in specific agricultural products by the world to Japan / million USD

Code	2012	2013	2014	2015	2016	2017	2018	2019	Change
3	13950.47	11782.90	11450.35	10243.44	10795.76	11154.49	11294.16	11000.08	-2950.40
7	2699.31	2512.24	2445.83	2351.48	2468.59	2495.50	2578.79	2469.95	-229.36
16	7046.06	6399.39	6052.87	5640.67	5618.38	6738.12	7157.18	7145.29	99.23
20	4013.56	3753.40	3492.93	3233.17	3147.03	3315.11	3533.55	3532.31	-481.25

Combining the above two tables, I found that the trade volume of four agricultural products mainly exported from China to Japan showed a downward trend from 2012 to 2019, especially the trade volume of Chapter 16 decreased by nearly 700 billion dollars. However, the difference is that Japan's imports of these four agricultural

products are different from 2012 to 2019. The import trade volume of Chapter 3, Chapter7 and Chapter20 decreased obviously, especially the import trade volume of Chapter3 decreased by more than 2950 billion dollars. As mentioned above, Japan's import of agricultural products Chapter 3 tends to decrease, and the import emphasis shifts from Chapter 3. And meanwhile, the import trade volume of agricultural products Chapter 16 showed a slight increase, with the trade volume increasing by 99.23 billion dollars.

As one of the agricultural products exported from China to Japan, Chapter 16, “Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates”, whose trade volume has decreased the most, Japan's imports to it have not decreased at all.

The trade volume of four agricultural products mainly exported from China to Japan showed a downward trend from 2012 to 2019, especially the trade volume of Chapter 16 decreased by nearly 700 billion dollars. However, the import trade volume of Chapter 16 by Japan showed a slight increase. So, from which countries Japan has imported Chapter 16 products and why Japan chose to import from such countries instead of importing more from China?

Table 3-11 Major export countries of agricultural product Chapter 16 to Japan / million USD

Country	2012	2013	2014	2015	2016	2017	2018	2019
World	7046.06	6399.39	6052.87	5640.67	5618.38	6738.12	7157.18	7145.29
China	3314.96	2841.78	2671.27	2351.41	2238.78	2550.72	2700.70	2617.68
Thailand	2089.08	1972.60	1729.39	1814.85	1924.10	2145.87	2286.36	2396.31
USA	545.67	554.59	556.46	464.88	425.47	481.29	486.33	388.81
Viet Nam	287.89	317.36	368.28	335.87	357.76	444.24	491.37	557.85
Indonesia	214.21	187.51	183.00	174.07	177.21	213.22	232.23	234.00
Rep. of Korea	137.91	103.92	106.54	78.12	77.90	104.34	105.07	93.19

I listed the major trading countries where Japan imported Chapter 16. It is not difficult to find from the table that Japan's imports of Chapter 16 are mainly concentrated in China and Thailand. These two countries have accounted for more than 70% of Japan's agricultural product Chapter 16 imports.

Then, which countries have Japan transferred its import of Chapter 16 from China? I further searched the trade data about Japan's import of Chapter 16, and then found that the trade volume of these agricultural products exported by the following three countries to Japan increased significantly.

Table 3-12 Chapter 16 import from countries with the largest growth / million USD

Country	2012	2013	2014	2015	2016	2017	2018	2019	Increase
Mauritania	0.05		0.03			133.64	136.06	115.84	115.79
Thailand	2089.08	1972.60	1729.39	1814.85	1924.10	2145.87	2286.36	2396.31	307.23
Viet Nam	287.89	317.36	368.28	335.87	357.76	444.24	491.37	557.85	269.95

Thailand is the largest exporter of Chapter 16 imported by Japan after China. Thailand's trade volume with Chapter 16 is also the most obvious increase. From 2012 to 2019, the trade volume increased by USD 307.23 billion. Then came Vietnam, whose trade volume of Chapter 16 almost tripled during this period, surpassing the United States and becoming the third largest exporter. So, that's definitely has some competition between China, Thailand and Vietnam in terms of Chapter 16 in Japanese market. Then the case for Mauritania is interesting. In 2012, its export to Japan was only 0.05 billion dollars, but in 2019, a few years later, its export trade volume increased to 115.85 billion dollars. I have found that China has invest in Mauritanian agricultural development for decades. So I tried to find reasons for such increase from the perspective of Chinese investment in Mauritania.

Chapter 4. Empirical analysis

4.1. Competition between China, Thailand and Vietnam

4.1.1. Market Share

Market share index can help me judge the change of competitiveness of Chapter 16 imported from China, Thailand and Vietnam in Japan. The higher the market share of Chinese agricultural products in Japan, the greater the competitiveness of Chinese agricultural products in the market of Japan. On the contrary, if the market share of Chinese agricultural products in Japan is lower, it shows that the competitiveness of Chinese agricultural products is declining.

Table 4-1 Agricultural Product Market Share in Japan

MS	2012	2013	2014	2015	2016	2017	2018	2019
China	47.05%	44.41%	44.13%	41.69%	39.85%	37.86%	37.73%	36.64%
Thailand	29.65%	30.82%	28.57%	32.17%	34.25%	31.85%	31.94%	33.54%
Viet Nam	4.09%	4.96%	6.08%	5.95%	6.37%	6.59%	6.87%	7.81%

Obviously, China once was the biggest supplier of Chapter 16 agricultural products imported from Japan. In 2012, China occupied an obvious dominant position in Japan's Chapter 16 market, with its market share reaching 47.05%, almost reaching half of the level. It can be said that in 2012, China's market share in Japan occupied an obvious dominant position with obvious advantages. However, this advantage did

not last. From 2012 to 2019, the market share of Chapter 16 exported by China dropped significantly, reaching only 36.64% in 2019. Corresponding to the sharp decline in China's share, the share of Thailand and Vietnam has increased. Especially in 2019, the market share gap between China and Thailand in Japan is no longer as big as before, and Thailand's market share has reached 33.54%, which is very close to China's share. This also means that China is no longer the only one in Japan's Chapter 16 import market, but has a competitor from behind, Thailand.

4.1.2. Trade Competitiveness index

By locking the import trade volume into the trade volume between China and Japan, Thailand and Japan and between Vietnam and Japan, we can compare the competitiveness level of agricultural products among these countries through TC index.

I got the agricultural trade competitiveness index of China and Japan through China's agricultural trade volume exported to Japan and China's agricultural trade volume imported from Japan. Similarly, the agricultural trade competitiveness index between Thailand and Japan, and between Vietnam and Japan is also obtained.

Table 4-2 Agricultural Trade Competitiveness Index

TC	2012	2013	2014	2015	2016	2017	2018	2019
China	0.999	0.997	0.998	0.995	0.982	0.868	0.845	0.847
Thailand	0.997	0.996	0.995	0.993	0.990	0.986	0.981	0.980
Viet Nam	0.999	0.999	0.997	0.994	0.990	0.988	0.981	0.978

The trade competitiveness index is in the range of -1 to 1. From Table 4-4, we can find that the agricultural trade competition indexes for three countries with Japan are at a very high level. In 2012, the trade competition index of Chapter 16 in China, Thailand and Vietnam was almost close to 1, which is a very high level. This shows that the agricultural products trade between these three countries and Chapter 16 in Japan almost showed that the export to Japan far exceeded the trade volume of the products imported from Japan. The high-level TC index of the three countries remained at a certain level until 2016. Until 2017, China's TC index dropped significantly and continued to drop to 2019. Therefore, according to the data from 2012 to 2019, China's competitiveness in Japan has weakened. Although the competitiveness of Thailand and Vietnam also showed a slight downward trend, from 0.997 to 0.980 and from 0.999 to 0.978, respectively, this downward trend is not obvious compared with China. Thailand and Vietnam are becoming more competitive than China in agricultural product Chapter 16.

4.1.3. Revealed Comparative Advantage

4.1.3.1. Revealed comparative advantage

RCA compares a country's trade advantage in a certain product at the world level. In this part, I will simply compare the advantages and disadvantages of China, Japan, Thailand and Vietnam in agricultural products trade, especially in the product Chapter 16, and the changes of their RCA in recent years.

Figure 4-3 Agricultural RCA in China, Japan, Thailand and Vietnam

RCAagri	2012	2013	2014	2015	2016	2017	2018	2019
China	0.391	0.367	0.368	0.351	0.382	0.372	0.373	0.367
Japan	0.081	0.086	0.090	0.101	0.106	0.103	0.119	0.126
Thailand	1.840	1.674	1.768	1.667	1.590	1.612	1.697	1.808
Vietnam	2.348	1.874	1.914	1.594	1.510	1.437	1.327	1.173

As far as agriculture is concerned, the comparative advantage of China and Japan is not obvious, especially compared with Southeast Asian countries Thailand and Vietnam. The RCA of total agricultural products of Thailand and Vietnam from 2012 to 2020 are all more than 0.8, which means that the proportion of agricultural products exports of the three countries in total exports has been higher than the world average. In 2012, Vietnam's agricultural comparative advantage was the most obvious among these four countries, reaching 2.348, followed by Thailand, which also reached 1.840. Compared with these two countries, China's agriculture has no obvious comparative advantage, which is only 0.391, while Japan's agricultural comparative advantage is even lower.

From the changing trend, the RCA of agricultural products of China, Thailand and Vietnam show a downward trend, especially for case of China, which is a weak advantage under the weakening trend. However, RCA in Japan showed an upward trend, which increased year by year. However, the RCA level of agricultural products in Japan was really low in 2012, so although it has been increasing, the RCA level still did not reach the RCA level of agricultural products in the other three countries. More importantly, although the comparative advantages of China, Thailand and Vietnam in agricultural trade show a downward trend, even Thailand and Vietnam have a greater decline than China's, the comparative advantages of Thailand and Vietnam after the decline are still much higher than China's.

Therefore, generally speaking, China and Japan do not have obvious comparative advantages in agricultural trade, especially when compared with Thailand and Vietnam, such disadvantages are more obvious. From 2012 to 2019, the agricultural comparative advantages of China, Thailand and Vietnam weakened, while the agricultural advantages of Japan were enhanced to some extent. However, Japan's enhanced agricultural advantage is still far lower than that of the other three countries,

especially Thailand and Vietnam.

Table 4-4 RCA in Chapter 16 Trade

RCA	2012	2013	2014	2015	2016	2017	2018	2019
Japan	0.31	0.33	0.31	0.32	0.34	0.31	0.33	0.33
China	1.73	1.55	1.44	1.30	1.35	1.40	1.42	1.27
Thailand	12.95	11.86	10.88	10.32	9.83	8.98	8.93	9.65
Viet Nam	4.23	4.65	5.07	3.89	3.75	3.24	3.41	3.06

The situation of Chapter16, a major agricultural product, is similar to that of agriculture as a whole. The difference is that China's comparative advantage in this product is much more obvious, reaching 1.73 in 2012, far exceeding 0.8. Compared with Thailand and Vietnam, however, the RCA is much larger. The RCA of Thailand reached 12.95 in 2012, while that of Vietnam reached 4.23, which shows that both countries have great and obvious advantages in the trade of “Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates” in the world.

Compared with Japan, China, Thailand and Vietnam all have obvious comparative advantages in this product, but such advantages showed a weakening trend from 2012 to 2019, especially Thailand, which dropped from 12.95 to 9.65. It is worth noting that until 2019, the comparative advantages of Thailand and Vietnam are still far higher than those of China in Chapter 16. Although the comparative advantages of the three countries are weakening, the advantages of Thailand and Vietnam are relatively stronger than those of China. On the whole, Japan intends to enhance its agricultural strength, and has indeed achieved an increase in its comparative advantage in agricultural product Chapter16. Correspondingly, the comparative advantages of China, Thailand and Vietnam have weakened. However, even under such different development trends, Thailand and Vietnam still maintain obvious trade advantages, which are far higher than China's comparative advantages.

4.1.3.2. Regional revealed comparative advantage

From the analysis in 4.3.1, I found that RCA in China, Thailand and Vietnam all showed a downward trend from 2012 to 2019. From the trend changes in the same direction, it can't completely explain why Japan chose to import more Chapter 16 from Thailand and Vietnam from 2012 to 2019 instead of China. From the world level, the comparative advantages of these three countries are gradually weakening. If the trade is locked between these countries, can we better understand the changes in the comparative advantages of these countries? Therefore, I choose to make use of regional revealed comparative advantages (RRCA) to further analyze and compare the development and changes of RRCA in these four countries.

Table 4-5 Agricultural RRCA in China, Japan, Thailand and Vietnam

RRCAagri	2012	2013	2014	2015	2016	2017	2018	2019
China	1.181	1.094	1.038	1.004	1.021	1.002	1.014	0.953
Japan	0.079	0.091	0.090	0.102	0.106	0.103	0.131	0.150
Thailand	2.490	2.397	2.577	2.488	2.314	2.320	2.385	2.692
Viet Nam	3.039	2.984	2.765	2.628	2.552	2.315	2.060	1.916

When I looked the import and export trade between China, Japan, Thailand and Vietnam, and replaced all the world trade data with the total import and export data of these four countries, I got a table about the regional comparative advantage. From Table 4-5, more obvious trends can be found. First of all, similar to RCA, in 2012, Vietnam's comparative advantage in agricultural trade was the most obvious, reaching 3.039, followed by Thailand, reaching 2.490. China's comparative advantage was relatively low, at 1.181, while Japan was the lowest among the four countries, and its comparative advantage in agriculture was not obvious.

In the development trend from 2012 to 2019, Japan's RRCA showed an upward trend, almost achieving double growth, but even this growth did not bring obvious agricultural trade advantages to Japan, reaching only 0.150 in 2019. While China and Vietnam have obvious advantages in agricultural trade, the RRCA from 2012 to 2019 has shown an obvious downward trend, and Vietnam's advantages have weakened more obviously. The difference is that Thailand not only has obvious comparative advantages among these four countries, but also keeps increasing between 2012 and 2019. Therefore, simply speaking, among these four countries, Japan is obviously in a weak position in agriculture, while among the three countries of China, Thailand and Vietnam, Thailand and Vietnam have more obvious advantages. Thailand, in particular, not only has an agricultural advantage over China, but also continuously enhanced this advantage from 2012 to 2019.

Table 4-6 RRCA in Chapter 16 Trade

RRCA	2012	2013	2014	2015	2016	2017	2018	2019
China	1.393	1.239	1.186	1.109	1.092	1.134	1.107	1.022
Japan	0.014	0.014	0.016	0.016	0.031	0.033	0.057	0.050
Thailand	2.971	3.029	3.042	3.249	3.394	3.369	3.359	3.690
Viet Nam	0.932	1.106	1.271	1.081	0.996	0.799	0.875	0.956

As far as Chapter 16 is concerned, the advantages of Thailand and Vietnam are increasing, while the trend of China's advantages weakening is more obvious. First of all, it is worth noting that China's RRCA in Chapter16 was even higher than that of Vietnam in 2012, which partly explains why China exported this product to Japan far more than Vietnam exported to Japan in 2012, and even became the main exporter of this kind of products imported by Japan. However, this advantage is gradually weakening, and the gap between China and Vietnam's RRCA is constantly narrowing

as China's RRCA declines and Vietnam's RRCA rises. In addition to the enhancement of Vietnam's advantages, the performance of RRCA in Thailand is even more outstanding. In 2012, the RRCA of Thailand in Chapter 16 was the highest among the four countries, reaching 2.971, while in 2019, the RRCA of Thailand increased to 3.690.

Therefore, while the advantages and competitiveness of Thailand and Vietnam are constantly strengthening, while China's existing comparative advantages are constantly weakening, Japan's imports of Chapter 16 naturally gradually shifted from China to Thailand and Vietnam.

4.1.4. Trade Intensity Index

By analyzing the trade intensity index, we can find the degree of trade dependence between China and Japan, Thailand and Japan and between Vietnam and Japan and also the changes of the dependence degree. To analyze the trade intensity of agricultural trade between countries, I put the total export or import as the total agricultural export or import.

I took 1 as the dividing line. When $TII_{ij} > 1$, it shows that country *i* is more dependent on country *j*'s export, otherwise, it is less dependent.

Table 4-7 Agricultural TII index

TIIagri	2012	2013	2014	2015	2016	2017	2018	2019
Ic _j	3.101	3.256	3.246	3.099	2.890	2.960	2.947	2.763
It _j	2.431	2.698	2.640	2.759	2.789	2.804	2.713	2.621
Iv _j	1.148	1.473	1.501	1.475	1.421	1.510	1.542	1.605

It can be seen from the table that the trade dependence between China and Japan, between Thailand and Japan, and between Vietnam and Japan are relatively high. From 2012 to 2020, all TII have remained above 1, which means all of three countries are important trading partners of agricultural products for Japan. Japan is highly dependent on the export of agricultural products from China, Thailand and Vietnam.

When comparing vertically, the TII of China and Japan is always higher than that of Thailand, Japan and Vietnam. As far as time is concerned, Japan is obviously more dependent on China's exports in agricultural imports. However, when looking at the development trend from the time line, it is not difficult to find that Japan's dependence on China's agricultural exports is obviously declining, from 3.101 in 2012 to 2.763 in 2019. However, the intensity of Japan's agricultural exports to Thailand and Vietnam has obviously increased. Until 2019, although their TII with Japan did not reach the level of TII between China and Japan, the TII between Thailand and Japan has reached 2.621, which is not far from the 2.763 between China

and Japan. With the weakening of Japan's dependence on China's agricultural exports and the increasing dependence on Thailand and Vietnam's agricultural exports, it is only a matter of time before the TII between Thailand and Japan exceeds that between China and Japan.

Therefore, under such a development trend, it is not difficult to find that Japan has obviously weakened its dependence on China, one of the most important agricultural trading partners, and instead, Japan intends to further develop agricultural trade relations with Thailand and Vietnam.

Table 4-8 TII in Chapter 16 Trade

TII	2012	2013	2014	2015	2016	2017	2018	2019
Icj	2.329	2.360	2.492	2.421	2.198	2.112	2.089	2.172
Itj	1.689	1.913	2.009	2.173	2.262	2.422	2.496	2.496
Ivj	1.472	1.488	1.498	1.456	1.394	1.459	1.460	1.686

This trend is more obvious in Chapter 16, the main trade of agricultural products. First of all, in 2012, Japan's imports were heavily dependent on China's exports of this product, and the TII between China and Japan reached 2.329. Once again, it is confirmed that almost half of Japan's imports of this product in 2012 came from China. Compared with the TII of China and Japan, the TII of Thailand, Japan and Vietnam in 2012 is not low, but it is not as strong as that of China and Japan. However, Japan's dependence on China is obviously weakening. Especially in 2016, the TII of Thailand and Japan has surpassed that of China and Japan, which means that from 2016, Japan's import of agricultural products such as Chapter 16 will start to depend more on Thailand's imports than on China's exports. This change continued until 2019, and the TII of China and Japan continued to decline, while the TII of Thailand and Japan also kept an upward trend after surpassing the TII of China and Japan in 2016. Although the TII of Vietnam has not reached the level of China and Japan, it has also increased from 1.472 in 2012 to 1.686 in 2019, which means that Japan's dependence on Vietnam's exports of such products is also constantly strengthening.

To sum up, Japan's dependence on China's agricultural exports is declining, and correspondingly, it is gradually relying on Thailand's agricultural trade. In the trade of Chapter 16, this trend is even more obvious. Even in 2016, Japan began to rely more on Thailand than China. Let us boldly predict that under such a trend, Thailand and Vietnam may one day replace China and become one of Japan's most important trading partners in agricultural products.

4.1.5. Trade Complementarity Index

TCI can show whether the trade structure between countries is complementary. The higher the TCI, the more complementary the trade structure between two

countries is, which is more conducive to the development of bilateral trade relations.

Table 4-9 Agricultural TCI

TCIagri	2012	2013	2014	2015	2016	2017	2018	2019
TCIcj	0.476	0.407	0.403	0.428	0.464	0.442	0.438	0.444
TCItj	2.237	1.858	1.938	2.036	1.933	1.916	1.989	2.189
TCIvj	2.855	2.080	2.099	1.946	1.834	1.707	1.555	1.420

Generally speaking, the trade structure between China and Japan is not the most suitable. From the table, it is not difficult to find that the trade structure of agricultural products exported by China and imported by Japan has not been higher than 0.5, and even showed a downward trend from 0.476 to 0.444 from 2012 to 2019, which further weakened the trade complementarity. The trade structure of agricultural products exported by Thailand and Vietnam is obviously more suitable for the structure imported by Japan. It is an undeniable fact that Thailand and Vietnam are far more suitable for Japan than China, although the trade structure complementarity between the three countries and Japan is declining.

Table 4-10 TCI in Chapter 16 Trade

TCI	2012	2013	2014	2015	2016	2017	2018	2019
TCIcj	5.432	4.529	4.073	4.303	4.458	4.540	4.372	4.037
TCItj	40.735	34.695	30.775	34.254	32.462	29.139	27.419	30.645
TCIvj	13.295	13.589	14.356	12.918	12.370	10.504	10.480	9.733

The trend of TCI in Chapter 16 products is similar. Although the TCI of this kind of products between China and Japan is obviously higher than that of agriculture as a whole, and the trade structure of this kind of products between China and Japan is indeed very complementary, the trade structure between China and Japan is still not as suitable as that between Thailand and Japan or Vietnam. The trade complementarity between Thailand, Japan and Vietnam in this kind of products is extremely strong, far higher than the TCI between China and Japan. However, it is worth noting that this can only explain the change at the time point, but cannot explain the trend well, given that the TCI of the three countries and Japan is weakening.

Table 4-11 TCI in Chapter 16 Trade with RRCA

TCI	2012	2013	2014	2015	2016	2017	2018	2019
TCIcj	2.758	2.476	2.434	2.395	2.393	2.678	2.545	2.341
TCItj	5.882	6.054	6.243	7.016	7.435	7.954	7.720	8.456
TCIvj	1.845	2.210	2.608	2.335	2.182	1.887	2.012	2.190

When I replaced RCA with RRCA and locked the trade between China, Japan, Thailand and Vietnam, the change of TCI could further explain that Japan chose to import more Chapter 16 from Thailand and Vietnam instead of China. First of all, by

vertical comparison, the degree of complementarity between the two countries has changed to varying degrees. As far as Chapter 16 is concerned, Thailand and Japan still maintain the highest structural complementarity, followed by China and Japan, and finally Vietnam and Japan. However, these three TCI show different development trends. The TCI between China and Japan decreased from 2.758 in 2012 to 2.341 in 2019, and the complementarity of trade structure weakened. At the same time, the TCI of Thailand and Japan, which was already very high, increased obviously from 5.882 to 8.456. At the same time, the TCI of Vietnam and Japan is also growing. Although it has not reached the level of China and Japan, it is constantly catching up.

Therefore, from this perspective, facing the different agricultural export structures of China, Thailand and Vietnam, Japan's import structure determines that it is more suitable for importing agricultural products from Thailand, especially for Chapter 16. From the TCI development trend from 2012 to 2019, the trade structure between Thailand and Vietnam is gradually developing in the direction suitable for Japan's import structure, while China is constantly moving away from the type that conforms to Japan's agricultural import trade structure.

4.2. China's Investment in Mauritania

4.2.1. Mauritanian agriculture development

Mauritania spans 1,030,700 square kilometers in West Africa, of which more than two thirds are deserts. According to the data of the World Bank in 2013, the country's population of 4 million is rapidly urbanizing, but half of the population's livelihood comes from planting crops, raising livestock and fishing. 41% of the population lives in rural areas, and half of the population depends on agriculture for a living. Agricultural production accounts for 25% of GDP. Mauritania is self-sufficient in red meat and fish, but imports 60% of other staple foods, especially rice, vegetables, sugar and cooking oil. However, the overall level of agricultural development in Mauritania still needs to be improved. Because of the resource endowment problems such as bad weather, short water resources and scarce cultivated land resources, and the problems such as backward infrastructure and backward agricultural policies, the sustainable development of agriculture is limited on a certain scale. Additionally, Mauritania's agricultural products processing industry is struggling to develop. Mauritania's agricultural products processing enterprises have low production rate and product quality, and are constrained by problems such as insufficient matching services for production and sales and lack of financial services, which have hindered the long-term development of Mauritania's agricultural products processing industry. However, it is worth noting that Mauritania has a good resource environment for

developing animal agricultural and fishery, but its agricultural products processing industry is struggling to develop.

Actually, Mauritania has got a lot of support from international organizations and foreign countries. Mauritania has accepted many agricultural aid projects from FAO, World Bank and foreign governments, which has provided guarantee for sustainable development of agricultural industry to a certain extent. Specifically, FAO has launched agricultural assistance in four areas. From 2013 to 2016, the World Bank approved a number of preferential loan projects for Mauritania's agricultural development and development in the fields of planting, livestock and animal husbandry, forestry, irrigation and water drainage, agricultural product processing, agricultural research and extension, rural infrastructure construction, and agricultural public management. In addition, China has directly provided agricultural aid projects to Mauritania by providing management and maintenance techniques for agricultural machinery, water pump stations and irrigation canals, and training farmers' agricultural production techniques.

4.2.2. Investment from Chinese enterprises

4-12 Import of Chapter 16 from Mauritania to Japan / million USD

Country	2012	2013	2014	2015	2016	2017	2018	2019	Increase
Mauritania	0.05		0.03			133.64	136.06	115.84	115.79

In 2017, the import volume of Chapter 16 imported by Japan from Mauritania increased greatly. I have found some reasons that can explain why the export from Mauritania has jump to a high level. In May 2017, there is a trade and investment agreement between China and Mauritania came out. The initiative was put forward as part of the trade and investment agreement signed when Chinese Foreign Minister Wang Yi visited the country. It has encouraged lots of Chinese companies set up business in Mauritania from 2017. These companies range in size from small, medium to large, covering various fields from food processing and construction to banking and other service industries. Some famous Chinese companies that also do business in Mauritania include Huajia Food Co., Ltd., Yantai Connor Food Co., Ltd. and some online trading companies, such as Alibaba, a world-renowned e-commerce giant.

Fishery is one of the local economic sectors that has gained the greatest boost from this investment. Due to many domestic and international challenges, the production capacity of this industry has been declining for many years. According to the data of the Food and Agriculture Organization of the United Nations (FAO), although Mauritania catches more than 1.2 million tons of tuna every year, only 5% of the fish are processed. FAO lists shrimp and tuna as the most common marine species caught

in Mauritanian waters every year. Investment from Chinese enterprises has brought employment opportunities and increased income to local businessmen. According to FAO data, if investment increases, Mauritania may produce more than 11.5 million tons of fish every year.

Many large fishery Chinese enterprises have established bases in Mauritania. Among them, there are three companies that have great influence on the development of fishery. One of them is Fuzhou hongdong ocean fishery co., ltd Hongtong's base in Mauritania is the largest overseas fishing base of China and is also the largest foreign-funded enterprise in Mauritania. It sends 10,000 tons of products to China, Europe and Japan every year. Another important overseas large-scale project is Mauritania Ocean Fishery Comprehensive Development Project. It was jointly established by two companies, Guangxi Xiangheshun Offshore Fishing Company and Shandong Rongcheng Risheng Aquatic Products Company. It is a comprehensive development project of Mauritania offshore fishing which was started to construct in 2016. By the end of 2017, the total catch of the project was 25,000 tons, and the total processing of aquatic products was 35,000 tons. In 2017, the total output value exceeded 70 million dollars.

Therefore, the huge increase of Chapter 16 products imported by Japan from Mauritania in 2017 is driven by the investment of some Chinese enterprises in Mauritania.

Chapter 5. Conclusion

Agricultural trade has always been one of the most sensitive topics in Asian countries. Both China and Japan have had differences and disputes with other countries on the trade of certain agricultural products. China should be one of Japan's important agricultural exporters in terms of geographical location and natural resources differences, and in fact, it is also true. Surprisingly, however, the agricultural trade relations between China and Japan are not getting closer and closer. Instead, they are alienating each other.

First of all, the share of agricultural products exported from China to Japan is decreasing year by year, and the trend is obvious. From the perspective of China, China is more inclined to export agricultural products to Hong Kong and some Southeast Asian countries such as Thailand and Vietnam from 2012 to 2019 than Japan. In 2019, Hong Kong became one of the most important trade export regions in China. In recent years, China has mainly increased the export of Chapter 07,

Chapter 08, Chapter 09 and Chapter 21. However, most of these agricultural products, which China mainly increase exports, are not mainly imported by Japan. To a great extent, the development and adjustment of China's agricultural export structure does not meet Japan's demand for agricultural imports. This can partly explain why the agricultural trade relationship between China and Japan is not as close as before.

Moreover, the increase of China's agricultural exports to Hong Kong and Vietnam is mainly concentrated on the increase of Chapter 07 exports. It is also the only one of products which China has increased a lot of export and also the main agricultural product traded between China and Japan. Strangely, however, the trade volume of such products exported by China to Japan showed a downward trend from 2012 to 2019. This further illustrates China's attitude of keeping away from Japan in agricultural trade. Compared with Japan, which is sensitive to agricultural trade and has complicated import and export requirements, China has chosen to establish and develop new and powerful agricultural trade relations with Southeast Asian countries.

Similarly, Japan is also deliberately reducing its dependence on major agricultural exporters. Among the agricultural products imported by Japan, the share of agricultural products exported by the United States and China has obviously decreased, and these two countries are precisely the most important sources of agricultural products imported by Japan. Japan hopes to reduce its dependence on these countries' agricultural products so as to give its agricultural products more opportunities for development. At the same time, Japan has further developed some new agricultural trade relations. Before 2012, Japan's agricultural trade with Italy and South Korea was not obvious, but the share of agricultural products exported by these countries to Japan was gradually increasing in recent years.

At the same time, I also consider whether the change of Japan's agricultural product import preference will also have an impact on Sino-Japanese agricultural product trade. However, from the perspective of the changes in Japan's preference for agricultural products, in theory, such changes will not bring very obvious impact. Among the main agricultural products traded between China and Japan, there are both agricultural products that Japan intends to increase its import share and agricultural products that reduce its import share. Therefore, from Japan's preference for agricultural products import, it is not the main reason for the decline of agricultural products trade between China and Japan.

Finally, the agricultural product Chapter 16, whose trade volume between China and Japan has decreased the most, has not been reduced by Japan. This is mainly due to the direct impact of the competition between Thailand, Vietnam and China, and the indirect impact of China's investment in Mauritania. First of all, compared with Thailand and Vietnam, China has lost its former advantage in the Japanese market,

and Thailand and Vietnam have obvious agricultural advantages and stronger competitiveness. Even in terms of trade structure, Thailand's export structure is more suitable for Japan's import structure. One day in the future, Thailand and Vietnam will probably replace China as Japan's most important trading partners of agricultural products. Meanwhile, the investment of Chinese government and Chinese enterprises in Mauritanian fishery and food production has also affected the Chapter 16 trade between China and Japan to a certain extent. Many Chinese enterprises choose to set up bases in Mauritania, capture and produce them locally, and then transport the processed agricultural products to China, Japan and Europe. At this point, Mauritania has also become one of Japan's trading partners for importing Chapter 16, and the trade volume between the two countries has increased significantly.

Generally speaking, the trade volume of agricultural products between China and Japan has obviously decreased, and the trade relationship is not as close as before. The main reasons are as follows: First, the development of new trade lines. Both China and Japan are interested in developing agricultural trade relations with other different countries, such as Hong Kong, Thailand and Vietnam,; Secondly, in the Japanese market, the advantages of China's agricultural products are weakened and the strength of competitors is enhanced.

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초록

21 세기 초에 한일 자유무역협정이 제정되었지만, 2021 년까지 한일 FTA 에 도달한 적이 없다. 일본의 농업무역에 대한 신중한 태도는 무시할 수 없기 때문이다. 사실 지난해 RCEP 가 성공적으로 체결되기 전에는 중국과 일본 간의 농업 무역의 관세 장벽은 항상 높았다. RCEP 의 성공적인 서명은 중국과 일본 사이의 농업 무역에 새로운 희망을 가져다 줄 것으로 보인다. 중국과 일본 의 일부 농산물에 대한 관세를 실제로 제거하거나 줄였지만 곡물, 채소, 돼지 고기 또는 쇠고기와 같은 일부 민감한 농산물 무역에서는 여전히 이 높은 관세 장벽을 주장하고 있다. 더욱이 더 심각한 문제는 최근 중국과 일본의 농업 무역 관계가 약화된 추세를 보이고 있으며, 양측은 일부 동남아시아 국가들과보다 완벽하고 긴밀한 농업 무역 관계를 구축하기 위해 노력하고 있다는 것이다.

이러한 배경과 동기를 바탕으로 이 논문을 통해 중일 농업무역관계가 약화되는 이유를 분석하려고 노력하다. 우선 2012 년부터 2019 년까지 중국과 일본 간의 농업무역이 크게 증가한 협력 분야나 국가와 중국과 일본의 농산물 무역 수출입 구조의 변화를 발견했다. 중국 - 홍콩, 중국 - 베트남, 일본 - 태국, 일본 - 베트남과 같은 새로운 개발 농업 무역 라인을 발견했다. 2012 년부터 2019 년까지는 이러한 무역선의 농산물 수입 및 수출량이 크게 증가하여 중국과 일본 간의 농업 무역 관계 발전에 큰 영향을 미쳤다. 중국은 동남아시아 국가들과 우호적인 무역 관계를 구축할 계획이며, 일본은 동남아시아 국가의 농산물 경쟁력과 무역 구조가 수입 수요에 더 부합하기 때문에 무역 교류를 확대했다. 또한 중일 농업 무역 관계의 약화를 연구할 때 모리타니와 같은 일부 아프리카 국가에 대한 중국의 농업 투자라는 새로운 이유를 발견했다. 모리타니의 농업 개발 수준은 높지 않으며, 특히 제품 가공 산업의 발전은 더욱 어렵다. 일부 중국 어업 또는 제품 가공 회사의 투자와 설립으로 모리타니가 매년 생산하고 수출할 수 있는 생선과 고기의 양은 질적인 도약을 이루었다. 모리타니의 연간 일본 농산물 수출도 증가하고 있으며, 이는 중국과 일본 간의 농업 무역에 어느 정도 영향을 미쳤다.

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