

Analyzing Intra-Industry trade between Thailand and China: A
case study on Agricultural sector



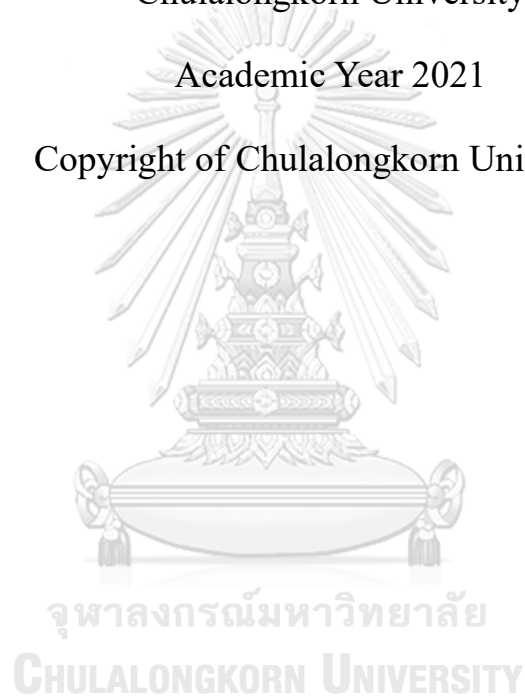
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จุฬาลงกรณ์มหาวิทยาลัย

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การวิเคราะห์การค้าภายในอุตสาหกรรมระหว่างไทยกับจีน : กรณีศึกษาภาคเกษตร



สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
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คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

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สาขาวิชา	เศรษฐศาสตร์ธุรกิจและการจัดการ	ลายมือชื่อนิติศ
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก

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In the process of regional strategic cooperation on a global scale, agricultural trade cooperation is very crucial in foreign trade, China and Thailand occupy an important position in the international market, and both sides maintain close trade relationship. China is Thailand's top partner in agricultural trade, and Thailand is China's second largest agricultural import trade partner in ASEAN. The two countries are similar in terms of basic national conditions, industrial trade structure and agricultural export markets. Agriculture, as one of the important foreign exchange-generating industries for both sides, plays an important role in their economies development, also expanding agricultural exports has become an important element in promoting sustainable economic development.

Since 1975, when China and Thailand established formal diplomatic relation, the agricultural trade between the two countries has been on a growing trend. In 2010, after the China-ASEAN free trade agreement was formally reached, the trade relations between Thailand and China developed rapidly, providing a strategic basis for further strengthening bilateral economic and trade cooperation, of which the agricultural trade undoubtedly occupies a key position.

This paper uses the relevant trade theory and economic index to study the current situation of agricultural product trade between China and Thailand, also analyzes the affecting factors by using the gravity model. Explore the opportunities and challenges of agricultural trade development between China and Thailand, hoping to increase the depth and breadth of agricultural trade cooperation between Thailand and China, and promote mutual benefits in bilateral trade.

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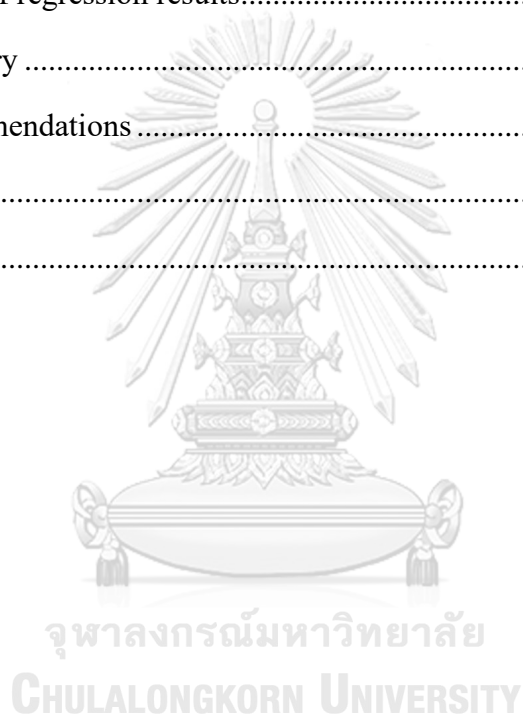
Li Wang



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Chapter 1 Introduction

1.1 Research background

Thailand is a major exporter of agricultural products in the world. Agricultural products trade plays an important role in Thailand's international trade. It is not only an important boost to Thailand's foreign economic development, but also enables Thailand to achieve more trade income and give a strong impetus to the sustainable development of Thailand's economy. Similarly, China is also a major agricultural products exporter. The total trade volume of China's agricultural products will exceed US\$230 billion in 2020, an increase of 7.5% compared with the previous year. For a long time, there have been close agricultural trade exchanges between China and Thailand, and the bilateral trade volume has repeatedly hit new highs. Since the beginning of the new century, China and Thailand have lowered tariffs on each other, further promoting bilateral trade and accelerating the pace of cooperation. The first promotion began in June 2003 with the implementation of the zero-tariff regime. On the basis of the Framework Agreement, China and Thailand signed the Agreement on Accelerating the Elimination of Tariffs between China and Thailand. There are specific provisions in the agreement, between the two countries, more than 188 kinds of fruit and vegetable products to achieve zero tariffs. With the implementation of this plan, the trade volume of agricultural products between China and Thailand has maintained an average annual growth rate of over 20%, which has an important impact on bilateral trade. The second push was that China and ASEAN countries officially launched the China-ASEAN Free Trade Area (CAFTA) on January 1, 2010, and the number of products enjoying zero tariffs reached 7,000. Since then, the trade cooperation between the two sides has continued to expand, entering a new era of "zero tariffs". The economic exchanges between China and ASEAN have also become closer and entered a new stage. Similarly, there are also deeper exchanges and

cooperation in the field of agriculture. In 2020, the bilateral trade volume between China and ASEAN will reach 4 trillion yuan.

In the Chinese market, Thai agricultural products are widely welcomed. However, the country that exports the largest agricultural products to China is not actually Thailand, but Malaysia, Indonesia and even Vietnam is a major competitor of Thailand. In the half-century-long trade exchanges between China and Thailand, there are many twists and turns. Among them, there are the obstacles of the international environment and the influence of the relationship between the two countries. Under the background of frequent changes in the international environment, the two countries have different development paths. In the future, the economic and trade exchanges between China and Thailand may also face more and more complex problems, which all require thinking and analysis. Under this realistic background, it is a great significance to analyze and study the current situation of agricultural trade between China and Thailand, and to conduct a specific structural analysis of the trade.

1.2 Purpose and significance of the research

The trade of agricultural products occupies a very important position in the international trade of China and Thailand. China and Thailand have unique geographical advantages, and the level of agricultural resources, agricultural products and agricultural products processing is highly complementary. Since China and ASEAN launched the FTA negotiation, bilateral trade between China and Thailand has been greatly promoted. Since October 1, 2003, China has implemented a zero-tariff early harvest arrangement for more than 180 types of Thai agricultural products. Since then, the trade in agricultural products between China and Thailand has maintained an annual growth rate of 21% to 22%, with certain complementarities. However, due to the policy environment and imperfect market system between China and Thailand, the agricultural products trade is still hindered to some extent. Therefore, how to reduce the obstacles caused by the limitations of national policies

and market systems, and how to continuously develop the trade between Chinese and Thai enterprises, has become an urgent problem to be solved. Therefore, it will be of great practical significance to study how to better and comprehensively promote the trade of agricultural products between China and Thailand. In the past 10 years, the bilateral trade structure between China and Thailand has been continuously optimized, trade channels have become more and more smooth, have effectively promoted the development of bilateral trade. Now, China and Thailand have upgraded their strategic cooperative relationship to a comprehensive strategic cooperative partnership, which means that the two countries will carry out all-round cooperation, and the development of bilateral relations, including China-Thailand economic and trade cooperation, will have a brighter prospect.

This paper will use the data of bilateral agricultural trade between China and Thailand over the years to analyze, hoping to find out the problems existing in the development and give corresponding suggestions.

1.3 Research methods and innovations

(1) Literature research method

By analyzing and summarizing the domestic and foreign literature on China-Thailand trade and the literature on China's bilateral trade potential with other countries or regions, the research ideas are clarified, the framework of the article is formulated, and the theoretical foundation is laid for the theoretical and empirical parts of the article by drawing on relevant research methods.

(2) Comparative research method

In the process of research, the comparative analysis method occupies a very important position, especially in promoting the cooperation or healthy competition between the two parties, the comparative analysis method is even more essential. This paper takes the overall trade situation of agricultural products as the object of comparison, takes China and Thailand as examples, analyzes and compares their data, and combines the

development history and climate characteristics of the two countries to put forward appropriate suggestions for the next development.

(3) Induction

The induction method refers to summarizing the obtained information, and then drawing corresponding conclusions and making suggestions for the next further development. This paper has a basic understanding of the development of China and Thailand through reviewing the previous literature on the development between China and Thailand, analyzes and summarizes the required data to make suggestions for the next development.

(4) Quantitative analysis method

Quantitative analysis is a method of analyzing the quantitative characteristics, quantitative relationships and quantitative changes of economic phenomena. In the empirical analysis part, this paper intends to use the econometric model to quantitatively analyze the influencing factors of Sino-Thai agricultural trade, and on this basis, summarizes the policy recommendations to promote Sino-Thai agricultural trade.

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Chapter 2 Overview research at home and abroad and related theories

2.1 Research at home and abroad

There is high complementarity between ASEAN countries and CHINA in the production of agricultural products. This characteristic has not to be confirmed. Sun Lin (2005) provided strong data and empirical support by comparing and verifying the trade complementarity index and the export similarity index. For the types of agricultural products with complementarity, the competition relationship between ASEAN countries and CHINA is listed. Through data sorting and analysis, it is found

that although competition exists between countries, the primary agricultural trade relationship is still based on the feature of complementarity, the difference in export products is the primary factor leading to this status quo.

Huang Jinzhen (2011) proposed that competition-complementarity will become the mainstream product structure of mutual trade between Thailand and China in the future, and the independent competitive relationship will no longer exist, because Thailand's geographical advantage in the tropics provides it with better raw material production, therefore, the cooperation between the two countries will become the main development trend in the future, the trade exchanges between the two countries will gradually become closer, and the cooperation will be continuously strengthened. In this context, enhancing the political mutual trust and economic exchanges between the two countries will better promote the economic and trade cooperation between the two countries and achieve a win-win situation.

Zhang Ya and Li Jie (2018) used the output data of upstream agricultural production in China and Thailand as the basis for analysis, and made a preliminary judgment on the multivariate variables and trade development trends of agricultural trade between the two countries. The trade of agricultural products is healthy and sustainable, and it is also necessary to carry out more professional and detailed research. According to the conclusions in the article, the two countries' respective agricultural resource advantages are discussed again. At present, the expansion of product transportation channels also requires the policy support of the two governments.

Wipapan Kokiakajom (2005) no longer focuses on analyzing the competitiveness and complementarity between China and Thailand and which direction they are more inclined to, but instead analyzes the reasons for this difference, one of which is to analyze the difference export procedures of the two countries. Compared with Thailand, China has two problems. First, the export procedures are cumbersome, resulting in a long period when exporting agricultural products. Second, the transportation is inconvenient, the transportation for export is relatively lacking, the

use of sea transportation means is insufficient, and the use of continental transportation has no direct transportation route, which requires more time and fuel.

Somsak Priebprom (2011) and Wullop Santipracha (2012) pointed out the reasons that hinder the development of agriculture in Thailand: defects in agricultural production, unstable and volatile prices, and lack of enough skilled labor. However, Thailand's food development is relatively stable.

NONTIPA KLANGAM (2017) analyzed the agricultural trade status and existing problems between China and Thailand since the establishment of the China-ASEAN Free Trade Area based on the trade data between China and ASEAN, and made a preliminary judgment and discussed future development trends based on the judgment.

Overall, there are not many studies related to Sino-Thai agricultural trade in the comprehensive literature at home and abroad. The more relevant content is to analyze the trade potential index between the two countries and explore the factors that affect the development of the two countries. This paper is very realistic to study the trade of agricultural products between China and Thailand, use the revealed comparative advantage index, net export competitiveness index, trade complementarity index, etc. to analyze trade complementarity and competitiveness. This paper draws on the historical research results of various scholars for reference and explores the factors that can really affect the trade of agricultural products between China and Thailand.

2.2 Overview of related theories

2.2.1 Comparative Advantage Theory

David Ricardo in his "On the Principles of Political Economy and Taxation" not only developed the great theory of labor value, but also developed the theory of trade, made up for the deficiency of the theory of absolute advantage, and put forward the theory of comparative advantage. The difference in labor productivity between the two countries is not equal for every commodity. For countries with absolute

advantages, they should concentrate on producing commodities with greater advantages, and countries with absolute disadvantages should concentrate on producing commodities with smaller disadvantages, and then exchange them with each other through international trade.

The theory of comparative advantage provides theoretical support for the research of the article. Although there is a large gap between China and Thailand in terms of economic strength, industrial level, science and technology, etc., due to the differences in natural endowments and other conditions between the two countries, China needs to import its relatively inferior products from Thailand and export its own superior products to Thailand, which is also the case in Thailand. Therefore, the prospect of deepening Sino-Thai trade cooperation is still broad.

2.2.2 Factor endowment theory

Factor endowment, also known as "Heckscher-Ohlin theory" and "HO theory", believes that the relative differences in factor endowments among countries and the differences in the intensity of using these factors in the production of various commodities are the basis of international trade, emphasizing the production of commodities. Different production factors are required, such as capital, land, etc., not just labor; different commodity production requires different production factor allocations. It is believed that a country should export products whose production factors are relatively abundant and import products whose production factors are relatively scarce. From the factor endowment theory, it can be seen that the rich natural resources give Thailand a great trade advantage in Sino-Thai trade exchanges, while China's abundant capital and advanced technology level give China a great trade advantage in Sino-Thai trade exchanges.

2.2.3 Competitive Advantage of Nations Theory

The Competitive Advantage of Nations Theory was proposed by Porter (1990), which believes that a country's competitive advantage is not static, but largely depends on the innovation and optimization and upgrading capabilities of the country's industries.

If a country wants to gain a competitive advantage, it must not only rely on the four decisive factors of its own abundant factor endowments, market and production demand, industrial cluster strength and corporate strategy, but also pay attention to the two auxiliary forces of government and external opportunities. , the dynamic competition environment they build is an important source for a country's industry to establish itself in the international market in the fierce competition. Therefore, in order to gain long-term trade benefits, a country's industry based on the international market not only relies on its own comparative advantage, but also needs to have the ability to convert its comparative advantage into a competitive advantage. This theory has strong theoretical guiding significance for the optimization and improvement of the bilateral trade structure between China and Thailand.

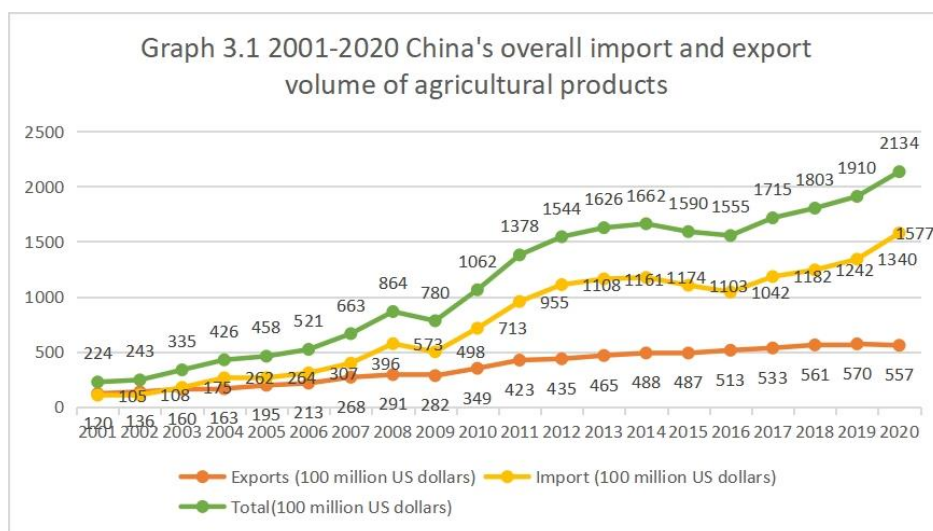
Chapter 3 Current situation and characteristics of agricultural products of China and Thailand

3.1 The overall status and characteristics of China's agricultural trade

3.1.1 The overall status of China's agricultural product trade

China has the title of a major agricultural country. The quality of agricultural products will directly affect the employment rate and family income of farmers. The economic growth of the nation and the harmony and stability of the society are also inseparable from the economic benefits brought by agricultural products. Since the reform and opening up, China's agricultural products have made remarkable progress in foreign trade. As Asia's largest exporter of agricultural products, China has a solid agricultural foundation, and the dominant trade sector in China's national economy has always been agriculture. Compared with other developing countries, the proportion of China's agricultural products in the international market has always been at the forefront and

has maintained a growing trend. The reason why China is called a "big importer of agricultural products" is not only due to the large consumer population base, but also thanks to the growing scale of China's economic development, which has also produced a benign development trend in China, such as the growing diversified demand for agricultural products, and the quality development of agricultural products will gradually move towards the middle and high-end ranks.



Data Sources: UN Comtrade database and obtained by calculation

As shown in Table 3.1, the total trade volume of agricultural products in China has maintained a good momentum for 20 consecutive years, with an increase of nearly US\$190 billion since 2001. There are two time points worth paying attention to. In 2003 and 2010, the total trade volume increased by more than 30%. This is due to the implementation of the zero-tariff system in June 2003. In the "China-ASEAN Comprehensive Economic Cooperation Framework Agreement" (CAFTA), China and Thailand signed the Agreement on Accelerating the Elimination of Tariffs between China and Thailand, and more than 188 fruit and vegetable products have achieved zero tariffs. In 2010, China and ASEAN countries officially launched CAFTA, and the number of products enjoying zero tariffs reached 7,000, including a large number of agricultural products. Another point to pay attention to is the trade deficit of China's agricultural products, which began to appear in 2003 and is increasing year by year.

This is also a typical phenomenon that the production of Chinese agricultural products does not match people's needs and is too dependent on foreign agricultural products. This phenomenon is mainly constrained by the following four reasons: First, since the beginning of the 21st century, China's economy has grown rapidly, and the phenomenon of urbanization has gradually increased, and the urban population has gradually increased, which has led to Chinese market demand for agricultural products. The demand is expanding, but it is impossible for China to meet people's needs at any time, so import has become a common means to meet the needs of people. Second, for the import of agricultural products, China has given corresponding policy support, for example, by reducing import tariffs to reduce friction in international trade. Thirdly, the supply and demand of agricultural products in China cannot reach a balance. Finally, the fluctuation of the price of agricultural products in the world will have some impact on the Chinese market.

3.1.2 Analysis on the Characteristics of China's Agricultural Products Trade

At present, China is the world's largest importer of agricultural products, and the increase in imports is significantly faster than that in exports. The species with the largest trade deficit is edible oil, of which soybeans are the largest category of imported agricultural products. Followed by livestock products, the main imported varieties are pork, minced pork, beef and milk powder. And the third with a deficit is Edible vegetable oil. The species with the largest trade surplus is vegetables, and the second is aquatic products. The trade volume of fruit has turned from profit to loss, and the export value has not changed much year-on-year, but the import value has increased by 34.5%, which also shows that the Chinese market has a strong demand for imported high-end fruits. Agricultural products have become an important bargaining chip for international cooperation, and changes in the variety and quantity of imported and exported agricultural products will have a profound impact on the domestic industry. China has become the country with the largest cultivation area in the world, most of which are oranges and apples, which are fruit-thinning crops. In

recent years, it has often been unsold in China. Therefore, in order to maintain international market share, the fruit industry should continue to improve the quality and building a brand is the only way for China's fruit thinning planting industry to continue to develop.

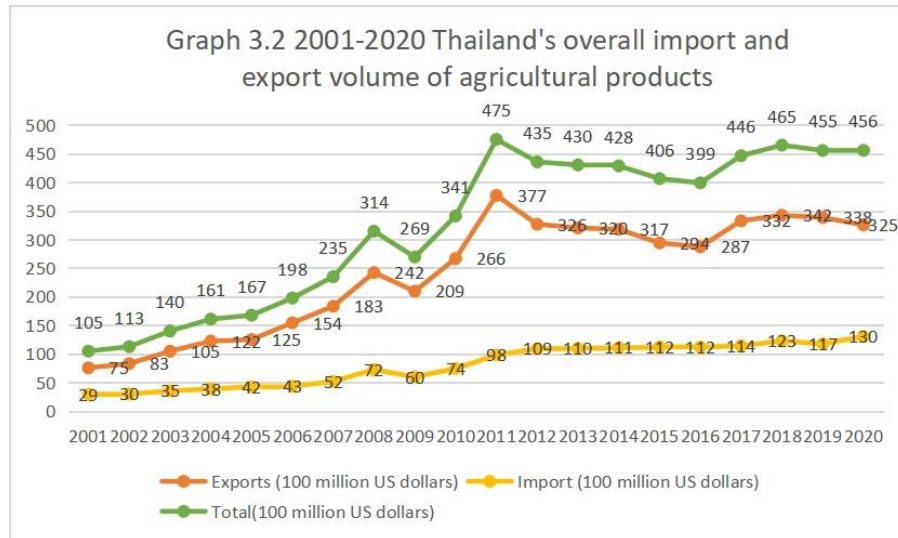
The authors reviewed statistics from 2005 to 2015, showing that China mainly exported agricultural products to five countries and regions: ASEAN, Japan, Hong Kong, China, the European Union (EU), and the United States. However, from the current situation, Asia is the largest overseas market for China's agricultural exports. There are two main reasons for this conclusion: First, other Asian countries have small cultural differences with China, so the number of agricultural products imported from China is very big. Second, the distance from China to other Asian countries to transport agricultural products is relatively short, the logistics cost is low, and there are many transportation channels, and the three modes of transportation by sea, land and air are very convenient. The second place is Europe, which also shows that China's high-quality agriculture is further developing, and the European market is developed through high-quality agricultural products, which is of great significance to enhance the value of Chinese agricultural products. Secondly, the scale of China's export markets in Africa, South America, Oceania, etc. is gradually increasing. These phenomena all indicate that the single pattern of China's agricultural export market is gradually changing. It is no longer limited to the only market in Asia, but also begins to occupy new markets market.

3.2 The overall status and characteristics of Thailand's agricultural trade

3.2.1 The overall status of agricultural trade in Thailand

Although Thailand is not the largest exporter of agricultural products in Asia, it also ranks among the top in terms of export volume, and its agricultural export earnings account for a large proportion of its national economy. According to the data of the UN Statistics Bureau, Thailand, as a country with developed traditional agriculture,

has occupied the second place in the export market share of agricultural products in Asia, ranking second only to China.



Data Sources: UN Comtrade database and obtained by calculation

The figure above shows the total value of Thailand's agricultural exports from 2001 to 2020. It can be seen that the total trade volume has also increased year by year since 2001 and has increased by about four times by 2020. The import and export volume has also increased by about four times, but the increase has fluctuated greatly. Anyway, it can still be seen that the proportion of Thailand's import and export is relatively stable. Also in 2003 and around 2010, the trade volume of agricultural products in Thailand increased significantly. This is because of the implementation of the zero-tariff system in 2003 and the full-scale launch of CAFTA between China and ASEAN countries in 2010. Most agricultural products have zero tariffs and promote the growth of trade volume.

Agriculture is the main industry for Thailand to obtain economic sources, so a lot of labor resources are invested in agriculture. According to the custom data, the export of agricultural products currently accounts for a large proportion of the total export products, and the export demand for agricultural products has increased. If the export volume of agricultural products increases, there will inevitably be higher requirements for the output of agricultural products, so the income of personnel engaged in

agricultural work will also increase, which can ease the economic pressure of domestic personnel.

3.2.2 Analysis on the Characteristics of Thailand's Agricultural Products Trade

Since the middle of the 20th century, Thailand has been diversifying from a single rice production to a variety of agricultural products in the production of agricultural products. In Thailand, the export trade value of rice still accounts for a large proportion of the total export trade value of agricultural products. In addition, the proportion of fruits and vegetables, coffee beans, tobacco, cotton, and palm trees in Thailand's foreign trade in agricultural products has increased year by year. It can also be seen that Thailand is deeply developing its own agriculture in many aspects.

The largest source of income from Thailand's major agricultural exports is aquatic and marine products. The main factor is also due to its unique climatic conditions and geographical location. Thailand has a vast sea area and a coastline of nearly 3,000 kilometers. There are many natural marine fishing grounds. Among them, the more well-known are Gulf of Thailand and Andaman Bay, and also many small fishing grounds with countless fishing ground resources. The capital of Thailand is naturally an important fishery center and a distribution center for fishery products. With the addition of these superior natural conditions, Thailand's fishery in Asia has a position that cannot be underestimated. The export share of Thailand's fresh frozen fish, fresh frozen cuttlefish and canned fish and other products accounts for a large share of the world's total aquatic products, which also brings Thailand considerable foreign exchange earnings. Thailand's total grain export accounts for the second place in Thailand's export volume, and the export volume has grown relatively steadily in recent years.

Although Thailand's imported products are mostly aquatic and marine products, such agricultural products are in a trade surplus, and the import value is decreasing compared with previous years. The import volume of agricultural products such as oil seeds and seed kernels has grown rapidly and has a trend of continuous growth.

3.3 Current situation of bilateral agricultural trade between China and Thailand

3.3.1 The overall status of agricultural trade between China and Thailand

Trade in agricultural products between China and Thailand reached US\$5 billion in 2010, five times the trade volume in 2001. Thailand's rice and fruit have a large number of potential consumers in China. Free trade agreements and diversification of export channels have brought direct trade benefits to China and Thailand. According to statistics, Thailand exported nearly 400 million US dollars of tropical fruits to China in 2011, doubling that of 2010. Trade volume reached \$8.5 billion, an increase of 70%. China became Thailand's second largest trading partner that year, and is Thailand's largest export market and second largest source of imports. It can be seen that the Sino-Thai agricultural trade cooperation relationship is becoming more and more mature.

China mainly imports natural rubber, chemical products, cassava, refined oil and wood from Thailand. The two sides ensure the rapid development of bilateral trade through the steady growth of import and export commodities. Although the import and export volume between China and Thailand has always maintained a steady growth, the average growth rate of agricultural products is much lower than that of industrial products, and the proportion of exports has gradually decreased, which is facing huge challenges. On the other hand, China and Thailand have zero tariffs on fruit and vegetable products, creating a huge market for the complementary agricultural products of the two countries, especially for the export of temperate fruits and vegetables in northern China. China is now one of the world's fastest growing and most stable economies. As China expands domestic demand and consumption upgrades, also the convenience brought by the China-ASEAN Free Trade Area, Thai agribusinesses have reaped tangible benefits from the Chinese market. Especially since 2011, the Chinese government has encouraged imports, gradually improved the level of trade facilitation, cancelled non-tariff measures, improved trade policies,

simplified and relaxed some import management, reduced import procedures, shortened time, reduced import costs. In the near future, China's import trade environment will be further improved. ASEAN countries (including Thailand) will gain business opportunities brought about by China's rapid economic development by strengthening economic cooperation with China. In addition, due to the geographical location and long-term friendly political relationship between China and Thailand, they have also laid a solid foundation for the development of economic and trade cooperation, and have unique advantages in economic and trade cooperation.

Development of Sino-Thai bilateral agricultural trade promotes the liberalization of agricultural product trade between China and Thailand; strengthens the external attractiveness of China and Thailand; expands the market size of both sides; cooperates with each other to improve productivity and reduce import and export costs; keep pace with the times and improve the market and institutional structure; maintain regional political stability and improve the status of both sides in international affairs; and promote the formation of a "common agricultural market" with the goal of maximizing the effect of trade welfare.

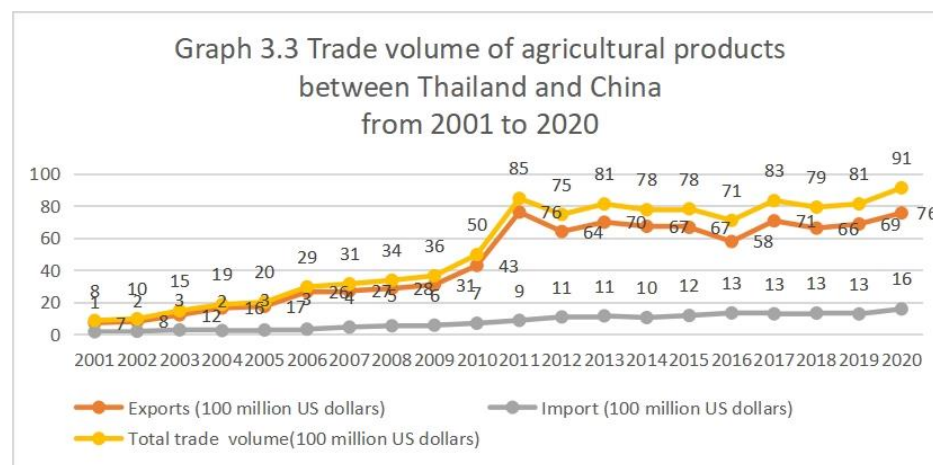
3.3.2 The scale of bilateral agricultural products trade between China and Thailand

Since 2007, China-Thailand bilateral trade cooperation has developed rapidly. By 2013, China replaced Japan as Thailand's largest trading partner, and continued to maintain its status as the largest export market and the second largest source of imports, and bilateral trade links have become increasingly close.

As can be seen from Table 3.3, the bilateral trade volume of agricultural products between China and Thailand has been increasing year by year. The total trade volume between China and Thailand increased from \$800 million in 2001 to \$5 billion in 2010. Influenced by the establishment of the China-ASEAN Free Trade Area in 2010, Thailand's agricultural exports to China began to show a trend of substantial growth.

In terms of Thailand's imports to China alone, it has risen from US\$100 million in 2001 to US\$1.6 billion in 2020, an increase of nearly 16 times. In terms of export data,

from US\$700 million in 2001 to US\$7.6 billion in 2020, although there has been a slight fluctuation in the middle, the growth is also very fast. In terms of trade deficit, although Thailand has maintained a surplus in agricultural trade with China in the past two decades, since the establishment of the China-ASEAN Free Trade Area in 2010, the trade balance between the two countries has also shown a steady trend.



Data Sources: UN Comtrade database and obtained by calculation

Judging from the total change of Thailand's agricultural exports to China from 2001 to 2020, in the years after the establishment of the China-ASEAN Free Trade Area, Thailand's agricultural exports to China have also increased significantly. According to statistics from UN Comtrade, the total trade of agricultural products between Thailand and China in 2020 was \$9.2 billion, an increase of 12.35%. Among them, Thailand's exports to China were \$7.6 billion, increase by 10.14%, accounting for 11.8% of Thailand's total exports. Thailand's imports from China were \$1.6 billion, increase by 23.08%.

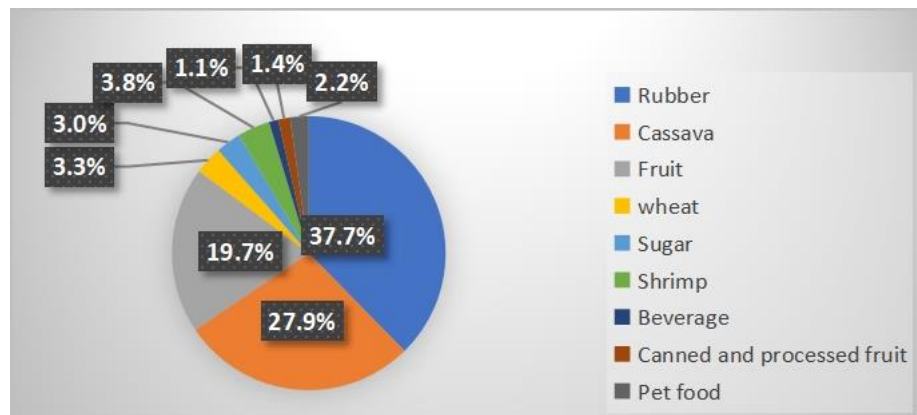
3.3.3 China-Thailand trade structure of agricultural products

(1) Structural types of Sino-Thai agricultural trade

In terms of the types of agricultural product trade structure, both Thailand and China have rich and various resources, and the trade volume of agricultural products is also relatively large. According to statistics from the Food and Agriculture Organization of the United Nations, Thailand's agricultural exports have accounted for about one-fifth

of Thailand's overall trade exports since 2010, making it one of the top four agricultural exporting countries in Asia.

Graph 3.4 The main types of agricultural products exported from Thailand to China in 2020

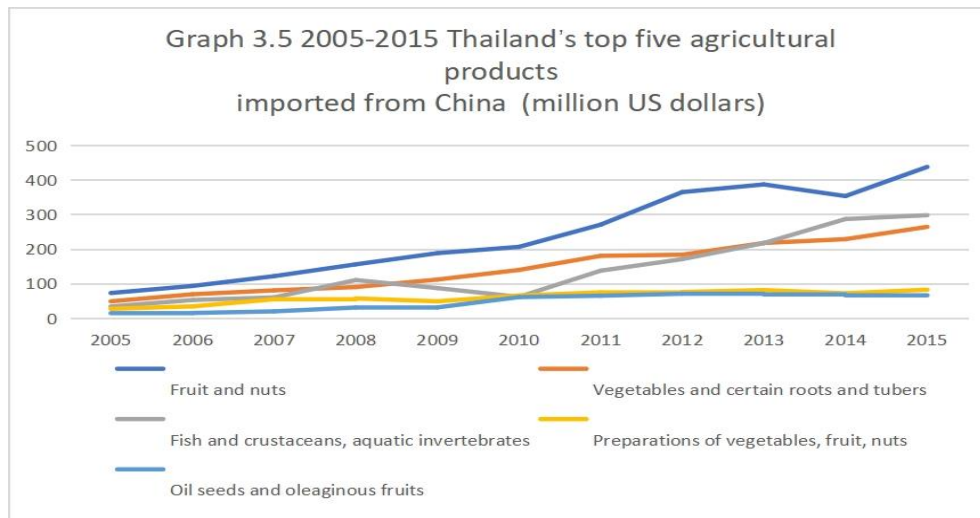


Data Sources: UN Comtrade database and obtained by calculation

Graph 3.4 shows that statistics show that the top three export items from Thailand to China are rubber, cassava and fruit. Compared with the same period last year, rubber exports have fallen significantly, and the upgrading and transformation of China's industry is the primary reason for this change.

Cassava was Thailand's second largest export to China in 2020. Thailand has a share of more than 70% in China's cassava market, and Vietnam and Indonesia are the second and third in China's cassava market. Thailand exports 2 million to 3 million tons of fruit to China every year, with various transportation methods, and the sales market ranges from wholesale markets to various department stores.

China's imports of wheat and ready-to-eat food are increasing every year due to the development of economic development. Among them, due to the increase in the audience of sugar and confectionery, China has become the world's largest sugar importer. Thailand is a country rich in sugar production. , its export market is basically concentrated in China, but after China issued relevant restrictions on imported sugar, Thailand's export volume was also affected to a certain extent.



Data Sources: UN Comtrade database and obtained by calculation

As can be seen from the above figure, from 2005 to 2015, Thailand's agricultural products imported from China ranked first is fruits and nuts, and second is vegetables. Both products showed an increasing trend, especially in 2010. later doubled. The third place is fish and other aquatic invertebrates and other aquatic products, which maintained steady growth before 2010, but achieved breakthrough growth after 2010, and the trade volume increased by as much as five times. The import value of the above three categories of products ranks among the top three.

(2) Trade combination degree index (TCD)

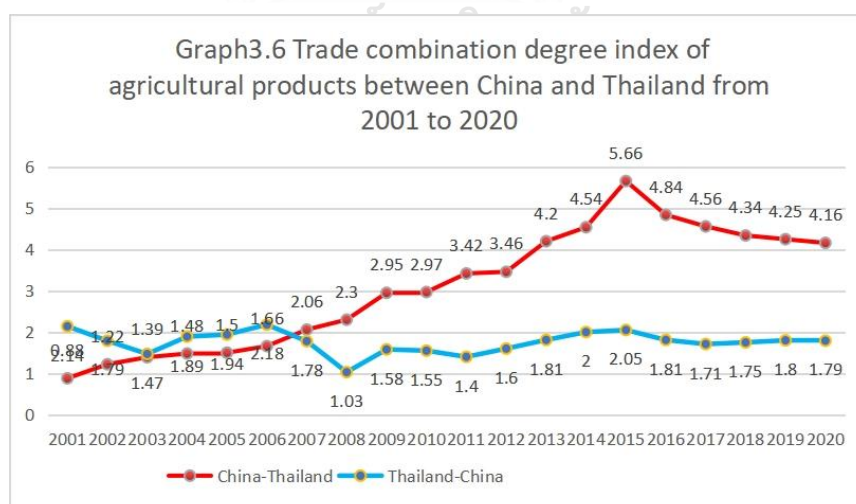
It is a comprehensive indicator to measure the trade interdependence between the two countries. CD refers to the ratio of a country's exports to a certain trading partner to the country's total exports and the trade partner's total imports to the world's total imports. The larger the value, the closer the trade relationship between the two countries. Its formula is:

$$TCD_{ab} = (X_{ab} / X_a) / (M_b / M_w) \text{ (Formula 3.1)}$$

Among them, TCD_{ab} represents the trade combination degree between country a and country b, X_{ab} represents the export value of country a to country b, X_a represents the total export value of country a; M_b represents the total import value of country b; M_w represents the total world import value. If $TCD_{ab} > 1$, it indicates that the two

countries a and b are closely connected in terms of trade; if $TCD_{ab} < 1$, it indicates that the two countries a and b are loosely connected in terms of trade.

Based on the preliminary analysis of the TCD index between China and Thailand in the past ten years, it can be concluded that the agricultural product trade combination between China and Thailand has a trend of first rising and then falling. The Trade combination degree increased from 0.88 in 2001 to 5.66 in 2015, an increase of more than 6 times, but decreased year by year after 2015. The degree of trade combination between Thailand and China in agricultural products is generally stable but weaker. Digging into the data, it is not difficult to see that since 2007, Thailand's trade combination with China's agricultural products has no longer maintained its dominant position, and has gradually lagged behind China's trade combination with Thailand's agricultural products. This means that the Chinese market has become more and more important to Thai agricultural products in recent years, and it also means that the export market of Chinese agricultural products has shown a trend of diversification. The rise of many emerging markets, such as Latin America, Oceania and Africa, more The market means that China has more choices, has less dependence on the old market, and is no longer only limited by the influence of a single country.



(2) Market structure of agricultural products export in China and Thailand

According to the data on the development of agricultural product trade, China is

currently the largest agricultural product trading country in Asia. Nonetheless, Thailand is more competitive than China in terms of total agricultural exports and per capita trade. According to the data given by the Ministry of Commerce of China and Thailand, among the top 15 varieties of agricultural products exported by Thailand, 10 varieties are the same as those of China, which means that the varieties of agricultural products exported by China and Thailand are very similar. In addition, in terms of export market countries, there has high similarity between Chinese and Thai export markets, and four of the top five export markets for agricultural trade of the two countries are the same. The top three export markets of China's agricultural products are Japan, the United States, and Hong Kong, China. Japan, as China's largest export market, basically maintains a share of more than 15% of China's exports. According to literature search, the largest export market of Thai agricultural products is China, and the second largest export market is Japan. In addition, the United States is also one of the main export markets for Thai agricultural products. The main export markets of agricultural products in China and Thailand include Japan and the United States. It can be seen that the market competition of agricultural products in China and Thailand is still relatively large. These are the reasons for the high competitiveness of agricultural exports in China and Thailand.

(3) Differences in climate and resource endowments of agricultural products between China and Thailand

Thailand is located in Southeast Asia and has a typical tropical monsoon climate. Its unique geographical environment and climatic conditions suitable for the growth of crops, and also brought innate conditions to the production of agricultural products in Thailand. Thailand, known as the "granary of Southeast Asia", from the central area to the northeast area is the main producer of Thai rice. Secondly, the rubber planted in southern Thailand is the best rubber production base in the world. The vast sea area of Thailand not only brings huge benefits to its seafood breeding industry, but also provides convenient transportation conditions for the export of agricultural products.

Thailand has an advantage in tropical crops, but China has an advantage in temperate crops. Due to China's intensive labor force, meat varieties such as lambs from Inner Mongolia and pork products from Henan are more widely sold around the world. Compared with Thailand, China has a vast territory, a high degree of mechanization of agriculture, more varieties of crops, and more diversified exports.

Chapter 4 An empirical analysis of complementarity of agricultural products

between China and Thailand

4.1 Trade Complementarity Index Analysis

Due to the inconsistency in the level of development and differences in industrial structure of each country, there may be large complementarities between countries with different trade resources. Under normal circumstances, the degree of similarity between the product structure of a country's export to a country and the product structure of the country's cooperating importing country can be used to compare the complementarity between countries.

The Trade Complementarity Index (TCI) is often used to measure the degree of complementarity between two countries in a certain commodity trade. Its formula is

$TCI_{ijk} = RCA_{xik} \times RCA_{mjk}$ (Formula 4.1)

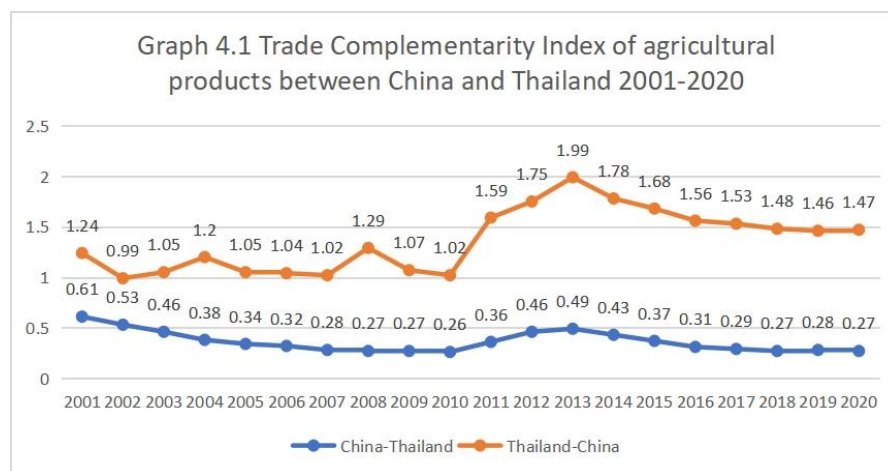
$$RCA_{xik} = (X_{kiw} / X_{iw}) / (X_{kww} / X_{ww})$$

$$RCA_{mjk} = (M_{kjw} / M_{jw}) / (M_{kww} / M_{ww})$$

In the formula, TCI_{ijk} represents the complementarity of country i and country j in products k ; RCA_{xik} and RCA_{mjk} respectively represent the apparent comparative advantage of country i in exporting type k products and the apparent comparative disadvantage of country j in importing type k products. When $TCI \geq 1$, it means that the two countries have high trade correlation and strong complementarity in a certain

commodity; when $TCI < 1$, it means that the two countries have weak trade correlation and poor complementarity in a certain commodity.

From 2001 to 2020, China's agricultural trade complementarity index with Thailand was generally weaker, and each year was less than 1, which means the complementarity was weak. Thailand's agricultural trade complementarity index with China is relatively stable as a whole, with each year greater than 1, which means the complementarity is strong (See graph below).



From Graph 4.1, it can be seen that the trade complementarity index of agricultural products imported from China and exported from Thailand is on the rise as a whole, indicating that China's dependence on Thailand has gradually deepened in the trade of agricultural products between China and Thailand. The continuous expansion of China's trade deficit with Thailand's agricultural products can also reflect that China's agricultural products are facing greater pressure on Thailand's exports, and the degree of dependence on imported agricultural products from Thailand has increased. The geographical proximity of China and Thailand, coupled with the differences in natural conditions, resource endowments and agricultural production structures between the two countries, makes Thailand a natural source of raw materials for tropical crops and agricultural products to China.

4.2 Analysis of the reasons for complementarity of agricultural products between China and Thailand

In agricultural production, climate is a key factor. Although Thailand and China are not far apart geographically, due to the land area and orientation, the climates of the two countries are very different. Thailand mainly belongs to the tropical monsoon climate, which is characterized by high temperature and humidity throughout the year. Such a climate is very good for the growth of crops. There are many central plains in Thailand, and such an environment is also suitable for growing crops. China's latitude and longitude spans are very large, so the climate in each region is often different. In the south, it is mainly a subtropical monsoon climate, so the temperature in the south is a bit higher than that in the north. The north has a continental climate, but generally the characteristics of summer is high temperature and rainy. According to different climates, the varieties of crops grown in northern and southern China are quite different, which also makes China rich in crop varieties. Due to the above climatic factors, China and Thailand are quite different in the structure of crops. China's main advantage lies in temperate fruits and vegetables, while Thailand's main advantage is tropical fruits and tropical plants. The factors affecting agricultural production also include the country's natural resource endowment, and the degree of scientific and technological progress and development. Thailand's coastline is numerous and very wide, which is very conducive to the development of fishery-related agriculture. Inland Thailand's dense agricultural land is also suitable for growing crops such as rice and rubber. Compared with China, the prevalence of agricultural mechanization is not enough, and the main advantage is the abundant labor resources, so the intensive labor force is a significant feature of Chinese agricultural products. To sum up, the different factors affecting agricultural products ultimately lead to the different complementarity between China and Thailand in agricultural products.

Chapter 5 An empirical analysis of competitiveness of agricultural products between China and Thailand

5.1 Revealed Comparative Advantage Index (RCA) Analysis

Next, this paper will conduct an empirical analysis on the competitiveness of agricultural trade between China and Thailand through the Revealed Comparative Advantage Index (RCA).

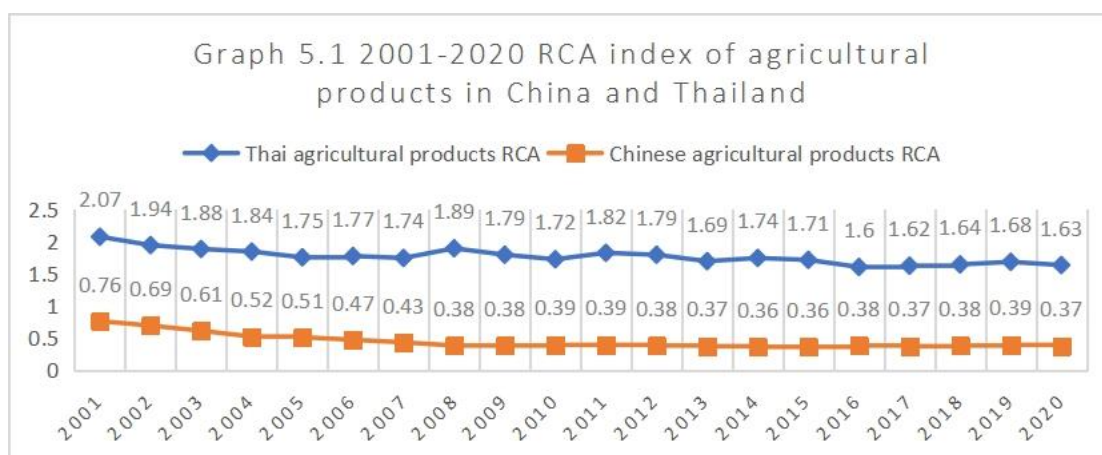
One of the commonly used indicators for analyzing international competitiveness is the Revealed Comparative Advantage Index. Its value is equal to the ratio between the share of a country's export of a commodity in its total exports and the world's share of that commodity in the world's total exports. The calculation formula is:

$$RCA_{ij} = (X_{ij}/X_{tj})/(X_{iw}/X_{tw}) \quad (\text{Formula 5.1})$$

In the above formula, X_{ij} represents the export value of product i exported by country j , X_{tj} represents the total export value of country j ; X_{iw} represents the export value of world export product i , and X_{tw} represents the total export value of the world.

Generally speaking, the RCA index is divided into four grades, which are used to indicate the degree of comparative advantage of the country's industry, as shown in the following table:

Table 5.1 RCA Grade Index Table	
RCA Index	Degree of comparative advantage
>2.5	Very strong comparative advantage
1.25-2.5	Strong comparative advantage
0.8-1.25	Have a comparative advantage
<0.8	Weak comparative advantage



From a Chinese perspective, as the Chinese economy grows, the domestic demand for agricultural products is in the stage of continuous rise, so in this case, the total amount of domestic agricultural products need to be used to supplement the domestic demand for agricultural products, so the export is decreasing and the import is increasing. In the overall discussion, Thailand's agricultural products still have a stronger comparative advantage than China's agricultural products in the face of international trade.

5.2 Analysis on the causes of competitiveness of agricultural products between China and Thailand

According to the above empirical analysis of the RCA and TSC indices, the trade competitiveness of China's agricultural products is slightly weaker than that of Thailand. The main reasons are as follows.

From the perspective of the government, due to the establishment of the China-ASEAN Free Trade Area, the tariffs on many agricultural products have been reduced or even reduced to zero tariffs in the process of trade in agricultural products. This is a double-edged sword for Chinese agricultural enterprises. On the positive side, the zero-tariff policy has improved the competitiveness of Chinese agricultural products in the market of importing countries and can effectively increase the export volume of agricultural products. On the other hand, Thailand's excellent agricultural

products and enterprises have also entered the Chinese market. If Chinese agricultural products and enterprises gradually lose their local advantages, this will cause the phenomenon of oppressing the enterprise market. In this environment, the growth rate of local emerging agribusinesses and pre-existing small and medium enterprises will be affected and slowed down. However, implementing tariff policies, strengthening the supervision of the origin certification of agricultural products, raising the technical review standards for agricultural products and other non-tariff barriers to protect the domestic agricultural product market will also cause the Thai market to set a corresponding threshold for Chinese-made agricultural products.

From the perspective of agricultural products themselves, China's agricultural products are insufficient in terms of technical content, processing level and standardization. First of all, although China's current agricultural technology will not affect the growth of domestic agricultural products, in the external competition, the shortcomings of low utilization rate and low technical content of agricultural products will become more and more obvious, which will eventually affect the competition of China's agricultural exports. The requirements and guidelines for agricultural products are different in each country. If China's testing standards for domestic agricultural products are not strict enough, it will make the export of agricultural products easily restricted by the trade barrier policies of other countries, affecting the country's export volume and economic development. The low degree of processing will affect the competitiveness of domestic agricultural products, and export products are often less profitable, often subject to non-tariff barriers. Third, although the processing level of agricultural products in China is low, in the final analysis, the reason for the low technical content makes China's agricultural exports mainly primary products, and the added additional value is not high.

From the perspective of agricultural enterprises, the popularity of agricultural industrialization in China is still not enough. Most of the agricultural products are produced by families or individuals. When facing the local or domestic market, the

output may be sufficient, but if the export is expanded, the production scale will be insufficient, and the cost will not be proportional to the benefit. Of course, to improve this situation, it is far from enough to increase the scale of planting and other production methods, it also needs the support of the government. Now the government has issued many policies and guidelines related to the agricultural industry. Brand companies are just around the corner.

Chapter 6 Factors affecting the trade of agricultural products between China and Thailand

6.1 Construction of measurement model

The gravitational model of trade is derived from Newton's law of gravitation. Tinbergen (1962) and Poyhonen (1963) were the first to use the gravity model to study international trade. They showed that the size of trade between two countries is directly proportional to the size of their economies and inversely proportional to the cost of transportation (distance between the two sides). In this regard, the size of the exporting country's economy reflects its intrinsic supply capacity, the size of the importing country's economy reflects its intrinsic demand capacity, and the distance between the two countries (transportation cost) becomes the resistance to trade between the two countries.

In addition to the GDP and distance in the traditional gravity equation, per capita GDP and the completion of the free trade zone also have a certain impact on the regression results. According to the previous discussion on the selection of influencing factor variables, we can construct a gravity model with the scale of agricultural trade between China and Thailand as the dependent variable, and variables such as GDP, per capita GDP, and free trade zones as independent variables, and construct the

gravity model as follows:

$$\ln X_{ij} = b_1 \ln(Y_i Y_j) + b_2 \ln(N_i N_j) + b_3 \ln(D_i D_j) + b_4 \text{CAFZT}_{ij} + \varepsilon_{ij}$$

In the above formula, X_{ij} represents the trade volume between the two countries; Y_i is the GDP of country i , and Y_j is the GDP of country j ; N_i and N_j represent the per capita GDP of country i and country j , respectively; D_i and D_j represent the distance of country i and country j ; CAFZT represents the China-ASEAN Free Trade Area. b_1 , b_2 , b_3 and b_4 are the regression coefficients of the respective variables, and ε_{ij} is the error term.

6.2 Variables and data description

GDP reflects the export supply capacity of the exporting country and the import demand capacity of the importing country. Both indicate that the larger the total size of the economy, the greater the potential export or import capacity and the greater the bilateral trade flows. The coefficient is expected to be positive. GDP per capita represents the economic development level of exporting and importing countries and represents the per capita income of the country. It is positively correlated with trade volume, and the coefficient is expected to be positive. Distance is used to explain bilateral trade costs in traditional trade gravity models. The farther the bilateral trade distance is, the lower the trade volume, and the coefficient is expected to be negative. The free trade zone mechanism has promoted the implementation of the zero-tariff system, and both trade barriers and trade frictions have been effectively reduced. The smooth bilateral agricultural product trade channel will increase the bilateral agricultural product trade. Therefore, it is expected that the coefficient symbol of this variable is positive.

Description of data sources for this chapter: This chapter is based on sample data from 2005 to 2015. China's import and export data to Thailand comes from the Uncomtrade database; China's and Thailand's GDP and per capita GDP, Distance come from the United Nations Bureau of Statistics; The Thai Free Trade Zone was

established in 2010, so 2010 is the dividing line, that is, CAFTA = 0 before 2010, and CAFTA = 1 in 2010 and later.

6.3 Empirical Analysis of Gravity Model

The empirical test results are shown in Tables 6.1 and 6.2.

According to Table 6.1, R-Squared in the model is 0.999, and the model has a high degree of fit. The F value is 2584, and the P value is 2.56e-13, which is below the given 1% significance level and passes the test.

According to Table 6.2, it can be seen that the model has passed the four independent variable factors, and the P values are 0.0316, 0.0148, 0.0246 and 0.0679, which are lower than the given 10% significance level, so the hypothesis that the regression coefficient is equal to zero is rejected. Based on the above analysis results, the linear regression equation as a whole passed the test. The regression equation expression is:

$$\text{Ln}X_{ij} = 0.8519 \text{Ln}(Y_i Y_j) + 1.1845 \text{Ln}(N_i N_j) - 0.2865 \text{Ln}(D_i D_j) + 0.4568 \text{CAFTZ}_{ij}$$

R-Squared	Adjusted R-Squared	F-statistic	P-value
0.999	0.9982	2584	2.56E-13

	Estimate	Std.Error	t value	Prob.
Ln($Y_i Y_j$)	0.8519	0.1232	2.459	0.0316
Ln($N_i N_j$)	1.1845	0.3658	3.025	0.0148
Ln($D_i D_j$)	-0.2865	0.1086	2.4678	0.0246
CAFTZ _{ij}	0.4568	0.1745	2.054	0.0679

6.4 Analysis of regression results

With the help of the gravity model and the bilateral trade data between China and

Thailand, this paper discusses the consequences of the establishment of the China-ASEAN Free Trade Area.

Research on trade effects. It can be seen from the research results that the establishment of the free trade area has affected the trade effect between the two countries to a certain extent. It can be seen from the regression equation that GDP and the per capita GDP of the two countries greatly affects the trade volume of agricultural products between China and Thailand. The empirical results show that for every 1% increase in the per capita GDP and GDP between the two countries, the bilateral trade volume increases by 1.1845% and 0.8519% respectively. Although the coefficient of the establishment of the free trade zone (0.4568) is less than the coefficient of the per capita GDP and GDP of the two countries, it can still be seen that the establishment of the free trade zone will promote the trade of agricultural products between China and Thailand. And the distance of the two countries (- 0.2865) will have the negative influence on the trade volume of agricultural products between China and Thailand.



จุฬาลงกรณ์มหาวิทยาลัย
Chapter 7 Summary
CHULALONGKORN UNIVERSITY

Based on comparative advantage theory, factor endowment theory, national competitive advantage of nations theory and other economic theories, this paper makes a basic overview of the current situation of agricultural trade between China and Thailand, then select relevant parameters in combination with economic indices to discuss the competitiveness and complementarity of agricultural products between the two countries, also analysis of factors affecting agricultural trade between the two countries. On this basis, put forward suggestions on the existing problems of agricultural trade between China and Thailand, and provide a theoretical basis for the follow-up development of the two countries.

1. An overview of relevant trade theories

According to the theory of comparative advantage, Thailand and China are both major exporters of agricultural products in the world, and agricultural trade plays an important role in international trade, and at the same time brings important boost to the economic development of the two countries.

According to the factor endowment theory, Thailand is located in Southeast Asia and has a typical tropical monsoon climate. Its unique geographical environment and climatic conditions suitable for the growth of tropical crops have brought innate conditions to the production of agricultural products in Thailand, which is called "the granary of Southeast Asia". China has a vast territory and is the country with the largest cultivated area in the world. It has a wide variety of crops and has advantages in temperate crops. At the same time, labor-intensive and high degree of mechanization make exports more diversified.

According to the competitive advantage of nations theory, a country's industry based on the international market must have the ability to convert its comparative advantage into a competitive advantage in addition to relying on its own comparative advantage. Thailand is continuously transforming from a single rice production to a diversified agricultural product. It can be seen that Thailand is deeply developing its own agriculture from many aspects. China's agriculture industry is continuously improving its quality and building its own brand, which also shows that China's high-quality agriculture is further developing, and opening up blank markets through high-quality agricultural products.

2. Trade competitiveness and complementarity

Although from the trade data between the two countries and the correlation index of trade competitiveness, it can be seen that China has a dominant position in the overall world market share, but from the calculated RCA data, it can be seen that China's agricultural products are relatively less competitive. Comparing the relevant data of Thailand with the results obtained above, although Thailand's share in the world

market is not as large as that of China, when subdivided into individual product categories, Thailand's agricultural products with a large export volume are highly competitive in the market.

In the analysis of the complementarity of agricultural products between the two countries, trade complementarity index is used for empirical analysis. From the data structure, we can see that the trade of agricultural products between China and Thailand is mainly complementary for a long period of time. Different development stages and differences in resource endowments will greatly affect the comparative advantages of different agricultural products between China and Thailand, and have a positive impact on the import and export trade between the two sides.

3. Analysis of factors affecting trade by gravity model

Through the analysis of the factors affecting the trade of agricultural products between China and Thailand, it is found that the trade scale is mainly affected by the economic scale GDP of China and Thailand, the per capita GDP of the two countries, and the policies of the free trade zone, and have negative influence on distance between the two countries.

4. Free trade policy has a positive impact on the trade

Through the above data analysis and the verification results of the model, we can see that the establishment of the free trade zone or the implementation of the tax-free policy has positively promoted the trade between the two countries to a certain extent. After the establishment of the ASEAN-China Free Trade Area in 2010, it marked the reduction of tariff and non-tariff barriers and the more favorable terms of trade between the two countries, which almost doubled the trade volume between China and Thailand, and reduced the cost of entering the market of the other country. The fields that both sides can enter are broader, which is conducive to the formation of economies of scale and the optimization and upgrading of the agricultural industrial structures of the two countries.

Chapter 8 Recommendations

8.1 Optimize the export structure of agricultural products between the two countries and leverage complementary advantages

Based on analysis and understanding of relevant trade theories, the difference in agricultural resources between China and Thailand is mainly due to the natural endowments of the two countries. The advantages of various resources are different. As a land-intensive agriculture, Thailand has a fundamental gap with China's labor-intensive agriculture. For Thailand, it can continue to expand its own advantages, focusing on the cultivation of crops such as rice and rubber, and focusing on improving agricultural technology, increasing production and improving quality. For China, it should increase efforts to change the traditional agricultural management model, carry out large-scale agricultural operations, and extend multiple industrial chains on this basis, implement sustainable development, enhance product development momentum, make improvement in the added value of the product. As for the different advantages of agricultural products due to natural endowments such as climate, the two countries can cooperate to form complementary needs and optimize their respective export types.

In addition, the two governments should actively promote the transformation of complementary industries from inter-industry trade to intra-industry trade to expand the scale of bilateral trade. For competitive products, when there are many competitive products in the trade between the two countries, it will inevitably cast a shadow on the bilateral trade between the two countries. Therefore, the two countries should fully tap their own comparative advantages, implement differentiated production, turn competition into complementarity, and expand the scope of trade, reduce trade imbalances, and deepen trade cooperation.

8.2 Strengthen the use of bilateral trade cooperation mechanism

From the analysis in the third part above, we can see that the establishment of the

China-ASEAN Free Trade Area and the implementation of a series of tax-free policies have had a positive impact on the trade of agricultural products between China and Thailand. RCEP has provided new opportunities for the improvement and upgrading of China-Thailand agricultural cooperation. Agricultural enterprises can pay close attention to the progress of RCEP, make active plans, and strive to fully tap RCEP's dividends. First, to further prosper bilateral trade in agricultural products. Thailand's tropical fruits and health products, as well as China's fish and nuts, are well-known in each other's markets. they can take advantage of the tariff reduction and exemption and convenient customs clearance conditions under the agreement to expand bilateral trade. Second is to actively develop agricultural investment and cooperation with Thailand. Taking advantage of the relaxed rules of origin in the agreement and the opportunity of improving agricultural investment access in Thailand, expand investment in Thailand's agriculture and agricultural product processing industry, optimize resource allocation, and carry out agricultural industry chain cooperation.

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VITA

NAME	Li Wang
DATE OF BIRTH	17 Aug 1992
PLACE OF BIRTH	China



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY