THE IMPACTS OF CAFTA ON TRADE AND FDI IN CHINA

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THE IMPACTS OF CAFTA ON TRADE AND FDI IN CHINA

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ABSTRACT

The China and ASEAN Free Trade Area (CAFTA) was established on 4th November 2002. Since then, trade flows, trade structure, trade complementarities，trade competition and FDI between China and ASEAN have grown rapidly. Nevertheless, the basic issue remains - whether these growth are due to CAFTA. Thus, this study examines the effects of CAFTA on China's trade flow, trade structure, trade complementarities and competition and, the flow of FDI. A gravity model is used to estimate these effects, while the qualitative method is used to analyze the economic integration. Data for the analysis is obtained from UN database, WTO database, World Bank database and China Statistical Yearbook. This study employed five models to examine the effects of CAFTA on trade structure, trade complementarities and competition, the FDI flow and the effects on different regions in China. The overall results indicate that CAFTA produces trade creation effect and greatly improves the trade structure of China. CAFTA has caused an expansion of inter-industry trade of the main products (crude materials and manufactured goods) between China and ASEAN countries. It has strengthened the trade complementarities between China and Cambodia, Indonesia, Singapore, Malaysia and Thailand. However, there are tendencies of weakening trade complementarities between China, the Philippines and Vietnam. On the other hand, trade competition for some products between two sides indicated a different trend. Several ASEAN countries have experienced increasing export comparative advantages in agriculture products, food, fuels and mining products. Meanwhile, China has obvious export comparative advantages in manufactured products and machinery and transport equipment. In addition, the domestic analysis revealed a very promising effect. CAFTA has promoted trade growth for 17 provinces and 7 regions, with positive effect on the geographically advantaged provinces and regions in China. Surprisingly, CAFTA caused a reduction of FDI outflow and inflow in China. In conclusion, CAFTA has improved the trade growth and trade structure in China, while promoting the expansion of trade between China and ASEAN. However, FDI reduced due to CAFTA.

Keywords: CAFTA, FDI, trade flow, trade competition, trade complementary, trade structure

ABSTRAK

Kawasan Perdagangan Bebas China dan ASEAN (CAFTA) telah ditubuhkan pada 4 November 2002. Semenjak itu, aliran dan struktur perdagangan, perdagangan komplementari serta persaingan di antara negara China dan ASEAN telah berkembang pesat. Namun, isu asasnya ialah sama ada perkembangan ini disebabkan oleh CAFTA. Justeru itu, kajian ini menilai kesan CAFTA ke atas aliran, struktur, pelengkap dan persaingan perdagangan. Selain itu, kajian ini juga menilai aliran pelaburan asing secara langsung di China. Model graviti digunakan untuk menganggarkan kesan-kesan tersebut. Sementara itu, kaedah kualitatif digunakan untuk menganalisis integrasi ekonomi akibat kesan daripada CAFTA. Data untuk tujuan analisis diperolehi dari pangkalan data UN, WTO, Bank Dunia serta Buku Statistik Tahunan negara China. Kajian ini mengguna pakai lima model untuk menilai kesan CAFTA ke atas aliran, struktur, pelengkap dan persaingan dagangan, aliran pelaburan asing langsung, serta kesannya terhadap wilayah-wilayah yang berbeza di China. Secara keseluruhannya, hasil kajian menunjukkan bahawa CAFTA telah menghasilkan kesan pembentukan perdagangan, serta memperbaiki struktur perdagangan di negara China. CAFTA telah memperkembangkan perdagangan antara industri bagi produk-produk utama iaitu bahan-bahan mentah serta barangan perkilangan di antara negara China dan negara-negara ASEAN. CAFTA turut memperkukuhkan pelengkap dagangan di antara China dan Kemboja, Indonesia, Singapura, Malaysia dan Thailand. Namun, wujud kecenderungan pelengkap dagangan yang lemah di antara China dengan Filipina dan Vietnam. Sementara itu, corak persaingan dagangan bagi sebahagian produk di antara kedua-dua pihak agak berbeza. Sebahagian daripada negara ASEAN mempunyai kelebihan berbanding eksport untuk produk-produk pertanian, makanan, bahan api dan produk perlombongan. Negara China pula memiliki kelebihan berbanding eksport untuk barangan pembuatan serta jentera dan kelengkapan pengangkutan. Malahan, analisis domestik mempamerkan kesan yang lebih baik, apabila CAFTA turut menggalakkan pertumbuhan perdagangan bagi 17 buah daerah dan 7 buah wilayah utama di China. Kesimpulannya, CAFTA telah memperbaiki struktur serta pertumbuhan perdagangan China. Di samping itu, CAFTA menggalakkan aliran perdagangan di antara negara China dan negara-negara ASEAN. Walau bagaimanapun, CAFTA turut mengurangkan FDI.

Kata kunci: CAFTA, FDI, aliran perdagangan, pesaingan perdagangan, pelengkap perdagangan, struktur perdagangan

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LIST OF ABBREVIATIONS

ACIA	ASEAN Comprehensive Investment Area
AEC	ASEAN Economic Community
AFAS	ASEAN Framework Agreement on Services
AFTA	ASEAN Free Trade Area
APEC	Asia-Pacific Economic Cooperation
ASEAN	Associated Southeast Asia Nations
CAFTA	China and ASEAN Free Trade Area
CEPA	Closer Economic Partnership Arrangement
CEPT	Common Effective Preferential Tariff
CGE	Computable General Equilibrium
CHINGEM	A Computable General Equilibrium Model
DID	Difference in Difference Model
ECPA	Economic Cooperation Framework Agreement
EEC	European Economic Community
EFTA	European Free Trade Association
EU	European Union
Eviews	Econometrics Views
FDI	Foreign Direct Investment
FII	Foreign Indirect Investment
FTA	Free Trade Area
GATS	General Agreement on Trade in Services (WTO)
GCC	Gulf Cooperation Council
GTAP	Global Trade Analysis Project
HS92	Harmonized Commodity Description and Coding System (1992)
MNC	Multi-National Corporation
MNF	Most Favored Nation
NAFTA	North American Free Trade Area
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
RC	Revealed Comparative
RCA	Revealed Comparative Advantage
RCEP	Regional Comprehensive Economic Partnership Agreement
RTA	Regional Trade Agreement
SITC	Standard International Trade Classification
TCI	Trade Complementarities Index
TII	Trade Intensity Index
TSC	Trade Specialization Coefficient
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The China/ASEAN Agreement on comprehensive economic cooperation was signed on 4 November 2002, which marked the establishment of the China and ASEAN Free Trade Area, i.e., CAFTA. Many researchers believe that CAFTA is a win-win situation for both ASEAN and China (Chen, 2002; Chirathivat, 2002; Wang, 2002; Wei, 2002; Liang, 2003). However, some researchers (He, 2002; Zhang, 2002; Zhao, 2002) concluded that CAFTA would play a negative role in China due to intense competition between ASEAN and China.

Initially, scholars mainly focused on the significance, process and prospects of CAFTA, using the qualitative method. For instance, Wang (2002) and Chen (2002) introduced the background and process of CAFTA. He (2003), Zhao (2002) and Zhang (2002) discussed the advantages and disadvantages of establishing CAFTA, while Liang (2003), Wei (2002) and Zhang (2002) analyzed the significance and prospects of CAFTA.

There have been different views on the effects of CAFTA based on quantitative analyses. Some researchers have proposed that CAFTA would be beneficial to China. The ASEAN-China Expert Group on Economic Cooperation (2001) was the first to conduct research on the effects of CAFTA. They adopted Computable

General Equilibrium (CGE) model to simulate these effects and concluded that CAFTA would lead to a 55.1% export growth and a 0.3% GDP growth for China, compared to a 48.0% export growth and a 0.9% GDP growth for ASEAN. Based on the CGE model, Chirathivat (2002) drew a conclusion that the establishment of CAFTA would improve GDP of China by 0.36% and by 0.38% for ASEAN.

Lai (2007) simulated CAFTA's effects on export competitiveness of China and ASEAN, using a CGE model (CHINGEM), as devised by the Policy Research Centre of MONASH University, Australia and the College of Economics and Trade of Hunan University, China. The results indicated that CAFTA would cause a 1.41% export growth, 2.85% import growth and the reduction of trade surplus in China due to the reduction of tariff.

Li (2007) utilized multi-mode gravity model to analyze trade flows in CAFTA using 1990-2000 data. Chen and Tu (2007) applied single-country gravity model to analyze panel data of 2000-2004 for imports and exports among China and 22 trading partners. The conclusions (Li, 2007; Chen & Tu, 2007) were that CAFTA would bring about effects of trade creation and trade diversion to China.

However, several researchers have forecasted CAFTA would give negative effects to China. For instance, Xue and Zhang (2004) simulated the trade cooperation in East Asia based on Global Trade Analysis Project (GTAP). They

projected that CAFTA would reduce the exports of China for forest products, paper products, chemical products, general machinery products and clothing products due to the decline of export comparative advantages. Zhou (2006) simulated the effects on the trade of agriculture products within CAFTA, the prices of export and import products and industrial structure due to tariff reduction in CAFTA. Lai and Li (2007) analyzed the trade effects on agriculture products and mechanical and electrical products in China due to import tariff reduction, and concluded that China's exports of tropical fruits and electronic products would reduce, and the employment of labor-intensive manufacturing would decrease by 0.36% after the establishment of CAFTA.

Generally speaking, most previous studies analyzed the significance, process and prospects of CAFTA around 2002. Later, researchers began to discuss the effects of CAFTA based on quantitative analyses. However, these quantitative analyses were based on historical data collected before 2002 (i.e., before CAFTA was officially established). Their conclusions were merely projections rather than the actual implications and situation.

Several studies have used data after the implementation of CAFTA to provide more realistic responses on its effects. For example, Chen (2009) used gravity model of "single country mode" to analyze the effects of CAFTA on China's trade, based on 2002-2006 data. Zhou and Cui (2010) analyzed the impacts on

imports and exports of China using 1997-2007 data. They concluded that the trade of China has increased due to CAFTA. In addition, Zhang and Wang (2011) showed the trade structure effects on China using 1995-2008 data and drew a conclusion that CAFTA has caused an expansion of the inter-industry trade in China.

Overall, previous studies have focused on trade flow and trade structure effects of CAFTA. Such issues are further investigated in this study by updating the data to 2011 and changing the quantitative methods. Further, this study delves into the effects of CAFTA on trade complementarities and competition, trade flows of different regions and FDI of China compared to previous studies. Thus, this study aims to analyze the effects of CAFTA and seeks to answer the essential question whether CAFTA has caused the growth of trade and FDI, changes in trade structure, trade complementarities and competition between China and ASEAN.

1.2 Problem Statement

The trade growth between China and ASEAN has been rapid since 2002 (the establishment of CAFTA) with total trade value of USD 54.78 billion in 2002 and USD 434.60 billion in 2013. Nevertheless, is this growth due to CAFTA? Most previous studies (Chriathivat, 2002; Lai, 2007; Li, 2007; Chen & Tu, 2007) estimated the relationship between CAFTA and trade flow based on the

historical data collected before 2002. Although most of these researches indicated that the establishment of CAFTA would be beneficial to trade growth in China, nevertheless they were predictions rather than actual presentations about the current situation after 2002.

Besides, most previous studies mainly focused on the trade flow effect of CAFTA (i.e., the relationship between CAFTA and trade flow), with few analyzing the impacts of CAFTA on trade complementarities and competition, the trade of different regions and the effect on FDI especially on China.

Specifically, previous studies on trade flow effect of CAFTA did not distinguish different effects of CAFTA on exports and imports，and neglected the trade flow effect on different regions in China. Few studies focused on the trade structure effect of CAFTA, and analyzed the effect on the trade structure of China. However, not many studies had examined the effect on the trade structure between China and ASEAN. Previous studies on the effect of trade complementarities and competition did not present changing trends of trade complementarities and competition due to CAFTA. Meanwhile, the studies on FDI effect of CAFTA emphasized the effect on FDI inflow and neglected the effect on FDI outflow. Indeed, they did not distinguish the different effects of CAFTA's trade liberalization and investment liberalization on FDI flows.

Therefore, the present study aims to make a comprehensive analysis on the impacts of CAFTA on trade flow, trade structure, trade complementarities and competition, as well as the trade flows of different regions and FDI flows in China.

1.3 Research Questions

This study intends to verify the effects of CAFTA on trade, based on historical and current data in China. The analysis includes two aspects: First, to analyze the effects of CAFTA on goods trade in China. Specifically, the effects are analyzed in four dimensions: trade flows (effects on the trade flow of imports and exports in China); trade structure (effects on the trade structure between China and ASEAN); trade complementarities and competition (analyzing changes of the trade complementarities and competition between China and ASEAN); and the effects of CAFTA on different regions in China. Secondly, this study intends to test the effects of CAFTA on the flows of FDI in China.

Basically, the study focuses on the following questions:

1. Does CAFTA improve the trade flows in China?
2. Does CAFTA bring changes to the trade structure of China?
3. Does CAFTA bring changes to trade complementarities and competition between ASEAN and China?
4. What is the impact of CAFTA on regional trade in China?
5. Does CAFTA promote FDI flows between China and ASEAN?

Based on these questions, the study proposes the following research objectives.

1.4 Research Objectives

The general objective is to analyze the impacts of CAFTA on the trade between China and ASEAN, while the specific objectives are:

1. To evaluate how CAFTA improve the import and export flows in China.
2. To estimate the effect of CAFTA on trade structure between China and ASEAN.
3. To estimate the effect of CAFTA on trade complementarities and competition between China and ASEAN.
4. To analyze the effect of CAFTA on the trade flows of different regions in China.
5. To evaluate whether CAFTA promotes FDI flows between China and ASEAN.

1.5 Significance of the Study

The contributions of this study can be divided into three aspects: practical, theoretical and research aspects.

1.5.1 Practical Significance

This study examines the relationships between CAFTA; and the trade and FDI growth based on historical and present data (updated to 2011). Practically, the intention is to explain the importance of CAFTA and to answer whether CAFTA causes the growth of trade and FDI in China. Most previous studies have mainly

used the historical data before 2002 and their results do not reflect the current situation after the establishment of CAFTA.

The findings of this study on the effects of CAFTA may serve as a basis for the Chinese Government to deepen the integration of CAFTA. For instance, this study estimates the effects of CAFTA on trade complementarities and competition between China and ASEAN. The results will show the changes of export comparative advantage based on the analyses of trade complementarities and competition between both sides. The Government may therefore focus on the export incentive policy for the industries with the export comparative advantages to expand the export trade.

Further, CAFTA is the first free trade area joined by China. It provides the basis for China to join other trade integrations. Thus, these findings on the effects of CAFTA will provide methods to estimate the effects of other free trade areas (FTAs) which China intends to join.

1.5.2 Theoretical Significance

This study aims to examine the applicability of the related theories by analyzing the effects of CAFTA. Firstly, this study examines whether the trade creation effect in the Customs Union theory (Viner, 1950) has occurred in CAFTA. Trade

creation effect is the expansion of trade scale caused by the reduction and elimination of tariffs. This study examines whether the trade creation effect is applicable to CAFTA based on the analysis of the trade flow effect of CAFTA.

Secondly, this study examines the applicability of investment creation and investment diversion due to the regional economic integration (Kindleberger, 1966) in CAFTA. The intention is to examine if CAFTA causes creation and diversion of investment, by analyzing the effect of CAFTA on FDI flows.

Thirdly, this study examines the relationships between some variables by analyzing the effects of CAFTA on trade flows and FDI flows; the relationship between economic growth and trade flow; the relationship between economic growth and FDI flow; and the relationship between trade flow and FDI flow.

1.5.3 Research Significance

The research significance of this study is divided into five main elements:

Firstly, this study underlines the comprehensive impacts of CAFTA on trade flow of China. Previous studies only presented effects of CAFTA on the total trade flow of China (Li, Gong & Meng, 2007; Chen & Meng, 2007; Chen, 2009; Lang & Yin, 2009). This study extends the analysis of the effects of CAFTA on export flow and import flow in China, and compares the export flow effect with the import flow effect. In addition, previous studies only presented the trade

flow effects on China. This study does not only estimate the trade flow effects on China by updating the data and enlarging the test sample scope, but also analyzes the trade flow effects on 22 provinces and seven regions in China, exploring the reasons behind those different impacts. Therefore, this study provides a more comprehensive analysis on the trade flow effect of CAFTA compared to previous studies.

Secondly, the study examines the contribution of CAFTA to the changes of trade structure between China and ASEAN. There is little quantitative study on the trade structure effect of CAFTA, and most of them have focused on the impacts on several categories of products, especially agriculture, textiles and clothing and electronic products (Zhang & Li, 2008; Zhou & Cui, 2010). This study analyzes the effects on 10 categories of products based on the Standard International Trade Classification (SITC), representing the changes of trade structure between China and ASEAN.

Thirdly, previous studies have mainly examined the trade complementarities between China and ASEAN based on the data before 2003 (Yu, 2003; Pan, 2004; Hou & Song, 2005; Rong and Yang, 2006), and did not analyze the changing trend of trade complementarities between both sides after the establishment of CAFTA. The present study describes the changing trends of trade complementarities between China and seven members of ASEAN due to

CAFTA using the 2001-2011 data.

Fourthly, this study presents the changes of trade competition between China and six members of ASEAN in 16 categories of products based on the Harmonized Commodity Description and Coding System 1992 (HS92) after the establishment of CAFTA. This provides an extension to the previous studies that do not involve the changing trend of trade competition between both sides.

Finally, this study extends the effect of CAFTA on FDI flows and examines the effect of CAFTA on not only FDI inflow but also on FDI outflow in China. Besides, this study distinguishes the different effects of trade and investment liberalization of CAFTA on FDI flows, neglected by previous studies.

1.6 Definition of Terms and Concepts

There are four main concepts used throughout this study.

ASEAN: The Association of Southeast Asian Nations is a geo-political and economic organization of ten countries located in Southeast Asia. It was formed on 8 August 1967 by five countries: Indonesia, Malaysia, the Philippines, Singapore and Thailand. Then, Brunei Darussalam became the sixth member on 8 January 1984, followed by Vietnam (28 July 1995), Laos and Myanmar (23 July 1997) and Cambodia (30 April 1999). ASEAN therefore currently comprise

ten countries: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. The map of ASEAN is in Figure 1.1.

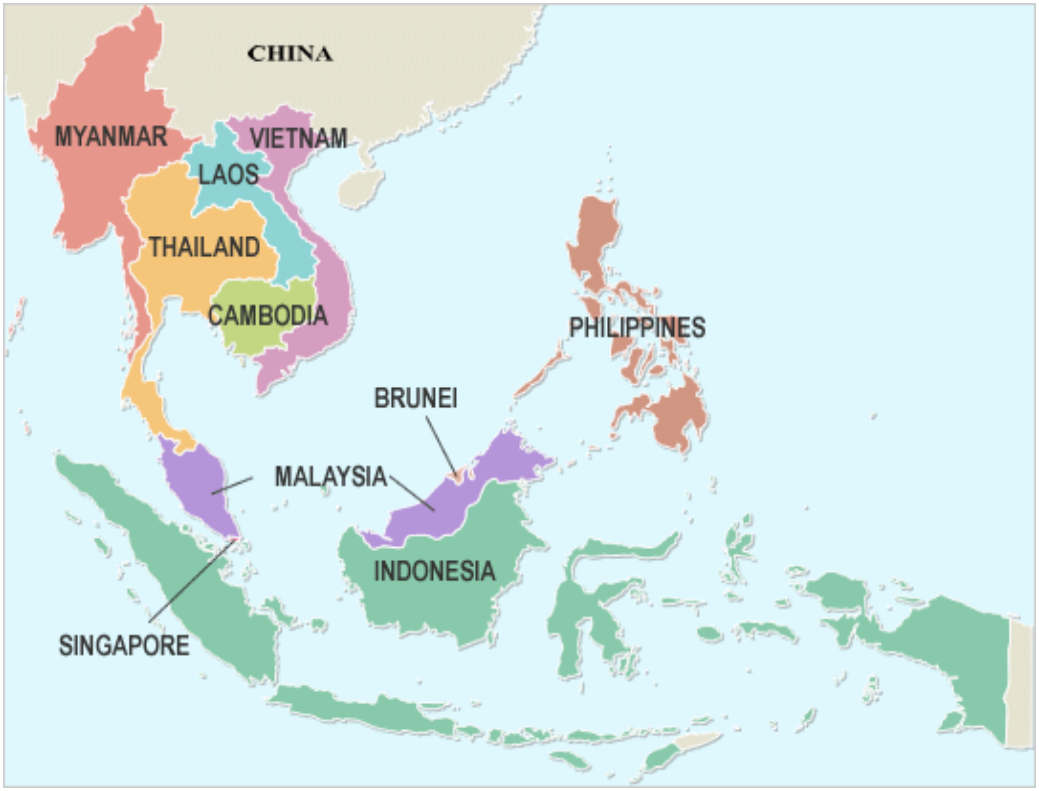


Figure 1.1
Members of ASEAN

CAFTA: the China-ASEAN Free Trade Area established in 2002, involving 11 member countries i.e., China and the ten ASEAN countries. CAFTA covers 14 million square kilometers including a population of 1.9 billion. The trade volume occupies 13% of the world's trade. CAFTA has become the most populous FTA (China$_2$, 2010).

FTA: Free trade area is a type of trade bloc, where designated group of countries sign a free-trade agreement and agree to eliminate tariffs, quotas and preferences on most (if not all) goods and services traded between them (Xue, 2012). It is usually considered the second stage of economic integration. Members of a FTA do not have a common external tariff, which is different from the Customs Union. One of the most well-known FTAs is the North American Free Trade Area (NAFTA).

Revealed comparative advantage: an index designed to provide some insight into the export activity of a certain nation or industry based on how that activity compares to the activity of one or more similar entities, and used in international economics to measure the relative advantage or disadvantage of certain country in a certain category of good or service based on their trade flows (Yu, Cai & Leung, 2008). It is based on the Ricardian comparative advantage concept. The commonly referred index was introduced by Béla Balassa (1965):

$$RCA = (X_{ij} / X_{it}) / (X_{nj} / X_{nt})$$

X Exports
i Country i
n Set of countries
j Commodity j
t Set of commodities

A country would have a comparative advantage if RCA>1, and a comparative disadvantage if RCA <1. Based on the index, a country is defined as being

specialized in exports of a certain product if its market share in the product or the weight of the product of the country's exports is higher than its weight of the exports of the reference area.

1.7 Scope of study

This study aims to estimate the effects of CAFTA on China's trade involving goods trade and FDI. Firstly this study examines the effects of CAFTA on goods trade, including the effects on trade flows of China, trade structure between China and ASEAN, trade complementarities between China and seven ASEAN members, trade competition between China and six ASEAN members, and trade flows of seven regions and 22 provinces in China. Secondly, the study analyzes the effects of CAFTA on China's FDI outflow and inflow.

Specifically, this study focuses on the effect of CAFTA on trade and FDI between China and ASEAN. However, data on only seven ASEAN members of the 10 members is collected to examine the effect of CAFTA on trade complementarities due to lack of detailed statistics. These ASEAN members are Singapore, Malaysia, Thailand, Indonesia, Philippines, Vietnam and Cambodia. Similarly, the study of trade competition effect due to CAFTA only includes six ASEAN members involving Singapore, Thailand, Indonesia, Malaysia, Philippines and Vietnam.

In terms of data used for analysis, data to analyze effects of trade flows and trade structure covers the period from 1990 to 2011, and the data to analyze other effects of CAFTA covers the period from 2001 to 2011.

1.8 Organization of the Thesis

This study is divided into six chapters. Chapter one provides a brief description on the background and the main objectives of this study. Chapter two presents a comprehensive review on theoretical and empirical literature related to the effects of FTAs and CAFTA, which underlies the theoretical basis for this study.

Chapter three focuses on regional integration of CAFTA. It mainly introduces free trade agreements of China; the economic integration of ASEAN; the agreements and contents of CAFTA; and the development of trade and investment in CAFTA.

Chapter four discusses the research method, followed by research findings in Chapter five. The final chapter summarizes the main contributions and policy recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter outlines the theoretical and empirical reviews of FTAs and CAFTA as presented in Figure 2.1.

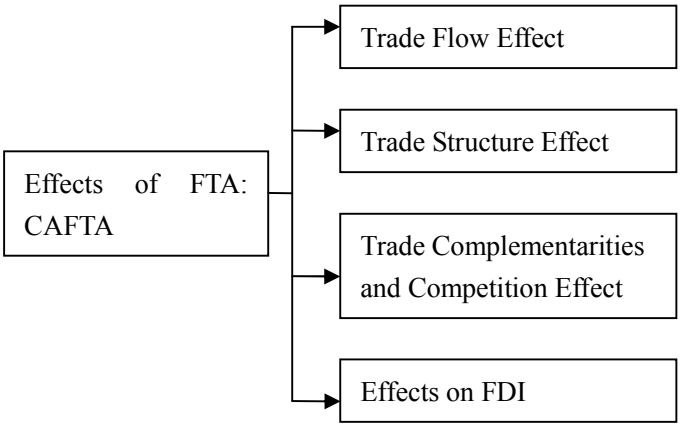


Figure 2.1

Outline of Literature Reviews

2.2 The Trade Flow Effect

The analysis of trade flow effects is mainly based on the theories of regional economic integration. Heckscher (1931), Gaedicke and Eyern (1933) were the first to use "economic integration" in its current sense of combining separate economies into a larger economic integration (Machlup, 1977). However, they did not provide any clear definition of economic integration. Tinbergen (1954) was the first economist who put forth the definition of economic integration, and

divided it into negative and positive integration. Negative integration is the removal of discriminatory and restrictive practices, and positive integration is the adjustment of existing and establishment of new policies or institutions endowed with coercive powers.

Balassa (1961) further defined that economic integration is the flow of goods and factors of production without any discrimination and limitation of governments, and proposed that the development of international trade would cause the reduction of the barriers among countries and promote the development of regional economic integration.

Later, many scholars developed the definition of economic integration (Pinder, 1969; Kahnert te al, 1969; Mennis & Sauvant, 1976; Pelkmans, 1984; Agraa, 1985; Molle, 1991; Swann, 1996; Bhagwati, 1999). At present, economic integration commonly refers to the unification of economic policies among different states or countries through the partial or full abolition of tariffs and non-tariff restrictions on trade taking place among them prior to their integration (Salvador, 2008).

Generally, the degree of economic integration is categorized into seven stages, from lower to higher categories: preferential trading area; free trade area; customs union; common market; economic union; economic and monetary

union; and complete economic integration (Gao, 2010). These stages differ based on the degree of economic unification and policies. The highest one is the complete economic integration, which would most likely involve political integration union as well as within the integration union.

A “preferential trade area”, the first stage of economic integration, is a trading bloc that provides preferential access to certain products from the participating countries, by reducing tariffs but not by abolishing them completely. A “free trade area” (FTA) refers to a trade bloc that partially or fully abolishes customs tariffs or non-tariff barriers on the inner border of members. A “customs union” adds common external tariffs to non-members compared to a “FTA”. A “common market” adds the free movement of production factors (capital, labor and services) among members compared to the customs union. An “economic union” forms a “fiscal union” through a shared fiscal and budgetary policy among members based on a common market. A “monetary union” adds a shared currency to the former. A “complete economic integration”, the final stage, actually forms a “political union” through unification of economic policies (tax, social welfare benefits, etc.) and introduction of supranational bodies (Salvador, 2008).

Based on different stages of economic integration, related theories of economic integration have been produced to explain the relationship between economic

integration and trade flows. The framework of the theory of economic integration was presented by Viner (1950) (Zhan, Hu & Men; 2003). Viner was the first to propose the Customs Union theory. He defined the trade creation and trade diversion effects of the Customs Union, which introduced the changes of inter-regional flow of goods caused by the reduction or elimination of customs tariffs due to the creation of the Customs Union. Later, Meade (1955), Lipsey (1960), Johnson (1967) and Corden (1972) developed on the Customs Union theory (Qiu, 2008). Until now, the Customs Union theory is regarded as the core and foundation of regional economic integration theories (Zhang & Yang, 2003). According to the Customs Union theory, static and dynamic effects are caused by the Customs Union.

The static effects are measured by trade creation and trade diversion. Trade creation is the expansion of trade scale and welfare growth caused by elimination of tariffs among members of the Customs Union (Zhang, Hu & Men, 2003; Huang, Peng & Ling, 2008). Specifically, the formation of the Customs Union makes the import prices of products decrease among member nations due to the reduction of tariffs, which would stimulate the exports and imports between members, expand trade scale and improve welfare (Huang, Peng & Ling, 2008).

Trade diversion is the diversion of trade direction caused by the constant external tariffs and the elimination of tariffs within the Customs Union. As the Customs Union eliminates tariffs among members, the importers who are members of the Customs Union would increase imports from members and reduce imports from non-members, i.e., the trade diverting effect (Li, 2010). The formation of a Customs Union resulted in trade being diverted from low-cost export countries to high-cost export countries (i.e., trade diversion). This leads to the reduction of welfare for importing countries. In other words, trade diversion causes production diversion from non-member countries with high productivity to member countries with low productivity. It results in the deterioration of allocation of international resources and deviates from the principle of comparative advantage. Most economists believe that trade diversion is harmful to consumers (Zhang, Hu & Meng, 2003).

Besides static effects, the dynamic effects in the Customs Union theory mainly include: i) promoting competition between members due to the free trade and the free flows of goods within Customs Union; ii) boosting the achievement of economics of scale for the reason that producers in member countries face an expanded market and centralize the utilization of productivity factors to expand the production scale, while a member country may improve an industry by fully exerting comparative advantage of the industry to achieve the economics of scale; and iii) expanding investment from the expansion of mutual investment

among members and, similar expansion from non-members to evade the trade tariff of a Customs Union (Xue, 2012).

Besides the Customs Union theory, Spark (1956) put forward the Common Market theory based on economics of scale under the condition of perfect competitive market. Common Market is a higher form of economic integration than the Customs Union, accompanied by the free movement of goods and production factors. The theory explains that a Common Market can cause the reduction of prices of production factors, the net profits growth of economics of scale and technical progress, which finally lead to the improvement of national income and economic growth (Carbaugh, 2011).

Compared to other theories of regional economic integration, the theory of Customs Union is the most mature theory to expound the trade and welfare effects of economic integration (Tong, 2000). Later, researchers began to examine whether trade creation under the Customs Union theory occurred in special economic integration organizations. They used the gravity model as an empirical method to estimate the trade effects caused by the economic integration organizations.

Tinbergen (1962) and Poyhonen (1963) were the first to propose the gravity model. Inspired by the law of universal gravitation, Tinbergen explained the

trade flows between two countries based on the gravity model. Poyhonen applied the gravity model to estimate trade flows and used nautical miles between two major ports of two countries as distance that represents the trade costs. The gravity model was developed by Tinbergen and Poyhonen as follows:

$$T_{ij} = \alpha \frac{GDP_i GDP_j}{D_{ij}} \qquad (2.1)$$

T_{ij} is the trade flow between country i and country j. α is constant. GDP_i, GDP_j are the national income of country i and country j. D_{ij} is the distance between two countries. They applied the following regression estimation equation to substitute the above formula.

$$\ln\left(T_{ij}\right) = \alpha + \beta_1 \ln(GDP_i \bullet GDP_j) + \beta_2 \ln\left(D_{ij}\right) + u_{ij} \qquad (2.2)$$

In regression equation 2.2, α, β_1, β_2 are coefficients needed to estimate. u_{ij} is the residual. This was the core expression of gravity model.

The main conclusion is the trade between two countries has a positive correlation with the national income but a negative correlation with the distance between two countries.

Some researchers have added other variables into the gravity model. Linnemann (1966) added two variables into the model considering the impacts of preferential trade agreement between two countries. Two variables separately

expressed the effects of preferential trade agreement and demographic factor. He believed that a country with a large population would make the country tend to be dependent on domestic production, thus reducing the tendency of foreign trade. His gravity model is as follows:

$$\ln\left(X_{ij}\right)=\alpha_0+\alpha_1\ln Y_i+\alpha_2\ln Y_j+\alpha_3 PR-\alpha_4\ln POP_i-\alpha_5\ln POP_j-\alpha_6\ln D_{ij} \quad (2.3)$$

In equation 2.3, Y_i and Y_j are GNP of country i and country j. POP_i and POP_j are the population of two countries. PR represents whether country j joined the preferential trade agreement, induced as dummy variable. PR=1 if country j joined the above agreement, or PR=0 if country j did not join it.

Aitken (1973) also put dummy variables into the model when analyzing the European Economic Community (EEC) and the European Free Trade Association (EFTA). Dummy variables represented whether trade partners belonged to the same trade bloc. The aim was to analyze the trade creation effects on the members caused by the trade bloc. At the same time, there was a dummy variable to represent whether two trade partners had a common border. If they had the same border, it would be convenient to trade between both sides. Aitken's gravity model is as follows:

$$\ln\left(X_{ij}\right)=\ln b_{ij}+b_1\ln D_{ij}+b_2\ln Y_i+b_3\ln Y_j+b_4 N_i+b_5 N_j+b_6 A_{ij}+b_7 P_{ij}^{ECC}+b_8 P_{ij}^{EFTA} \quad (2.4)$$

N_i and N_j are the population of two countries. A_{ij} is dummy variable whether there is a common border between both sides. If there is a common border between two countries, A_{ij} =1; if there is no common border, A_{ij} =0. P_{ij}^{ECC} is dummy variable to represent whether two countries are members of ECC. If they are members of ECC, P_{ij}^{ECC} =1; if not, P_{ij}^{ECC} =0. P_{ij}^{EFTA} is dummy variable as to whether two countries are members of EFTA. If they are members of EFTA, P_{ij}^{EFTA} =1, if not, P_{ij}^{EFTA} =0.

Practically, researchers widely used dummy variable to express whether countries belonged to the same trade bloc; the present study aims to estimate the effects of CAFTA on trade flows.

In 1980's, some researchers began to study the relationship between the economic growth of members and economic integration based on gravity model (Li, 2010). Bergstrand (1985) used GDP per capita of the two trade partners into the gravity model on the basis of the imperfect substitution trade model. Helpman and Krugman (1985) provided a basic theory for the relationship between national scale and the trade flows between two trade partners. Frankel (1992) and Frankel and Wei (1993) wrote a series of papers to reveal the effects on the trade flows brought by EEC, EFTA, NAFTA, ASEAN and APEC (Asia-Pacific Economic Cooperation) in the 1980s. Srivivasan (1993) and Canonero (1993) used the gravity model to verify the effects brought about by

regional economic integration in South Asia.

Gravity model is also widely used to estimate the trade flow effect of CAFTA. Li (2006) used gravity model to estimate the trade flow effect of CAFTA based on the cross section data of 2000-2004. The result showed that establishment of CAFTA increased the trade between China and ASEAN by 43.6%.

Li, Gong & Meng (2007) analyzed the trade flows effects of CAFTA based on the multi-gravity model selecting 1990-2000 period as time series and 60 countries as a sample to predict the trade creation effect of CAFTA. Chen and Meng (2007) examined the trade flow effects of CAFTA on China and 22 trade partners using panel data of 2000-2004. They concluded that the establishment of CAFTA caused trade creation and trade diversion effect on China.

Chen (2009) used cross-sectional data of the 2002-2006 period and confirmed that the establishment of CAFTA brought trade creation to both China and ASEAN. Lang and Yin (2009) concluded that CAFTA caused trade creation effect between members and between the members and non-members based on the gravity model using the panel data in the 1999-2007 period.

Additionally, other models have been employed to examine the trade flow effect of CAFTA. The ASEAN-China Expert Group on Economic Cooperation (2001)

adopted the CGE model to estimate the effects of CAFTA using historical data before 2001. They predicted that the establishment of CAFTA would lead to 55.1% export growth and 0.3% GDP growth for China, while it was 48.0% export growth and 0.9% GDP growth for ASEAN. Chirathivat (2002) drew a conclusion that the establishment of CAFTA would improve 0.36% GDP of China and 0.38% GDP of ASEAN.

Lai and Li (2007) used the CHINGEM, jointly devised by the Policy Research Centre of MONASH University, Australia and College of Economics and Trade of Hunan University, China to analyze 2001 trade data between China and six members of ASEAN. The results indicated that the elimination of tariffs in CAFTA would cause a 0.4% growth of real GDP; 2.85% import growth; 1.41% export growth; 1.58% reduction of government revenue; and 0.58% welfare growth in China.

Li, Gong & Meng (2007) employed the Global Trade Analysis Project (GTAP) model to analyze 2001 data of China, six members of ASEAN, Japan, South Korea, Hong Kong and Taiwan. The results predicted that CAFTA would cause 0.26% GDP growth; 1.92% export growth, 2.97% export growth; and a welfare growth of USD 1499.93 million in China.

However, the studies based on the CGE, CHINGEM and GTAP models used the data before 2002. Thus, their results were forecasts, rather than descriptions of actual situation after 2002. Based on the gravity model, a few studies (Chen & Meng, 2007; Chen, 2009; Lang & Yin, 2009) have analyzed the total trade flow effect of CAFTA using the data after 2002, but they did not distinguish the different effects of CAFTA on exports and imports of China. This study intends to examine separately the trade flow effect of exports and imports caused by CAFTA and to present their differences based on the gravity model, by updating the data to 2011.

In addition, a few studies have focused on the trade flow effect of CAFTA on different regions of China. Several studies only analyzed the impacts of CAFTA on tropical fruits and agricultural products in Guangxi province, Hainan province and the southwestern region of China (Tan, 2009; Qin, 2009; Zhang, 2010; Yang, 2011; Zhao, 2011). Hence, this study tries to estimate the trade flow effect of CAFTA on different provinces and regions of China.

2.3 The Trade Structure Effect

The analysis of trade structure effect refers to changes in intra-industry trade between China and ASEAN in different industries. Intra-industry trade is the exchange of similar products which belong to the same industry. It means that a country imports and exports the same types of goods or services at the same

time. Thus, it is also known as two-way trade or over-lap trade (Li, 2010; Tong, 2000; Krugman, 1998).

Inter-industry trade, in contrast to intra-industry trade, refers to exchange of goods belonging to different industries, such as agricultural products against computer products. In other words, a country either only imports or exports similar types of goods or services, which is a one-way trade within a similar industry (Zhang &Yang, 2003; Li, 2010).

Intra-industry trade can be measured by intra-industry trade index, which is usually used to estimate the changes of trade structure (Krugman, 1991; Puga & Vinables, 1997; Baldwin et al, 2003; Egger etc, 2008; Zhang & Wang, 2011). The most often used intra-industry index is the Grubel-Lloyd index (G-L index) as proposed by Grubel and Lloyd (1971):

$$T = 1 - \frac{|X - M|}{X + M} \qquad (2.4)$$

The equation represents the intra-industry trade of an industry or a particular product in a country. In the above formula, T is the intra-industry trade index; X denotes exports of an industry or a particular product; M denotes imports of an industry or a particular product.

T value range is from 0 to 1 (i.e. $0 \leq T \leq 1$).

If T=0, there is only inter-industry trade, without the intra-industry trade. It means that there is either only import or only export of the particular product.

If T=1, there is only intra-industry trade, without the inter-industry trade. It means that the export of the particular product is equal to its import, while intra-industry trade is at its highest.

If T is approaching 1, the intra-industry trade in a particular product becomes greater. If T is approaching 0, the intra-industry trade is smaller, but the inter-industry trade becomes greater.

Considering all industries, the intra-industry index of a country can be expressed by weighted average of the indices in different industries. It is shown in the following formula.

$$T = 1 - \frac{\sum_{i=1}^{n} |X_i - M_i|}{\sum_{i=1}^{n} X_i + \sum_{i=1}^{n} M_i} \qquad (2.5)$$

X_i denotes the export of industry i or product i (with i = 1, 2,…,n). M_i denotes the import of industry i or product i. The value range of T is the same as the formula (2.4). Here, the index is used to measure the whole intra-industry trade of a country, instead of the intra-industry trade of an industry in formula (2.4). If the index is closer to 1, the intra-industry trade of a country is much greater.

What are the dominant factors influencing the intra-industry trade of a country? There are different explanations in the related theories. The traditional trade models of Ricardo and Heckscher–Ohlin used comparative advantage to explain inter-industry trade without explanations on intra-industry trade (Krugman & Obstfeld, 1991). Grimwade (2000) also pointed out that the classical and neoclassical trade theories only focused on inter-industry specialization and trade.

However, Davis (1995) insisted that both the Ricardian and Heckscher–Ohlin models are still relevant to explain intra-industry trade, and proposed Heckscher-Ohlin-Ricardo model, which posits that intra-industry trade could still occur even with constant returns to scale under the traditional setting. The model explains that differences in technology could cause intra-industry trade between countries with identical factor endowments.

Another explanation is provided from the demand side. In the overlapping demand theory, Linder (1961) explained the intra-industry trade of manufactured products between developed countries and inferred that the similarity of demand preference is the dominant factor to cause intra-industry trade.

Based on Chamberlinian's monopolistic competition model, Dixit & Stiglitz (1977) developed the general equilibrium model under the conditions of

economics of scale and monopolistic competition, and tried to explain the intra-industry trade. Krugman (1979) proposed a formal model in which trade was due to economies of scale. The formal treatment of monopolistic competition was based on the model by Dixit and Stiglitz (1977) with slight modifications.

Dixit, Stiglitz and Krugman used the model based on the theory of monopolistic competition to explain the intra-industry trade of differentiated products, called the neo-Chamberlin model (Gao, 2007). Later, Krugman (1980, 1981, 1986) developed the above model to explain the intra-industry trade of standardized products. He pointed out that for differentiated products, the economies of scale and the difference of consumer preference are the dominant factors to influence intra-industry trade, which is the most widely accepted explanation (Tong, 2000; Shelburne & Gonzales, 2004; Li, 2010).

Later, a few researchers formulated empirical models to examine how economic integration influenced the intra-industry trade of members, i.e., the effect of economic integration on trade structure. The difference in differences (DID) model was used to estimate the relationship between the establishment of economic integration organization and trade structure (Egger et al., 2008; Zhang and Wang, 2011).

In the traditional model to estimate the effects of regional economic integration, the establishment of economic integration organization was basically treated as an exogenous variable (Baier and Bergstrand, 2007). However, Egger et al. (2008); and Zhang and Wang (2011) set the establishment of the economic integration organization as an endogenous variable in their trade structure model. An endogenous variable refers to a factor in a causal model or causal system whose value is determined by the state of other variables in the system. In contrast to the endogenous variable, an exogenous variable refers to a factor whose value is determined by factors or variables outside the causal system under study (Hendry, 1995; Pearl, 2000).

Zhang and Wang (2011) estimated the effects of CAFTA on trade structure based on the DID model. Firstly, the general DID model was formulated as follows:

$$T_{\text{it}} = \alpha + \beta_1 d_i + \beta_2 d_t + \beta_3 d_i \times d_t + \varepsilon_{it} \qquad (2.6)$$

In model 2.6, T_{it} denotes the trade structure index (G-L index), d_i and d_t are dummy variables. If country i belongs to CAFTA, d_i=1, in stead d_i=0. If it is before the establishment of CAFTA, d_t=0; if it is after the establishment of CAFTA, d_t=1.

Secondly, control variables were added into model 2.6, as shown in model 2.7. The control variables are expressed by X_{it} (vector set).

$$T_{\text{it}} = \alpha + \beta_1 d_i + \beta_2 d_t + \beta_3 d_i \times d_t + \beta_4 X_{it} + \varepsilon_{it} \qquad (2.7)$$

According to the explanation of Zhang and Wang (2011), β_3 is the net effect of CAFTA on the trade structure of China.

The same control variables were selected by Egger et al. (2008) and Zhang and Wang (2011). Egger et al. (2008) selected country size, factor endowments and the costs of trade and investment as control variables to estimate the effects of regional free trade agreement on intra-industry trade. Then, the similarity indices were used to represent the above control variables.

Zhang and Wang (2011) selected the same similarity indices (Egger et al., 2008) of economic structure as control variables to estimate the effect of CAFTA on the intra-industry trade structure, including consumption similarity index, similarity index of government purchase, investment similarity index, population similarity index and similarity index of labor efficiency as follows:

$$SC_{ijt} = \ln\left\{1-\left[C_{it}/\left(C_{it}+C_{jt}\right)\right]^2-\left[C_{jt}/\left(C_{it}+C_{jt}\right)\right]^2\right\} \quad (2.8)$$

$$SG_{ijt} = \ln\left\{1-\left[G_{it}/\left(G_{it}+G_{jt}\right)\right]^2-\left[G_{jt}/\left(G_{it}+G_{jt}\right)\right]^2\right\} \quad (2.9)$$

$$SI_{ijt} = \ln\left\{1-\left[I_{it}/\left(I_{it}+I_{jt}\right)\right]^2-\left[I_{jt}/\left(I_{it}+I_{jt}\right)\right]^2\right\} \quad (2.10)$$

$$SP_{ijt} = \ln\left\{1-\left[P_{it}/\left(P_{it}+P_{jt}\right)\right]^2-\left[P_{jt}/\left(P_{it}+P_{jt}\right)\right]^2\right\} \quad (2.11)$$

$$SL_{ijt} = \ln\left\{1-\left[L_{it}/\left(L_{it}+L_{jt}\right)\right]^2-\left[L_{jt}/\left(L_{it}+L_{jt}\right)\right]^2\right\} \quad (2.12)$$

GLI_{ijk} denotes trade structure index (i: country i; j: country j; t: time). SC_{ijt} denotes consumption similarity index. C represents per capita consumption. SG_{ijt} denotes similarity index of government purchase. G expresses per capita government expenditure. SI_{ijt} denotes investment similarity index. I denotes per capita investment. SP_{ijt} denotes population similarity index. P denotes population. SL_{ijt} denotes similarity index of labor efficiency. L denotes Labor productivity.

Zhang and Wang (2011) examined the effect of CAFTA on the trade structure of China in 19 categories of goods (based on HS92), using panel data of the 1995-2008 period. The results showed that CAFTA caused the reduction of intra-industry index in 14 categories of goods in China. Then, they drew conclusions that CAFTA mainly decreased the intra-industry trade as well as increased the inter-industry trade in China.

However, Egger et al. (2008) had a different answer to the trade structure effect of regional trade agreement based on the sample of the Organization for Economic Cooperation and Development (OECD) members. The results indicated that membership of regional trade agreement increased intra-industry trade not only in relative but also in absolute terms, and the trade volume effect was due to the associated growth in trade within industries.

Based on the above model, Egger et al. (2008) had a different conclusion with Zhang & Wang (2011) on the effects of regional trade agreement on trade structure. Therefore, what is the actual effect of regional free trade agreement on trade structure? This study further re-examines the question based on the trade structure effect of CAFTA in different ways with Zhang & Wang. It is based on the products classification of SITC (different selection with Zhang and Wang) by updating the data to 2011 and selecting different samples. In addition, the study modifies the sets of variable d_t and dependent variable to examine the effect on the trade structure between China and ASEAN rather than the effect on trade structure of China (Zhang & Wang, 2011).

2.4 The Trade Complementarities and Competition

Trade complementarities exist when the exports of a country coincide with the imports of another country (Fu, 2005). The principle of trade complementarities is from the comparative advantage theory proposed by Ricardo (Yu, 2008).

The trade theories explain the reasons for trade complementarities existing in different ways. Generally speaking, the differences of comparative advantages cause trade complementarities between trading partners, which is determined by the differences in labor productivity; or factor endowments; or technology; or product life cycle; or government help (Ricardo, 1817; Heckscher, 1919; Ohlin, 1933; Posner, 1961; Vernon, 1966; Memedovic, 1994; Samuelson & Nordhaus,

2008).

Several indices are employed to measure trade complementarities in different ways, including the indices of the revealed comparative advantage (RCA); the relative trade advantage (RTA); the revealed competitiveness (RC); the trade complementarities index (TCI); the trade intensity index (TII); and trade specialization coefficient (TSC).

Balassa (1965) proposed the revealed comparative advantage (RCA) to calculate the comparative advantage or disadvantage of a given country. It is expressed as follows:

$$RCA = (X_{ik} / X_{it}) / (X_{nk} / X_{nt}) \qquad (2.13)$$

In formula 2.13, X represents exports, i represents country i, k represents commodity k, n represents a set of countries, and t represents a set of commodities. A country would have a comparative advantage if RCA $>$ 1, and a comparative disadvantage if RCA $<$ 1.

RCA is widely applied to compare the relative advantage between trade partners. Vollrath (1991) revised the Balassa's RCA and presented the relative trade advantage (RTA) and the revealed competitiveness (RC) as follows:

$$RTA_{ik} = RCA_{xik} — RCA_{mjk} \qquad (2.14)$$

$$RC_{ik} = \ln (RCA_{xik}) — \ln (RCA_{mjk}) \quad (2.15)$$

In formula 2.14 and 2.15, RCA_{xik} and RCA_{mjk} are presented as following:

$$RCA_{xik} = (X_{ik} / X_i) / (X_{wk} / X_w) \quad (2.16)$$

$$RCA_{mjk} = (M_{jk} / M_j) / (M_{wk} / M_w) \quad (2.17)$$

Where RCA_{xik} denotes revealed comparative advantage of k product in country i; RCA_{mjk} denotes revealed comparative advantage of k product in country j; X_{ik} : the export of k product in country i; X_i : the export of all products in country i; X_{wk} : the export of k product in the world; X_w : total export in the world; M_{jk} : the import of k product in country j; M_j : the import of all products in country j; M_{wk} : the import of k product in the world; M_w: total import in the world.

Actually, RCA_{xik} and RCA_{mjk} are the RCA index of Balassa. RCA_{mjk} measures the comparative advantage by way of the imports in country j. If RTA_{ik} and RC_{ik} are smaller, the trade complementarities will be greater. However, the stability and consistency of RTA and RC had been questioned or doubted (Yeats, 1985; Balance et al., 1987; Hinloopen and Marrewijjk, 2001).

TCI is also based on RCA and presented as follows (Pan, 2004):

$$TCI_{ij} = \sum[(RCA_{xik} \times RCA_{mjk}) \times (W_k / W)] \quad (2.18)$$

Where TCI_{ij} denotes the complementarities index; RCA_{xik} and RCA_{mjk} have the same meaning with that in formula 2.16 and 2.17. W_k denotes total import and export of k product in the world; W denotes total import and export of all products in the world. The degree of trade complementarities is expressed by RCAxik×RCAmjk. The complementarities index of bilateral trade is computed by the weighed average of complementary indices of all industries. Weighted coefficient is the proportion of trade products in world trade (W_k/W). If TCI is greater, the trade complementarities between two countries are greater.

Another method is TII to explain the trade complementarities based on the trade flow proposed by Frankel (1997).

$$TII_{ij} = (x_{ij} / X_{it}) / (x_{wj} / X_{wt}) \qquad (2.19)$$

Where x_{ij} denotes the exports of country i to country j; x_{wj} denotes the exports of the world to country j; X_{it} denotes the total exports of country i. (x_{wj} / X_{wt}) is treated as the expected value. If TII $>$ 1, it means that the trade flow between two countries is greater than the expected value and then will increase gradually, which indicates the trade complementarities will be greater (Hong and Song, 2005).

Another way to estimate the trade complementarities is TSC, which is also called TCI. It is expressed as follows:

$$TSC_i = (X_i - M_i) / (X_i + M_i) \quad (2.20)$$

Where X_i represents the export of product i in a country; M_i represents the imports of product i in the country; $-1 \leq TSC_i \leq 1$ (if $X_i=0$, $TSC_i = -1$; if $M_i=0$, $TSC_i = 1$). Generally, if TSC_i is closer to 1, it indicates that exports greatly exceed imports and the comparative advantage is much stronger.

In general, RCA and TII explain the trade complementarities in the export aspect of one country without considering the import aspect. RCA analyzes the trade complementarities based on the comparative advantage. However, TII explains the trade complementarities based on the size of the trade flow compared to the expected value. TSC considers the two aspects of import and export, yet only focuses on one country without considering the situation of the trade partner. RTA, RC and TCI are all on the basis of RCA considering the comparative advantages in both exports and imports by subtracting or multiplying RCA_{xik} and RCA_{mik}. TCI can better explain the trade complementarities for the reason that the index is more obvious due to the multiplication in the formula (Zhou & Du, 2006; Wang, 2008; Yu, 2008).

There is statistical data about the frequency of using the above indices in the articles published on the China National Knowledge Internet (CNKI). There are 27 articles using RCA, 15 articles using RTA, 13 articles using RC, seven articles using TII, five articles using TSC, and 84 articles using TCI in the

1999-2007 period (Yu, 2008). Thus, TCI is used more widely than other indices. TCI is the better way to measure the trade complementarities compared to others due to its better reflection of the comparative advantage (Fu, 2005; Wang and Fan, 2006; Wang, 2008).

Except for RCA, the relative competitiveness index (R_{ijk}) is also used to measure the degree of the trade competition based on RCA of both trade partners (Pan, 2004). R_{ijk} is expressed by the following formula 2.21.

$$R_{ijk} = RCA_{ik} / RCA_{jk} \qquad (2.21)$$

In formula 2.21, i means country i, j means country j, k means commodity k. If the index is closer to 1, the trade competition is more intensive.

Based on the above indices, some researchers have analyzed the trade complementarities and competition between China and ASEAN. Zhang and Xu (2003) analyzed the 2001 trade data between China and five members of ASEAN based on TII and RCA. They concluded that the exports of China had great similarities with exports of ASEAN members, and the trade competition between both sides were much greater compared to trade complementarities.

Pan (2004) calculated TCI between China and five members of ASEAN in 1990, 1995, 1996 and 1997. The results showed declining trade complementarities

between exports of China and imports of ASEAN and increasing trade complementarities between imports of China and exports of ASEAN. He also calculated the relative competitiveness index between China and five members of ASEAN in 1994-2001. The results revealed that the exports of China to ASEAN would face more intense competition, especially manufactured exports.

Hou and Song (2005) used TII and RCA to explain the expansion of trade and comparative advantages between China and ASEAN based on 2003 trade data. Based on TCI, they concluded that there are favorable trade complementarities between China and ASEAN in minerals, chemical products, textiles, machinery and electronic products and steel products.

Based on TSC, Yu (2003) analyzed six industries (agriculture, mining, chemical, textiles, machinery and electronics) in China and five members of ASEAN, using 1980-1997 data. He concluded that there are unobvious trade complementarities between exports of China and imports of Indonesia, Thailand, Singapore, Malaysia and the Philippines.

Rong and Yang (2006) also used TSC to estimate the trade complementarities of agriculture products in China and ASEAN members, and agreed that there are strong trade complementarities between both sides. In the same way, Wang and Zeng (2008) concluded that the trade complementarities between China and

Singapore are highest compared to Indonesia or Malaysia, Philippines and Thailand, based on the trade data of three years (2003, 2005 and 2006).

Generally, previous studies have analyzed the trade complementarities and competition mainly based on the historical data before 2002. Thus, they do not reflect the situation after 2002. Certainly, Wang and Zeng (2008) used the data of 2003, 2005 and 2006 after 2002, but they did not present the changing trend of trade complementarities caused by CAFTA. In addition, Wang and Zeng employed TSC (not the best way) to estimate the trade complementarities without examining trade competition between China and ASEAN. This study analyzes the changing trend of both trade complementarities and competition based on TCI and the trade competitiveness index using the trade data of 2001-2011.

2.5 The FDI

Investment refers to the accumulation of tangible capital goods or physical entities newly produced, including factories, machinery, housing and goods inventories (Samuelson, 2010). Britannica Concise Encyclopedia (2002) explains that investment is a process of benefits by transferring assets in a certain period in order to gain the expectation of income in the future.

International investment, which is also called foreign investment or overseas investment, refers to an economic behavior of investing monetary capital or industrial capital into other countries by a multi-national corporation (MNC) or other subject of international investment in order to gain the benefits (Solnik, 2010).

According to the modes of business operations, international investment may be divided into international direct investment or foreign direct investment (FDI) and international indirect investment or foreign indirect investment (FII) (Zhao, 2005; Zhu, 2009). FDI is that an individual or company in a country has a direct investment into the production or business in a destination country, either by buying a company or by expanding operations of an existing business in the destination country. FII refers to activities of investing in international capital market, such as securities, funds or private equity (Huang, Peng & Ling, 2008; Gao, 2010).

FDI by a multinational company is determined by three factors: ownership advantage, location advantage and internalization advantage (Dunning, 1977). By changing the above three factors, regional economic integration can influence the flow direction and scale of FDI. Moreover, the influence of regional economic integration usually is divided into static effect and dynamic effect (Zhao, 2005; Zhang, 2008; Zhu, 2009).

The static effect mainly refers to the investment creation and investment diversion as proposed by Kindleberger (1966). Studying the effects of trade creation and trade diversion (Viner, 1950), Kindleberger pointed out the creation and diversion of investment also occurs due to the establishment of regional economic integration. Specifically, investment creation is a growth of FDI in a member country due to the regional economic integration (Zhu, 2009).

Investment diversion is the change of the FDI flow direction, which is categorized into two types: (1) the growth of FDI inflow in a member country would lead to the reduction of FDI in other member countries within the regional economic integration, which means the direction of FDI would transfer between the member country and other member countries; (2) the reduction or elimination of tariffs causes the sharp increase of trade in goods and then results in the reduction or stagnation of FDI between members, which indicates FDI is substituted by trade in goods (Yu, 2004; Zhu, 2009).

Later, some researchers further examined the FDI creation and diversion caused by regional economic integration in different ways. Yanopoulos (1990) and Unctad (1990) discussed the investment effect caused by trade liberalization in the regional economic integration. The tariff elimination led to internal manufacturers (within a regional economic integration organization) having

advantages in the price of products compared to the external manufacturers, which in turn led to the trade diversion (the imports of members from external manufacturers are changed into imports from internal manufacturers). Then external manufactures would intend to change the production location to the members of regional integration in order to avoid the above trade diversion.

Motta and Norman (1996) analyzed the investment effect of trade liberalization on the FDI of evading tariffs (this kind of FDI is invested in order to evade tariffs). They distinguished the changes of market access in members caused by the reduction of trade barriers. If the tariffs reduction caused the degree of market access of a member to rise, high market access would cause the increasing of platform FDI (FDI is invested from a source country into a destination country for the purpose of exporting to a third country), which indicates the complementary relationship between trade and investment.

Neary (2002) also analyzed the FDI effect of trade liberalization on a MNC based on the Common Market. The elimination of tariffs in the Common Market would reduce the FDI of evading tariffs, and increase the export-oriented FDI to a certain member while reducing the FDI to other members.

Blomstrom and Kokko (1997) discussed the FDI effect caused by investment liberalization due to regional economic integration. The establishment of

regional economic integration would bring about the investment liberalization (reducing the limitations of capital flows) and then speed up the inflow of FDI in members; and the FDI from non-members would be concentrated to the most attractive member in the regional economic integration.

Du and Song (2004) categorized investment creation and investment diversion. Investment creation was divided into two types: (1) investment creation from a member to other members (investment creation was caused by the growth of FDI among members); and (2) investment creation from a non-member to a member (investment creation was caused by the growth of FDI from non-members to members). Similarly, investment diversion was also divided into two types: (1) investment diversion from a member to other members; and (2) investment diversion from a non-member to a member.

The dynamic effects of the FDI are also caused by regional economic integration, including economics of scale, market expansion, intense competition, technology spillover and economic growth (Tian & Wu, 2002; Du and Song, 2004; Zhao, 2005; Zhang, 2008; Zhu, 2009).

Previous studies on FDI in China focused more on the relationship between FDI and trade and less on the FDI effect caused by CAFTA.

The relationship between the FDI and trade in China has been examined in a few studies. Xiang (2003) examined the correlation between FDI and trade of China and concluded that the correlation had different characters in different historical stages. In the 1980s, it was a substitution relationship between FDI and trade in China. After that, it was mutual promotion and complementary relationship between FDI and trade in China. Zhu (2007) applied correlation and regression analyses to examine the relationship between FDI and trade or economic growth in China using 1983-2005 data of China. The results indicated that the FDI caused trade and economic growth of China.

There are some researches about the FDI effect on the trade between China and ASEAN. Zhang and Hock (1996) compared the FDI from ASEAN to China and that from USA to China to show the impacts of FDI on the bilateral trade and found that FDI from ASEAN was absorbed by the economic growth of China.

Wang and Zhu (2004) used regression analyses to examine the impacts of FDI from ASEAN to China based on the 1984-2003 data. They concluded that FDI from ASEAN to China had more contribution to imports than to exports in China in 1984-1997. However, the FDI had more contribution to exports than to imports in 1997-2003. Guo (2006) analyzed the FDI from ASEAN to China in different industries and believed that the contribution rate of FDI to imports was more than that to exports in China.

Cai & Gu (2005) used a regression analysis to test the positive relationship between FDI and export growth in China. The results showed FDI caused the export growth in China. Tu (2006) estimated China's FDI to the members of ASEAN, APEC and WTO (world trade organization) based on the gravity model using the panel data of the 2000-2004 period. The results showed that China's FDI reduced after joining APEC and CAFTA. On the contrary, China's FDI increased after joining WTO.

Fan and Cao (2008) concluded that the FDI from ASEAN to China improved the trade between both sides based on the gravity model, using 2006 data. Based on regression analysis, Zheng (2010) concluded that the FDI from ASEAN to China strongly affected the trade between them and made larger the trade deficit in China from 1990 to 1997. However, FDI from ASEAN to China only strongly influenced the export trade from China to ASEAN.

There are few researches on the relationship between FDI and trade in different regions of China. Jiang and Liu (2010) conducted an exploratory analysis of spatial data on the distribution of FDI in China. The results showed that FDI was centralized in most of Eastern provinces of China. Huang (2011) explained that the relationships between FDI and international trade of the different provinces in China based on the gravity model using 2008 data. The results indicated that

FDI and international trade were complementary. In addition, the elasticity of FDI on international trade in the east was the biggest, followed by the middle region and the west region in China.

The above studies mainly analyzed the relationship between FDI and trade in China or different regions of China, and the effect of FDI on the trade between China and ASEAN, without considering the effect of CAFTA.

There are a few studies that have emphasized the effect of CAFTA on the FDI flow. Du and Song (2004) pointed out that the effects of CAFTA on the FDI are dominantly investment creation and investment diversion from non-members to members based on the qualitative analyses. Zhao (2005) also employed qualitative method to analyze the static and dynamic effects of the FDI caused by CAFTA based on the related theories, and concluded that the FDI inflow of China from ASEAN and non-members would expand.

Zhu (2009) used the investment gravity model to analyze the effects of CAFTA on the FDI inflow of China based on cross-sectional data in 2006. The investment gravity model was on the basis of the gravity model in which the dependent variable of trade value was substituted by the FDI. The result indicated that CAFTA did not obviously lead to FDI creation of China. Li (2011) analyzed the effect of CAFTA on the FDI inflow of China based on the

investment gravity model using 2003-2009 data. He concluded that CAFTA caused the reduction of FDI inflow in China for the reason that the trade expansion between both sides substituted the FDI flow.

In all, the previous studies on the FDI effect of CAFTA emphasized the FDI inflow of China without analyzing the effect on FDI outflow of China. Actually, the FDI outflow is a very important content in the "going out" strategy of China (a national strategy proposed by Jang Zemin, the former president of China). Thus, the effect on the FDI outflow should be taken into consideration in studies. In addition, the previous studies did not analyze the different effects of trade liberalization and investment liberalization in CAFTA on the FDI flows.

This study estimates the effects of CAFTA on both the inflow and outflow of FDI in China using 2001-2011 data and the investment gravity model with added control variables. In addition, this study examines the effect of CAFTA on the FDI in two ways: (1) the FDI effect caused by trade liberalization; and (2) the FDI effect caused by investment liberalization.

2.6 Summary

While most previous studies mainly examined the effect of CAFTA on the total trade flow effects of China, they did not distinguish the difference between export flow effect and import flow effect caused by CAFTA. This study

separately examines the effect of CAFTA on both export flow and import flow and discusses their differences using the gravity model. Further, this study estimates the trade flow effect of CAFTA on different provinces and regions of China, which have been neglected in the previous studies.

Secondly, few previous studies have focused on the trade structure effect of economic integration based on an empirical model. This study further estimates the trade structure effect of CAFTA based on the trade structure model, by modifying the variables, employing the different classifications of products and updating the data compared to the previous studies.

Thirdly, most of previous studies examined the trade complementarities and competition based on the historical data before 2002, which did not reflect the situation after 2002. In addition, these studies did not present the changing trend of trade complementarities and competition caused by CAFTA. Based on TCI and the trade competitiveness index, this study analyzes the changing trends of trade complementarities and competition due to CAFTA using the trade data of 2001-2011.

Finally, previous studies have just focused on the effect of CAFTA on the FDI inflow of China without considering the effect on FDI outflow of China. Moreover, previous studies did not distinguish the different effects of trade

liberalization and investment liberalization of CAFTA on the FDI flows. This study estimates the effects of CAFTA on both FDI inflow and FDI outflow of China based on the investment gravity model by adding control variables. Besides, this study examines the effect of CAFTA on FDI flows in two ways: the FDI flows effect caused by trade liberalization of CAFTA and the effect caused by investment liberalization of CAFTA.

CHAPTER THREE

REGIONAL INTEGRATION OF CAFTA

3.1 Introduction

This chapter presents a review on the regional integration of CAFTA. Firstly it introduces the regional integration of China and the economic integration of ASEAN, which provide the policy basis and background for the formation of CAFTA. Secondly, the integration process of China and ASEAN provides a basis for the implementation of CAFTA. Finally, this chapter analyzes the development of trade and investment between China and ASEAN through the establishment of CAFTA.

3.2 Free Trade Agreements of China

The Chinese Government considers Free Trade Agreements as a new platform to further open up the economy to the outside market and speed up domestic reforms. It is an effective approach to integrate into the global economy and strengthen economic cooperation with other economies. Particularly, it is an important supplement to the multilateral trading system (China$_3$, 2012).

According to the Ministry of Commerce (China$_3$, 2014), China had established 20 Free Trade Agreements comprising of 33 economies. Among them, 12 Free Trade Agreements have been signed (involving 20 economies) and 8 Free Trade

Agreements are still under negotiation (Table 3.1 and Table 3.2).

Table 3.1
Completed Free Trade Agreements

Free Trade Agreements	**Signing**	**Implementing**
China-ASEAN	Nov. 2002	Jan. 2004
China- HK CEPA	Jun. 2003	Jan. 2004
China- Macao CEPA	Oct. 2003	Jan. 2005
China-Chile	Nov. 2005	Oct. 2006
China-Pakistan	Nov. 2006	Jan. 2006
China-New Zealand	Jul. 2008	Oct. 2008
China-Singapore	Oct. 2008	Jan. 2009
China-Peru	Apr. 2009	Mar. 2010
China-Costa Rica	Apr. 2010	Aug. 2011
China- Taiwan ECFA	Jun. 2010	Sep. 2010
China-Iceland*	Apr. 2013	----------
China-Switzerland*	Jul. 2013	----------

Note: CEPA refers to "Closer Economic Partnership Arrangement".
ECFA refers to "Economic Cooperation Framework Agreement".
"-----" and * denote that FTA is not effective.
Source: China Free Trade Network of China's Bureau of Commerce
http://fta.mofcom.gov.cn/topic/chinaasean.shtml

The eight Free Trade Agreements under negotiation or consideration are: (i) China and South Korea; (ii) China and Australia, (iii) China and Norway; (iv) China and the Gulf Cooperation Council (GCC); (v) China-Japan-ROK (Republic of Korea) regional comprehensive economic partnership agreement (RCEP); (vi) China and India completed joint feasibility study about regional trade arrangement (RTA); (vii) China and Sri Lanka; and (viii) China and Colombia joint feasibility study on FTA establishment. Moreover, China also joined the "Asia Pacific Trade Agreement". The details are given in Table 3.2.

Table 3.2
Incomplete Free Trade Agreements

under Negotiation	under Consideration
China-GCC FTA	China-India RTA Joint Feasibility Study
China-Australia FTA	China-Korea FTA Joint Feasibility Study
China-Norway FTA	China-Japan-Korea Joint Study
China-Sri Lanka FTA	China-Colombia Joint Feasibility Study

Source: China Free Trade Network of China's Bureau of Commerce
http://fta.mofcom.gov.cn/topic/chinaasean.shtml

3.3 The Economic Integration of ASEAN

3.3.1 The Internal Economic Integration

ASEAN was established on 8 August 1967 when the Foreign Ministers of Indonesia, Malaysia, Philippines, Singapore and Thailand signed the ASEAN Declaration in Bangkok, also known as the Bangkok Declaration (Bernard, Michael & Deborah, 1998). According to the United States Department (2007), the motivations to establish ASEAN was to make the governing elite focus on nation building, reduce the fear or mistrust of communism and meet a desire for economic development in the 1960s. Brunei became the sixth member of ASEAN on 8 January 1984 followed by Vietnam (28 July, 1995), Laos and Myanmar (23 July, 1997) and Cambodia (30 April 1999) ($ASEAN_1$, 2008).

Li, Gong & Meng (2007) stated that external and internal factors pushed for the economic integration of ASEAN. At the end of the 1980s, the focus of ASEAN gradually shifted from politics to economic cooperations due to the end of the

cold war. In addition, the Asian financial crisis made ASEAN leaders resist the economic risks by means of internal economic integration.

Specifically, the related agreements signed by ASEAN explain the process of ASEAN economic integration. A Common Effective Preferential Tariff (CEPT) was signed by ASEAN in January 1992. CEPT promoted the free flow of goods within ASEAN to achieve trade liberalization, which led to the ASEAN Free Trade Area (AFTA) (Sim, 2008). The AFTA agreement was signed on 28 January 1992 in Singapore and is concerned with local manufacturing in ASEAN ($ASEAN_2$, 2008). AFTA had six initial members: Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand. Vietnam took part in AFTA in 1995, Laos and Burma in 1997 and Cambodia in 1999. The latecomers have not fully met the obligations of AFTA, and have been given a longer time to meet the tariff reduction obligations of AFTA ($ASEAN_2$, 2008).

In December 1995, an ASEAN Framework Agreement on Services (AFAS) was passed at the ASEAN Summit in Bangkok. In October 1998, the ASEAN Comprehensive Investment Area (ACIA) was signed to encourage the free flow of investment within ASEAN. It aimed to establish an investment free area within ASEAN in 2010 (Vietnam in 2013, Myanmar and Laos in 2015) (Li, Gong & Meng 2007).

The ASEAN Charter signed in November 2007 was put into effect on 15 December 2008. The charter aims to move closer to "an EU-style community" and create a single FTA within ASEAN, as a basis for the ASEAN economic community (Wang, 2012). The above agreements are summarized in Table 3.3.

Table 3.3
The Economic Integration in ASEAN

Signing	**Agreements**
Jan. 1992	Common Effective Preferential Tariff (CEPT)
Jan. 1992	ASEAN Free Trade Area (AFTA)
Dec. 1995	ASEAN Framework Agreement on Trade in Services (AFAS)
Oct. 1998	ASEAN Comprehensive Investment Area (ACIA)
Oct. 2003	The second ASEAN agreement declaration (agreement on the economic community and preferentially developed 11 fields)
Nov. 2004	Vientiane action plan (ASEAN integration framework agreement in priority fields)
Nov. 2007	ASEAN Charter (the ASEAN Economic Community blueprint)
Mar. 2009	ASEAN Community scheme during 2009-2015 (substituted Vientiane action plan)
May. 2010	ASEAN Trade in Goods Agreement（ATIGA）was put into effect.

Source: ASEAN Secretariat Website (http://www.asean.org).

This regional grouping has greatly promoted economic integration, which is beneficial for establishing an ASEAN Economic Community (AEC) by 2015 (Sim, 2008). The average economic growth of ASEAN countries during the 1989–2009 period increased rapidly. The economic growth rate in Singapore was 6.73%, 6.15% in Malaysia, 5.16% in Indonesia, 5.02% in Thailand and 3.79% in the Philippines. The economic growth rate of ASEAN countries was nearly 5% higher than the 2.83% average growth rate of APEC members (Panennungi, 2011). Thus, ASEAN made great economic progress with the

development of ASEAN economic integration.

3.3.2 The External Economic Integration

ASEAN has established free trade agreements with six countries, namely China, Korea, Japan, Australia, New Zealand and India. The details of these free trade agreements are summarized in Table 3.4. In addition, ASEAN is currently negotiating a free trade agreement with the European Union (Singapore, 2012). Taiwan has interest in an agreement with ASEAN but needs to overcome diplomatic objections from China (Mo, 2008).

Table 3.4
FTAs of ASEAN

FTAs	Year	Agreements
ASEAN-China	2002	The framework agreement on comprehensive economic cooperation.
ASEAN-Japan	2003	The framework agreement on comprehensive economic cooperation.
	2008	The comprehensive economic partnership agreement.
ASEAN-South Korea	2005	The framework agreement on comprehensive economic cooperation and the framework agreement on the dispute settlement mechanism.
	2006	The agreement on trade in goods (Thailand is not a signatory).
	2007	The agreement on trade in services (Thailand is not a signatory).
	2009	The investment agreement, the agreement on Thailand to join the service trade, and the agreement on Thailand to join the agreement on trade in goods
ASEAN-Australia, New Zealand	2009	The agreement on the establishment of the ASEAN - Australia Free Trade Area
ASEAN-India	2003	The framework agreement on comprehensive economic cooperation.
	2009	The agreement on trade in goods, agreement on dispute settlement mechanism, a correction of framework agreement on comprehensive economic cooperation.

Source: ASEAN Secretariat Website (http://www.asean.org/20164.htm).

3.3.3 The Implementation Effects of ASEAN Economic Integration

AFTA, i.e., the ASEAN Free Trade Area, includes economic integration in goods trade, service trade and investment. The integration contents are similar to the CAFTA framework, including tariffs, non-tariffs, service trade and economic and technological cooperation in other fields.

After the establishment of AFTA, all ASEAN countries have undertaken various active measures to improve trade liberalization and deepen the economic integration within ASEAN. The tariff rates for 63% of products were nil and the average tariff rate was 1.95% within ASEAN countries in 2008 ($ASEAN_3$, 2010).

Besides the tariff reduction, the index of intra-regional trade share also reflects the degree of regional trade integration. If the share of intra-ASEAN trade in the whole ASEAN trade is larger, the degree of regional trade integration is higher (Wang, 2012). For instance, the share of intra-ASEAN trade from 2000 to 2009 generally showed an increasing trend, except for 2004 and 2009 (Figure 3.1). This indicates that the degree of ASEAN trade integration was increasing gradually. The share of intra-ASEAN trade was only 19% in 1993, increased to around 22% in 2000-2002 and 25% in 2003-2007, and reached highest share of 26.8% in 2008 (Figure 3.1). The trade volume between ASEAN and main partners decreased in 2009 due to the world financial crisis (2008-2009)

(ASEAN$_4$, 2010).

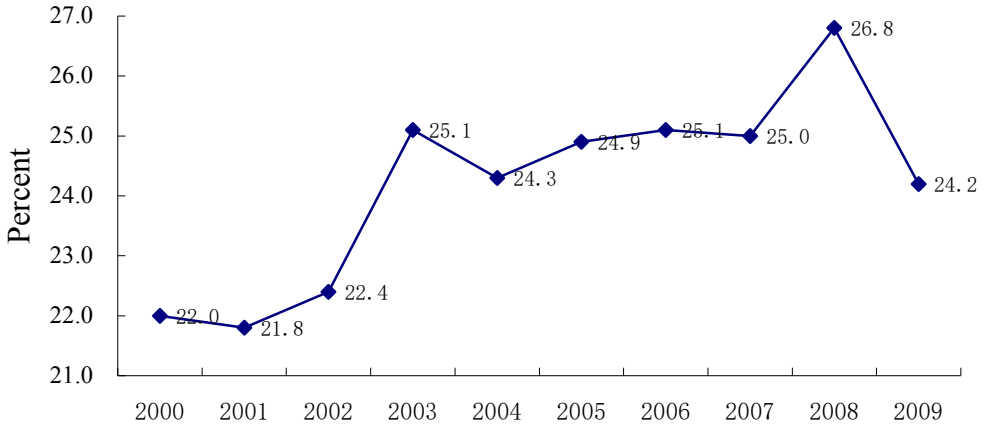


Figure 3.1
ASEAN: Share of Intra-ASEAN Trade

3.3.4 Strategic Choice of ASEAN Integration

Bhagwati (1995) firstly proposed "noodle bowl" to describe the numerous and overlapping free trade agreements, which would lead to a more complex system of international trade. Greenaway and Panagariya (1998) and Panagariya (2000) discussed spaghetti bowl effect, which was a complication arising from the application of domestic rules of origin in the signing of free trade agreements across nations. The effect had led to discriminatory trade policy and often contradictory outcomes among bilateral and multilateral trade partners, later known as the noodle bowl effect.

Baldwin (2006) pointed out that the noodle bowl phenomenon also appeared in East Asia. A pattern was formed to regard ASEAN as the axis of free trade agreements in East Asia, i.e., ASEAN maintained the dominant position in East

Asian Cooperation (Masahiro & Ganeshan, 2011). ASEAN, as a whole, signed individually economic cooperation agreements with China, Japan and South Korea in East Asia, and approved agreements with India, Australia and New Zealand outside East Asia. At the same time, each ASEAN country also singly has agreements with these countries. The above actions led to the noodle bowl effect in East Asia (see Figure 3.2). Each line represents the free trade agreement between both sides. The free trade agreements of East Asia have been described in a complicated draft with intertwined lines which express the overlapping free trade agreements, which directly presents the complex FTA relations.

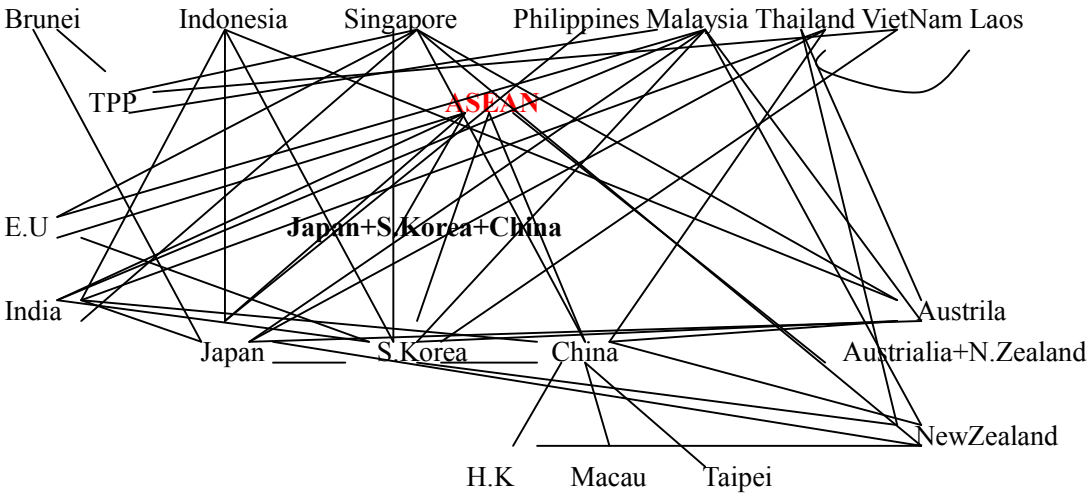


Figure 3.2
A Noodle Bowl of FTAs in East Asia

In the noodle bowl effect, ASEAN utilizes its non-threatening advantages to other countries and integration experience to win trust from big countries and

grasps the initiative in the economic integration of East Asia (Wang, 2012). At present, ASEAN implements the "concentric circles" strategy with "ASEAN Community" as the core, with "10+1" (ASEAN individually with China, Japan, South Korea, India, Russia, Australia, etc.) as the first periphery, with "10+3" (ASEAN + China, Japan and South Korea) as the second periphery, with the "East Asia Summit" (10+3+ Australia, New Zealand and India) as the third periphery, which is illustrated in Figure 3.3. The East Asia Summit with ASEAN at a leadership position had a role in regional community building (Lu, 2006). In October 2010, the summit formally invited Russia and the US to participate in the 2011 summit as full members ($ASEAN_4$, 2010).

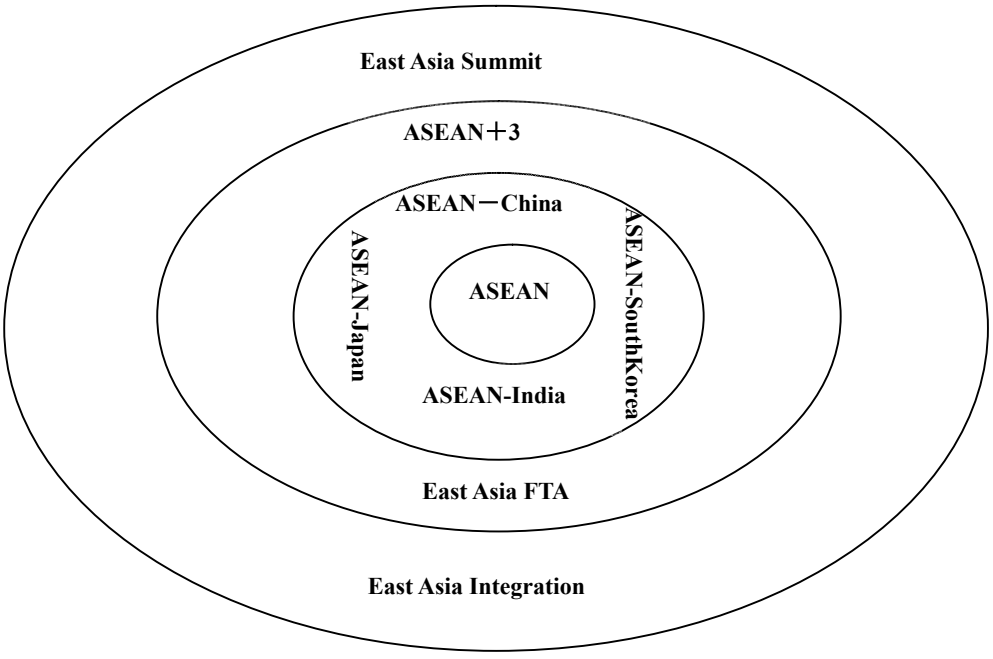


Figure 3.3
The Strategy of "Concentric Circles"

The above strategic map of ASEAN describes blueprint of the future “East Asia Community”, or even “Wide East Asia Community” (including India, Australia and New Zealand). ASEAN has been pushed to the main driving position in the regional economic integration of East Asia and Asia, and would play a leading role (Lu, 2006). According to the situation of East Asia and Asia, this is an appropriate choice. Li Ke-Qiang, the Chinese Premier, stated that China supports the leading role of ASEAN in the cooperation of East Asia during the Tenth China-ASEAN Expo and the China-ASEAN Business and Investment Summit on 3 September 2013. Therefore, the strategic selection of integration cooperation of both sides continuously promoted the establishment and implementation of CAFTA.

3.4 Integration of CAFTA

The reviews of the above two sections indicate that China and ASEAN are active in pushing for regional integration development. Against this background, CAFTA was established. The EU, NAFTA and CAFTA are three of the largest regional economic cooperation zones in the world. CAFTA has the highest population compared to the other free trade areas in the world, which is made up of developing countries. Meanwhile, CAFTA is the first and biggest FTA joined by China.

3.4.1 The Origin of CAFTA

Zhu Rong-Ji, former Premier of China, first put forward an assumption of the China-ASEAN FTA at the fourth China-ASEAN leaders' meeting held in Singapore in November 2000. He also proposed the setting up of an experts group of China-ASEAN economic cooperation in the framework of Joint Committee on China-ASEAN Economic & Trade Cooperation, which was to have a joint feasibility study on CAFTA. These suggestions received a positive response from the leaders of ASEAN countries.

The experts group of China-ASEAN Economic Cooperation was formally established in Joint Committee on China-ASEAN trade and economic cooperation in March 2001, focusing on two issues: the impacts of China's accession into WTO and the establishment of CAFTA. The experts group concluded that the establishment of CAFTA would be a win-win decision for China and ASEAN, and suggested that China and ASEAN should establish the FTA in 10 years. This proposal was approved by senior officials and economic ministers from China and ASEAN, and officially published at the 5th China-ASEAN leaders' meeting held in Brunei in November 2001.

3.4.2 The Comprehensive Framework Agreement

The 6th China-ASEAN leaders' meeting was held in Phnom Penh, the capital of Cambodia in November 2002. The "Agreement on comprehensive economic

cooperation framework between China and ASEAN" was signed at the meeting. This marked the official start of establishment process of CAFTA.

The agreement proposed a comprehensive economic cooperation target, to strengthen and enhance the economic, trade and investment cooperation; to promote trade in goods and services; to gradually liberalize trade in goods and services and create a transparent, free and convenient investment mechanism; and to open up new areas for closer economic cooperation between all the parties. The agreement is the basis of the other agreements of CAFTA.

The "Early Harvest Program" was a special arrangement involved in the framework agreement, which was put into effect smoothly on 1 January 2004. When signing the agreement in 2002, China and ASEAN had not complete the discussion on the tariff reduction of all categories of goods. However, in order to enjoy the benefits of CAFTA as soon as possible, both sides decided to firstly open the domestic markets to each other for nearly 600 categories of goods (mainly agriculture products) which were complementary and of interest to both sides. The "Early Harvest Program" is looked upon as the preliminary implementation stage of CAFTA.

The goods listed in the "Early Harvest Program" were divided into three categories to reduce and eliminate tariffs with different schedules based on the

level of tariff rates of Most Favored Nation (MFN) status in China and ASEAN members as follows:

1) the goods applied greater than 15% MFN tariff rate in China and six older members of ASEAN (ASEAN 6) (greater than 30% in the four newer members of ASEAN);

2) the goods applied 5%-15% MFN tariff rate in China and ASEAN 6 (15%-30% MFN tariff rate in the four newer members of ASEAN);

3) the goods applied less than 5% MFN tariff rate in China and ASEAN 6 (less than 15% in the four newer members of ASEAN). ASEAN 6 refers to Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand. The four newer ASEAN Member States refer to Cambodia, Laos, Myanmar and Vietnam. Three categories of goods are presented in Table 3.5.

Table 3.5
Early Harvest Program: Three Categories of Goods

Category	**Tariff Rate in China and ASEAN 6**	**Tariff Rate in New ASEAN Members**
1	X > 15%	X > 30%
2	5%≤ X ≤ 15%	15%≤ X ≤ 30%
3	X < 5%	X < 15%

Note: X= Applied MFN Tariff Rate.

Source: Appendix 3 in Agreement on Comprehensive Economic Cooperation Framework between China and ASEAN (2002).

The tariffs of three categories of goods were ultimately reduced to zero tariff rates based on the tariff rates implemented on 1 July 2003. Meanwhile, there are different arrangements in the schedule of the early harvest program for China,

ASEAN 6 and newer ASEAN member states. The time schedule of early harvest program for China and ASEAN 6 is presented in Table 3.6.

Table 3.6
Time Schedule: Tariff Reduction in China and ASEAN 6

Categories	Not later than January 1 2004	Not later than January 1 2005	Not later than January 1 2006
1	10%	5%	0
2	5%	0	0
3	0	0	0

Source: Appendix 3 in Agreement on Comprehensive Economic Cooperation Framework between China and ASEAN (2002).

The reduced tariffs for the early harvest goods for CAFTA members are shown in Table 3.7. The trade value of goods listed in "Early Harvest Program" increased 40% compared to before, over the average growth level of all export & import products in 2004 (Ministry of Commerce of China, 2006).

Table 3.7
Early Harvest Program: Tariffs Reduction

Countries	Items*	Countries	Items*
1.Brunei	597	7. Philippines	214
2.Cambodia	539	8. Singapore	602
3. Indonesia	595	9. Thailand	581
4. Laos	406	10.Viet Nam	547
5. Malaysia	599	11. China	593
6. Myanmar	579		

Note: * categories of goods under tariffs reduction.
Source: China Commerce Ministry Statistics

3.4.3 The Agreement on Goods Trade

The Agreement on Trade in Goods of the Framework Agreement on Comprehensive Economic Co-operation between China and ASEAN was signed in November 2004. According to the agreement, both sides will implement the tariff reduction involving 7,000 categories of goods from 1 July 2005. These 7,000 categories of goods are beyond the scope of the early harvest goods. China and ASEAN also signed "Agreement on Dispute Settlement Mechanism of the Framework Agreement on Comprehensive Economic Co-operation between China and ASEAN" that provides a basis for trade disputes between two sides.

The agreement on goods trade includes 23 articles and three annexes, and stipulates the contents of goods trade liberalization, involving tariff reduction and elimination, the modification of concessions, quantitative restriction and non-trade barriers, safeguard measures, acceleration of commitments, measures to safeguard the balance of payments, general exceptions, security exceptions, institutional arrangements, dispute settlement, etc.

The products of tariff reduction are divided into two categories: sensitive products and normal products. Sensitive products are needed to protect and are listed by each member on their own accord, whose tariff rates are not zero at the end of tariff reduction. The products that are not included in the list of sensitive products are regarded as normal products, whose tariff rates are zero at the end

of tariff reduction.

There are different arrangements of tariff reduction for the two categories in the schedule and reduction degree for different members. Next, the tariff reductions of normal products in China and ASEAN 6 are introduced in Table 3.8. The tariff reductions of sensitive products and normal products in the four newer ASEAN members are summarized in Appendix A. Besides, each country promises to eliminate quantitative restrictions and non-trade barriers as soon as possible. In addition, the core of rules of origin is to determine the origin criteria.

Table 3.8
China and ASEAN 6: Tariff Reduction of Normal Products

X=Applied	**CAFTA Preferential Tariff Rate (Not later than 1 January)**			
MNF Tariff Rate	**2005***	**2007**	**2009**	**2010**
X ≥ 20%	20%	12%	5%	0
15% ≤ X < 20%	15%	8%	5%	0
10% ≤ X < 15%	10%	8%	0	0
5% ≤ X < 10%	5%	5%	0	0
X < 5%	Standstill	Standstill	0	0

Note: * The first date of implementation shall be 1 July 2005.

In general, goods trade liberalization is the primary field or the first stage in establishing CAFTA. Actually, the effect of CAFTA on trade in goods refers to the measures of the tariff eliminations in trade liberalization on how to influence the trade between China and ASEAN.

3.4.4 The Agreement on Service Trade

The "Agreement on Trade in Services of the Framework Agreement on Comprehensive Economic Co-operation between China and ASEAN" was signed in January 2007, which was carried out in July 2007. The agreement stipulates 33 articles and one Annex based on the General Agreement on Trade in Services (GATS) of WTO, involving definitions and scope, obligations and disciplines, specific commitments and other provisions.

Each country listed a schedule of specific commitments attached to Annex 1 of the agreement to present the service sections and sub-sections committed to reduce the limitation on market access. Members committed different service sections or sub-sections to reduce the limitations based on their own status. The brief descriptions of specific commitments by each member are listed in Appendix A.

The agreement provides the basis and contents for service trade liberalization between China and ASEAN. Service trade liberalization of CAFTA mainly refers to the specification on the market liberalization of service trade, which is listed in a schedule of specific commitments by each member. Service trade liberalization is the second field or stage in establishing CAFTA after finishing the negotiation on goods trade liberalization.

3.4.5 The Agreement on Investment

The Agreement on Investment between China and ASEAN was signed in August 2009, which was formally implemented on 15th August 2010. The agreement stipulated the contents of investment liberalization, including: definitions, objectives and scope, national treatment, MFN treatment, non-conforming measures, treatment of investment, expropriation and compensation for losses, transfers and repatriation of profits, measures to safeguard the balance of payment, subrogation, investment disputes, denial of benefits, general and security exceptions, promotion of investment, facilitation of investment, institutional arrangements and other obligations.

The agreement improved the transparency of laws and regulations related to the investment, created a free and convenient, transparent and fair investment environment for the investors of both sides, and provided sufficient legal protection for investors of both sides (China$_1$, 2009). However, some scholars pointed out the shortcomings of the agreement while approving its significance.

Zhang (2011) explained that the investment liberalization was limited due to the measures of taxation and subsidies not restricted in the agreement which would bring the distortion of foreign investment. Liao (2013) pointed out that the agreement was difficult to operate and implement although the agreement looked “beautiful”. Several bilateral agreements on investment among members

of CAFTA existed but the agreement on investment of CAFTA could not substitute the bilateral agreements. The above situation led to inevitable conflict and contradiction between the bilateral agreements and the agreement on investment of CAFTA. Besides, foreign enterprises found it difficult to enjoy the preferential measures, such as national treatment, and MFN treatment among the newer members of ASEAN, such as Myanmar and Cambodia, because of their incomplete implementation of the agreement. In addition, the lack of insurance system for overseas investment made the foreign enterprises face an increasing risk (Che, 2011). They believed that the agreement on investment of CAFTA was the preliminary framework and was expected to be further improved.

Generally, the investment liberalization is the third field or stage in establishing CAFTA following goods and service trade liberalization. In fact, the effect of CAFTA on FDI is the FDI effect due to the measures of investment liberalization in the agreement.

3.4.6 Full Implementation of CAFTA

Based on the framework agreement in 2002, CAFTA was fully implemented on 1 January 2010. The economic integration of CAFTA accordingly experienced three stages: goods trade liberalization (implemented in 2004); service trade liberalization (implemented in 2007); and investment liberalization (implemented in 2010). Definitely, the effects of CAFTA refer to the effects of

goods trade liberalization, service trade liberalization and FDI liberalization in CAFTA. All agreements of CAFTA are summarized in Table 3.9.

Table 3.9
CAFTA: Evolution of Agreements

Agreements	**Signing Time**
1. Framework Agreement on China-ASEAN Comprehensive Economic Cooperation	04.11.2002
2. Early Harvest Program Implementation	01.01.2004
3. Framework Agreement Trade in Goods	29.11.2004
4. Agreement on Dispute Settlement Mechanism	29.11.2004
5. Framework Agreement on Trade in Services	14.01.2007
6. Framework Agreement Investment	15.08.2009

Source: China FTA network (http://fta.mofcom.gov.cn/topic/chinaasean.shtml)

China's average tariffs rate to ASEAN is from 9.8% down to 0.1%, while the average rate of ASEAN 6 to China is from 12.8% down to 0.6% at present. The tariffs rate of other four members will complete zero tariffs rate for 90% commodities in 2015 (Wang, 2010). The reduction of tariffs profits both sides.

Generally speaking, the establishment of CAFTA enhances the close economy and trade relations between the two partners as introduced in the next section.

3.5 Trade and Investment between China and ASEAN

This section introduces the development of trade and investment between China and ASEAN in recent years. It shows the facts of trade and investment between China and ASEAN after the implementation of CAFTA, which provide the basis

for the next quantitative tests on CAFTA's effects. The contents about trade development have two parts: trade in goods; and trade in services. The contents about investment development also have two parts: China's FDI to ASEAN; and ASEAN's FDI to China.

3.5.1 Commodity Trade between China and ASEAN

Since the 1990s, the commodity trade between China and ASEAN has undergone rapid development. The exports value, imports value and total trade value had significant growth in 1990-2011 (refer to Figures 3.4, 3.5 and 3.6). The statistical data are from the United Nations Comtrade Database. Figure 3.4 shows the total trade value between China and ASEAN in 1990-2011. Figure 3.5 presents China's exports to ASEAN in 1990-2011. Figure 3.6 describes China's imports from ASEAN in 1990-2011. In the three Figures, the rapidly increasing total trade value, exports and imports can be observed in recent years except for year 2009 when they decreased due to the influence of US' subprime mortgage crisis (Wang, 2012).

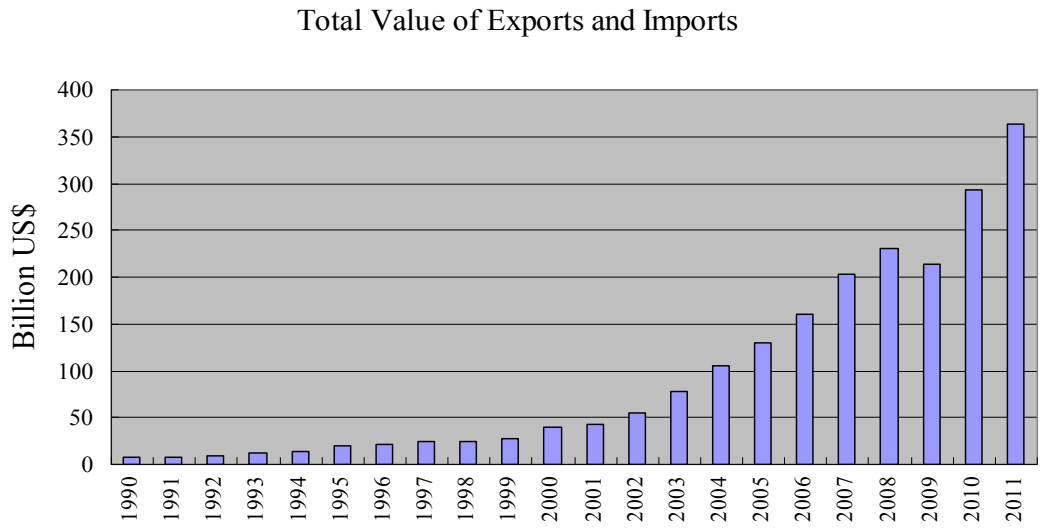


Figure 3.4
Total Trade Value between China and ASEAN (1990-2011)

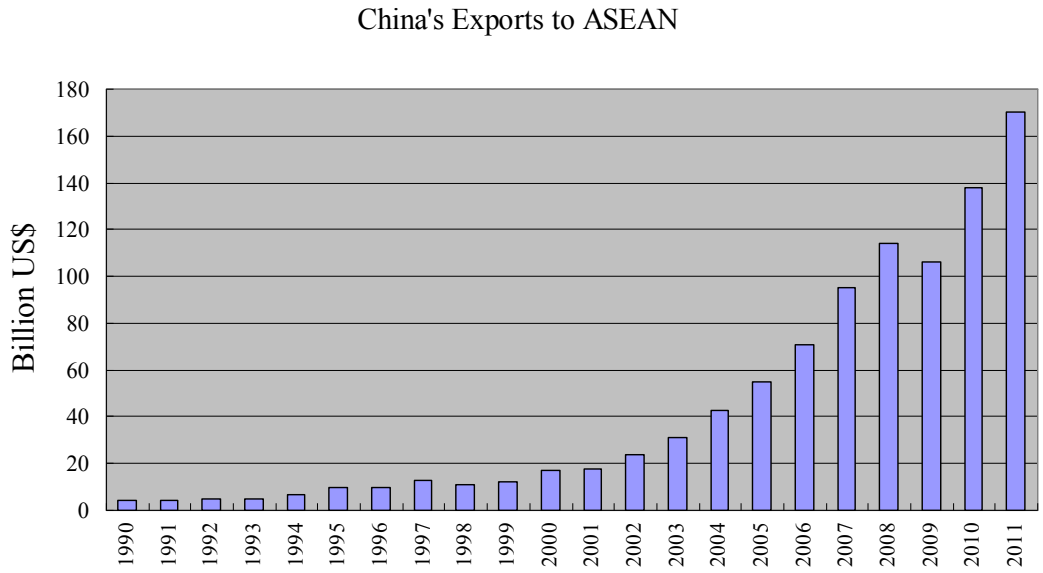


Figure 3.5
China: Exports to ASEAN (1990-2011)

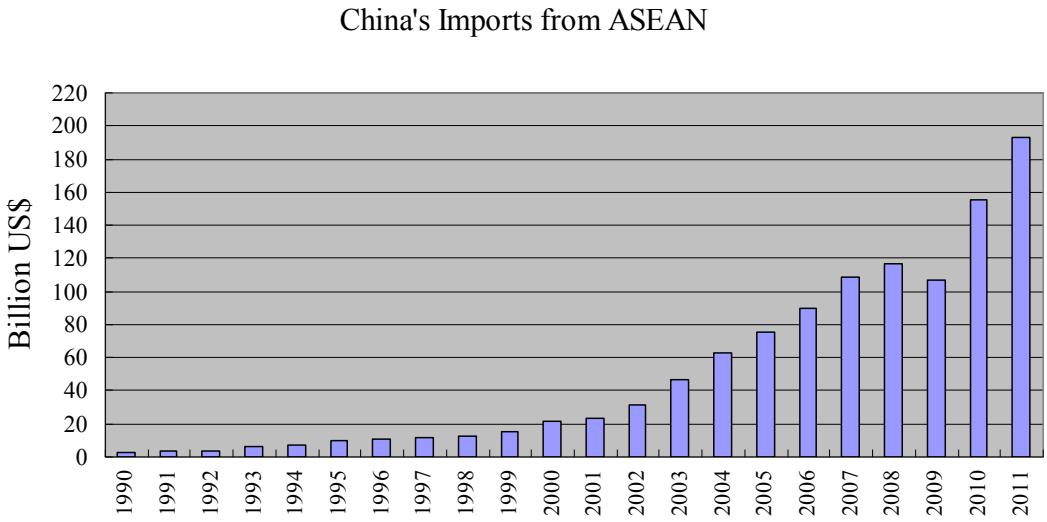


Figure 3.6
China: Imports from ASEAN (1990-2011)

From 1990 to 2011, the average growth rate of total trade value was 21.63%; the average growth rate of exports value was 20.75%; and the average growth rate of imports value was 22.87%. The changing trend of exports growth rate was similar to that of imports growth rate and total value growth rate (refer to Figure 3.7). The data are calculated based on the statistical data from the United Nations Database.

Figure 3.7 and Table 3.10 show that the exports and imports kept high growth rates from 2002, when the "Agreement on comprehensive economic cooperation framework between China and ASEAN" was signed. From 2002 to 2011, the average growth rate of total trade value was 25.01%; the average growth rate of exports value was 25.56%; and the average growth rate of imports value was 24.76%. The average growth rates in 2002-2011 were greater than that of

1990-2011. It indicates that China's commodity trade has increased rapidly since 2002, with the beginning of CAFTA. The exports and imports in particular, had increased from 2004, the year the "Early Harvest Program" was implemented.

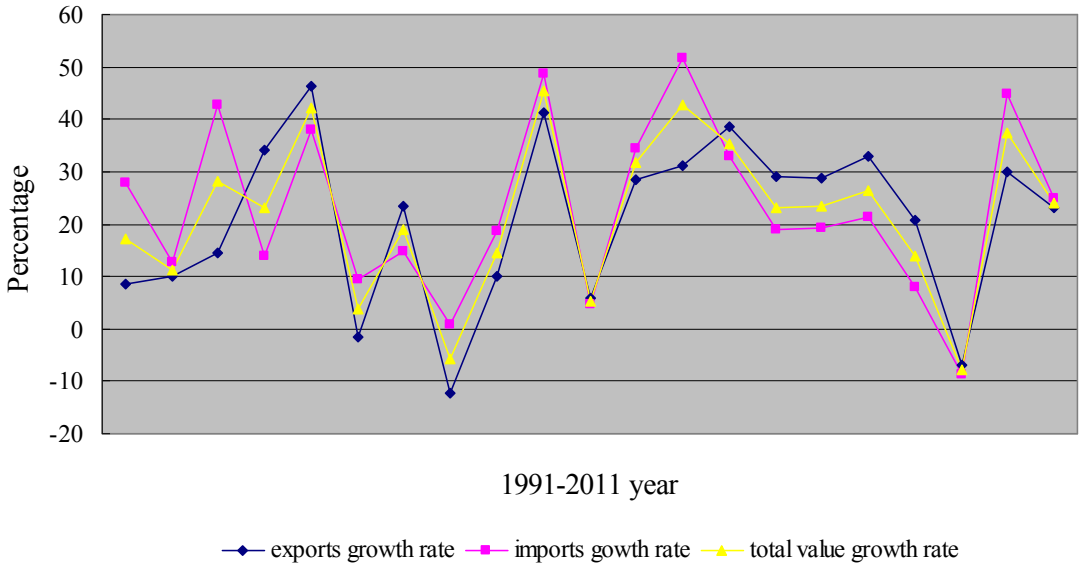


Figure 3.7
Growth Rates of Trade between China and ASEAN (1991-2011)

The trade growth rate reduced in 2008, and showed negative growth in 2009 due to the influence of the US subprime mortgage crisis (Wang, 2012). But the trade between China and ASEAN recovered rapidly after that (shown in Figure 3.7 and Table 3.10). In 2010, the growth rate of total trade value was 37.48%; the growth rate of exports was 29.98%; and the growth rate of imports was 44.95%. Remarkably, the commodity trade between China and ASEAN has registered rapid growth since 2002 when CAFTA started.

Table 3.10

Trade Value: China and ASEAN (2001-2011)

Year	Total Trade(Billion US$)		Exports (Billion US$)		Imports (Billion US$)	
	Value	Growth (%)	Value	Growth (%)	Value	Growth (%)
2001	41.59	5.24	18.38.	5.97	23.21	4.66
2002	54.78	31.71	23.58	28.34	31.20	34.38
2003	78.25	42.85	30.93	31.13	47.33	51.71
2004	105.87	35.29	42.90	38.71	62.97	33.05
2005	130.36	23.14	55.37	29.06	75.00	19.10
2006	160.84	23.38	71.31	28.80	89.53	19.38
2007	203.23	26.35	94.72	32.82	108.51	21.20
2008	231.32	13.82	114.32	20.69	117.00	7.83
2009	213.01	-7.91	106.30	-7.02	106.71	-8.80
2010	292.84	37.48	138.16	29.98	154.68	44.95
2011	363.10	23.99	170.08	23.10	193.02	24.79

Note: The growth rates and trade balance are calculated based on the above data.

Source: The data of total trade value, exports and imports are from United Nation Comtrade Database (http://comtrade.un.org/).

3.5.2 Commodities Trade Structure between China and ASEAN

This sub-section expounds the trade complementarities, trade competition and the changes of commodity trade structure between both sides by analyzing the commodities trade structure after CAFTA's implementation. Firstly, this study analyzes trade complementarities between China and ASEAN 6, followed by the trade competitions between China and ASEAN countries. Lastly, the changes of trade structure are presented based on the trade structure of 2007-2011.

3.5.2.1 Trade Complementarities

Export commodities structure shows different characteristics compared to import commodities structure for China and ASEAN. However, there is a similar commodities trade structure for Brunei, Cambodia, Indonesia, Myanmar, Laos

and Vietnam.

Their exports to China mainly concentrated on raw materials, fuel, mineral fuels, lubricants and related materials, which occupied more than 50% of total exports. For instance, 98.5% of Brunei's exports to China were mineral fuels, lubricants and related materials (Table 3.11).

However, their main import products from China were manufactured goods, machinery and transport equipment, which occupied more than 60% of total imports (Table 3.12). It shows that there are apparent complementarities between China and ASEAN 6 in import and export commodities structure after the implementation of CAFTA.

Table 3.11
ASEAN: Exports to China (2011)

Goods	**Brunei**	**Cambodia**	**Indonesia**	**Laos**	**Myanmar**	**Vietnam**
1.raw materials, fuel	0.1%	59.4%	65.7%	86.9%	26.6%	29.4%
2.mineral fuels, lubricants and related materials	98.5%	0.0%	0.1%	0.6%	38.9%	28.0%

Source: China's Ministry of Commerce statistics Database (http://data.mofcom.gov.cn/).

Table 3.12
ASEAN: Imports from China (2011)

Goods	**Brunei**	**Cambodia**	**Indonesia**	**Laos**	**Myanmar**	**Vietnam**
1.manufactured goods	62.5%	64.40%	21.7%	14.5%	41.1%	33.2%
2.machinery and transport equipment	10.3%	24.04%	44.1%	64.0%	31.9%	35.1%

Source: China's Ministry of Commerce statistics Database (http://data.mofcom.gov.cn/).

3.5.2.2 Trade Competitions

The highest export products from Singapore, Malaysia, Philippines and Thailand to China are machinery and transport equipments, with a ratio of almost 50% of the total exports (refer to Table 3.13). On the other hand, the highest import products from China are also machinery and transport equipments, whose ratio occupied over 50% of total imports (refer to Table 3.13). This indicates the existence of trade structure overlap between these countries and China in exports and imports after the establishment of CAFTA. The trade structure overlap possibly has led to trade competition between China and ASEAN countries.

Table 3.13
ASEAN: Trades of Machinery and Transport Equipments to China (2011)

Trade	Singapore	Malaysia	Philippines	Thailand
exports	48.9%	47.4%	49.8%	29.3%
imports	63.0%	58.4%	32.5%	52.5%

Source: China's Ministry of Commerce statistics Database (http://data.mofcom.gov.cn/).

3.5.2.3 Changes of Trade Structure

There is similar trade commodity structure in six ASEAN countries, namely Brunei, Cambodia, Indonesia, Myanmar, Laos and Vietnam. However, the export trade structure of these six ASEAN countries is different from their import trade structure. Specifically, their exports to China mainly focus on raw materials, fuel, mineral fuels, lubricants and related materials, but their main import products from China are manufactured goods, machinery and transport equipment. The categories of products are based on SITC. Due to the limitation

of data, the trade structure is analyzed based on the data of 2007-2011 to show the changes of trade structure after the establishment of CAFTA.

Trade Structure between Viet Nam and China

Table 3.14 shows the export and import trade structure of Vietnam to China. Based on Table 3.14, the percentage of each category of products in export trade had fluctuations in 2007-2011. However, two categories of products, i.e., crude materials and mineral fuels; and lubricants and related materials always accounted for near 60% of total exports. They were the main products in export trade structure. Therefore, the export trade structure of Vietnam to China has shown no crucial changes because the main export products did not change.

The import trade structure shows a great difference compared to the export trade structure. Based on Table 3.14, the percentage of each category of products fluctuated, but the percentage of manufactured products, machinery and transport equipment of total imports were always around 70% in the five years. Hence, import trade structure of Vietnam from China has shown no crucial changes in five years because the main import products had been manufactured products, machinery and transport equipment all along.

Generally, the data shows that both export and import structure between Vietnam and China had no crucial changes after the implementation of CAFTA.

Table 3.14
Viet Nam: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	15.1%	11.9%	15.4%	11.6%	12.4%
	Import	2.8%	2.4%	2.6%	2.0%	2.4%
Beverages and tobacco	Export	0.6%	0.7%	0.8%	0.6%	0.6%
	Import	0.2%	0.2%	0.5%	0.3%	0.3%
Crude materials	**Export**	**31.5%**	**27.5%**	**20.0%**	**22.3%**	**29.4%**
	Import	1.2%	1.2%	1.1%	1.6%	1.3%
Mineral fuels, lubricants and	**Export**	**26.8%**	**28.3%**	**29.0%**	**22.3%**	**28.0%**
related materials	Import	6.3%	6.2%	10.6%	8.6%	10.4%
Animal and vegetable oils,	Export	0.5%	0.7%	0.4%	0.2%	0.4%
fats and waxes	Import	0.0%	0.3%	0.0%	0.0%	0.1%
Chemicals and related products	Export	5.0%	4.3%	5.3%	6.3%	4.7%
	Import	12.6%	12.7%	11.6%	11.6%	12.3%
Manufactured goods	Export	5.9%	8.4%	9.7%	14.1%	12.0%
	Import	**39.6%**	**34.4%**	**23.7%**	**29.5%**	**33.2%**
Machinery and transport	Export	6.1%	9.0%	9.1%	13.6%	8.7%
equipment	**Import**	**31.6%**	**36.4%**	**43.5%**	**39.6%**	**35.1%**
Miscellaneous manufactured	Export	3.6%	3.9%	3.5%	4.0%	3.3%
articles	Import	4.2%	4.3%	5.0%	5.7%	4.8%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Indonesia and China

Table 3.15 presents the percentage of nine categories of products in exports and imports of Indonesia to China. The changes of trade structure between Indonesia and China are similar to that between Brunei and China. There were some fluctuations of the percentage of each category per year, but no crucial changes for the trade structure in 2007-2011. Crude materials, mineral fuels, lubricants and related materials accounted for about 60% of exports, while manufactured goods, machinery and transport equipment accounted for around 66% of imports in the five years. That means that trade structure between Indonesia and China

has shown no crucial changes after the implementation of CAFTA.

Table 3.15
Indonesia: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	2.2%	1.9%	1.5%	1.9%	3.2%
	Import	6.8%	4.0%	5.5%	5.8%	5.3%
Beverages and tobacco	Export	0.0%	0.0%	0.0%	0.1%	0.0%
	Import	0.9%	0.7%	1.0%	0.9%	0.9%
Crude materials	**Export**	**21.5%**	**21.3%**	**18.6%**	**24.1%**	**26.6%**
	Import	0.9%	0.7%	1.0%	0.9%	0.9%
Mineral fuels, lubricants and related materials	**Export**	**36.2%**	**39.2%**	**40.5%**	**38.4%**	**38.9%**
	Import	8.5%	3.8%	6.2%	6.4%	6.3%
Animal and vegetable oils, fats and waxes	Export	15.1%	17.9%	17.5%	16.0%	13.0%
	Import	0.0%	0.0%	0.1%	0.0%	0.0%
Chemicals and related products	Export	9.2%	6.1%	6.5%	8.1%	9.3%
	Import	12.1%	12.0%	11.0%	10.3%	11.2%
Manufactured goods	Export	8.9%	7.3%	7.9%	6.4%	4.9%
	Import	**26.4%**	**25.1%**	**20.3%**	**20.6%**	**21.7%**
Machinery and transport equipment	Export	5.9%	5.0%	6.5%	4.0%	3.0%
	Import	**35.9%**	**45.2%**	**46.9%**	**45.2%**	**44.1%**
Miscellaneous manufactured articles	Export	1.1%	1.2%	1.0%	1.1%	1.0%
	Import	8.4%	7.6%	7.9%	9.5%	8.9%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Myanmar and China

The export and import trade structures between Myanmar and China are listed in Table 3.16. Crude materials were the main products in exports of Myanmar to China. The percentage of crude materials in total exports showed a decreasing trend in 2007-2011. However, crude materials were still the main export products in 2011, accounting for 65.7% of exports.

The import trade structure is different from the export structure. Manufactured goods, machinery and transport equipment occupied the main percentage of about 70% of imports in 2007-2011. They were the main products in imports of Myanmar from China in the five years. There were no crucial changes for the import trade structure in 2007-2011. That means that trade structure between Indonesia and China had no crucial changes after the implementation of CAFTA.

Table 3.16
Myanmar: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	6.8%	7.4%	8.5%	21.3%	14.5%
	Import	3.7%	3.6%	3.5%	1.0%	3.0%
Beverages and tobacco	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	2.5%	2.5%	2.8%	0.0%	2.5%
Crude materials	**Export**	**85.8%**	**85.9%**	**83.9%**	**34.4%**	**65.7%**
	Import	0.5%	0.6%	0.5%	0.3%	0.6%
Mineral fuels, lubricants and	Export	0.1%	0.2%	0.1%	0.0%	0.1%
related materials	Import	9.7%	12.8%	8.2%	1.3%	8.7%
Animal and vegetable oils,	Export	0.0%	0.0%	0.0%	0.0%	0.0%
fats and waxes	Import	0.0%	0.0%	0.0%	0.0%	0.0%
Chemicals and related products	Export	0.4%	0.4%	0.5%	0.0%	0.4%
	Import	8.7%	9.9%	9.9%	4.8%	8.3%
Manufactured goods	Export	6.0%	5.4%	6.1%	42.5%	18.4%
	Import	**33.3%**	**32.4%**	**32.9%**	**49.6%**	**41.1%**
Machinery and transport	Export	0.7%	0.5%	0.7%	0.0%	0.5%
equipment	**Import**	**36.8%**	**34.0%**	**37.3%**	**39.0%**	**31.9%**
Miscellaneous manufactured	Export	0.2%	0.2%	0.2%	1.1%	0.5%
articles	Import	4.9%	4.3%	4.9%	3.9%	3.9%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Laos and China

Trade structure between Laos and China is presented in Table 3.17. Crude materials were the main products in exports of Laos to China. Its percentage in total exports increased from 65.2% in 2007 to 86.9% in 2011 (Table 3.17).

Based on Table 3.17, manufactured goods, machinery and transportation accounted for around 80% of imports in the five years. Machinery and transport equipment were the highest export products with 64% of exports in 2011.

Thus, there were no crucial changes in the export and import structure of Laos to China after the implementation of CAFTA because there were no changes for the main products in trade structure. Crude materials were always the main export products, and machinery and transport equipment were the main import products all along.

Table 3.17
Laos: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	9.1%	9.6%	6.6%	4.0%	2.5%
	Import	0.3%	0.6%	0.5%	0.8%	0.6%
Beverages and tobacco	Export	0.0%	0.0%	0.1%	0.0%	0.1%
	Import	0.3%	0.3%	1.2%	2.2%	1.5%
Crude materials	**Export**	**65.2%**	**69.6%**	**81.6%**	**84.4%**	**86.9%**
	Import	0.5%	0.4%	0.5%	0.3%	0.1%
Mineral fuels, lubricants and related materials	Export	0.4%	0.6%	0.4%	0.4%	0.6%
	Import	0.9%	0.8%	0.7%	1.3%	1.7%
Animal and vegetable oils, fats and waxes	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	0.0%	0.0%	0.0%	0.0%	0.0%
Chemicals and related products	Export	3.1%	1.9%	0.9%	0.4%	0.1%
	Import	3.1%	3.1%	3.5%	2.4%	3.1%
Manufactured goods	Export	20.9%	15.6%	10.2%	10.5%	9.4%
	Import	**12.9%**	**20.7%**	**14.5%**	**19.0%**	**14.5%**
Machinery and transport equipment	Export	0.0%	0.0%	0.1%	0.0%	0.0%
	Import	**71.1%**	**70.4%**	**68.4%**	**41.1%**	**64.0%**
Miscellaneous manufactured articles	Export	1.3%	2.6%	0.2%	0.2%	0.4%
	Import	3.2%	3.4%	9.8%	31.7%	13.3%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Cambodia and China

Table 3.18 describes the export and import trade structure of Cambodia to China. Crude materials were the highest export products based on Table 3.18. Its percentage in total exports decreased from 71.5% in 2007 to 59.4% in 2011. However, the percentage of miscellaneous manufactured articles of total exports increased from 8.9% in 2007 to 29.5% in 2011. Crude materials and miscellaneous manufactured articles were the main export products, accounting for almost 89% of exports in 2011.

Manufactured goods, machinery and transports equipment were the main import products. Their percentages saw a few fluctuations in 2007-2011. However, this percentage was always close to 90%. Thus, there have been no crucial changes in the import trade structure after the implementation of CAFTA.

Table 3.18
Cambodia: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	3.9%	7.7%	14.9%	2.6%	5.0%
	Import	0.51%	0.65%	0.67%	0.86%	0.71%
Beverages and tobacco	Export	0.3%	0.4%	0.2%	0.1%	0.2%
	Import	1.60%	1.32%	0.72%	0.56%	0.48%
Crude materials	**Export**	**71.5%**	**54.9%**	**46.0%**	**65.6%**	**59.4%**
	Import	0.25%	0.21%	0.62%	0.44%	0.34%
Mineral fuels, lubricants and related materials	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	0.32%	1.33%	1.15%	0.55%	0.75%
Animal and vegetable oils, fats and waxes	Export	0.0%	0.3%	0.0%	0.0%	0.1%
	Import	0.00%	0.02%	0.00%	0.00%	0.00%
Chemicals and related products	Export	3.9%	0.4%	0.1%	1.4%	1.4%
	Import	2.63%	2.26%	2.64%	2.06%	1.77%
Manufactured goods	Export	11.3%	2.4%	2.2%	1.2%	2.6%
	Import	**67.70%**	**63.86%**	**63.41%**	**68.41%**	**64.40%**
Machinery and transport equipment	Export	0.1%	0.6%	3.2%	2.0%	1.8%
	Import	**20.37%**	**22.68%**	**24.30%**	**20.58%**	**24.04%**
Miscellaneous manufactured articles	**Export**	**8.9%**	**31.0%**	**32.7%**	**27.0%**	**29.5%**
	Import	6.59%	7.48%	6.46%	6.54%	7.49%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Brunei and China

Table 3.19 shows that the export structure of Brunei to China after the establishment of CAFTA. Mineral fuels, lubricants and related materials have always accounted for the highest percentage of total exports, which was around 98% in 2007-2011. They were the main products in the exports of Brunei to

China.

The import structure of Brunei from China is also presented in Table 3.19. The percentage of manufactured goods increased from 54.8% in 2007 to 62.5% in 2011. Manufactured goods were the main products in the imports of Brunei to China. Thus, there have been no crucial changes in trade structure of Brunei to China after the implementation of CAFTA.

Table 3.19
Brunei: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	0.9%	0.9%	1.5%	1.2%	1.1%
	Import	9.1%	9.4%	9.7%	9.7%	9.1%
Beverages and tobacco	Export	0.0%	0.0%	0.0%	1.1%	0.0%
	Import	0.0%	0.0%	0.0%	0.0%	0.0%
Crude materials	Export	0.2%	0.2%	0.2%	0.2%	0.1%
	Import	1.4%	1.4%	1.3%	1.2%	1.0%
Mineral fuels, lubricants and related materials	**Export**	**98.7%**	**98.7%**	**97.9%**	**0.1%**	**98.5%**
	Import	0.1%	0.1%	0.1%	0.1%	0.1%
Animal and vegetable oils, fats and waxes	Export	0.0%	0.0%	0.0%	98.5%	0.0%
	Import	0.1%	0.1%	0.1%	0.1%	0.1%
Chemicals and related products	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	3.5%	4.1%	4.3%	4.0%	4.1%
Manufactured goods	Export	0.1%	0.1%	0.2%	0.0%	0.1%
	Import	**54.8%**	**55.8%**	**52.3%**	**57.0%**	**62.5%**
Machinery and transport equipment	Export	0.1%	0.1%	0.2%	0.1%	0.1%
	Import	14.7%	14.1%	15.6%	12.9%	10.3%
Miscellaneous manufactured articles	Export	0.0%	0.0%	0.0%	0.1%	0.0%
	Import	16.3%	14.9%	16.6%	15.1%	12.8%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

In section 3.5.2.2 (page 80), it is mentioned that there are trade overlaps of machinery and transport equipment in the trade structure between China and

four ASEAN countries (Philippines, Singapore, Malaysia and Thailand) after the establishment of CAFTA, i.e., there are similarities between export and import trade structure for these countries. The changes of trade structure between them are analyzed as follows:

Trade Structure between Philippines and China

Table 3.20 presents the export and import structure of Philippines to China after the implementation of CAFTA. The percentage of machinery and transport equipment in total exports decreased from 80.8% in 2007 to 73.3% in 2011. However, machinery and transport equipment has always been the main products in the export structure of Philippines to China.

There is a slight similarity between the import and export trade structure. The percentage of machinery and transport equipment also decreased from 44.9% in 2007 to 32.5% in 2011. Besides, the percentage of manufactured goods increased from 22.1% in 2007 to 22.8% in 2011. Manufactured goods, machinery and transport equipment were the main products in the import structure all along. Thus, there have been no crucial changes for the trade structure between Philippines and China due to the same main products in the trade structure after the implementation of CAFTA.

Table 3.20
Philippines: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	0.7%	0.7%	1.2%	1.4%	2.4%
	Import	5.8%	5.3%	6.4%	5.9%	6.3%
Beverages and tobacco	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	0.4%	0.6%	0.4%	0.2%	0.4%
Crude materials	Export	6.2%	3.5%	7.5%	6.9%	8.6%
	Import	1.5%	1.1%	1.4%	1.8%	1.0%
Mineral fuels, lubricants and related materials	Export	2.4%	2.6%	2.6%	3.3%	2.9%
	Import	3.3%	4.6%	7.4%	4.5%	8.0%
Animal and vegetable oils, fats and waxes	Export	0.3%	0.9%	0.8%	1.8%	1.7%
	Import	0.0%	0.0%	0.0%	0.0%	0.1%
Chemicals and related products	Export	1.3%	1.6%	3.9%	4.1%	3.6%
	Import	10.6%	13.5%	10.9%	13.3%	13.0%
Manufactured goods	Export	7.6%	2.6%	9.0%	5.0%	6.2%
	Import	**22.1%**	**21.5%**	**14.2%**	**19.6%**	**22.8%**
Machinery and transport equipment	**Export**	**80.8%**	**87.3%**	**73.2%**	**76.3%**	**73.3%**
	Import	**49.9%**	**47.3%**	**52.1%**	**46.1%**	**32.5%**
Miscellaneous manufactured articles	Export	0.7%	0.9%	1.8%	1.2%	1.3%
	Import	6.3%	6.2%	7.1%	8.7%	10.4%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Singapore and China

The trade structure between Singapore and China is presented in Table 3.20. The percentage of machinery and transport equipment decreased from 64.8% in 2007 to 48.9% in 2011. However, machinery and transport equipment have always been the main products in the export structure since 2007.

Similar to the export trade structure, machinery and transport equipment occupied the top proportion of the imports (Table 3.21). The percentage of machinery and transport equipment declined from 66.1% in 2007 to 63% in 2011. Machinery and transport equipment have been also the main import

products since 2007. Hence, there have been no crucial changes in the trade structure between Singapore and China after the implementation of CAFTA.

Table 3.21
Singapore: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	0.7%	0.9%	1.6%	1.3%	1.1%
	Import	1.2%	1.3%	1.6%	1.5%	1.5%
Beverages and tobacco	Export	0.8%	0.8%	0.8%	0.6%	0.7%
	Import	0.2%	0.2%	0.4%	0.3%	0.4%
Crude materials	Export	1.5%	1.5%	1.2%	1.0%	1.0%
	Import	0.6%	0.5%	0.4%	0.4%	0.5%
Mineral fuels, lubricants and related materials	Export	8.6%	12.8%	12.9%	15.0%	18.0%
	Import	7.2%	4.7%	10.4%	11.5%	8.1%
Animal and vegetable oils, fats and waxes	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	0.1%	0.1%	0.1%	0.1%	0.1%
Chemicals and related products	Export	12.2%	11.4%	14.1%	16.6%	17.8%
	Import	3.0%	3.8%	3.4%	3.7%	4.3%
Manufactured goods	Export	3.4%	3.3%	4.3%	2.8%	3.8%
	Import	11.3%	13.1%	9.1%	9.5%	11.6%
Machinery and transport equipment	**Export**	**64.8%**	**61.2%**	**56.2%**	**54.6%**	**48.9%**
	Import	**66.1%**	**65.7%**	**63.3%**	**62.3%**	**63.0%**
Miscellaneous manufactured articles	Export	6.5%	6.0%	6.8%	6.4%	7.1%
	Import	9.6%	10.0%	10.3%	9.9%	9.9%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Malaysia and China

Machinery and transport equipment accounted for the largest proportion in total exports with 47.4% in 2011. The percentage of animal and vegetable oils, fats and waxes in total exports ranked the second in 2007-2011. These two categories of products accounted for more than 60% of the exports. They have been the main export products since 2007. Hence, there have been no crucial changes in the export trade structure of Malaysia to China after the establishment of

CAFTA.

The percentage of machinery and transport equipment in total imports has been about 60% since 2007. Machinery and transport equipment were the main import products. The percentages of different categories had a few fluctuations, but their rankings in total imports did not change in 2007-2011. Thus, there have been no crucial changes in the import trade structure of Malaysia from China after the establishment of CAFTA.

Table 3.22
Malaysia: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	0.8%	1.0%	0.9%	1.1%	1.1%
	Import	4.2%	3.4%	4.6%	5.2%	4.9%
Beverages and tobacco	Export	0.1%	0.1%	0.1%	0.1%	0.1%
	Import	0.2%	0.2%	0.2%	0.2%	0.2%
Crude materials	Export	7.3%	5.9%	4.2%	6.2%	9.0%
	Import	0.9%	0.9%	1.3%	1.2%	1.5%
Mineral fuels, lubricants and related materials	Export	3.2%	4.5%	5.1%	6.6%	6.3%
	Import	0.2%	0.8%	0.6%	0.7%	0.4%
Animal and vegetable oils, fats and waxes	**Export**	**18.9%**	**20.5%**	**15.1%**	**13.0%**	**16.0%**
	Import	0.1%	0.1%	0.1%	0.1%	0.1%
Chemicals and related products	Export	9.3%	7.9%	7.9%	8.4%	8.7%
	Import	6.2%	7.4%	6.7%	8.4%	9.0%
Manufactured goods	Export	6.9%	7.0%	7.4%	8.2%	8.6%
	Import	14.2%	14.3%	11.2%	15.1%	16.0%
Machinery and transport equipment	**Export**	**49.7%**	**25.3%**	**56.9%**	**53.1%**	**47.4%**
	Import	**65.3%**	**55.0%**	**66.6%**	**60.0%**	**58.4%**
Miscellaneous manufactured articles	Export	3.0%	2.5%	2.2%	3.1%	2.5%
	Import	6.5%	8.0%	7.9%	8.5%	9.1%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

Trade Structure between Thailand and China

Table 3.23 lists the export and import structure between Thailand and China after the implementation of CAFTA. The percentage of machinery and transport equipment reduced apparently from 45.9% in 2008 to 29.3% in 2011, but it still ranked the first in the export trade structure. The percentage of crude materials ranked the second in the exports of 2011, increasing from 15.4% in 2007 to 23.6% in 2011. The percentage of chemicals and related products increased to 20.7% in 2011, and its ranking in the exports declined from the second to the third place. Hence, there have been changes in the export trade structure due to the ranking changes of main export products.

The percentage of machinery and transport equipment in total imports was 52.5% in 2011, which has been the top rank among exports. The percentage of machinery and transport equipment and manufactured goods in total imports added up to more than 70%. They were the main import products. Although the percentage of different categories had a few fluctuations, their rankings in the imports did not change in five years. Thus, there have been no crucial changes in the import trade structure of Thailand from China after the implementation of CAFTA.

Table 3.23
Thailand: Trade Structure to China

Year		**2007**	**2008**	**2009**	**2010**	**2011**
Food and live animals	Export	6.3%	4.5%	7.7%	7.2%	7.7%
	Import	2.7%	2.9%	3.6%	2.8%	3.2%
Beverages and tobacco	Export	0.0%	0.0%	0.0%	0.0%	0.0%
	Import	0.1%	0.1%	0.0%	0.0%	0.0%
Crude materials	Export	15.4%	15.8%	14.0%	16.0%	23.6%
	Import	0.9%	1.1%	1.0%	1.2%	1.1%
Mineral fuels, lubricants and related materials	Export	8.3%	10.9%	6.8%	6.5%	4.1%
	Import	1.0%	1.2%	0.6%	0.9%	0.5%
Animal and vegetable oils, fats and waxes	Export	0.2%	0.4%	0.1%	0.2%	0.1%
	Import	0.0%	0.0%	0.0%	0.0%	0.0%
Chemicals and related products	Export	16.7%	13.1%	17.0%	18.3%	20.7%
	Import	9.8%	12.2%	10.7%	10.9%	11.5%
Manufactured goods	Export	7.5%	7.0%	8.5%	10.2%	11.9%
	Import	**29.0%**	**25.3%**	**19.1%**	**21.2%**	**21.7%**
Machinery and transport equipment	**Export**	**43.0%**	**45.9%**	**43.4%**	**38.8%**	**29.3%**
	Import	**48.3%**	**48.6%**	**55.0%**	**53.2%**	**52.5%**
Miscellaneous manufactured articles	Export	2.5%	2.4%	2.4%	2.9%	2.5%
	Import	8.2%	8.5%	9.9%	9.8%	9.4%

Source: China's Ministry of Commerce Statistics (http://data.mofcom.gov.cn/).

3.5.3 Service Trade between China and ASEAN

In this sub-section, the facts on service trade between China and ASEAN after CAFTA's establishment are presented. The world service trade is first introduced as the background, followed by the development of China's service trade, the development of ASEAN's service trade, and the development of service trade between them after the establishment of CAFTA.

3.5.3.1 World Service Trade

The total value of imports and exports in world service increased from USD 2,870 billion in 2000 to USD7170 billion in 2010 (Data from WTO Database).

The value in 2010 was about 2.55 times than that in 2000. Therefore, the world service trade has increased rapidly in the ten years.

Figure 3.8 shows the percentage of service exports in the world from 1980 to 2010. The percentage of service exports of total world value of goods and services gradually increased and the percentage of service exports in total value of world production also rose in 1980-2010. This indicates that service industries are playing a more and more important role in world trade and world production. The data in Figure 3.8 are from WTO Database.

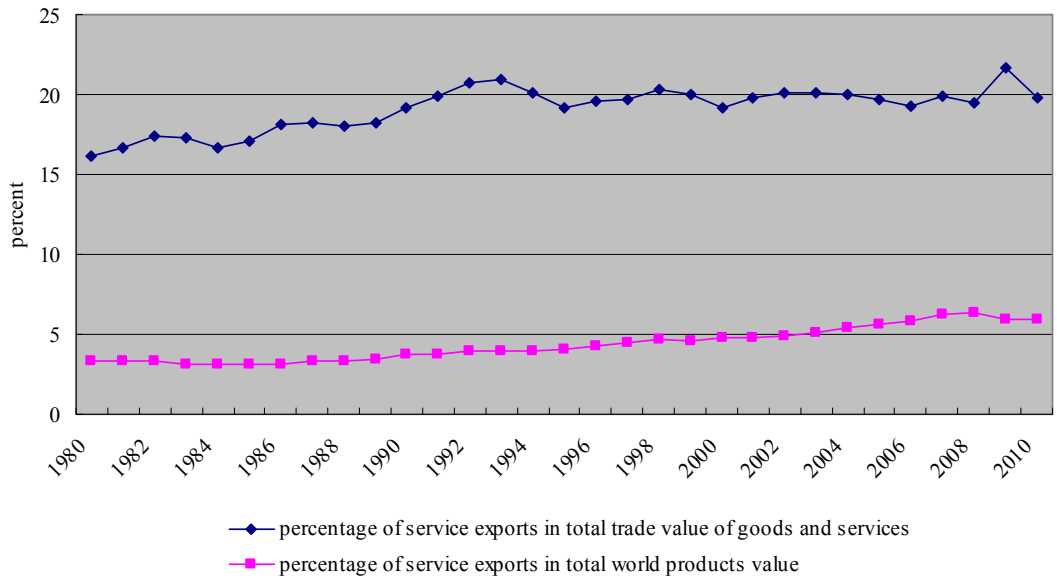
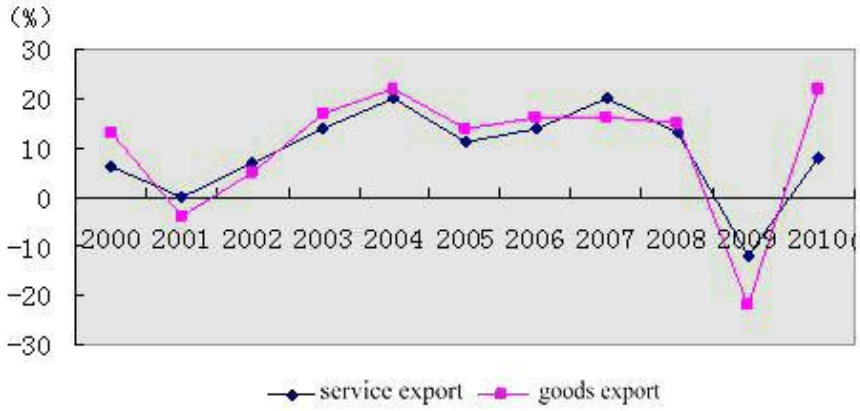


Figure 3.8
The percentage of world service exports

The growth rates of world service export and world goods export in 2000-2010 are presented in Figure 3.9. It shows the changes of the growth rates of service exports generally are in accordance with those of goods export in 2000-2010.



Source: WTO Database

Figure 3.9
Growth Rates: World Service Export and World Goods Export

In the last ten years, international investment has been more inclined to the service industries, and FDI in service industries has accounted for two thirds of the global FDI flows, which promotes the development of international service trade (China$_3$, 2012). However, service trade has an unbalanced development in the whole world (Gao & Tan, 2006). Developed countries are the core in international service trade, which has better competitive power. However, relatively their growth rate slows down. For developing countries, service trade relatively lags compared to developed states.

3.5.3.2 China's Service Trade

Service trade of China has been growing rapidly in recent years. In 2010, the percentage of service industries in GDP was 41.05%, more than 24.47% in 1970. In 2012, the total value of China's service trade was USD 470.048 billion, and

its growth rate was 12.3% greater than 10.3% of the average growth rate of world service trade. In 1982, China's service trade accounted for 0.6% in world service trade, which ranked 34th among countries of the world. However, the percentage of China's service trade in world service trade was 5.6%, which ranked 3rd among the countries of the world in 2012 (data from China Commerce Ministry). Thus, China has made great progress in service trade.

China's export of service trade has seen a rapid growth after CAFTA. Its growth rate has always been higher than the average growth rate of service trade in the world in general, and East Asia, specifically. Table 3.24 shows that the average growth rate of China's exports in service trade was 18.86% in 2001-2010, which was greater than the world's 9.37% and East Asia's 11.64%. In 2010, the growth rate was 32.15%, which was greater than the growth rate of the world and East Asia. In 2009, the growth rates were negative due to the impact of the world financial crisis (Gu, 2010), similar to the growth rates of commodity trade.

Table 3.24
Global Service Exports

The Growth Rate of Export Trade in Services (Unit %)

	1996-2000	2001-2010	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
World	4.49	9.37	0.42	7.25	15.15	20.85	11.87	13.22	19.75	12.99	-11.73	8.01
East Asia	0.97	11.64	-0.75	7.97	11.47	26.81	13.06	14.37	22.00	15.84	-10.55	21.48
China	10.24	18.86	9.54	19.23	17.59	33.60	19.17	23.65	32.83	20.38	-11.94	32.15

Source: United Nations Database (http://unstats.un.org/).

Meanwhile, China's import of service trade grew rapidly after CAFTA. Table 3.25 shows the growth rate of China's imports in services. It is also greater than the growth rate of the world and East Asia. The average growth rate of China's imports in services was 18.29% in 2001-2010, which was greater than the world's 8.83% and East Asia's 8.91%. In 2010, the growth rate was 21.63%, which was much greater than that of the world and East Asia. In 2009, the growth rates of service imports were negative growth rates, same as those of service exports. The negative growth is due to the impact of the world financial crisis (Gu, 2010; Wang, 2012).

Table 3.25
Global Service Imports

The Growth Rate of Import Trade in Services (Unit %)

	1996-2000	2001-2010	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
World	4.08	8.83	1.07	4.39	15.21	18.63	11.23	11.48	18.01	13.84	-10.97	8.95
East Asia	1.72	8.91	-1.81	5.39	8.22	21.53	9.33	10.66	17.34	14.64	-9.50	17.17
China	7.39	18.29	8.98	18.49	18.87	30.42	16.17	20.33	29.04	22.14	0.01	21.63

Source: United Nations Database (http://unstats.un.org/).

With the stable growth rate of service trade, the percentage of China's service trade in the world is increasing fast. In 1982, China's exports in services just occupied 0.63% of the world exports in services. But in 2010, the percentage was up to 4.55%, and China's exports & imports in services occupied 5.5 % of the world trade in services. At the same time, China's ranking in the world trade in services rose. In 1995, China's ranking in world exports in services was 16th, and ranking in world imports in services was 12th. However, in 2010, they

respectively changed to 4th and 3rd (from WTO Database). In 2012, the ranking of total value of China's service trade of world services had 3rd ranking.

The relative scale of China's service trade is smaller, though the absolute scale developed rapidly. The relative scale means the percentage of China's service trade of GDP or total service trade value in goods and services. In 2010, China's exports in services occupied 2.98% in GDP and 9.86% in total trade value, including goods and services. In the same year, China's imports in services occupied 3.37% in GDP and 13.19% in total trade value. But in East Asia, the average percentages in GDP and in total trade value were about 6% and 15% in 2010. So there is still a gap to pursue for China. The data are from China's Ministry of Commerce.

In addition, there is an imbalance for China's trade in services in the long-term, as shown in Figure 3.10. Before 1994, China's service trade was generally balance. After 1994, balance deficit appeared in service trade, which became larger year by year except for several years. In 2009, the balance deficit was greater than that in any other year due to the impact of the global economic crisis.

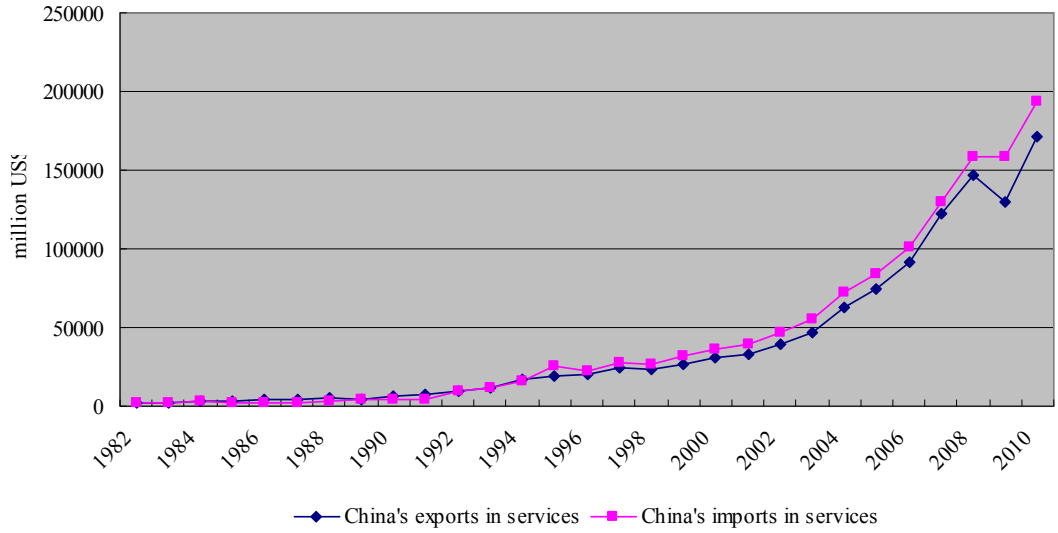


Figure 3.10
China: Exports and Imports in Services

Tables 3.26 and 3.27 show the percentage of different departments in service trade after the establishment of CAFTA. In 2001-2011, the percentage of modern service in service exports had a rapid growth, from 32.72% in 2001 to 53.26% in 2010. However, the percentage of tourism reduced, from 53.37% in 2001 to 26.76% in 2010. The percentage of transport had a 6% growth in 2010 compared to 2001 (refer to Table 3.26). In the same period, the percentage in service imports had slight fluctuation. The percentage of transportation and modern service grew slightly, but tourism had about 7% reduction (refer to Table 3.27).

Table 3.26
China: Service Exports (2001-2010)

Exports	**2001**	**2003**	**2005**	**2007**	**2008**	**2009**	**2010**
Transport	13.90	16.92	20.73	25.63	26.11	18.19	19.98
Tourism	53.37	37.25	39.37	30.47	27.76	30.63	26.76
Modern Service	32.72	45.84	39.89	43.90	46.12	51.18	53.26
Total Exports	100	100	100	100	100	100	100

Source: United Nations Database (http://unstats.un.org/).

Table 3.27
China: Service Imports (2001-2010)

Imports	**2001**	**2003**	**2005**	**2007**	**2008**	**2009**	**2010**
Transport	28.84	32.97	33.95	33.26	31.67	29.30	32.72
Tourism	35.42	27.46	25.97	22.89	22.75	27.49	28.39
Modern Service	35.74	39.57	40.08	43.85	45.58	43.20	38.89
Total Imports	100	100	100	100	100	100	100

Source: United Nations Database (http://unstats.un.org/).

3.5.3.3 ASEAN's Trade in Services

ASEAN's service export occupied 5.88% of market share in the world in 2010, which was 3.5% higher than in 1980. It occupied 17.39% in total exports of goods and services, which was lower than the world average level but higher than the average level of East Asia. ASEAN's service import accounted for 6.33% in the world market, nearly 3% higher than that in 1980. At the same time, ASEAN's service import accounted for 20.59% in total exports of goods and services, which was slightly higher than the world average level, far higher than the average level in East Asia. This shows that ASEAN's service trade has been continuously improving in recent years.

Table 3.28 shows that ASEAN has made great progress in service trade after CAFTA. ASEAN's service trade volume reached USD 373.542 billion, which was more than twice that in 2000. But ASEAN's trade in services has been in deficit over the last ten years.

There are big differences in service trade among members of ASEAN (refer to Table 3.28). Singapore, Thailand, Malaysia, Indonesia, Philippines and Vietnam have been the subject of ASEAN's service trade, accounting for 98% share in ASEAN's trade in services. Singapore accounted for the largest share and has shown a rising trend. Singapore accounted for more than 34% in ASEAN's exports in services in 1996, which was up to 51% in 2009. But the share of Thailand has declined gradually. Thailand's share accounted for more than 20% in 1996, which fell to 16% in 2009. Malaysia's ranking is 3rd, whose share was 15% in 2009. ASEAN's service trade has a higher degree of concentration in these four countries, whose rankings are in the top four places in ASEAN's service trade. The four countries' share reached 90% of the total service trade in ASEAN.

In addition, every member plays a different role in ASEAN's service trade balance (refer to Table 3.28). Singapore is the biggest country in service trade surplus among ASEAN's members. Since 2005, Singapore has trade surplus in service trade, which has been growing gradually. Philippines, Malaysia,

Cambodia and Laos also have service trade surplus. However Indonesia has become the first service trade deficit country in ASEAN, followed by Thailand, Vietnam, Brunei and Burma. These countries have made ASEAN's overall service to be in deficit. The data is abstracted from United Nations Service Trade Database.

Table 3.28

ASEAN: Trade in Services (2000-2010)

US$100million		**2000**	**2002**	**2005**	**2007**	**2008**	**2009**	**2010**
	export	690.86	758.60	1192.4	1762.8	1983.8	1856.15	-----
ASEAN	import	881.80	946.02	1388.9	1832.9	2119.8	1879.27	-----
	net	-190.94	-187.42	-196.57	-70.14	-135.96	-23.12	-----
	export	285.40	309.20	556.75	851.55	994.35	937.45	1008.84
Singapore	import	300.95	336.71	552.33	747.00	875.45	795.04	985.06
	net	-15.55	-27.51	4.41	104.55	118.90	142.42	23.78
	export	138.68	153.91	201.63	303.57	333.83	299.41	342.94
Thailand	import	154.60	167.20	270.27	384.25	462.63	377.56	449.69
	net	-15.92	-13.30	-68.64	-80.69	-128.80	-78.15	-96.75
	export	139.41	148.78	195.76	294.62	303.21	287.69	325.91
Malaysia	import	167.47	164.48	219.56	286.68	302.70	274.72	320.65
	net	-28.07	-15.70	-23.80	7.94	0.51	12.98	5.26
	export	3.63	4.27	6.16	8.13	8.67	9.15	-----
Brunei	import	10.43	8.76	11.10	13.17	14.03	14.34	-----
	net exp.	-6.80	-4.49	-4.94	-5.04	-5.35	-5.19	-----
	export	1.76	1.76	2.04	2.78	4.02	3.91	-----
Laos.	import	0.43	0.29	0.39	0.44	0.85	1.20	-----
	net	1.33	1.47	1.65	2.34	3.16	2.71	-----
	export	4.78	4.26	2.59	3.81	3.56	2.93	-----
Myanmar	import	3.28	3.09	5.02	5.91	6.15	6.36	-----
	net	1.50	1.17	-2.43	-2.10	-2.59	-3.43	-----
	export	52.14	66.63	129.64	125.50	152.91	132.02	167.66
Indonesia	import	156.37	170.45	222.16	246.54	287.33	234.48	260.9
	net	-104.23	-103.82	-92.52	-121.04	-134.42	-102.46	-93.24
	export	33.77	34.28	45.25	97.66	97.17	110.14	140.95
Philippine	import	52.47	54.30	58.65	75.17	85.57	89.00	113.6
	net	-18.70	-20.02	-13.40	22.49	11.60	21.14	27.35
	export	27.02	29.48	41.76	60.30	70.06	57.66	74.6
Vietnam	import	32.52	36.98	44.72	67.85	79.56	81.87	99.21
	net	-5.50	-7.50	-2.96	-7.55	-9.50	-24.21	-24.61
	export	4.28	6.04	11.18	15.48	16.45	16.25	17.45
Cambodia	import	3.28	3.76	6.42	9.15	10.36	10.22	10.81
	net	1.01	2.29	4.76	6.32	6.09	6.02	6.64

Note: "-----" refers to no data in 2010.

Source: Untied Nations Database (http://unstats.un.org).

3.5.3.3 Service Trade between China and ASEAN

There are different views on the concept, scope and contents of service trade due to the insufficiency in the development of service trade theories and practice. Moreover, service trade has the features of intangibility and imperceptibility. These have made it very difficult to determine the service trade flows between trade partners (Wang, 2012).

Although International Balance of Payment (BOP) Services Statistics and Foreign Affiliates Trade (FAT) Statistics are widely used in the world, most economies have many difficulties in bilateral service trade statistics. At present, only a few economies show an incomplete report on the bilateral service trade data.

According to the "China Service Trade Development Report" of 2009 and 2010 produced by China's Ministry of Commerce, the service trade value between China and ASEAN is shown in Table 3.29. In 2009, China's export to ASEAN in service trade was USD 94 million, and the share in China's service exports was 7.31%. In the same year, China's import from ASEAN in service trade was USD 126.7 million and the share in China's service imports was 8.01%. China has a service trade deficit to ASEAN. About 50% share of China's service trade was concentrated in East Asia, of which the share of China's service trade with ASEAN was small. Thus, there is a great development potential in service trade

between China and ASEAN.

Table 3.29
China: Trade in Services

US$100million	**exports**				**imports**			
	2008		**2009**		**2008**		**2009**	
	Value	**Percent**	**Value**	**Percent**	**Value**	**Percent**	**Value**	**Percent**
EU	213.4	14.57	171.5	13.34	235.6	14.91	202.6	12.81
ASEAN	103.7	7.08	94	7.31	129.5	8.20	126.7	8.01
East Asia	817	55.79	710.4	55.24	739.3	46.78	738.3	46.69

Source: China Service Trade Development Report in 2009, 2010.

Due to the limitation of bilateral service trade data, it is impossible to do empirical tests on the relationship between CAFTA and the growth of service trade between China and ASEAN.

3.5.4 Investment between China and ASEAN

With the rapid development of trade between China and ASEAN, FDI has also shown quick growth after CAFTA. According to China's Statistical Yearbook (2003-2012), the FDI of ASEAN to China was USD 7004.78 million in 2011; while it was USD 3255.94 million in 2002 (refer to Figure 3.11). From 2002 to 2011, the average growth rate was 10.09%.

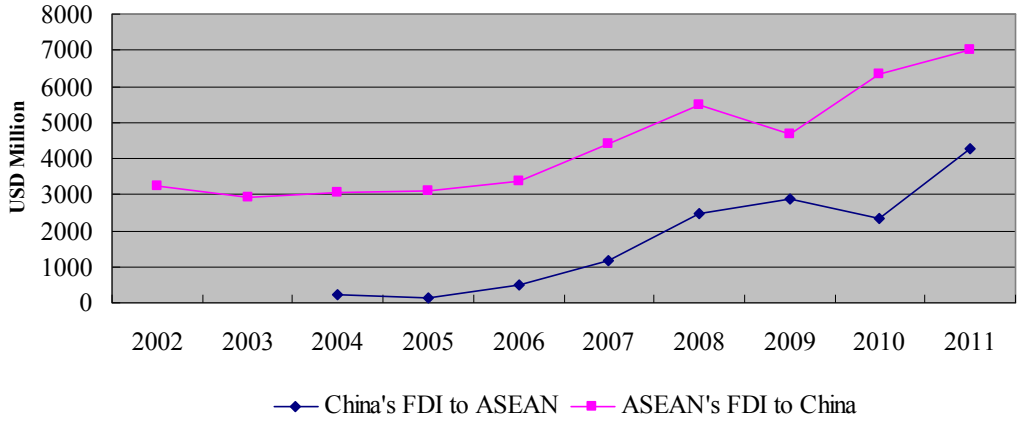


Figure 3.11
FDI between China and ASEAN

The net FDI of China to ASEAN, was from USD 220.52 million in 2004 up to USD 4280.45 million in 2011 (refer to Figure 3.11). The average growth rate was 77.79% in 2011 compared to 2004.

These facts show that FDI underwent rapid growth with CAFTA. However, did CAFTA cause the FDI growth between China and ASEAN? Further analysis answers this question by estimating the relationship between CAFTA and FDI growth in the next chapter.

3.6 Summary

This chapter introduces the background and development of CAFTA. Firstly, the regional integration of China and ASEAN are presented separately as the policy basis and background for the establishment of CAFTA.

Secondly, the agreements and contents of CAFTA are introduced as the basis for CAFTA implementation. In general, goods trade liberalization, service trade liberalization and investment liberalization make up the contents of CAFTA. Thus, the effects of CAFTA actually refer to the effects of trade and investment liberalization of CAFTA.

Finally, this chapter describes the development of trade and investment between China and ASEAN, especially after CAFTA. The analyses present the real situation about trade and FDI after 2002. The commodity trade, service trade, and FDI between China and ASEAN have been rapidly growing while trade structure has changed since the establishment of CAFTA.

Further quantitative analyses (empirical modes) in the next chapter are employed to estimate the relationships between CAFTA and the growth or changes of trade and FDI, i.e., to analyze whether CAFTA causes the growth and changes of trade and FDI between China and ASEAN.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This study adopts both quantitative and qualitative approaches. The quantitative method is used to estimate the effects of CAFTA on trade and FDI in China based on five models. Specifically, the gravity model is employed to examine the effects of trade and FDI flows; and the trade structure model is used to evaluate the changes in trade structure between China and ASEAN members. Trade complementarities index (TCI) and relative trade competitiveness index are utilized to estimate the changes of trade complementarities and competition between both sides after the existence of CAFTA. Finally, the policy recommendations will be presented based on qualitative analyses.

4.2 Hypothesis Development

The situations of trade and investment between China and ASEAN have been analyzed in chapter 3. After the establishment of CAFTA, trade and investment between both sides grew rapidly, followed by their trade structure, trade complementarities and trade competition. However, how does CAFTA influence these growths and changes? To answer this question, the study develops five basic hypotheses:

4.2.1 Hypotheses on Trade Flow

This study employs the gravity model to estimate the relationship between CAFTA and the trade flows in China. Based on the theory of Customs Union, economic integration would cause trade creation (i.e., trade growth of members) due to tariff reduction and elimination. Thus, this study proposes that:

Hypothesis 1 (H_1): CAFTA positively influences trade flows in China.

Further, this study examines the difference between export flow effect and import flow effect caused by CAFTA. For this, the study separately estimates the relationships between the export flow and CAFTA, followed by the relationship between the import flow and CAFTA. Accordingly, two hypotheses are developed:

Hypothesis 2 (H_2): CAFTA positively influences the export flow in China.

Hypothesis 3 (H_3): CAFTA positively influences the import flow in China.

These three hypotheses answer research objective 1, i.e., to evaluate how CAFTA improves the trade flows in China (refer to Section 1.4, Page 6).

4.2.2 Hypotheses on Trade Structure

The trade structure model is used to estimate the relationship between CAFTA and the intra-industry trade structure between China and ASEAN members. Thus, this study proposes that:

Hypothesis 4 (H_4): CAFTA positively influences the trade structure between China and ASEAN.

This hypothesis answers research objective 2, i.e., to estimate the effect of CAFTA on trade structure between China and ASEAN (refer to Section 1.4, Page 6).

4.2.3 Hypotheses on Trade Complementarities and Competition

This study utilizes TCI and trade competitiveness index to analyze the changes in the trade complementarities and competition between China and ASEAN after the establishment of CAFTA. Due to the great difference between export structure and import structure, this study separately examines the trade complementarities between the export structure of China and the import structure of ASEAN members, and the trade complementarities between the import structure of China and the export structure of ASEAN members. Hence, the hypotheses are:

Hypothesis 5 (H_5): CAFTA weakens the trade complementarities between the export structure of China and the import structure of ASEAN members.

Hypothesis 6 (H_6): CAFTA weakens the trade complementarities between the import structure of China and the export structure of ASEAN members.

Next, this study examines the trade competition between China and ASEAN members in 16 categories of products (HS92), using the relative competitiveness index. The hypothesis is:

Hypothesis 7 (H_7): CAFTA intensifies the trade competition between China and ASEAN members.

These three hypotheses answer research objective 3, i.e., to estimate the effect of CAFTA on trade complementarities and competition between China and ASEAN (refer to Section 1.4, Page 6).

4.2.4 Hypotheses on Regional Trade Flows

Based on the gravity model, the trade flow effect of CAFTA on different regions is analyzed in two steps: the effect on seven regions, followed by the effect on 22 provinces. Thus, two hypotheses are:

Hypothesis 8 (H_8): The trade flows of different regions are positively correlated to CAFTA.

Hypothesis 9 (H_9): The trade flows of different provinces are positively correlated to CAFTA.

These hypotheses answer research objective 4, i.e., to analyze the effect of CAFTA on different regions in China (refer to Section 1.4, Page 6).

4.2.5 Hypotheses on FDI

This study employs the investment gravity model to estimate the relationship between CAFTA and FDI outflow of China, and the relationship between CAFTA and FDI inflow of China. The FDI effect of regional economic integration can be divided into the FDI effect of trade liberalization and the FDI effect of investment liberalization (Yanopoulos, 1990; Unctad, 1990; Motta and Norman, 1996; Blomstrom & Kokko, 1997; Neary, 2002). Therefore, this study also separately estimates the FDI flow effects due to trade liberalization of CAFTA and investment liberalization of CAFTA.

There are four steps to estimate this:

1) the relationship between the trade liberalization of CAFTA and the FDI outflow of China;

2) the relationship between investment liberalization of CAFTA and FDI outflow of China;

3) the relationship between the trade liberalization of CAFTA and the FDI inflow of China; and

4) the relationship between the investment liberalization of CAFTA and the FDI inflow of China.

Therefore, four hypotheses are:

Hypothesis 10 (H_{10}): FDI outflow of China is positively correlated to trade liberalization of CAFTA (i.e., trade liberalization improves the FDI outflow of China).

Hypothesis 11 (H_{11}): FDI outflow of China is positively correlated to investment liberalization of CAFTA (i.e., investment liberalization improves the FDI outflow of China).

Hypothesis 12 (H_{12}): FDI inflow of China is positively correlated to trade liberalization of CAFTA (i.e., trade liberalization improves the FDI inflow of China).

Hypothesis 13 (H_{13}): FDI inflow of China is positively correlated to investment liberalization of CAFTA (i.e., investment liberalization improves the FDI inflow of China).

These four hypotheses answer the research objective 5, i.e., to evaluate whether CAFTA promotes FDI flows in China (refer to Section 1.4, Page 6).

4.3 Research Framework

Based on problem statements and research objectives, this study employs five models to examine the effects of CAFTA on trade flow, trade structure, trade complementarities and competition, trade flow effect of different regions and FDI flows, to fulfill the five research objectives. The overall framework is summarized in Figure 4.1.

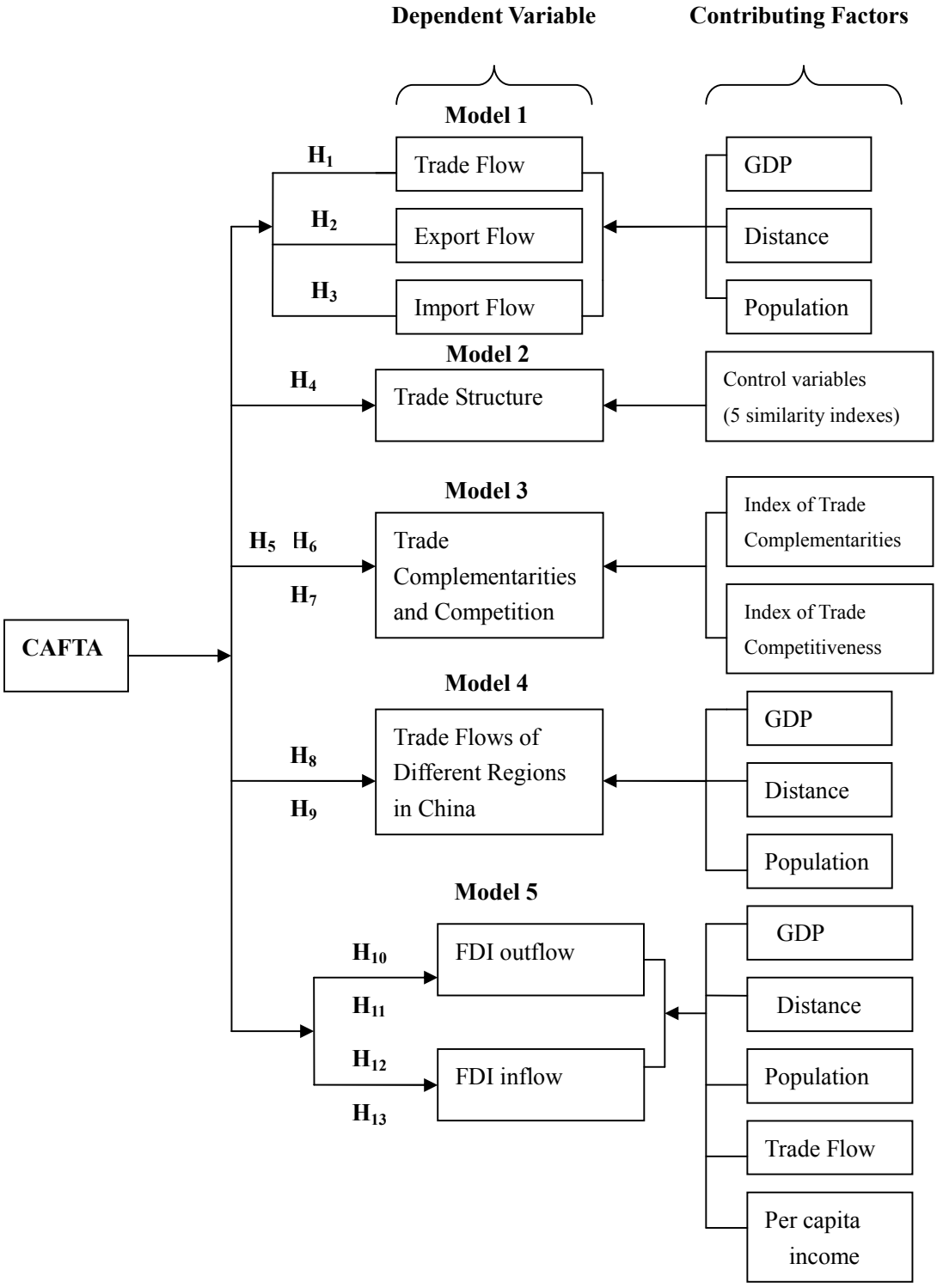


Figure 4.1
Research framework

Generally, this study focuses on the effects CAFTA on the trade and FDI of China, including the effects on trade flows, trade structure, trade complementarities and competition, the different regions of China, and FDI, by accordingly employing five models.

4.4 Research Models

This study employs five models to answer five research questions and five research objectives and to test 13 hypotheses.

4.4.1 Model 1: Trade Flow Effect

Gravity model is more widely used to estimate the trade flow effect of FTAs and CAFTA compared to the CGE, CHINGEM and GTAP models (Li, Gong & Meng, 2007). For instance, some researchers (Chen & Meng, 2007; Chen, 2009; Liang & Yin, 2009) have analyzed the total trade flow effect of CAFTA based on gravity model.

The trade flow effect model in this study is based on the single-country gravity model that analyzes the effect of CAFTA on total trade flow of China followed by the effects on the export and import flows. Model 1 separately estimates the effect of CAFTA on trade flows of China based on three regression analyses. Model 1_a is employed to evaluate the effect of CAFTA on total trade flow; Model 1_b estimates the effect of CAFTA on export flow; and Model 1_c analyzes

the effect of CAFTA on import trade flow of China. Basically, these models are:

$$\ln T_{cjt} = \alpha_0 + \alpha_1 \ln(Y_{jt} Y_{ct}) + \alpha_2 \ln D_{jt} + \alpha_3 \ln(POP_{jt} POP_{ct}) + \alpha_4 P_{jt} + \varepsilon_{cjt}$$

(Model 1_a)

$$\ln X_{cjt} = \alpha_0 + \alpha_1 \ln\left(Y_{jt} Y_{ct}\right) + \alpha_2 \ln D_{jt} + \alpha_3 \ln\left(POP_{jt} POP_{ct}\right) + \alpha_4 P_{jt} + \varepsilon_{cjt}$$

(Model 1_b)

$$\ln M_{cjt} = \alpha_0 + \alpha_1 \ln\left(Y_{jt} Y_{ct}\right) + \alpha_2 \ln D_{jt} + \alpha_3 \ln\left(POP_{jt} POP_{ct}\right) + \alpha_4 P_{jt} + \varepsilon_{cjt}$$

(Model 1_c)

The definition of variables for Model 1 is summarized in Table 4.1.

Table 4.1
Model 1: Variable Definition

Sign	Variable	Definition
T_{cjt}	Total Trade Value	China's total trade value with county j in t year
X_{cjt}	Export Value	China's export to country j in t year
M_{cjt}	Import Value	China's import from country j in t year
Y_{jt}	Economic scale	GDP of country j in t year
Y_{ct}	Economic scale	GDP of China in t year
POP_{jt}	Population	Population of country j in t year
POP_{ct}	Population	Population of China in t year
D_{cjt}	Distance	The distance between China and country j in t year
P_{jt}	Effect of CAFTA	P_j=1 if country j is a member of CAFTA in t year; P_j=0 if country j is a non-member of CAFTA in t year.

Generally, the total trade, export and import values are dependent variables, determined by four independent variables: GDP (China and its trade partners), population (China and its trade partners), distance (between China and its trade partners), and the effect of CAFTA (dummy variable). The year 2004 is used as the start of implementation of CAFTA (different from previous studies that employed year 2002 as the start), which means that variable P_{jt} =1 if country j is a member of CAFTA since 2004 (i.e., $t \geq 2004$).

Coefficient α_4 (in Model 1_a, Model 1_b, and Model 1_c) reflects the effects of CAFTA on total trade flow, export flow and import flow of China. Coefficient α_1 represents the relationship between trade flow (total trade flow, export flow

and import flow) and GDP. Coefficient α_2 represents the relationship between trade flow (total trade flow, export flow and import flow) and population. Coefficient α_3 reflects the relationship between trade flow (total trade flow, export flow and import flow) and distance.

Model 1 evaluates H_1, H_2 and H_3 to answer research question 1 and research objective 1 and to estimate the effect of CAFTA on total trade flow, export flow and import flow.

4.4.2 Model 2: Trade Structure Effect

A few studies examined the trade structure effect of economic integration. For instance, Egger et al. (2008), Zhang and Wang (2011) used trade structure model to estimate the intra-industry trade structure based on DID model. The model considers the establishment of the organization of economic integration as an endogenous variable.

Based on the trade structure model, Model 2 in this study examines the effect of CAFTA on trade structure between China and ASEAN and tests H_4 to answer research question 2 and research objective 2 based on the trade structure model (Egger et al., 2008; Zhang and Wang, 2011).

Firstly, the Grubel-Lloyd Index (GLI), the most often used intra-industry index to express intra-industry trade structure, which is the dependent variable in Model 2 is use.

$$GLI_{ijk} = 1 - \frac{\left| X_{ijk} - M_{ijk} \right|}{\left(X_{ijk} + M_{ijk} \right)} \qquad (4.1)$$

Variable definition in G-L Index is listed in Table 4.2.

Table 4.2
G-L Index: Variable Definition

Variable	**Definition**
GLI_{ijk}	the intra-industry trade index
i	country i
j	country j
k	k kind of product
X_{ijk}	the export of k product between country i and country j
M_{ijk}	the import of k product between country i and country j

The Grubel-Lloyd Index has the following interpretation (Li, 2010; Tong, 2000).

$0 \leq GLI_{ijk} \leq 1$

If the value of GLI_{ijk} is closer to 1, the level of intra-industry trade is higher.

If $GLI_{ijk} = 0$, no intra-industry trade (but only inter-industry trade).

If $GLI_{ijk} = 1$, no inter-industry trade (but only intra-industry trade).

Secondly, Model 2 selects the similarity indices of economic structure as control variable, including consumption similarity index (SC_{ijt}), similarity index of government purchase (SG_{ijt}), investment similarity index (SI_{ijt}), population similarity index (SP_{ijt}) and similarity index of labor efficiency (SL_{ijt}) as introduced in Table 4.3, based on the trade structure model (Egger et al., 2008; Zhang & Wang, 2011). Five similarity indices are presented as follows:

$$SC_{ijt} = \ln\left\{1-\left[C_{it}/\left(C_{it}+C_{jt}\right)\right]^2-\left[C_{jt}/\left(C_{it}+C_{jt}\right)\right]^2\right\} \quad (4.2)$$

$$SG_{ijt} = \ln\left\{1-\left[G_{it}/\left(G_{it}+G_{jt}\right)\right]^2-\left[G_{jt}/\left(G_{it}+G_{jt}\right)\right]^2\right\} \quad (4.3)$$

$$SI_{ijt} = \ln\left\{1-\left[I_{it}/\left(I_{it}+I_{jt}\right)\right]^2-\left[I_{jt}/\left(I_{it}+I_{jt}\right)\right]^2\right\} \quad (4.4)$$

$$SP_{ijt} = \ln\left\{1-\left[P_{it}/\left(P_{it}+P_{jt}\right)\right]^2-\left[P_{jt}/\left(P_{it}+P_{jt}\right)\right]^2\right\} \quad (4.5)$$

$$SL_{ijt} = \ln\left\{1-\left[L_{it}/\left(L_{it}+L_{jt}\right)\right]^2-\left[L_{jt}/\left(L_{it}+L_{jt}\right)\right]^2\right\} \quad (4.6)$$

Finally, Model 2 (trade structure model) is presented as following:

$$GLI_{ijt} = \alpha + \beta_1 d_i + \beta_2 d_t + \beta_3 d_i \times d_t + \beta_4 (SC_{ijt}, SG_{ijt}, SI_{ijt}, SP_{ijt}, SL_{ijt}) + \varepsilon_{ijt}$$

(Model 2)

Table 4.3
Model 2: Variable Definition

Variable	**Definition**
GLI_{ijt}	trade structure index
SC_{ijt}	consumption similarity index
SG_{ijt}	similarity index of government purchase
SI_{ijt}	investment similarity index
SP_{ijt}	population similarity index
SL_{ijt}	similarity index of labor efficiency
i	country i
j	country j
k	k kind of product
t	time
d_i	dummy variables
	If state j is a member of i free trade area, d_i=1;
	If state j is not a member of i free trade area, d_i=0.
d_t	dummy variables
	If it is before the establishment of CAFTA, d_t=0;
	If it is after the establishment of CAFTA, d_t=1.
C	Per capita consumption
G	Per capita government expenditure
I	Per capita investment
P	Population
L	Labor productivity
ε_{ijt}	Model errors

In Model 2, coefficient β_3 represents the net effect of CAFTA on trade structure. Year 2004 is as the implementation of CAFTA, i.e., if t ≥ 2004, d_t=1,

which is different from Zhang and Wang (2011) (2002 as the start of CAFTA). In addition, the previous study (Zhang & Wang, 2011) only focused on single-country model, i.e., the dependent variable was intra-industry trade index of one country (China). This study extends to a multi-country model, i.e., the dependent variable is intra-industry trade index of multi-countries (including China and 10 ASEAN members).

4.4.3 Model 3: Trade Complementarities and Competition Effect

The study uses two indices to evaluate H_5, H_6 and H_7, and to answer research question 3 and research objective 3. At first, TCI is applied to test H_5 and H_6, and to estimate the trade complementarities between China and ASEAN. Secondly, the relative trade competitiveness index is adopted to analyze the trade competition between China an ASEAN and to test H_6.

4.4.3.1 Trade complementarities index

Several indices are employed to measure trade complementarities, including RCA, RTA, RC, TCI, TII, and TSC. However, TCI is a better index to measure trade complementarities because it better reflects the comparative advantage, and it is used widely as compared to other indices (e.g. Fu, 2005; Wang & Fan, 2006; Zhou & Du, 2006; Wang, 2008; Yu, 2008).

Thus, the study employs TCI to analyze the trade complementarities between China and ASEAN and to test H_5 and H_6. When the exports of China and the imports of ASEAN are more accordant, the index is larger, i.e., the trade complementarities are much greater between China and ASEAN.

The complementarities index can be expressed as follows:

$$TCI_{ij} = \sum [(RCA_{xik} \times RCA_{mjk}) \times (W_k / W)] \qquad \text{(Model } 3_a\text{)}$$

RCA_{xik} and RCA_{mjk} are calculated as following.

$$RCA_{xik} = (X_{ik} / X_i) / (X_{wk} / X_w) \qquad (4.7)$$

$$RCA_{mjk} = (M_{jk} / M_j) / (M_{wk} / M_w) \qquad (4.8)$$

Variable definitions in Model 3_a are presented in Table 4.4.

Table 4.4
Model 3_a: Variables Definition

Variable	Definition
C_{ij}	the complementarities index
RCA_{xik}	revealed comparative advantage of k product in country i
RCA_{mjk}	revealed comparative advantage of k product in country j
X_{ik}	the export of k product in country i
X_i	the export of all products in country i
X_{wk}	the export of k product in the world
X_w	the export in the world
M_{jk}	the import of k product in country j
M_j	the import of all products in country j
M_{wk}	the import of k product in the world
M_w	the import in the world
W_k	total import and export of k product in the world
W	total import and export of all products in the world

Trade complementarities exist when the exports of a country coincide with the imports of another country (Fu, 2005). In fact, TCI is use to compare the export trade structure of a country with the import trade structure of another country. For the reason that the export trade structure is different from the import trade structure in a country, there are two ways to calculate the TCI: one way is to calculate it based on China's exports and the imports of ASEAN members, which will indicate the trade complementarities between the export trade structure of China and the import trade structure of ASEAN members (H_5); the

other way is to calculate it based on China's imports and the exports of ASEAN members, which will examine the trade complementarities between the import trade structure of China and the export trade structure of ASEAN members (H_6).

4.4.3.2 Relative trade competitiveness index

The relative competitiveness index is employed widely to measure the degree of the trade competition based on RCA (Pan, 2004). Thus, the study uses the relative trade competitiveness index (R_{ijk}) to analyze trade competition between China and ASEAN to test H_7. The relative trade competitiveness index (R_{ijk}) is also based on RCA of two countries. The relative trade competitiveness index reflects the relative competitive advantage of a product in the trade between two countries. The relative trade competitiveness index (R_{ijk}) is derived as follows:

$$R_{ijk} = RCA_{ik} / RCA_{jk} \quad \text{(Model } 3_b\text{)}$$

$$RCA_{ik} = \left(X_{ik} / X_i\right) / \left(X_{wk} / X_w\right) \quad (4.9)$$

$$RCA_{jk} = \left(X_{jk} / X_j\right) / \left(X_{wk} / X_w\right) \quad (4.10)$$

(4.9), (4.10) substituted to Model 3_b:

$$R_{ijk} = \left(X_{ik} / X_i\right) / \left(X_{jk} / X_j\right) \quad (4.11)$$

The definitions of variables in Model 2_b are introduced in Table 4.5.

Table 4.5
Model 3b: Variable Definition

Variable	Definition
R_{ijk}	the relative trade competitiveness index
RCA_{ik}	the revealed comparative advantage of product k in country i
RCA_{ik}	the revealed comparative advantage of product k in country j
X_{ik}	the export of product k in country i
X_{jk}	the export of product k in country j
X_i	the export of all products in country i
X_j	the export of all products in country j
X_{wk}	the export of k product in the world
X_w	the export in the world

i) If R_{ijk}〉1, it means that the comparative advantage of the export of product k in country i is much greater than that in country j.

ii) If R_{ijk}〈1, it means that the comparative advantage of the export of product k in country j is much greater than that in country i.

iii) If R_{ijk}=1, it means that the comparative advantage of the export of product k in country i is the same as that in country j, which indicates that the competition between the two countries is intense.

4.4.4 Model 4: Trade flow effect on Different Regions

Gravity model is more widely used to estimate the trade flow effect of FTAs and CAFTA compared to other models (Chen, 2009; Lang & Yin, 2009; Li, 2010). This model is also used to estimate the trade flow effect of CAFTA on different

regions of China, which tests H_8, H_9 and research objective 4. Model 4 only tests the total trade flow effect on different regions, and is proposed as follows:

$$\ln T_{ijt} = c_0 + c_1 \ln Y_{it} + c_2 Y_{jt} + c_3 \ln D_{jit} + c_4 \ln P_{it} + c_5 \ln P_{jt} + c_6 \ln B_{jt} + \varepsilon_{ijt}$$

(Model 4)

The variable definition in Model 4 is presented in Table 4.6.

Table 4.6
Model 4: Variables Definition

Variable	**Definition**
T_{ijt}	The total trade value between Province i(or Region i) and Country j in t year
Y_{it}	GDP of Province i (or Region i) of China in t year
Y_{jt}	GDP of Country j in t year
D_{ijt}	Distance between Province i (or Region i) and Country j
P_{it}	Population of Province i (or Region i)
P_{jt}	Population of Country j
B_{jt}	It is a dummy variable, expressing if Country j is one of the members of CAFTA in t year. If B_{ijt} =1, Country j is one of the members of CAFTA in t year. If B_{ijt} =0, Country j is not one of the members of CAFTA in t year.
c_0	Constant
ε_{ijt}	Residual

There are two steps to analyze the effects of CAFTA on different regions using the multi-country gravity model. The first step is to analyze the effects on the trade of seven regions of China, which is to test H_8. The second step is to estimate the effect of CAFTA on 22 provinces in China, which is to test H_9.

4.4.5 Model 5: FDI Flow Effect

Investment gravity model was used to analyze the FDI effect of CAFTA in previous studies (Zhu, 2009; Li, 2011). This model was derived from the gravity model in which the dependent variable of trade value was substituted by the FDI. This study also used investment gravity model to examine the FDI effect of CAFTA.

Model 5 is employed to estimate the effect of CAFTA on FDI flows of China, which answers research objective 5 and tests H_{10}, H_{11}, H_{12}, and H_{13}. Previous studies only focused on the effect of CAFTA on the FDI inflow of China. However, this study emphasizes on the effect of CAFTA on both the FDI outflow and inflow of China.

Regional economic integration also causes the effects of FDI creation and diversion (Kindleberger, 1966). Moreover, both trade liberalization and investment liberalization of a FTA could cause the effects of FDI creation and diversion (Yanopoulos, 1990; Unctad, 1990; Motta & Norman, 1996;

Blomstrom & Kokko, 1997; Neary, 2002). Thus, this study examines the effects of CAFTA in two ways: the effect of trade liberalization and the effect of investment liberalization in CAFTA (not undertaken in previous studies).

Based on the investment gravity model, Model 5 is set up as follows:

$$\ln FDI_{cjt} = \alpha_0 + \alpha_1 \ln(Y_{ct} Y_{jt}) + \alpha_2 \ln(P_{ct} P_{jt}) + \alpha_3 \ln D_{cjt} + \alpha_4 \ln Z_{cjt} + \alpha_5 \ln T_{cjt} + \alpha_6 \ln CT_{cjt} + \alpha_7 \ln CI_{cjt} + \varepsilon_{ijt}$$

(Model 5)

The definitions of variables in Model 5 are summarized in Table 4.7.

Table 4.7

Model 5: Variable Definition

Variable	Definition
FDI_{ijt}	FDI inflow of China from Country j in t year, or FDI outflow of China to Country j in t year.
T_{ijt}	The total trade value of China with Country j in t year
Y_{it}	GDP of China in t year
Y_{jt}	GDP of Country j in t year
D_{ijt}	Distance between China and Country j
P_{it}	Population of China
P_{jt}	Population of Country j
CT_{ijt}	It is a dummy variable, which denotes the effect of trade liberalization of CAFTA. If CT_{ijt} =1, Country j is a member of CAFTA in t year (t ≥ 2004). If CT_{ijt} =0, Country j is a member of CAFTA in t year (t＜2004).
CI_{ijt}	It is a dummy variable, which denotes the effect of investment liberalization of CAFTA. If CI_{ijt}=1, Country j is a member of CAFTA in t year (t ≥ 2010). If CI_{ijt} =0, Country j is a member of CAFTA in t year (t＜2010).
Z_{ijt}	$Z_{ijt} = Y'_{jt} / Y'_{it}$ Y'_{jt}: GDP per capita in Country j. Y'_{it}: GDP per capita in China. It is the ratio of per capita income of trade partners. It is to represent the differences in factor endowments between two trade partners. If the ratio of is greater, the differences in factor endowments are greater and the scale of international trade is larger.
c_0	Constant
ε_{ijt}	Residual

The tariff reduction of goods in early harvest program of CAFTA began on 1 January 2004. Thus, year 2004 is selected as the start of trade liberalization in CAFTA. Agreement on investment between China and ASEAN was implemented in February 2010. Therefore, year 2010 is selected as the start of investment liberalization in CAFTA. Previous studies did not distinguish the different effects of trade liberalization and investment liberalization in CAFTA, using year 2002 (in which the comprehensive framework agreement was signed) as the start of the implementation of CAFTA.

This study separately examines the effect of trade liberalization of CAFTA on FDI outflow (H_{10}) and FDI inflow (H_{12}), and the effect of investment liberalization of CAFTA on FDI outflow (H_{11}) and FDI inflow (H_{13}) of China.

In addition, compared to the investment gravity model in the previous studies, this study adds total trade value as a control variable into Model 5 in order to examine the relationship between trade and FDI.

4.5 The Samples and Data Sources

These five models used different samples based on different data sources. There are more than 150 countries or states had trade relations with China, from 1990 to 2011. However, only specific samples are selected due to data limitation. Sections 4.5.1-4.5.5 provide more details.

4.5.1 Model 1

Model 1 selects 144 countries or states (refer to Table 4.8) including 10 ASEAN countries as the study sample to estimate the trade flow effect of CAFTA. This study selects the time series 1990-2011 to make clear the changes of the exports and imports of China before and after implementation of CAFTA. This study expands the sample and updates the new data compared to previous studies.

Table 4.8
Model 1: Sample

The Names of Countries or States
Brunei Darussalam Cambodia Solomon Islands Bulgaria Myanmar Belarus Canada Chile Colombia Democratic Republic of the Congo Costa Rica Croatia Cuba Cyprus Czech Republic Denmark Dominica Ecuador Dominican Republic Estonia El Salvador Equatorial Guinea Ethiopia Eritrea Fiji Finland France Fmr Sudan Gabon Georgia Gambia Germany Ghana Greece Greenland Grenada Guatemala Guinea Guyana Haiti Honduras Hungary Iceland Indonesia Iran (Islamic Republic of) Iraq Ireland Israel Italy India Kuwait Côte d'Ivoire Jamaica Japan Kazakhstan Jordan Kenya Republic of Korea Kyrgyzstan Laos Lebanon Latvia Liberia Libya Lithuania China, Macao Special Madagascar Malawi Malaysia Maldives Mali Malta Mauritania Mauritius Mexico Other Asia, nes Mongolia Republic of Moldova Morocco Mozambique Oman Nepal Netherlands New Caledonia Vanuatu Slovenia New Zealand Nicaragua Niger Nigeria Micronesia (Federated States of) Marshall Islands Pakistan Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Guinea-Bissau Qatar Romania Russian Federation Rwanda Sao Tome and Principe Sark Saudi Arabia Senegal Seychelles Sierra Leone Singapore Slovakia Viet Nam Somalia South Africa Zimbabwe Spain Suriname Swaziland Sweden Switzerland Syrian Arab Republic Tajikistan Thailand Togo Tonga Trinidad and Tobago Tunisia Turkey United Arab Emirates Turkmenistan Uganda Ukraine Egypt Uruguay Uzbekistan The former Yugoslav Republic of Macedonia United States of America United Kingdom of Great Britain and Northern Ireland United Republic of Tanzania Venezuela (Bolivarian Republic of) Samoa Yemen Zambia

The data sources of variables in Model 1 are summarized in Table 4.9.

Table 4.9
Model 1: Data Source of Variables

Variable	**Data Source**
Trade Value	United Nations Commodity Trade Statistics (COMTRADE) Database
GDP	United Nations Database
Population	United Nations Database
Distance	City Distance Calculator

There are different methods to calculate the distance between two partners. One way is to calculate actual mileage between economic centers of trading partners (Bergstrand, 1989). The second way is to use transportation cost to substitute distance (Aitken, 1973). Transportation time from major port of export country (or state) to major port of import country (or state) is used to represent the distance (Zhang 1999, Liao 2003). The present study employs actual kilometers between capitals of trade partners, which is the most often used method (Chen, 2009). The data of distance is calculated by City Distance Calculator (http://www.geobytes.com/citydistance.htm). Eviews 6.0 software is used to deal with the regression analyses of Model 1.

4.5.2 Model 2

ASEAN has FTA arrangements with South Korea, Japan, Australia, New Zealand and India; while China has economic cooperation with Hong Kong, Macau and Taipei. Thus, the sample includes these states to accurately compare the trade structure effect of CAFTA. Eighteen states are involved in the sample

of Model 2 (refer to Table 4.10) to evaluate the trade structure effect of CAFTA. Compared to the previous study (Zhang & Wang, 2011), this study expands the sample. Sample interval is from 1990 to 2011. The regression analysis software is Eviews 6.0.

Table 4.10
Model 2: Sample

Names of Countries or States
Brunei Cambodia Laos Singapore Malaysia Myanmar Thailand Indonesia Philippines Vietnam South Korea Japan Australia New Zealand India Hong Kong Macau and Taipei

Types of goods are divided into 10 categories (refer to Table 4.11) according to the SITC formulated by the United Nations Statistical Commission.

Table 4.11
Catalogue of SITC

SITC	**Name**
0	Food and live animals
1	Beverages and tobacco
2	Crude materials, inedible, except fuels
3	Mineral fuels, lubricants and related materials
4	Animal and vegetable oils, fats and waxes
5	Chemicals and related products, n.e.s.
6	Manufactured goods classified chiefly by material
7	Machinery and transport equipment
8	Miscellaneous manufactured articles
9	Commodities and transactions not classified elsewhere in the SITC

The trade data is from the UN database. Other related data is from the World Bank Database. The Grubel-Lloyd index, trade structure index, consumer similarity index, similarity index of government purchase, investment similarity

index, population similarity index, and similarity index of labor efficiency are calculated based on the data from the World Bank database.

4.5.3 Model 3

Model 3 separately evaluates the trade complementarities effect (Model 3_a) and trade competitiveness effect (Mode 3_b) of CAFTA. The samples and data sources are summarized in Table 4.12.

Table 4.12
Model 3: Sample and Data Source

Model 3	**Model 3_a**	**Mode 3_b**
Sample	China+7 ASEAN members	China+6 ASEAN members
Sample Interval	2001-2011	2001-2011
Categories of Goods	10	16
Data Source	United Nations COMTRADE database	World Trade Organization (WTO) database

Trade complementarities effect (Model 3_a) selects Singapore, Malaysia, Thailand, Indonesia, Philippines, Vietnam, Cambodia and China as the research sample, due to the data limitation. Because the trade of seven ASEAN members occupies most of the total trade of ASEAN, the sample is enough to reflect the trade complementarities between China and ASEAN. Sample interval is from 2001 to 2011 (updated data compared to previous studies). Types of goods are divided into 10 categories (refer to Table 4.12) based on SITC.

Trade competitiveness effect (Mode 3_b) selects Singapore, Malaysia, Thailand, Indonesia, Philippines, Vietnam, and China as the research sample, due to data limitation. Sample interval is from 2001 to 2011 (updated data compared to previous studies). To reflect the changes of relative trade competitiveness on specific products in a different way, types of goods are based on the standard of "Harmonized Commodity Description and Coding System" (HS92) formulated by the Customs Cooperation Council. Sixteen kinds of products are selected due to data limitation (refer to Table 4.13).

Table 4.13
Model 3_b: Categories of Products Sample

Names of products	**Names of products**
1. Agricultural products	9. Manufactures
2. Food	10.Iron and steel
3. Fuels and mining products	11.Telecommunications equipment
4. Fuels	12.Integrated circuits and electronic components
5. Chemicals	13.Automotive products
6. Pharmaceuticals	14.Textiles
7. Machinery and transport equipment	15.Clothing
8. Office and telecom equipment	16.Electronic data processing and office equipment

4.5.4 Model 4

Twenty-two provinces of China are selected to evaluate the regional trade flow effect of China (refer to Table 4.14). The study had planned to involve 30 provinces of China mainland as the sample, but finally selected 22 provinces due to the limitation of data collection.

Table 4.14
Model 4: Provinces Sample

Names of Provinces
Beijing Fujian Gansu Guangdong Guangxi Hebei Heilongjiang Hubei Jilin Jiangsu Jiangxi Liaoning Shanxi Shandong Shanxi' Shanghai Tianjin Xinjiang Yunnan Zhejiang Chongqing

Seven regions are selected to further estimate the regional trade flow effect of China. According to geographical zoning, China is divided into seven regions (refer to 4.15).

Table 4.15
Model 4: Regions Sample

No.	**Region**	**Provinces***
1	Northern China	Beijing, Tianjin, Hebei, Shanxi, Neimenggu
2	Eastern China	Shanghai, Jiangsu, Zhejiang, Shandong, Anhui
3	Central China	Henan, Hunan, Hubei
4	Southern China	Guangdong, Guangxi, Hainan
5	Northeastern China	Liaoning, Jilin, Heilongjiang
6	Northwestern China	Shanxi, Gansu, Ningxia, Xinjiang, Qinghai
7	Southwestern China	Sichuan, Chongqing, Guizhou, Hainan, Fujian

Note: * denotes the provinces included by the corresponding region.

The sample of Model 4 selects 26 main trade partners of 22 provinces in China mainland (refer to Table 4.16). Sample interval is from 2001 to 2011.

Table 4.16
Model 4: Sample of Trade Partners

Names of Courtiers or States
Singapore Malaysia Thailand Indonesia Philippines Brunei Japan South Korea Hong Kong Taiwan India America Canada Russia Britain Germany France Italy Netherlands Australia Brazil Belgium Spain Switzerland Pakistan New Zealand United Arab Emirates

The GDP data of provinces is from the China Statistical Yearbook 2002-2012. The data of bilateral trade is from Statistical Yearbook of the provinces in 2002-2012. The data of distance adopts the distance between the central city of a province and the capital of the trade partner. The data of distance is calculated by City Distance Calculator. The data of regions is calculated based on the data of 22 provinces. Eviews 6.0 software is used to deal with regression analysis of Model 4.

4.5.5 Model 5

FDI outflow effect and FDI inflow effect are separately evaluated by Model 5 based on different samples. Sample of the FDI outflow effect selects the main 30 countries or states including ASEAN members (refer to Table 4.17). The sample interval is from 2004 to 2011.

Table 4.17
Sample: FDI Outflow Effect of China

Country					
Hongkong	Japan	Singapore	Thailand	Indonesia	Vietnam
Brunei	Cambodia	Malaysia	Philippines	Myanmar	Laos
South Kearo	USA	German	France	Macao	UK
Canada	Australia	Algeria	Sudan	Guinea	Madagascar
Nigeria	New Zealand	Mexico	Russia	South Africa	Cayman Islands

Sample of FDI inflow effect selects 40 countries that invested FDI in China, which are listed in Table 4.18. The sample interval is from 2001 to 2011.

Table 4.18
Sample: FDI Inflow Effect of China

Country					
Hongkong	Japan	Singapore	Thailand	Indonesia	Vietnam
Brunei	Cambodia	Malaysia	Philippines	Myanmar	Laos
South Kearo	USA	Taiwan	Mauritius	Macao	France
Netherland	Australia	Samoan	UK	Switzerland	Luxemburg
Canada	New Zealand	Italy	Russia	South Africa	Australia
Spain	Denmark	Sweden	Ireland	Belgium	Austria
Saudi Arabic	Finland	India	United Arab	Emirates	

The data of GDP, population, and trade value are from United Nations database. Z_{ijt} is calculated based on the data of GDP and population. The data source of distance is the same as Model 1. The data of FDI are from the China Statistical Yearbook in 2002-2012. Eviews 6.0 software is also used for regression analysis on Model 5.

In all, samples and data sources of the five Models are summarized in Table 4.19.

Table 4.19
The Samples and Data Sources

Model	Sample	Time Series	Data Source
Model 1 (trade flow effect model)	144 states	1990-2011	United Nation Database City Distance Calculator
Model 2 (trade structure model)	18 states	1990-2011	United Nation Database World Bank Database
Model 3			
Trade complementarities effect	China+7ASEAN members	2011-2011	United Nation Database WTO Database
Trade competitiveness effect	China+6ASEAN members	2001-2011	
Model 4 (trade flow effect on different regions of China)	22 provinces 7 regions 26 trade partners	2001-2011	China Provinces Statistical Yearbook (2002-2012)
Model 5			United Nations Database
FDI outflow effect	30 states	2004-2011	China Statistical
FDI inflow effect	40 states	2001-2011	Yearbook (2002-2012)

4.6 Summary

This study analyzes the effects of CAFTA on the trade and FDI of China. Thus, 13 hypotheses and five models have been developed to answer five research objectives. Firstly, Model 1 examines the effect of CAFTA on trade flows in China, which tests H_1, H_2 and H_3. Secondly, Model 2 estimates the effect on the trade structure between China and ASEAN to test H_4. Model 3 is employed to test the effect on trade complementarities and competition, which evaluates H_5, H_6 and H_7. Fourthly, trade flow effects of different regions in China examine H_8 and H_9 using Model 4. Finally, Model 5 tests the effect on the FDI flow which evaluates H_{10}-H_{13}. The next chapter (Chapter 5) presents the overall findings for this study.

CHAPTER FIVE

RESEARCH FINDINGS

5.1 Introduction

This chapter presents the results of the data analysis on the trade between China and ASEAN that is related to the effects of CAFTA on trade flow, trade structure, trade complementarities and competitiveness, trade flow of different regions in China and the effects on FDI.

Unit root test is used to analyze whether a time series variable is non-stationary in five models. The test results show that Prob. values are less than 0.01 (refer to Appendix C, Page 252), rejecting null hypothesis. These indicate that all variables are stationary at their first difference value in five models, i.e. all the variables were integrated in order one, I(1). Further, cointegration test is employed to test whether two or more series are cointegrated in five models. The cointegration test results signify long-run cointegration relationship between variables in five models, due to Prob. values less than 0.01 (see Appendix C, Page 252).

5.2 CAFTA and Trade Flows

Based on the gravity model, the trade flow effect model (Model 1) separately examined the effects of CAFTA on total trade flow, export trade flow and import flow in China. Firstly, we present the results of regression analyses, followed by

a comparison of export and import flow effects.

5.2.1 CAFTA and Total Trade Flow

The trade flow effect model (Model 1) is used to estimate the effect of CAFTA on total trade flow of China (refer to Section 4.4.1, Page 119), and Table 5.1 presents the results of the regression analysis for Model 1_a. Coefficient α_4 expresses the effect of CAFTA on total trade flow of China. As α_4 is greater than 0, it indicates that CAFTA positively influences the total trade flow (H_1 is supported). In other words, CAFTA improves trade growth and causes "trade creation", i.e., new trade flow creation for China. That is to say, the trade creation effect proposed by the Customs Union theory (refer to Section 2.2, Page 19) is applicable to CAFTA. The result of trade flow effect in this study concurs with that by Li (2006); Li, Gong and Meng (2007); Chen and Meng (2007); Chen (2009); and Liang and Yin (2009).

Table 5.1
Model 1: The Total Trade Flow

Variable	Coefficient	Coefficient	Std. Error	t-Statistic	Prob.	Adjusted R^2
Constant	α_0	-23.37029***	0.641467	-36.43256	0.0000	0.962034
GDP	α_1	0.903985***	0.010647	84.90619	0.0000	
Distance	α_2	-0.700330***	0.042202	-16.59462	0.0000	
Population	α_3	0.064999***	0.014457	4.496166	0.0000	
CAFTA	α_4	0.6554755***	0.146340	4.481037	0.0000	

Note: *** denotes the coefficient is significant at 1% significance level.

In addition, the total trade flow is positively influenced by GDP ($\alpha_1 > 0$) and Population ($\alpha_3 > 0$) but negatively correlated to Distance ($\alpha_2 < 0$, i.e., the trade flow is smaller if the distance is further). These indicate that the growth of GDP and population improve the growth of total trade flow, but further distance causes the reduction of total trade flow in China.

5.2.2 CAFTA and Export Trade Flow

Table 5.2 presents the results of the regression analysis for Model 1_b [the export trade flow effect of China (refer to Section 4.4.1, Page 119)]. As α_4 (the effect of CAFTA on export trade flow) is greater than 0, it indicates that CAFTA positively influences the export trade flow of China, thus, accepting H_2. In other words, CAFTA improves the export growth of China.

Table 5.2
Model 1: The Export Flow

Variable	Coefficient	Coefficient	Std.Error	t-Statistic	Prob.	Adjusted R^2
Constant	α_0	-22.41751***	0.317463	-70.61465	0.0000	0.953734
GDP	α_1	0.852804***	0.005094	167.4258	0.0000	
Distance	α_2	-0.529649***	0.018622	-28.44154	0.0000	
Population	α_3	0.127470***	0.008628	14.77407	0.0000	
CAFTA	α_4	0.547168***	0.060537	9.038531	0.0000	

Note: *** denotes the coefficient is significant at 1% significance level.

In addition, the export trade of China is positively influenced by GDP ($\alpha_1 > 0$) and Population ($\alpha_3 > 0$) but negatively correlated to Distance ($\alpha_2 < 0$). These mean that the growth of GDP and population promote the growth of export trade while further distance results in the reduction of export trade in China.

5.2.3 CAFTA and Import Trade Flow

Table 5.3 introduces the results of the regression analysis for Model 1_c [the import trade flow effect of China (refer to Section 4.4.1, Page 119)]. As α_4 (the effect of CAFTA on import trade flow) is greater than 0, it indicates that CAFTA positively influences the import trade flow of China, therefore, supporting H_3. That is to say, CAFTA causes the import growth of China.

Table 5.3
Model 1: The Import Flow

Variable	Coefficient	Coefficient	Std.Error	t-Statistic	Prob.	Adjusted R^2
Constant	α_0	-27.06819***	0.574226	-47.13856	0.0000	0.872561
GDP	α_1	1.054769***	0.009859	106.9838	0.0000	
Distance	α_2	-1.276483***	0.041238	-30.95410	0.0000	
Population	α_3	0.104372***	0.015617	6.683392	0.0000	
CAFTA	α_4	0.696840***	0.108458	6.424962	0.0000	

Note: *** denotes that the coefficient is significant at 1% significance level.

Besides, the import trade of China is positively influenced by GDP ($\alpha_1 > 0$) and Population ($\alpha_3 > 0$) but negatively correlated to Distance ($\alpha_2 < 0$). In other

words, the growth of GDP and population improve the growth of import trade, but further distance results in the reduction of import trade in China.

5.2.4 The Comparison of Export and Import Effects

The results indicate that CAFTA positively influences the export and import trade flows of China. Further analysis shows the difference between the two effects. The coefficient of import flow effect is greater than that of export flow effect (refer to Table 5.4), which means that the import growth caused by CAFTA is greater than export growth. In other words, this study provides empirical evidence that import growth is greater than export growth due to CAFTA.

Table 5.4
Coefficient: Export and Import Flow Effects

The effect of CAFTA	**Coefficient** α_4
Export flow effect	0.547168
Import flow effect	0.696840

In summary, the results of three regression analyses in Model 1 show that CAFTA positively influences total trade flow, export trade flow and import trade flow. In other words, CAFTA improves the growth of trade, exports, and imports in China. The results support H_1 (CAFTA positively influences trade flows in China); H_2 (CAFTA positively influences the export flow in China); and H_3 (CAFTA positively influences the import flow in China); and answer research

question 1 (whether CAFTA improves the trade flows in China) and research objective 1 (to evaluate how CAFTA improves the import and export flows in China).

Besides, the results indicate the trade creation effect of the Customs Union theory is applicable to CAFTA, i.e., CAFTA causes trade creation for China. On the other hand, CAFTA causes greater import growth than export growth, which indicates that CAFTA causes the trade deficit for China. This study compared the export and import effects of CAFTA and found the differences between them, which was neglected in previous studies.

5.3 CAFTA and Trade Structure

The trade structure model (Model 2) was employed to examine the effect of CAFTA on trade structure between China and ASEAN (refer to section 4.4.2, Page 120), in order to test H_4 (CAFTA positively influences the trade structure between China and ASEAN). Under the trade structure model, the coefficient β_3 represents the effect of CAFTA on the intra-industry trade structure between both sides based on 10 categories of SITC. The results of the estimated regression are shown in Table 5.5.

Table 5.5

Model 2: Trade Structure Effect

SITC	β_3	t-Statistic	Prob.	R^2	Adjusted R^2	D-W
0	0.110434**	1.982126	0.0492	0.612863	0.595819	2.13693
1	-0.1018**	-2.2657	0.0251	0.760105	0.735227	2.052126
2	-0.11517***	-3.10023	0.0023	0.814627	0.79744	1.872229
3	0.132661**	2.013872	0.0458	0.659231	0.645509	2.313062
4	0.009392	0.376084	0.7075	0.662586	0.627979	2.052667
5	0.036019	1.24635	0.2145	0.917987	0.914399	1.943952
6	-0.09264**	-2.28136	0.0238	0.83502	0.827802	2.23727
7	-0.00741	-0.2216	0.8249	0.936968	0.934211	1.921333
8	0.009918	0.403462	0.6872	0.913466	0.909656	1.804901
9	0.170655**	2.093928	0.0382	0.75991	0.720663	2.156905

Note: ***, ** respectively denotes that coefficient is significant at 1%, 5% significance level.

Table 5.5 shows that coefficients (β_3) of SITC 0 (food and live animals), SITC 3 (mineral fuels, lubricants and related materials) and SITC 9 (commodities and transactions not classified elsewhere in the SITC) are greater than 0, which means that CAFTA positively influences the intra-industry trade of SITC 0, 3, 9, i.e., CAFTA results in the expansion of intra-industry trade of SITC 0, 3, 9 between China and ASEAN members.

The coefficients (β_3) of SITC 1 (beverages and tobacco), SITC 2 (crude materials, inedible, except fuels), and SITC 6 (manufactured goods classified chiefly by material) are less than 0, which means that CAFTA negatively influences the intra-industry trade of SITC 1, 2, 6. This indicates that CAFTA causes the reduction of intra-industry trade of SITC 1, 2, 6, i.e., the expansion of inter-industry trade of these four categories between China and ASEAN members.

The coefficients (β_3) of SITC 4 (animal and vegetable oils, fats and waxes), 5 (chemicals and related products, n.e.s), 7 (machinery and transport equipment), and 8 (miscellaneous manufactured articles) are not significant. It means that CAFTA does not influence the intra-industry trade of these four categories between China and ASEAN. These results are summarized in Table 5. 6.

Table 5.6
Model 2: Summary of Results

SITC	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Intra-industry trade	↑	↓	↓	↑	---	---	↓	---	---	↑

Note: ↑ denotes that CAFTA causes the expansion of intra-industry trade;
↓ denotes that CAFTA causes the reduction of intra-industry trade;
--- denotes that CAFTA has no influence to the intra-industry trade.

Summarily, CAFTA causes the expansion of intra-industry trade of SITC 0, 3, 9, the reduction of intra-industry trade of SITC 1, 2, 6, and no effects on SITC 4, 5, 7, 8. Only SITC 0, 3, 9 support H_4. Thus, all the results of 10 categories do not support H_4. The results answer research question 2 (whether CAFTA brings changes to the trade structure of China) and research objective 2 (to estimate the effect of CAFTA on trade structure between China and ASEAN).

Besides, the results also show the expansion of the inter-industry trade of SITC 2, 6 between China and ASEAN due to CAFTA. It was mentioned that SITC 6 were the main products in the exports of China to ASEAN members, SITC 2

were core products in the imports of China from ASEAN members (refer to Section 3.5.2, Page 78). These indicate that the trade growth due to CAFTA is mainly from the expansion of inter-industry trade, which is consistent with the findings proposed by Zhang and Wang (2011). Further, trade growth due to CAFTA is mainly dependent on strengthening specialization productivity among members.

Moreover, most CAFTA members employ export-oriented development strategies. If international division of labor and specialization productivity among members can be strengthened, it will be helpful to form collective competitive advantage in the FTA. This will push the rapid economic development of the whole area.

5.4 CAFTA and Trade Complementarities and Competition

Model 3 employs the TCI and relative trade competitiveness index to explain the changes of trade complementarities and competition between China and ASEAN after the establishment of CAFTA. It tests H_5 (CAFTA weakens the trade complementarities between the export structure of China and the import structure of ASEAN members), H_6 (CAFTA weakens the trade complementarities between the import structure of China and the export structure of ASEAN members) and H_7 (CAFTA intensifies the trade competition between China and ASEAN members), and answers research objective 3 (to

evaluate how CAFTA improves the trade flows in China).

5.4.1 CAFTA and Trade Complementarities

Due to the great difference between export and import structure in China and ASEAN, the trade complementarities are analyzed based on the trade complementarities between the exports of China and imports of ASEAN (H_5) and the trade complementarities between the imports of China and exports of ASEAN (H_6). TCI is used to examine the trade complementarities between China and ASEAN members. The value of the index represents the degree of the trade complementarities.

5.4.1.1 Trade Complementarities: China's exports and ASEAN's imports

TCI is calculated based on China's exports and ASEAN's imports. The complementarities index indicates the degree of trade complementarities between China and ASEAN members (greater degree if the index is greater). The complementarities indices are presented in Table 5.7.

Table 5.7

Trade Complementarities Index Based on China's Exports

Year	China-Cambodia	China-Indonesia	China-Malaysia	China-Philippines	China-Singapore	China-Thailand	China-Vietnam
2001	2.179818	1.517763	1.920901	1.783391	1.876973	2.014319	1.89874
2002	2.210229	1.47227	1.979764	1.85073	1.91801	2.04522	1.912321
2003	2.189367	1.455513	2.095244	1.998861	1.975407	2.133438	1.930376
2004	2.248777	1.46626	2.152583	2.042589	1.991854	2.180505	1.926106
2005	2.442319	1.457481	2.171738	2.031013	1.954408	2.164218	1.894982
2006	2.380115	1.422858	2.204518	2.035154	1.988101	2.135906	1.917861
2007	2.398803	1.446008	2.196563	2.009564	2.04287	2.122159	1.959174
2008	2.514194	1.830379	2.059408	1.936687	2.070635	2.058705	2.021803
2009	2.266911	1.88315	2.328308	1.994621	2.113609	2.12138	2.065261
2010	2.376336	1.838212	2.305678	2.013247	2.153251	2.07882	2.074465
2011	2.381303	1.808702	2.296531	1.558321	2.165375	2.001272	NA

Note: The indices are calculated based on China's exports and the imports of ASEAN members. NA- Data is not available.

The average value of TCI before and after the implementation of CAFTA is calculated based on the results in Table 5.7 and listed in Table 5.8. The results indicate that the trade complementarities between China and seven ASEAN members are strengthened after the implementation of CAFTA compared to that before the implementation of CAFTA, due to the higher indices after the implementation of CAFTA (refer to Table 5.8).

Table 5.8

Trade Complementarities Comparison: China's Exports

Time	China-Cambodia	China-Indonesia	China-Malaysia	China-Philippines	China-Singapore	China-Thailand	China-Vietnam
Before*	2.193138	1.481849	1.998636	1.877661	1.923463	2.064326	1.913812
After**	2.376095	1.644131	2.214416	1.952649	2.060013	2.107871	1.979950

Note: * Before the implementation of CAFTA (2004).

** After the implementation of CAFTA (2004).

To present the changes of trade complementarities after the implementation of CAFTA, the present study employs the trend lines of TCI to describe the changes of trade complementarities after the implementation of CAFTA.

Based on the results in Table 5.7, the changing trends of trade complementarities between exports of China and imports of ASEAN are presented in Figure 5.1. The increasing trend lines express the strengthening trade complementarities while the declining trend lines express the weakening trade complementarities between the exports of China and the imports of ASEAN members.

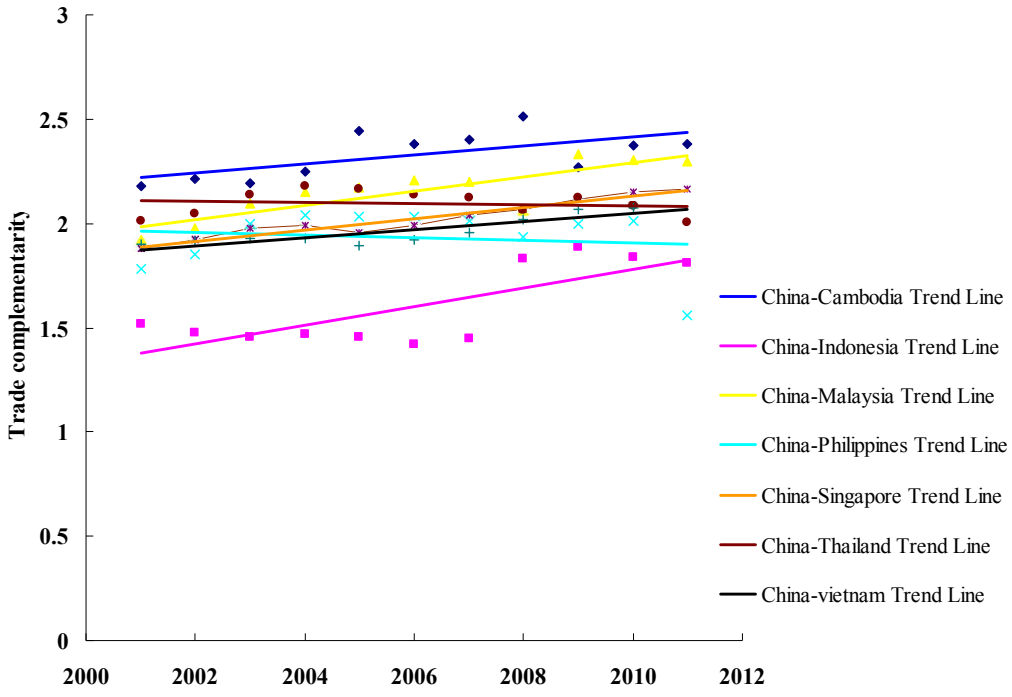


Figure 5.1
Trade Complementarities Trends: China's Exports

Figure 5.1 also presents a weakening trend for the trade complementarities between China-Thailand and China-Philippines. This supports H_5 (CAFTA weakens the trade complementarities between the export structure of China and the import structure of ASEAN members). However, there is a strengthening trend to the trade complementarities between China- Indonesia, China-Singapore, China-Malaysia, China-Cambodia and China-Vietnam, which does not support H_5.

The weakening trade complementarities indicate that the exports of China to Thailand and Philippines are likely to reduce. The strengthening trade complementarities mean that China will have trade advantages over various ASEAN countries and try to expand her exports especially to Indonesia, Singapore, Malaysia, Cambodia, and Vietnam.

Overall, H_5 is not fully supported since CAFTA weakens the trade complementarities between China-Thailand and China-Philippines while it strengthens the trade complementarities between China-Indonesia, China-Singapore, China-Malaysia, China-Cambodia and China-Vietnam.

5.4.1.2 Trade complementarities: China's Imports and ASEAN's Exports

TCI is calculated based on China's imports and the exports of ASEAN members. The TCI indicates the degree of trade complementarities between China and

ASEAN members (greater degree if the index is greater). The complementarities indices are presented in Table 5.9.

Table 5.9
Trade complementarities Index: China's Imports

Year	China-Cambodia	China-Indonesia	China-Malaysia	China-Philippines	China-Singapore	China-Thailand	China-Vietnam
2001	1.124635	2.170279	2.20767	2.17706	1.979494	1.380452	2.226995
2002	1.323982	2.164984	2.324924	2.297963	2.032585	1.383405	2.262995
2003	1.521206	2.259254	2.408331	2.378535	2.139797	1.489618	2.248407
2004	1.694001	2.375913	2.390796	2.38495	2.190583	1.639039	2.215314
2005	1.798985	2.388297	2.317726	2.374279	2.214123	1.671467	2.244538
2006	1.831873	2.445012	2.341515	2.392585	2.247618	1.737764	2.145236
2007	1.863208	2.657857	2.366028	2.412915	2.234524	1.757575	2.068019
2008	2.033656	2.702053	2.132719	2.353545	2.219946	1.776783	2.120207
2009	1.723145	2.638973	2.366844	2.389319	2.172104	1.705105	2.109542
2010	1.769908	2.642638	2.28325	1.904236	2.200657	1.765979	2.158913
2011	1.78352	2.588288	2.258407	2.237304	2.241734	2.153334	NA

Note: The indices are calculated based on China's imports and the exports of ASEAN members. NA- Data is not available.

The average value of TCI before and after the implementation of CAFTA is calculated based on the results in Table 5.9 and listed in Table 5.10. The results indicate that the trade complementarities are strengthened between China and five ASEAN members (Cambodia, Indonesia, Philippines, Singapore and Thailand) but weakened between China and two ASEAN members (Malaysia and Vietnam) after the implementation of CAFTA compared to that before the implementation of CAFTA (refer to Table 5.10).

Table 5.10

Trade Complementarities Comparison: China's Imports

Time	China-Cambodia	China-Indonesia	China-Malaysia	China-Philippines	China-Singapore	China-Thailand	China-Vietnam
Before*	1.323274	2.198173	2.313642	2.284519	2.050625	1.417825	2.246132
After**	1.812287	2.554879	2.307161	2.306142	2.215161	1.775881	2.151681

Note: * Before the implementation of CAFTA (2004).

** After the implementation of CAFTA (2004).

To present the changes of trade complementarities after the implementation of CAFTA, the present study employs the trend lines of TCI to describe the changes of trade complementarities after the implementation of CAFTA.

Based on the results in Table 5.9, the changing trends of trade complementarities between imports of China and exports of ASEAN are presented in Figure 5.2. The increasing trend lines express the strengthening trade complementarities while the declining trend lines express the weakening trade complementarities between the imports of China and the exports of ASEAN members.

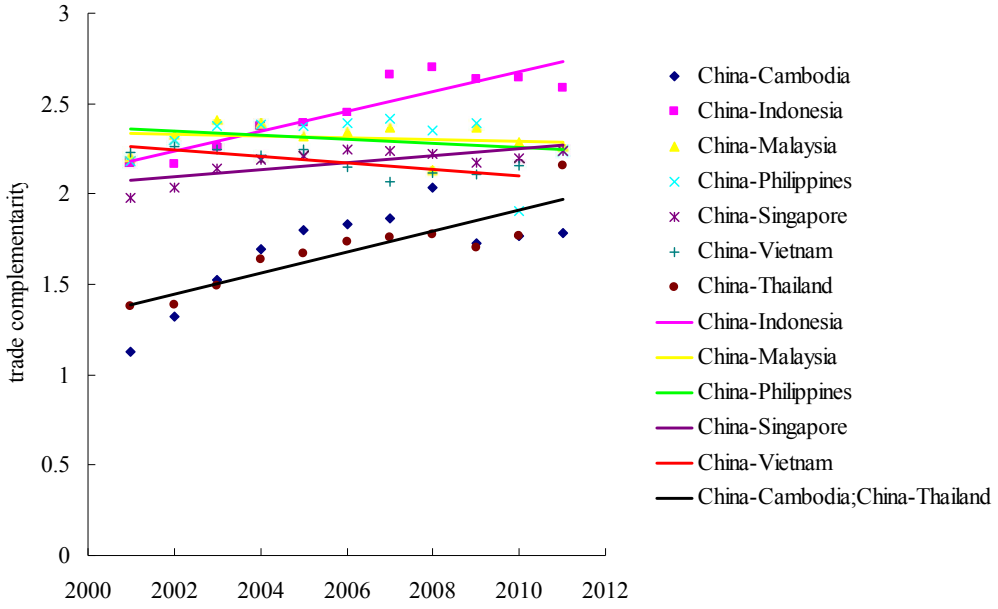


Figure 5.2
Trade complementarities Trends: China's Imports

The results present a weakening trend for the trade complementarities between China-Malaysia, China-Philippines and China-Vietnam (refer to Figure 5.2). This supports H_6 (CAFTA weakens the trade complementarities between the import structure of China and the export structure of ASEAN members). However, there is a strengthening trend for the trade complementarities between China-Indonesia, China-Singapore, China-Thailand and China-Cambodia (refer to Figure 5.2), which does not support H_6.

The weakening trade complementarities indicate that China will tend to reduce imports from Malaysia, Philippines and Vietnam. The strengthening trade complementarities mean that China will tend to increase the imports from Indonesia, Singapore, Thailand and Cambodia.

Overall, H_6 is not fully supported since CAFTA weakens the trade complementarities between China-Malaysia, China-Philippines and China-Vietnam while it strengthens the trade complementarities between China-Indonesia, China-Singapore, China-Thailand and China-Cambodia.

To conclude, Table 5.11 summarizes the whole trend of trade complementarities between China and ASEAN members in two ways. The trade complementarities are strengthened between China and three ASEAN members (Cambodia, Indonesia and Singapore) due to CAFTA, based on two calculation ways. The results do not support H_5 and H_6. The strengthening trade complementarities mean exports and imports between China and ASEAN members will be likely to increase.

Table 5.11
China and ASEAN: Trade Complementarities Trend

Countries	**Trade complementarities trend**	
	1	**2**
China-Cambodia	strengthen	strengthen
China-Indonesia	strengthen	strengthen
China-Malaysia	strengthen	weaken
China-Philippines	weaken	weaken
China-Singapore	strengthen	strengthen
China-Thailand	weaken	strengthen
China-Vietnam	strengthen	weaken

Note: 1.trade complementarities calculated based on China's exports and ASEAN's imports.
2.trade complementarities calculated based on China's imports and ASEAN's exports.

Meanwhile, the trade complementarities are weakened between China and Philippines based on two calculation ways. This supports H_5 and H_6. The

weakening trade complementarities mean that both exports and imports between China and ASEAN members will be inclined to decrease.

In addition, the trade complementarities are strengthened between China-Malaysia and China-Vietnam based on China's exports and imports of Malaysia and Vietnam, which does not support H_5. The trade complementarities are weakened between China-Malaysia and China-Vietnam based on China's imports and the exports of Malaysia and Vietnam, which support H_6.

Generally, the trade complementarities between China and different members of ASEAN have different changing trends due to CAFTA. Thus, the results do not support H_5 and H_6, which answer the research objective 3.

5.4.2 CAFTA and Trade Competition

The relative trade competitiveness index refers to the ratio of export comparative advantages of China and an ASEAN member. It is used to analyze the changes of trade competition for 16 categories of products (refer to Table 4.13, Page 139) between China and six ASEAN members, and to test H_7. If the index is closer to 1, the trade competition between two partners is greater (refer to Section 4.4.3.2, Page 127). The results are discussed between China and each individual ASEAN country.

5.4.2.1 Trade competitiveness: China-Indonesia

China-Indonesia relative trade competitiveness indices are summarized in Appendix B1 and their trends are presented in Figures 5.3, 5.4 and 5.5 based on the values of these indices. If a trend line approaches 1, the trade competition is intensified. On the contrary, the trade competition is weakened if the trend line is located away from 1. In addition, if the index is greater than 1, China has obvious export advantage. If the index is less than 1, Indonesia has obvious export advantage.

Figure 5.3 presents the trend lines of four categories, whose relative trade competitiveness indices are less than 1. Figures 5.4 and 5.5 introduce the other twelve categories, whose relative trade competitiveness indices are greater than 1. Trend lines of the other 12 categories could not be integrated in a Figure because they are difficult to be differentiated and visualized. Thus, these trend lines are separated into Figure 5.4 (index: 1-2) and Figure 5.5 (index: greater than 2).

Indonesia has the export comparative advantages in four categories of products, including agricultural products, fuels and mining products, food and fuels because their indices are less than 1 (refer to Figure 5.3). Further, China-Indonesia trade competitiveness in the four categories is weakened due to the reducing trend lines away from 1 (refer to Figure 5.3). The declining trend

lines of the four categories mean the export comparative advantages of Indonesia are increasing.

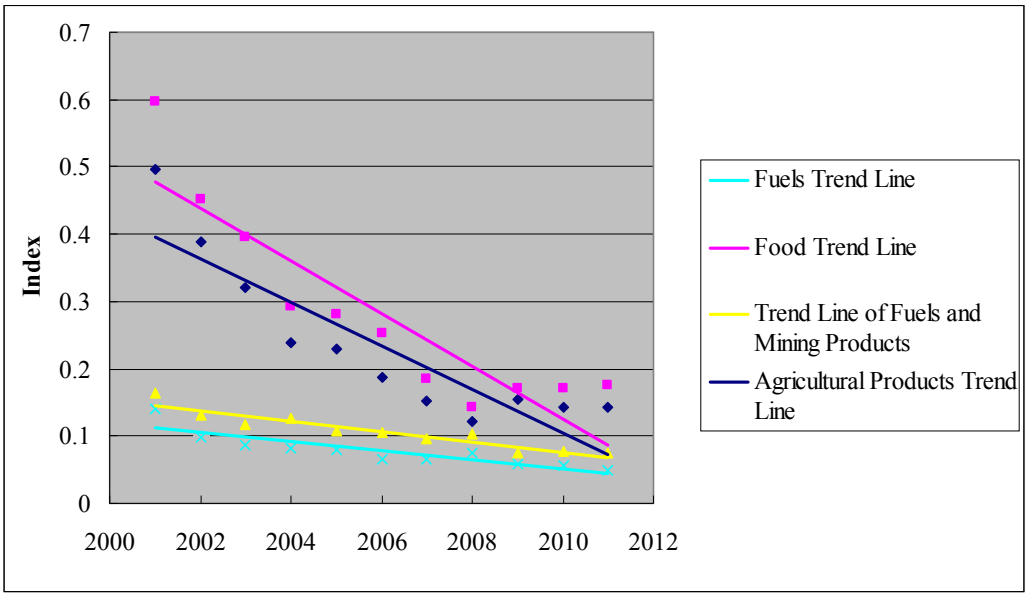


Figure 5.3
China-Indonesia: Trade Competitiveness Index (0-1)

There are two trend lines around 1 (refer to Figure 5.4). The trend line of automotive products is increasing closer to 1 from 2001-2007 (refer to Figure 5.4), which means that the trade competition of automotive products is intensified to the strongest in 2007 (the index is equal to 1). However, the increasing trend of automotive products is greater than 1 and away from 1 after 2007, which indicates that the trade competition is weakened with the increasing export advantage of automotive products in China after 2007.

According to Figure 5.4, the trade competitiveness of chemicals is intensified to the strongest in 2009 (the index is equal to 1). The trade competitiveness of

chemicals is also intense due to the index being close to 1 after 2009. However, a slight increasing trend away from 1 indicates that the trade competitiveness of chemicals is weakened after 2009.

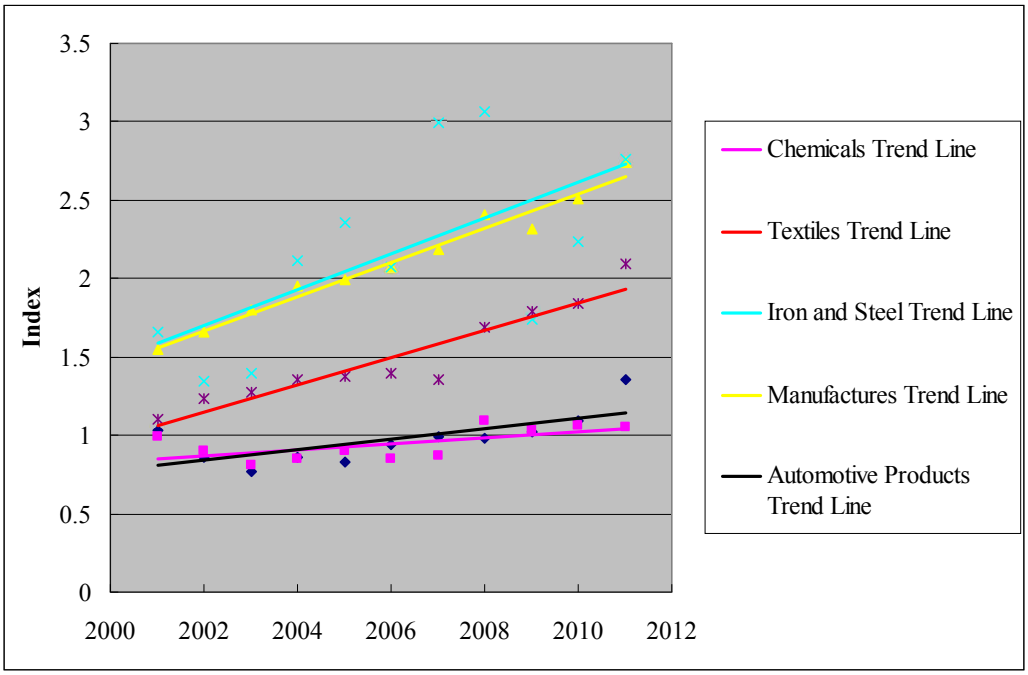


Figure 5.4
China-Indonesia: Trade Competitiveness Index (1-2)

China has the export comparative advantages in ten categories of products because the indices of these ten categories of products are greater than 1 (refer to Figures 5.4 and 5.5). Among them, the trend lines of nine categories of products are increasing away from 1, including manufactures, iron and steel, textiles, office and telecom equipment, electronic data processing and office equipment, telecommunications equipment, integrated circuits and electronic components, clothing, machinery and transport equipment. It means that China-Indonesia trade competitiveness on the nine categories of products is weakened, while the export comparative advantages of China in the nine categories of products are

increasing.

The trend line of pharmaceuticals is declining and approaching 1 (refer to Figure 5.5), which means that China-Indonesia trade competitiveness on pharmaceuticals is intensified. The declining trend of pharmaceuticals means that the export comparative advantage of China is weakened.

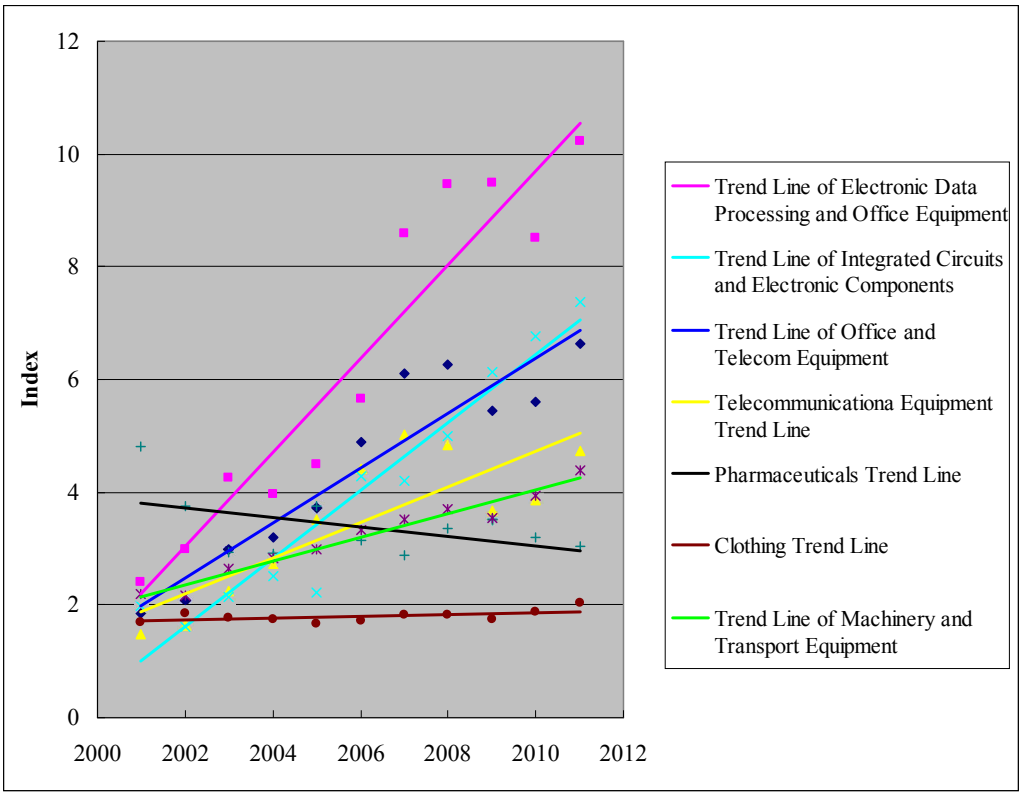


Figure 5.5
China-Indonesia: Trade Competitiveness Index (2-10)

In general, China-Indonesia trade competitiveness on chemicals and pharmaceuticals is intensified, while China-Indonesia trade competitiveness on the other fourteen categories of products is weakened. Therefore, the results of

China-Indonesia trade competitiveness do not fully support H_7.

5.4.2.2 Trade competitiveness: China-Malaysia

China-Malaysia relative trade competitiveness indices are summarized in Appendix B2 and their trends are presented in Figure 5.6 and Figure 5.7 based on the values of indices. Figure 5.6 presents the trend lines of nine categories of products, whose relative trade competitiveness indices are less than 1. Figure 5.7 shows the trend lines of the other seven categories of products, whose indices are greater than 1.

If the index is greater than 1, China has obvious export advantage. If the index is less than 1, Malaysia has obvious export advantage. Besides, if a trend line approaches 1, the trade competition is intensified. On the contrary, the trade competition is weakened if the trend line is located away from 1.

The trends lines of two categories (electronic data processing and office equipment, machinery and transport equipment) are around 1 (refer to Figure 5.6). Their trends are increasing close to 1 from 2001 to 2008, which means that the trade competitiveness on the two categories is intensified in 2001-2008. However, their trend lines are increasing away from 1 after 2008, which means that their trade competitiveness is weakened after 2008. Besides, the results indicate that Malaysia has the export comparative advantage in the two

categories of products before 2008. China has the export comparative advantage in the two categories of products after 2008.

According to Figure 5.6, the indices of seven categories of products are less than 1, which means that Malaysia has the export comparative advantage in the seven categories of products, including chemicals, agricultural products, food, fuels and mining products, fuels, office and telecom equipment, integrated circuits and electronic components.

Among the seven categories, the trend lines of five categories (chemicals, agricultural products, food, fuels and mining products, fuels) are declining away from 1 (refer to Figure 5.6), which indicates that China-Malaysia trade competitiveness on these five categories is weakened and Malaysia has increasing export comparative advantage in these five categories of products.

However, China-Malaysia trade competitiveness on the other two categories of products (office and telecom equipment, integrated circuits and electronic components) is intensified due to their increasing trend lines approaching 1 (refer to Figure 5.6). Besides, the export comparative advantages of Malaysia in the two categories of products are reducing.

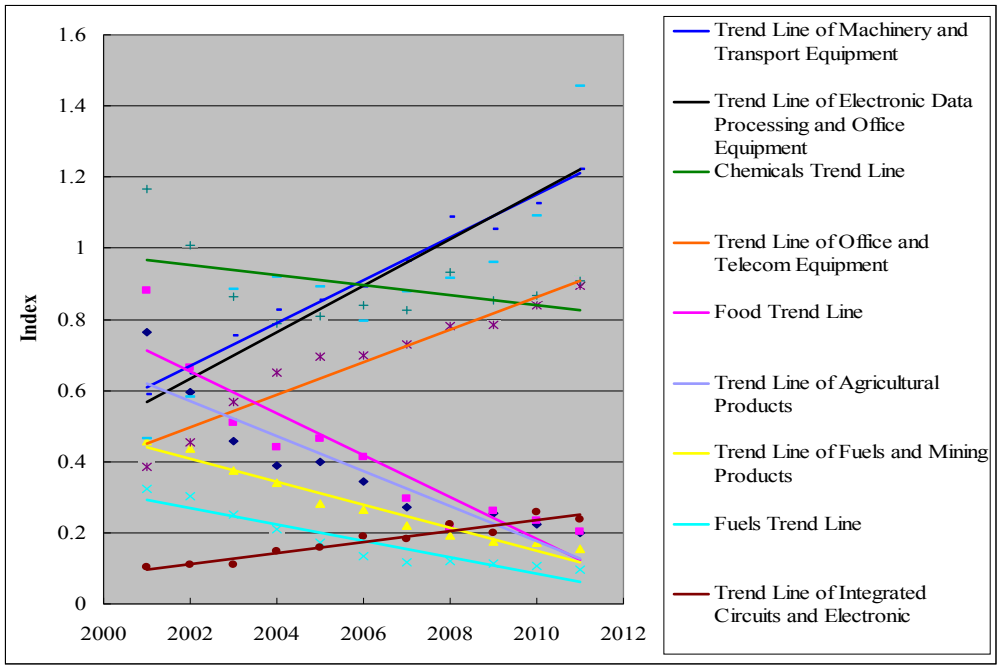


Figure 5.6
China-Malaysia: Trade Competitiveness Index (0-1)

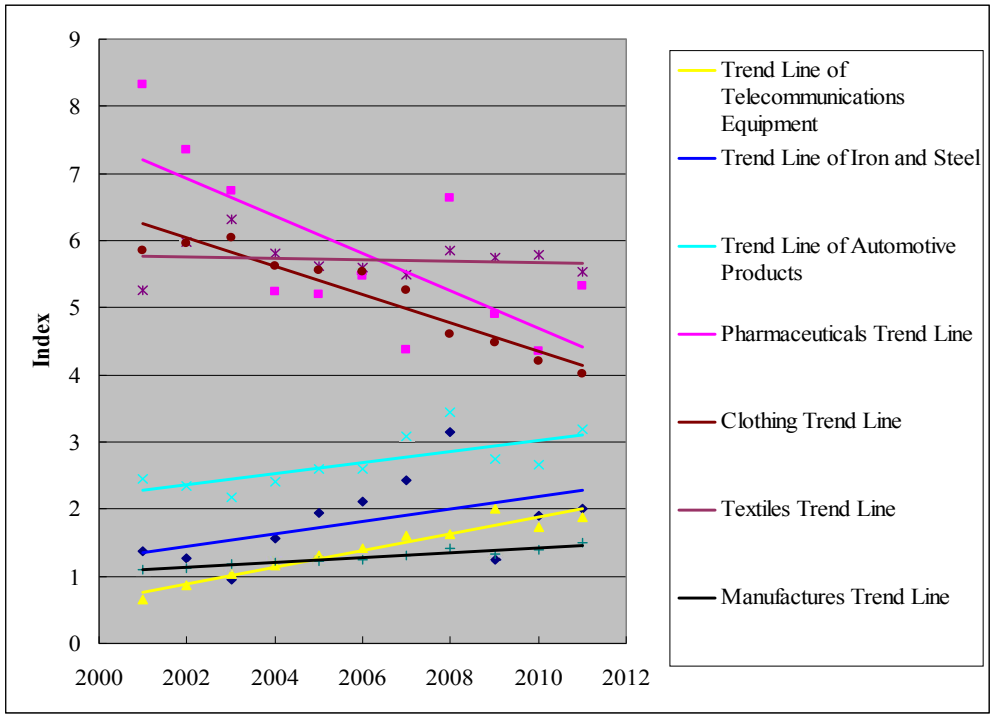


Figure 5.7
China-Malaysia: Trade Competitiveness Index (1-8)

According to Figure 5.7, the indices of seven categories of products are greater than 1, which means that China has the export comparative advantage in the seven categories of products, including iron and steel, pharmaceuticals, telecommunications equipment, automotive products, textiles, clothing and manufactures.

For the reason that the increasing trend lines of four categories of products (iron and steel, telecommunications equipment, automotive products, manufactures) are away from 1 (refer to Figure 5.7), China-Malaysia trade competitiveness on these four categories is weakened, while China has increasing export comparative advantage in these four categories of products.

China-Malaysia trade competitiveness on two categories of products (pharmaceuticals, clothing) is intensified, due to their increasing trend lines approaching 1 (refer to Figure 5.7). Besides, China has reducing export comparative advantages in the two categories of products.

In addition, the trend line of textiles is a horizontal line much greater than 1, which means that China-Malaysia trade competitiveness on textiles has no changes and is not intensified. China maintains a stable export comparative advantage in textiles.

Generally, China-Malaysia trade competitiveness on four categories of products (office and telecom equipment, integrated circuits and electronic components, pharmaceuticals, clothing) is intensified, which supports H_7. However, China-Malaysia trade competitiveness on textiles shows no change, and China-Malaysia trade competitiveness on the rest of the eleven categories is weakened. H_7 is not supported. Thus, the results of China-Malaysia do not fully support H_7.

5.4.2.3 Trade competitiveness: China-Philippines

China-Philippines relative trade competitiveness indices are summarized in Appendix B3 and their trends are presented in Figure 5.8, Figure 5.9 and Figure 5.10 based on the values of indices. Figure 5.8 presents the trend lines of eight categories, whose relative trade competitiveness indices are less than 1. Figures 5.9 and 5.10 introduce trend lines of the other eight categories whose indices are greater than 1.

If the index is greater than 1, China has obvious export advantage. If the index is less than 1, Philippines has obvious export advantage. The trade competition is intensified if a trend line approaches 1. On the contrary, the trade competition is weakened if the trend line is located away from 1.

Philippines has the export comparative advantages in eight categories of products, including agriculture products, food, fuels and mining products, office and telecom equipment, electronic data processing and office equipment, integrated circuits and electronic components, automotive products, and machinery and transport equipment, due to their indices less than 1 (refer to Figure 5.8).

In these eight categories, China-Philippines trade competitiveness on three categories of products (fuels and mining products, agriculture products and food) is weakened due to the declining trend lines away from 1 (refer to Figure 5.8). Philippines has increasing export comparative advantages in these three categories of products.

China-Philippines trade competitiveness on five categories of products (office and telecom equipment, electronic data processing and office equipment, integrated circuits and electronic components, automotive products and machinery and transport equipment) is intensified, due to the increasing trend lines approaching 1 (refer to Figure 5.8). Besides, Philippines has reducing export comparative advantages in these four categories of products.

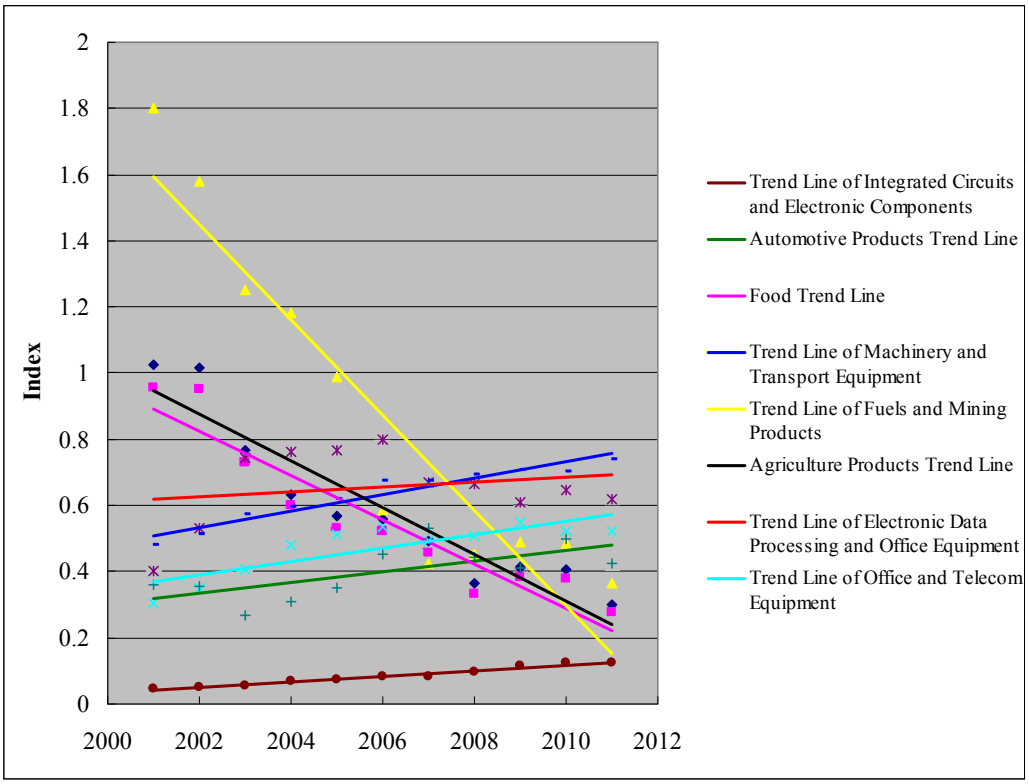


Figure 5.8
China- Philippines: Trade Competitiveness Index (0-1)

Based on Figure 5.9 and Figure 5.10, China has the export comparative advantages in six categories of products including chemicals, clothing, telecommunication equipment, textiles, pharmaceuticals and iron and steel, whose indices are greater than 1.

China-Philippines trade competitiveness on three categories of products (clothing, telecommunication equipment, textiles) is weakened due to the increasing trend lines away from 1. China has increasing export comparative advantages in these three categories of products.

China-Philippines trade competitiveness on the other three categories of products (chemicals, pharmaceuticals, iron and steel) is intensified due to the declining trend lines close to 1. China has reducing export comparative advantage in these three categories of products.

In addition, China-Philippines trade competitiveness on manufactures remains heavy for the reason that the trend line is close to 1 (refer to Figure 5.9). Due to a slight increasing trend, the trade competitiveness of manufactures is weakened. Both China and Philippines do not have obvious export comparative advantage in manufactures.

China-Philippines trade competitiveness on fuels is intensified due to the declining trend close to 1 before 2007; nevertheless it is weakened due to the reducing trend away from 1 after 2007 (refer to Figure 5.9). In other words, China lost the export comparative advantage in fuels, but Philippines gained the export comparative advantage in fuels after 2007.

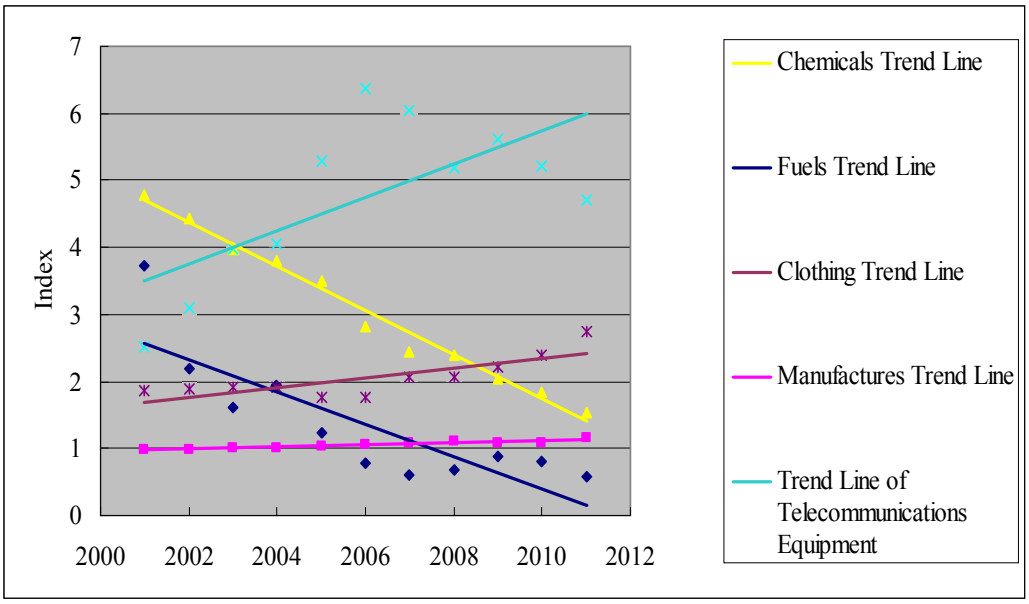


Figure 5.9
China- Philippines: Trade Competitiveness Index (1-5)

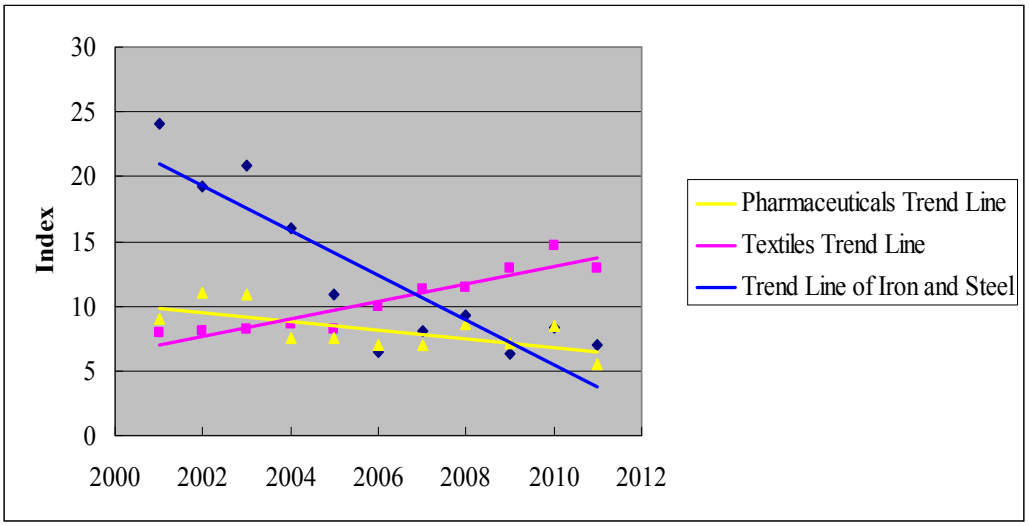


Figure 5.10
China-Philippines: Trade Competitiveness Index (5-25)

Generally, China-Philippines trade competitiveness on eight categories of products (office and telecom equipment, electronic data processing and office equipment, integrated circuits and electronic components, automotive products, machinery and transport equipment, chemicals, pharmaceuticals, iron and steel)

is intensified, while the trade competitiveness on the other eight categories (fuels and mining products, agriculture products, food, clothing, telecommunication equipment, textiles, manufactures, fuels) is weakened. Therefore, the results of China-Philippines do not fully support H_7.

5.4.2.4 Trade competitiveness: China-Singapore

China-Singapore relative trade competitiveness indices are summarized in Appendix B4 and their trends are presented in Figures 5.11, 5.12 and 5.13 based on the values of indices. Figure 5.11 presents the trend lines of seven categories, whose relative trade competitiveness indices are less than 1. Figures 5.12 and 5.13 introduce trend lines of the other eight categories whose indices are greater than 1.

Singapore has the export comparative advantages in seven categories of products including fuels and mining products, chemicals, fuels, pharmaceuticals, machinery and transport equipment, office and telecom equipment, integrated circuits and electronic components, due to their indices being less than 1 (refer to Figure 5.11).

Among these seven categories, China-Singapore trade competitiveness on four categories of products (fuels and mining products, chemicals, fuels, pharmaceuticals) is weakened due to the declining trend lines away from 1 (refer

to Figure 5.11). Singapore has increasing export comparative advantages in these four categories of products.

China-Singapore trade competitiveness on the other three categories of products (office and telecom equipment, integrated circuits and electronic components, and machinery and transport equipment) is intensified, due to the increasing trend lines approaching 1 (refer to Figure 5.11). Singapore has reducing export comparative advantages in these three categories of products.

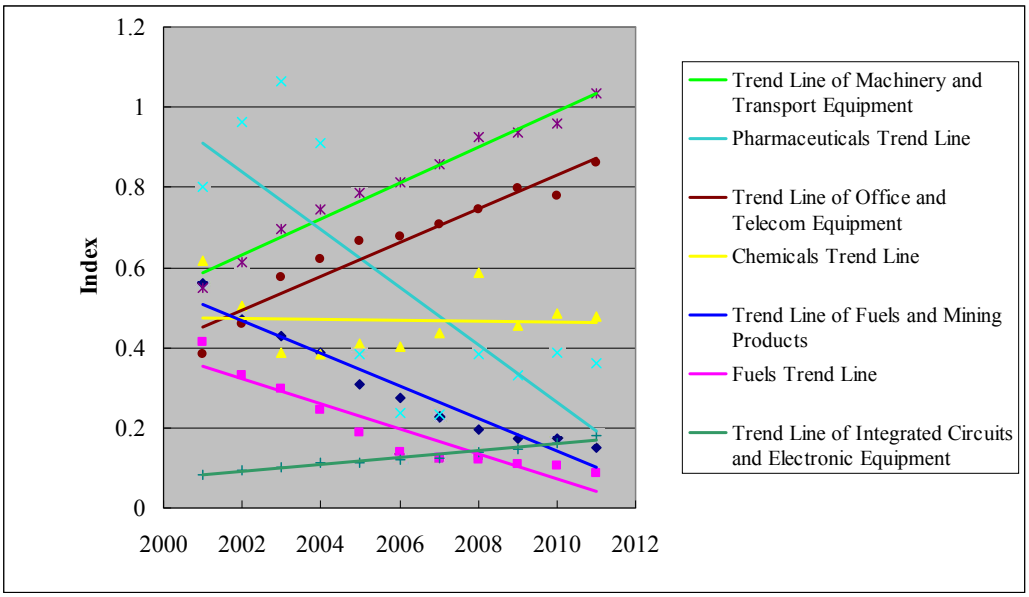


Figure 5.11
China-Singapore: Trade Competitiveness Index (0-1)

Based on Figures 5.12 and 5.13, China has the export comparative advantage in nine categories of products, including agriculture products, food, manufactures, iron and steel, electronic data processing and office equipment, clothing, textiles, telecommunication equipment, and automotive products, because their indices

are greater than 1.

In the nine categories of products, China-Singapore trade competitiveness on seven categories of products (manufactures, iron and steel, electronic data processing and office equipment, clothing, textiles, telecommunication equipment, automotive products) is weakened due to the increasing trend lines away from 1. China has increasing export comparative advantage in the six categories of products (refer to Figures 5.12 and 5.13).

China-Singapore trade competitiveness on the other two categories of products (agriculture products, food) is intensified due to the declining trend lines close to 1. China has reducing export comparative advantage in the two categories of products (refer to Figure 5.12).

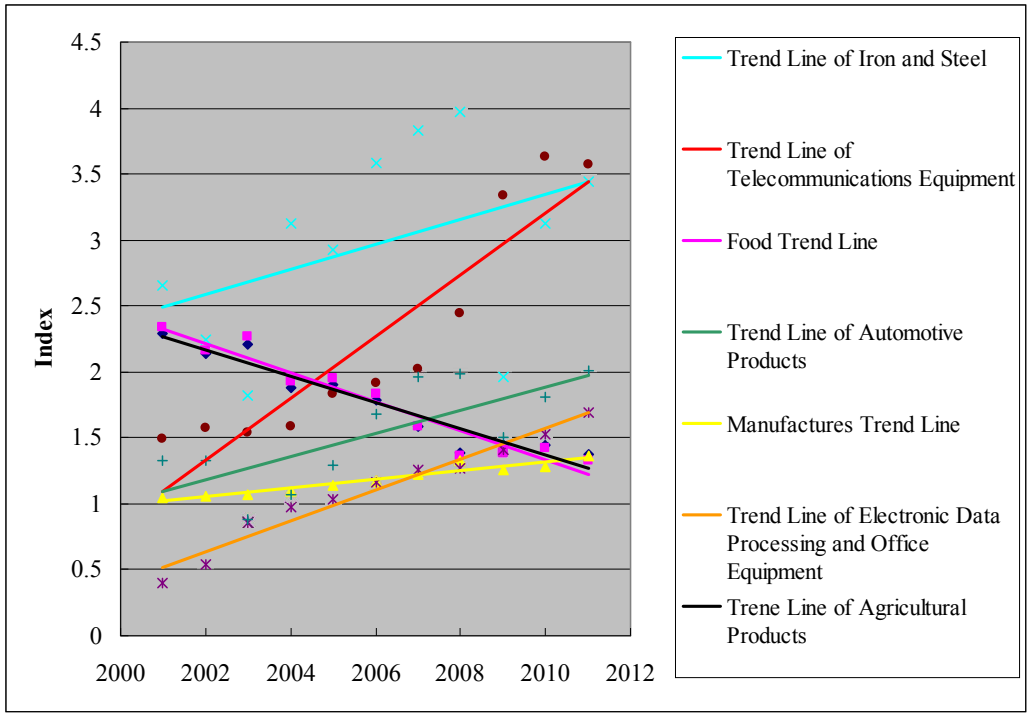


Figure 5.12
China-Singapore: Trade Competitiveness Index (1-4)

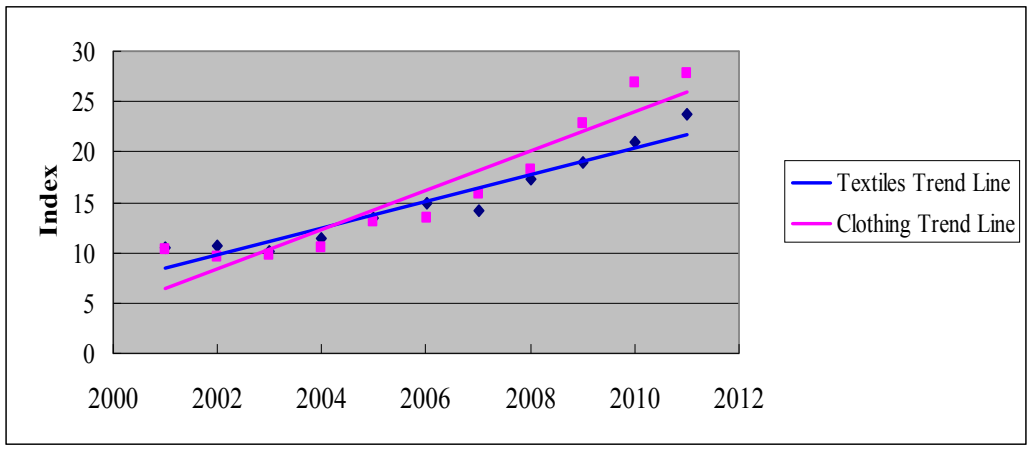


Figure 5.13
China-Singapore: Trade Competitiveness Index (5-30)

In all, China-Singapore trade competitiveness on five categories of products (agriculture products, food, office and telecom equipment, integrated circuits and electronic components, and machinery and transport equipment) is

intensified, which supports H_7. However, China-Singapore trade competitiveness on eleven categories of products (fuels and mining products, chemicals, fuels, pharmaceuticals, manufactures, iron and steel, electronic data processing and office equipment, clothing, textiles, telecommunication equipment, automotive products) is weakened, which does not support H_7. Thus, the results of China-Singapore do not fully support H_7.

5.4.2.5 Trade competitiveness: China-Thailand

China-Thailand relative trade competitiveness indices are summarized in Appendix B5 and their trends are presented in Figures 5.14 and 5.15 based on the values of indices. Figure 5.14 shows the trend lines of seven categories, whose relative trade competitiveness indices are less than 1. Figure 5.15 presents the trend lines of nine categories, whose indices are greater than 1.

Thailand has the export comparative advantages in seven categories of products including agricultural products, food, fuels and mining products, chemicals, fuels, integrated circuits and electronic components, and automotive products due to their indices being less than 1 (refer to Figure 5.14).

In these seven categories, China-Thailand trade competitiveness on five categories of products (agriculture products, food, fuels and mining products, chemicals, and fuels) is weakened due to the declining trend lines away from 1

(refer to Figure 5.14). Thailand has increasing export comparative advantages in these five categories of products.

China-Thailand trade competitiveness on two categories of products (integrated circuits and electronic components, and automotive products) is intensified, due to the increasing trend lines approaching 1 (refer to Figure 5.14). Thailand has reducing export comparative advantages in the two categories of products.

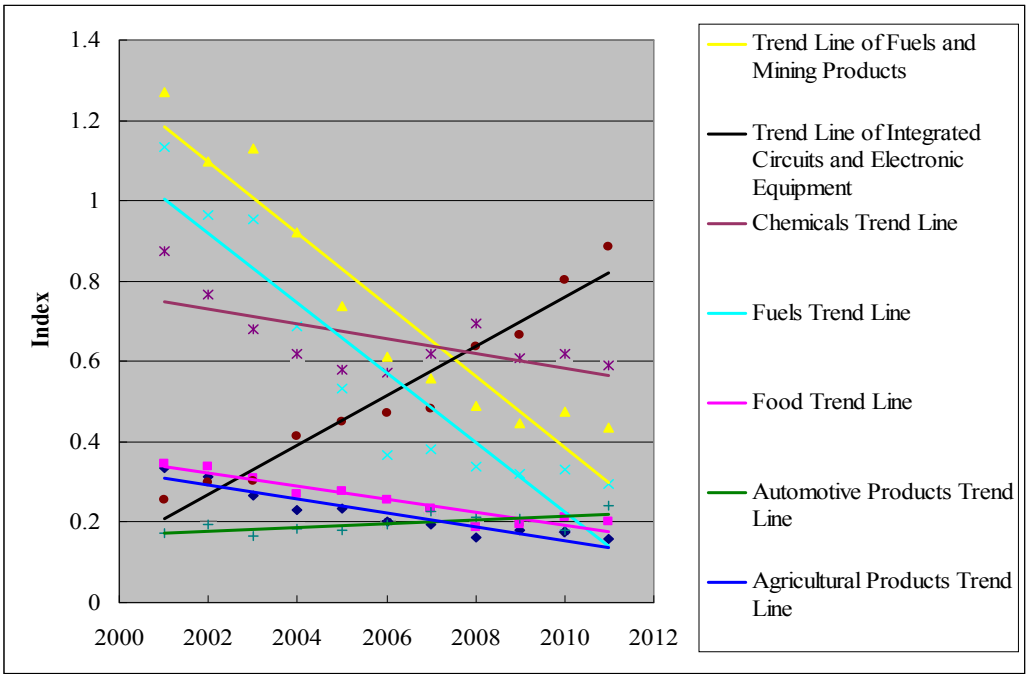


Figure 5.14
China-Thailand: Trade Competitiveness Index (0-1)

Based on Figure 5.15, China has export comparative advantages in nine categories of products, including manufactures, iron and steel, pharmaceuticals, machinery and transport equipment, office and telecom equipment, electronic data processing and office equipment, clothing, textiles, telecommunication

equipment, for the reason that their indices are greater than 1.

In the nine categories of products, China-Thailand trade competitiveness on eight categories of products (manufactures, iron and steel, machinery and transport equipment, office and telecom equipment, electronic data processing and office equipment, clothing, textiles, and telecommunication equipment) is weakened due to the increasing trend lines away from 1. China has increasing export comparative advantage in the eight categories of products (refer to Figure 5.15).

China-Thailand trade competitiveness on one category, i.e., pharmaceuticals is intensified due to the declining trend lines close to 1. China has reducing export comparative advantage in pharmaceuticals (refer to Figure 5.15).

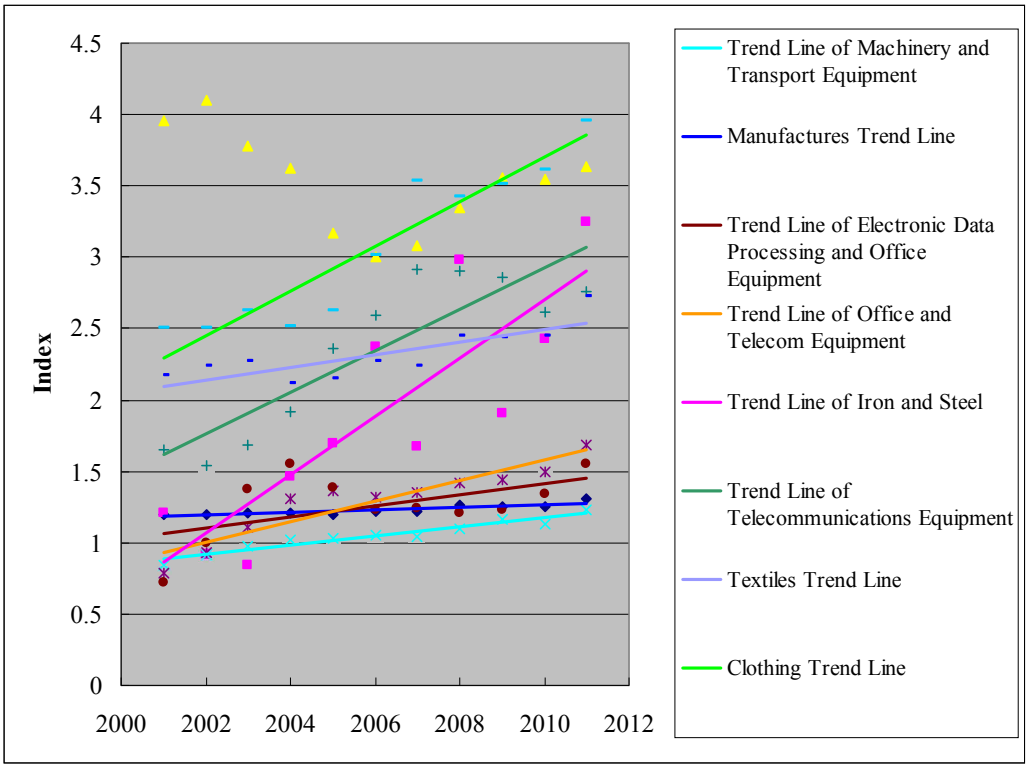


Figure 5.15
China-Thailand: Trade Competitiveness Index (1-4)

Summarily, China-Thailand trade competitiveness on three categories of products (automotive products, integrated circuits and electronic components, pharmaceuticals) is intensified, which supports H_7. However, China-Thailand trade competitiveness on 13 categories of products (agriculture products, food, fuels and mining products, chemicals, fuels, manufactures, iron and steel, machinery and transport equipment, office and telecom equipment, electronic data processing and office equipment, clothing, textiles, and telecommunication equipment) is weakened, which does not support H_7. Thus, the results of China-Thailand do not fully support H_7.

5.4.2.6 Trade competitiveness: China-Vietnam

China-Vietnam relative trade competitiveness indices are summarized in Appendix B6 and their trends are presented in Figures 5.16, 5.17 and 5.18 based on the values of indices. Figure 5.16 presents the trend lines of five categories, whose relative trade competitiveness indices are less than 1. Figures 5.17 and 5.18 show the trend lines of eleven categories, whose indices are greater than 1.

Vietnam has export comparative advantages in five categories of products, including agricultural products, food, fuels and mining products, fuels, clothing due to their indices being less than 1 (refer to Figure 5.16).

In the five categories, China-Vietnam trade competitiveness on three categories of products (agriculture products, food, and clothing) is weakened due to the declining trend lines away from 1 (refer to Figure 5.16). Vietnam has increasing export comparative advantages in these three categories of products.

China-Vietnam trade competitiveness on two categories of products (fuels and mining products, fuels) is slightly intensified, due to slightly increasing trend lines (refer to Figure 5.16). Vietnam has obvious export comparative advantages in these two categories of products.

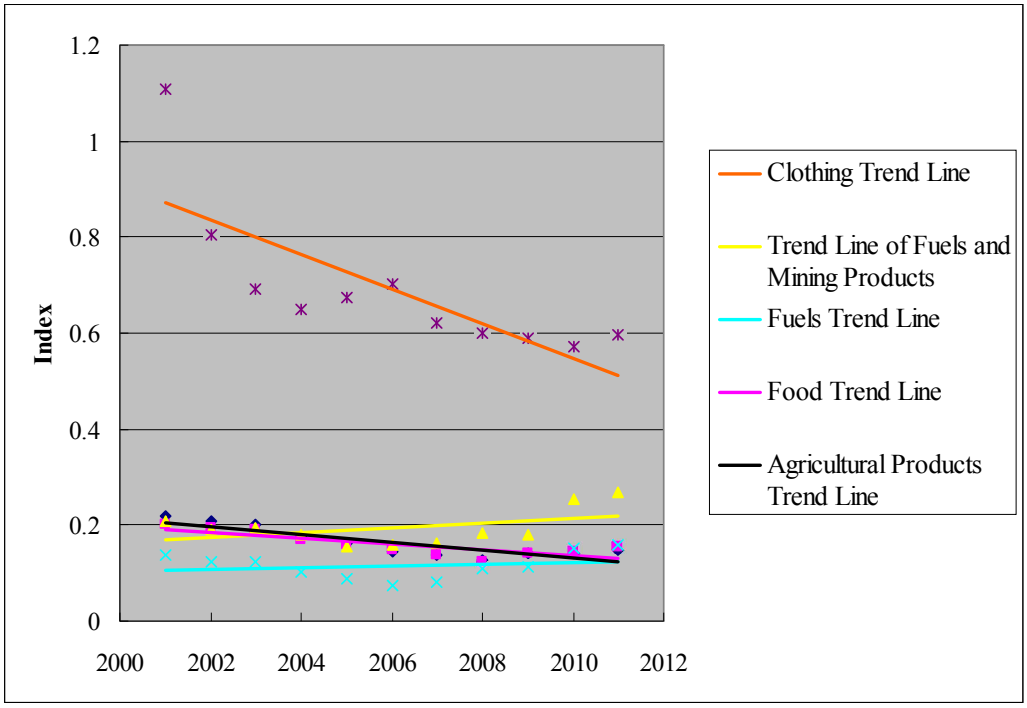


Figure 5.16
China-Vietnam: Trade Competitiveness Index (0-1)

Based on Figures 5.17 and 5.18, China has export comparative advantages in 11 categories of products, including manufactures, iron and steel, pharmaceuticals, machinery and transport equipment, office and telecom equipment, electronic data processing and office equipment, textiles, telecommunication equipment, integrated circuits and electronic components, automotive products, and chemicals, because their indices are greater than 1.

China-Vietnam trade competitiveness on these 11 categories of products is intensified due to the reducing trend lines. China has reducing export comparative advantage in these 11 categories of products (refer to Figure 5.17 and Figure 5.18).

Generally, China-Vietnam trade competitiveness on three categories of products (agriculture products, food and clothing) is weakened, which does not support H_7. Meanwhile, China-Vietnam trade competitiveness on 13 categories of products (fuels and mining products, fuels, manufactures, iron and steel, pharmaceuticals, machinery and transport equipment, office and telecom equipment, electronic data processing and office equipment, textiles, telecommunication equipment, integrated circuits and electronic components, automotive products and chemicals) is intensified, which supports H_7. Thus, the results of China-Vietnam do not fully support H_7.

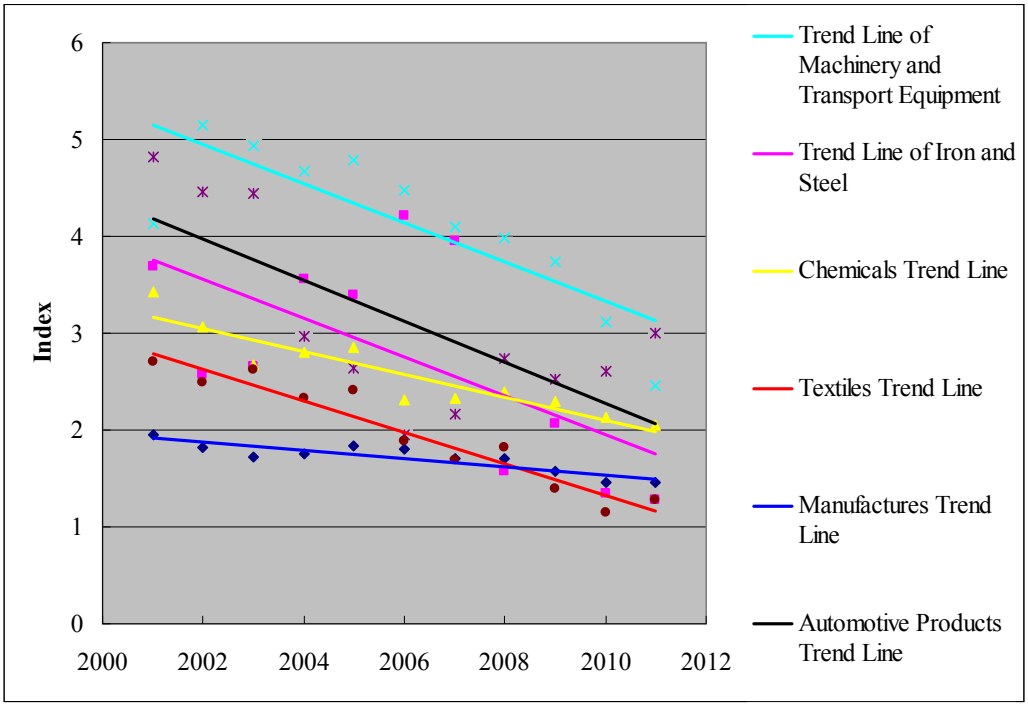


Figure 5.17
China-Vietnam: Trade Competitiveness Index (1-5)

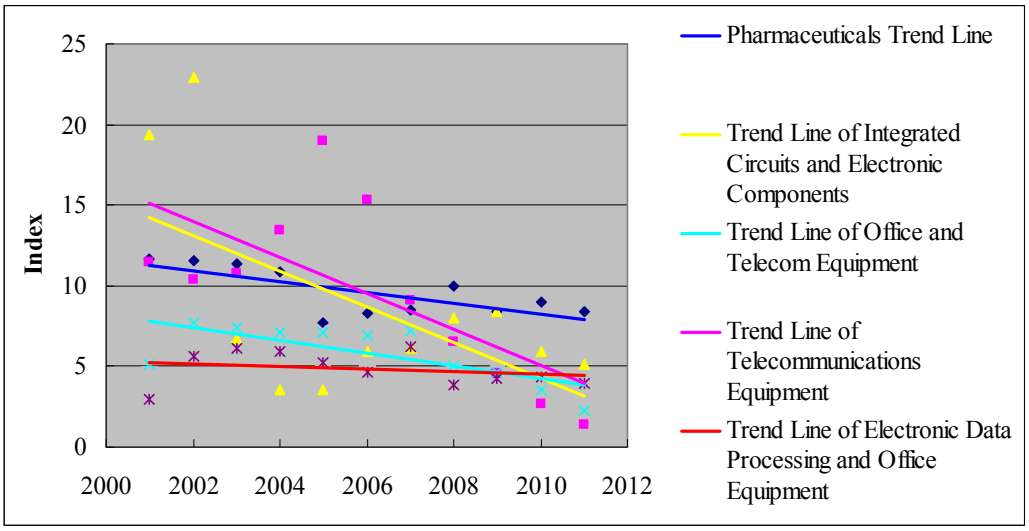


Figure 5.18
China-Vietnam: Trade Competitiveness Index (5-25)

In summary, the trade competitiveness on 16 categories of products is different between China and each ASEAN country. The trade competitiveness on some categories of products is intensified, but that on some other categories is weakened. Thus, the results do not support H_7 (CAFTA intensifies the trade competition between China and ASEAN countries). Research objective 3 (to estimate the effect of CAFTA on trade complementarities and competition between China and ASEAN) is answered.

These results are based on the comparison of export comparative advantages of products between China and six ASEAN members. Thus, the results also present the export comparative advantages of products in China and ASEAN.

Basically, ASEAN members have increasing export comparative advantages in agriculture products, food, fuels and mining products, and fuels. On the other

hand, China has obvious export comparative advantages in manufactures and machinery and transport equipment, which are the main export products to ASEAN countries. However, the export of machinery and transport equipment in China is facing increasing competition from Philippines and Vietnam.

5.5 CAFTA and Regional Trade Flow

The regional trade flow effect model (Model 4) is used to estimate the effect of CAFTA on trade flow of different regions and provinces in China, as well as to test H_8 and H_9. The first section estimates the effect of CAFTA on seven regions, followed by its trade flow effect on 22 provinces in China.

5.5.1 CAFTA and Regional Trade Flow

Regional trade flow effect model (Model 4) estimates the trade flow effect of CAFTA on seven regions of China (refer to section 4.4.4, Page 128). Specifically, the coefficient C_6 represents the trade flow effect of CAFTA on each region. The results are presented in Table 5.12.

Table 5.12

China: Regional Trade Flow Effect

No.	Regions in China	C_6	Std.Error	t-statistic	Prob.	Adjusted R^2
1	Southern	2.314051	0.350887	6.594871	0.0000	0.807152
2	Southwestern	2.039417	0.425935	4.788088	0.0000	0.887441
3	Eastern	1.256665	0.202098	6.218092	0.0000	0.906417
4	Northwestern	0.942913	0.181204	5.203595	0.0000	0.851872
5	Central	0.802669	0.084481	9.501168	0.0002	0.916154
6	Northern	0.634397	0.194291	3.265198	0.0016	0.848745
7	Northeastern	0.459337	0.068715	6.684676	0.0000	0.933911

Note: Coefficients are significant at 1% significance level. The adjusted R-squared is greater than 0.80, which indicates the statistical reliability of variable coefficients.

All coefficients for C_6 are greater than 0, which supports H_8, i.e., the trade flow of different regions is positively correlated to CAFTA. This indicates that CAFTA results in trade growth in seven regions. In other words, CAFTA has trade creation effect, such as trade growth between ASEAN and these seven regions of China.

In Table 5.12, the coefficient values represent the degree of the effects of CAFTA on different regions. The coefficient values of seven regions are in descending order, which implies that the effects of CAFTA on seven regions are also in descending order. In a descending order, these regions are Southern region, Southwestern region, Eastern region, Northwestern region, Central region, Northern region and Northeastern region. The results indicate that effect of CAFTA on the Southern region is the most significant compared to other regions.

The results indicate that geographical advantage is one of key factors that influence the regional trade flow effect of CAFTA on the seven regions, which can be explained by the gravity model (Tinbergen, 1962; Poyhonen, 1963). For instance, trade is negatively correlated with the distance between two countries. Specifically, the Southern region has a better geographical advantage compared to other regions. The Southern region includes Yunnan and Guangxi which are adjoining Myanmar, Laos and Vietnam as well as neighboring Thailand (refer to Figure 5.19). Thus, geographical advantage is a significant factor that has a positive effect on regional trade flow between the Southern region of China and ASEAN. Similarly, the Southwestern region of China also has a geographical advantage compared to the other five regions. Regional effect of CAFTA is also significant for trade flow in the Southwestern region. However, the Northeastern region does not have the geographical advantage as the region is located away from ASEAN countries. This region ranked the last based on regional trade flow effect of CAFTA as implied by the values of coefficient C_6 (refer to Table 5.12).

Figure 5.19
China: Regional Distribution

In addition, economic advantage of a region plays a very important role to influence regional trade flow effect of CAFTA. The Eastern region does not have obvious geographical advantage, similar to the Central region, Northern region and Northwestern region. However, the Eastern region is the most developed region with economic advantage for the reason that its GDP is greater than other regions (refer to Table 5.13). The effect of CAFTA on the Eastern region is more significant, following Southern region and Southwest region.

Table 5.13
Regional GDP: 2011 (*CNY Billion)*

Regions	East	North	South	Central	Southwest	Northeast	Northwest
GDP	19055.03	7767.24	6745.38	6623.29	4623.88	4537.75	3293.57

Source: Calculated based on data of provinces from China Statistics Yearbook in 2012.

5.5.2 CAFTA and Trade Flow of Provinces

Regional trade flow effect model (Model 4) also estimates the trade flow effect of CAFTA on 22 provinces of China (refer to section 4.4.4, Page 128), and the results of regression analyses are presented in Table 5.14. The coefficient C_6 expresses the trade flow effect of CAFTA on each province.

As presented, coefficients of 19 provinces meet the significance level test, except Gansu, Jilin and Beijing. This means that CAFTA has no significant effects on the trade flows between ASEAN and three provinces of Gansu, Jilin and Beijing.

Table 5.14

China: Trade Flow Effect of 22 Provinces

Provinces	**C_6**	**Std.Error**	**t-statistic**	**Prob.**	**Adjusted R^2**
Yunnan	2.555676***	0.440939	5.795985	0.0000	0.789106
Guangxi	2.486517***	0.468974	5.302033	0.0000	0.928595
Shanghai	1.676264***	0.081023	20.68884	0.0000	0.963723
Anhui	1.617404***	0.232499	6.956611	0.0000	0.785337
Jiangsu	1.418388***	0.37065	3.826761	0.0002	0.95312
Heilongjiang	1.335718***	0.197136	6.775617	0.0000	0.844262
Jiangxi	1.292807***	0.241511	5.353002	0.0000	0.81663
Chongqing	1.152282***	0.321998	3.578535	0.0004	0.899896
Shanxi’	1.065822***	0.195943	5.439449	0.0000	0.895691
Guangdong	1.022879***	0.34892	2.931554	0.0038	0.965551
Xinjiang	0.925477***	0.312133	2.965008	0.0034	0.697647
Shandong	0.904122***	0.251028	3.601682	0.0004	0.914048
Hubei	0.802669***	0.084481	9.501168	0.0000	0.916154
Zhejiang	0.654733***	0.137492	4.761988	0.0000	0.955873
Tianjin	0.517521**	0.207302	2.496455	0.0145	0.861377
Liaoning	0.391765**	0.182605	2.145425	0.0337	0.923767
Hebei	0.344424***	0.11021	3.125164	0.002	0.895338
Fujian	-0.073713*	0.043657	-1.688452	0.0932	0.967337
Shanxi	-0.16514*	0.088865	-1.85835	0.065	0.838008
Gansu	0.512964	0.469222	1.093223	0.2759	0.934309
Jilin	0.925291	1.265618	0.731099	0.4674	0.982208
Beijing	0.112664	2.369005	0.047558	0.9622	0.682286

Note: ***, **, * —— estimated coefficient and respective 1%, 5%, 10% significant level.

In Table 5.14, the coefficient (C_6) values of 19 provinces are listed in descending order, expressing the decreasing effects of CAFTA on different provinces. Specifically, the coefficient values of 17 provinces are greater than 0, which means that the trade flows are positively related to CAFTA. In other words, CAFTA improves the trade growth of 17 provinces. It indicates that CAFTA causes trade creation effect (i.e., creates new trade flow) of 17 provinces.

Besides, the effects of CAFTA on two provinces (Guangxi and Yunnan) are more significant than the effects on other provinces, due to their greater coefficient values. The results also indicate that geographical advantages of provinces influence the regional trade flow effect of CAFTA. Specifically, Guangxi and Yunnan provinces have obvious geographical advantages adjoining Myanmar, Laos and Vietnam as well as nearing Thailand (refer to Figure 5.20); thus they have the most significant trade flow effects due to CAFTA.

However, coefficient values of Fujian and Shanxi provinces are less than 0. This represents that CAFTA is negatively related to the trade flows of the two provinces. In other words, CAFTA results in trade reduction of Fujian and Shanxi.

Thus, the results of 22 provinces do not support H_9 (the trade flows of different provinces are positively correlated to CAFTA).

Figure 5.20
China: The Provinces

In general, CAFTA causes the trade growth of seven regions, which supports H_8. However, there are different trade flow effects of CAFTA on 22 provinces. CAFTA causes the trade growth of 17 provinces (trade creation effect), trade decrease of two provinces and no effects on three provinces. Thus, the total results of 22 provinces do not support H_9. In addition, the results indicate that the effect of CAFTA is more significant in the province or region with geographical advantage.

The results of the trade flow effect of CAFTA on different provinces and regions answer research question 4 (the impact of CAFTA on regional trade in China)

and research objective 4 (to analyze the effect of CAFTA on the trade flows of different regions in China).

5.6 CAFTA and FDI

The FDI flow effect model (Model 5) is employed to examine the effect of CAFTA on FDI flows of China (refer to Section 4.4.5, Page 130), in order to answer research objective 5 (to evaluate whether CAFTA promotes FDI flows between China and ASEAN). Generally, the effect of CAFTA is divided into the effect on the FDI outflow of China (H_{10}, H_{11}) and the effect on the FDI inflow of China (H_{12}, H_{13}).

5.6.1 CAFTA and FDI Outflow of China

The FDI flow effect model (Model 5) examines the FDI outflow effect caused by trade liberalization and investment liberalization of CAFTA. Coefficient α_6 expresses the FDI outflow effect due to trade liberalization of CAFTA. Coefficient α_7 represents the FDI outflow effect due to investment liberalization of CAFTA. The results are presented in Table 5.15.

Table 5.15
China: CAFTA and FDI outflow

Variable	Coefficient	Coefficient	Std.Error	t-statistic	Prob.	Adjusted R^2
GDP	α_1	0.361747***	0.130672	2.768370	0.0000	0.972959
Population	α_2	1.981561***	0.263049	7.533042	0.0000	
Distance	α_3	-2.059010***	0.122694	-16.78162	0.0000	
Ratio of Per GDP	α_4	-2.048850***	0.150746	-13.59142	0.0000	
Trade	α_5	1.882883***	0.066464	28.32933	0.0000	
CT	α_6	-1.998800***	0.168640	-11.85247	0.0000	
CI	α_7	-0.045558*	0.285753	-0.159432	0.0874	

Note：CT: the trade liberalization of CAFTA; CI: the investment liberalization of CAFTA; ***, * the estimated coefficient is significant at 1%, 10% significance level.

Coefficient α_6 is less than 0 (refer to Table 5.15), which means that FDI outflow of China is negatively correlated to trade liberalization of CAFTA. In other words, trade liberalization of CAFTA results in the reduction of the FDI outflow of China. The result does not support H_{10} (FDI outflow of China is positively correlated to trade liberalization of CAFTA). The reduction of FDI outflow caused by CAFTA may be due to FDI diversion. FDI diversion occurs due to trade substitution as a result of improved trade growth caused by trade liberalization of CAFTA substituting the FDI of evading tariffs (this kind of FDI is invested in order to evade tariffs) (refer to Section 2.5, Pages 44-45).

Coefficient α_7 is less than 0 (refer to Table 5.15), which means that FDI outflow of China is negatively correlated to the investment liberalization of CAFTA. In

other words, the investment liberalization of CAFTA causes the reduction of FDI outflow of China. The result does not support H_{11} (FDI outflow of China is positively correlated to investment liberalization of CAFTA).

Besides, coefficient α_5 is greater than 0, which means that trade value is positively related to the FDI outflow in China. That is to say, the trade growth improves the FDI outflow growth in China. The result explains the relationship between trade growth and FDI outflow growth.

GDP and population are positively related to the FDI outflow while distance is negatively related to the FDI outflow. In other words, the growth of GDP and population improve the growth of FDI outflow in China; nevertheless, the further distance causes the reduction of FDI outflow. In addition, coefficient α_4 is less than 0, which means that the differences in capital factor endowments between two countries are negatively related to the FDI outflow. That is to say, the greater differences in capital factor endowments cause the decreasing of FDI outflow. This indicates that China tends to invest FDI in a country less developed than China.

5.6.2 CAFTA and FDI Inflow of China

Table 5.16 presents the results of the effects of CAFTA on the FDI inflow of China based on FDI flow effect model (Model 5). In Table 5.16, coefficient α_6

expresses FDI inflow effect due to trade liberalization of CAFTA. Coefficient α_7 represents FDI inflow effect due to investment liberalization of CAFTA.

Table 5.16
China: CAFTA and FDI Inflow

Variable	Coefficient	Coefficient	Std.Error	t-statistic	Prob.	Adjusted R^2
GDP	α_1	0.085316*	0.046322	1.841813	0.0662	0.776290
Population	α_2	-0.202485***	0.037868	-5.347125	0.0000	
Distance	α_3	-0.976699***	0.078775	-12.39854	0.0000	
Ratio of Per GDP	α_4	-0.596837***	0.043065	-13.85897	0.0000	
Trade	α_5	0.524461***	0.049193	10.66125	0.0000	
CT	α_6	-0.295038**	0.140818	-2.095172	0.0368	
CI	α_7	-0.315717**	0.222173	-1.421040	0.0156	

Note: CT: the trade liberalization of CAFTA; CI: the investment liberalization of CAFTA; ***, **, * separately denote that the estimated coefficient is significant at 1%, 5%, 10% significance level.

Table 5.16 shows that coefficient α_6 is less than 0, which means FDI inflow of China is negatively correlated to trade liberalization of CAFTA. In other words, the trade liberalization of CAFTA results in the reduction of FDI inflow of China. The results do not support H_{12} (FDI inflow of China is positively correlated to trade liberalization of CAFTA). It indicates that trade liberalization of CAFTA does not bring about FDI creation while it results in FDI diversion (refer to 2.5, Page 44).

Coefficient α_7 is less than 0 (refer to Table 5.16), which means that FDI inflow is negatively correlated to investment liberalization of CAFTA i.e. the investment liberalization of CAFTA causes the reduction of FDI inflow of China. The result does not support H_{13} (FDI inflow of China is positively correlated to investment liberalization of CAFTA).

Besides, coefficient α_5 is greater than 0, which means that trade value is positively related to FDI inflow in China. In other words, the trade growth improves the growth of FDI inflow in China. This explains the relationship between trade growth and FDI inflow growth.

In addition, coefficient α_4 is less than 0, which means that the differences in capital factor endowments between two countries are negatively related to FDI inflow. That is to say, FDI inflow of China is less if the differences in capital factor endowments are greater between two trade partners.

In summary, the FDI flow effect model (Model 5) estimates the effect of CAFTA on the FDI flows of China, and tries to answer research question and research objective 5. The results do not support H_{10}, H_{11}, H_{12}, and H_{13}, i.e., the FDI outflow and inflow of China decrease due to the trade liberalization and investment liberalization of CAFTA.

The FDI reduction due to the trade liberalization of CAFTA may be explained by FDI diversion proposed by Kingdleberger (1966) (refer to 2.5, Page 44). FDI diversion is mainly due to trade substitution as a result of improved trade growth caused by trade liberalization of CAFTA substituting the FDI of evading tariffs (invested in order to evade tariffs), which leads to the reduction of FDI flows.

The FDI reduction due to the investment liberalization of CAFTA may be explained in two ways. The agreement on investment between China and ASEAN was only implemented after 2010. Thus, the potential positive effects of the investment liberalization on FDI have not been fully developed due to this short implementation period. On the other hand, the inadequacy of investment agreement (as discussed in Section 3.4.5, Page 71) restricts the effect of the investment liberalization.

Finally, the relationship between trade growth and FDI growth is examined based on Model 5. The results present that trade growth improves the FDI growth. Meanwhile, the results indicate that FDI flow between two countries is less if the differences in capital factor endowments are greater.

5.7 Summary

This study employs five models and provides 13 hypotheses. The results indicate that nine hypotheses are not supported while four hypotheses are

supported.

The first three hypotheses are to examine the relationship between CAFTA and trade flows of China (research objective 1). The results find that CAFTA has positive influence on the total trade flows, export trade flow and import trade flow in China. Hence, H_1, H_2 and H_3 are supported.

Hypothesis 4 (H_4) relating to the relationship between CAFTA and trade structure is tested based on ten categories of SITC (research objective 2). The results indicate insignificant relationship between CAFTA and trade structure in four categories of SITC, positive relationship between them in three categories of SITC and negative relationship in three categories of SITC. Thus, the results do not support hypothesis 4.

The next three hypotheses (H_5, H_6 and H_7) are provided to examine the changes of trade complementarities and competition between China and ASEAN members after the establishment of CAFTA (research objective 3). The results indicate that trade complementarities and competition are weakened or intensified between China and different ASEAN members. Thus, the results do not support H_5, H_6 and H_7.

Further, two hypotheses (H_8, H_9) are to estimate the relationship between CAFTA and trade flows of different provinces and regions (research objective 4). The results indicate the trade flows of seven regions are positively related to CAFTA, which support H_8. However, CAFTA is positively related to trade flows of 17 provinces, negatively related to that of two provinces, and insignificant to that of three provinces. Thus, the results do not support H_9.

Finally, the last four hypotheses (H_{10}-H_{13}) predict that the FDI outflow and inflow of China are positively correlated to trade liberalization and investment liberalization of CAFTA. However, the results indicate a negative relationship between them, and answer research objective 5. Therefore, these four hypotheses are not supported.

CHAPTER SIX

CONCLUSION AND POLICY RECOMMONDATION

The general objective of this study is to analyze the impacts of CAFTA on the trade between China and ASEAN. Specifically, five objectives are proposed and thirteen hypotheses are developed. The study identified five models to ascertain the research objectives and to evaluate the hypotheses as summarized in Table 6.1 (Page 207).

Based on the five models and 13 hypotheses, this study examines five effects of CAFTA: the effects on trade flows; trade structure; trade complementarities and competition; trade flows on different regions; and FDI flows between China and ASEAN.

Research Objective 1

To evaluate how CAFTA improves the import and export flows in China.

Firstly, this study estimates the effect of CAFTA on trade flows to answer research question 1 based on Model 1. The results indicate that CAFTA improves the total trade flow, export trade flow and import trade flow in China, which is trade creation effect of CAFTA. These support H_1, H_2 and H_3. Moreover, CAFTA enjoys greater imports than exports in China, which means that CAFTA is inclined to cause potential trade deficit to China. Few studies

have examined the comparison of export and import effects of CAFTA.

Research Objective 2

To estimate the effect of CAFTA on trade structure between China and ASEAN.

Secondly, this study estimates the effect of CAFTA on trade structure between China and ASEAN based on Model 2. The results indicate that there are different effects of CAFTA on the intra-industry trade of different categories of products. Generally, CAFTA reduces the intra-industry trade and expands the inter-industry trade of main products (manufactured goods, materials) in trade structure between China and ASEAN. H_4 is not supported.

The results indicate that the trade growth due to CAFTA is mainly from the expansion of inter-industry trade. Further, trade growth due to CAFTA is mainly dependent on strengthening specialization productivity among members. If international division of labor and specialization productivity among members can be strengthened, it will be beneficial for forming collective competitive advantage within CAFTA. This will promote the economic development of the whole area. Previous studies just focused on the effect of CAFTA on the trade structure of China. This study better answers the effect of CAFTA on the trade structure between China and ASEAN.

Research Objective 3

To estimate the effect of CAFTA on trade complementarities and competition between China and ASEAN.

Thirdly, this study examines the effect of CAFTA on trade complementarities and competition based on Model 3. The results indicate that there are different effects on the trade complementarities between China and different ASEAN members. For instance, the trade complementarities are strengthened between China-Cambodia, China-Indonesia and China-Singapore; while they are weakened between China and Philippines after the establishment of CAFTA. Thus, H_5 and H_6 are not supported.

Meanwhile, there are different effects on trade competition in different categories of products between China and different members. Simply put, the trade competition of main products is weakened between China and ASEAN members (except Vietnam). Therefore, H_7 is not supported. Previous studies mainly analyzed the trade complementarities and competition based on historical data without analyzing their changing trends. This study employs different methods to examine the trade complementarities and competition and introduces their changing trends after the establishment of CAFTA, using current data.

Research Objective 4

To analyze the effect of CAFTA on the trade flows of different regions in China.

Fourthly, this study estimates the effect of CAFTA on different regions of China based on Model 4. The results present that CAFTA causes the trade growth of seven regions and 17 provinces, trade reduction of two provinces, and insignificant effect on three provinces. H_9 is supported. However, H_{10} is not supported. Moreover, significant effect of CAFTA is greater in the regions with geographical and economic advantages. Few previous studies have examined the effects of CAFTA on different regions of China, which is explored by this study.

Research Objective 5

To evaluate whether CAFTA promotes FDI flows between China and ASEAN.

Finally, this study evaluates the effect of CAFTA on FDI flows of China based on Model 5. The results indicate that trade liberalization and investment liberalization of CAFTA cause the reduction of FDI outflow and inflow of China. H_{10}-H_{13} are not supported. The FDI reduction due to trade liberalization may be explained by trade substitution (i.e., the FDI is substituted by the trade growth due to trade liberalization). The FDI reduction due to investment liberalization may be explained in two ways: the short implementation period and its inadequacy of investment liberalization. In addition, this study extends previous studies in two aspects: it emphasizes the effect on the FDI outflow of China; and distinguishes the different effects of trade liberalization and investment

liberalization of CAFTA.

Overall, CAFTA improved the trade growth, trade structure and trade complementarities between China and most ASEAN countries, and promoted the expansion of trade scale between China and ASEAN. However, FDI reduced due to China's participation in CAFTA. In other words, CAFTA has a positive effect on China in terms of trade and a negative effect on FDI due to the reduction of FDI as a result of China's participation in CAFTA.

Table 6.1
Summary of the Study

Research Question	Research Objective	Model	Hypothesis	Results
1	1	1	**H_1** CAFTA positively influences trade flows in China.	Supported
			H_2 CAFTA positively influences export trade flow in China.	Supported
			H_3 CAFTA positively influences import trade flow in China.	Supported
2	2	2	**H_4** CAFTA positively influences the trade structure between China and ASEAN.	Not Supported
3	3	3	**H_5** CAFTA weakens the trade complementarities between the export structure of China and the import structure of ASEAN.	Not Supported
			H_6 CAFTA weakens the trade complementarities between the import structure of China and the export structure of ASEAN.	Not Supported
			H_7 CAFTA intensifies the trade complementarities between China and ASEAN.	Not Supported
4	4	4	**H_8** The trade flows of different provinces are positively correlated to CAFTA.	Not Supported
			H_9 The trade flows of different regions are positively correlated to CAFTA.	Supported
5	5	5	**H_{10}** FDI outflow of China is positively correlated to trade liberalization of CAFTA.	Not Supported
			H_{11} FDI outflow of China is positively correlated to investment liberalization of CAFTA.	Not Supported
			H_{12} FDI inflow of China is positively correlated to trade liberalization of CAFTA.	Not Supported
			H_{13} FDI inflow of China is positively correlated to investment liberalization of CAFTA.	Not Supported

6.1 Contributions of the Study

There are three main contributions:

6.1.1 The extension of literatures

Previous studies only focused on the total trade flow effect of CAFTA based on historical data. This study adopts recent data and extends previous studies in two ways: it estimates not only the effect of CAFTA on total trade flow but also on the export and import trade flows; and compares the export with import flows effect to analyze the differences between them. Thus, the findings of this study provide a more comprehensive explanation on the trade flow effects of CAFTA compared to previous studies.

Secondly, this study analyzes the effects of CAFTA on trade structure between China and ASEAN, whereas previous studies only focused on the effect of the trade structure in China. Besides, this study updates the data to 2011 and employs different methods compared to previous studies: the products classification based on SITC (based on HS92 in previous studies); modifying the sets of dependent variable and dummy variable (trade structure effect of CAFTA) (refer to Section 4.4.2, Page 123). Therefore, this study extends previous studies on the trade structure effect of CAFTA.

Thirdly, this study develops the changing trends of trade complementarities and competition between China and ASEAN members due to CAFTA, while previous studies analyzed them based on historical data, without referring to their trends. In addition, previous studies presented the trade complementarities and competition in five categories of products (agriculture, mining, chemicals, textiles and electronics), whereas this study estimates trade complementarities based on 10 categories of SITC and trade competition in 16 categories of products (HS92), using current data of 2001-2011. Thus, this study extends the effect of CAFTA on trade complementarities and competition compared to previous studies.

Fourthly, this study explores the trade flow effect of CAFTA on different regions of China. Few previous studies attempted to empirically test regional trade flow effects of CAFTA. However, this study estimates the trade flow effect of CAFTA on 22 provinces and seven regions in China.

Finally, previous studies only emphasized the effect of CAFTA on the FDI inflows of China, but neglected the effect on the FDI outflow. The present study estimates the effects of CAFTA on both FDI inflows and outflows using current data of 2001-2011 and larger samples of 40 states. Besides, this study distinguishes the different effects of trade liberalization and investment liberalization on FDI outflow and inflow, which were neglected by previous

studies.

6.1.2 Theoretical Applicability

Firstly, the findings on trade flow effect (Model 1) indicate the trade creation effect of the Customs Union theory (Viner, 1950) occurred in CAFTA (refer to Section 5.2.1, Page 143). This means that the trade creation effect is applicable to CAFTA.

Secondly, the FDI flow effect presents that CAFTA results in the reduction of FDI. This means the investment creation (FDI growth caused by regional economic integration) does not occur in CAFTA. In other words, the investment creation effect as noted by Kindleberger (Zhu, 2009) is not applicable within CAFTA.

Thirdly, this study re-examines the relationships between economic growth and trade growth, between economic growth and FDI growth, between trade and FDI, and between FDI flows and different capital factor endowments. The findings of trade and FDI flow effects indicate that economic growth improves the trade and FDI growth, supporting previous studies by Tinbergen (1962); Poyhonen (1963); Zhu (2009); and Li (2011). Trade growth also promotes FDI growth in China, supporting the previous study by Xiang (2003). In addition, findings of FDI flow effects have reflected that FDI flows are negatively correlated to the differences

in capital factor endowments, as justified by Huang (2011).

Fourthly, this study further explains the importance of geographic advantage in regional economic integration. Findings of regional trade flow effects (Model 4) indicate that a province or region with geographic advantages, such as Guangxi province and other Southern region provinces, have a more significant trade growth due to CAFTA. This means that the geographic advantage in terms of shorter distance between two trade partners is beneficial to trade growth between Guangxi province or Southern region provinces and ASEAN members. This supports the explanation of the gravity model that distance is negatively correlated to trade flow.

6.1.3 Practical Contributions

First of all, this study attempts to answer an essential question as to whether CAFTA results in the growth of trade and FDI in China after the establishment of CAFTA. The findings of this study indicate that CAFTA promotes trade growth, but reduces FDI. In other words, CAFTA has both positive and negative effects on China. According to Kindleberger (1966), FDI reduction may be due to investment diversion (Zhu, 2009). FDI may be substituted by higher trade growth due to the trade liberalization of CAFTA such as elimination and reduction of tariffs imposed on goods. It means that CAFTA has a significant effect on China's trade.

Secondly, this study provides a direction to enhance collaboration between China and ASEAN with the integration of CAFTA. The findings of trade structure effect indicate the expansion of inter-industry trade between China and ASEAN that implies cooperation among industry players in CAFTA. For instance, China is strong in the manufacturing industry, while ASEAN is rich in materials, based on this study. Thus, China-ASEAN cooperation can emphasize the international division of labor and specialization productivity to improve the inter-industry trade.

Thirdly, this study analyzes export comparative advantages of China and ASEAN members based on the trade competition effect. It provides a policy basis for governments to formulate export trade policies.

6.2 Policy Recommendations

This study focuses on two main recommendations related to goods trade and FDI.

The findings present trade complementarities and export comparative advantages between China and ASEAN. China has export comparative advantages in manufactures, machinery and transportation equipment, i.e., the main export products to ASEAN. Therefore, China should fully develop these

products' existing advantages and enhance their comparative advantages to expand exports to ASEAN. The basic way for foreign trade enterprises is to improve the technology contents of products and achieve product differentiation. The government should carry out export incentive policies (such as preferential export credit) for the products or industries with export comparative advantages to expand exports. Besides, the government should unite industry associations to serve the enterprises by providing information about the relevant policies and regulations of CAFTA to encourage the enterprises to actively take part in the agreement.

In addition, China-ASEAN cooperation direction in the future is expected to focus on deepening the international division of labor between China and ASEAN. The findings of trade structure effect indicate that trade growth and further welfare growth between both sides due to CAFTA mainly depend on strengthening specialization productivity among members. If both sides strengthen the cooperation to deepen the international division of labor and specialization productivity, it is helpful to form the professional division and further to form the collective comparative advantage in the free trade area, which will push the economic growth in the whole area.

Findings of the study also indicate that investment liberalization of CAFTA causes FDI reduction, i.e., negative effect on the FDI in China. It reflects that the

inadequacy of investment liberalization contents (refer to Section 3.4.5) restricts its positive effect. Thus, China should further deepen the cooperation with ASEAN to push the investment liberalization of CAFTA in order to achieve its positive effect, by improving and perfecting the contents of investment liberalization.

6.3 Future Research

Despite the various contributions, some limitations are worth noting. These limitations may provide opportunities for future research.

Firstly, this study focuses on the effects of CAFTA on the goods trade and FDI in China. However, the effect of CAFTA on service trade has not been estimated due to data limitation of bilateral service trade. Thus, data availability on service trade would provide better understanding on the bilateral service trade. It is suggested that effect of CAFTA on service trade should be explored in the future research.

Secondly, this study emphasizes the trade flow effects of CAFTA on seven regions in China. The effects of CAFTA on various industrial sectors in these regions have not been examined due to the limitation of data and time. Hence, it is suggested that future research may focus on the trade structure effect of CAFTA on these regions to further explore regional effects of CAFTA.

Thirdly, based on the results from the Model 4, this study provides evidences that geographical and economic advantages may be important factors that influence the degree of regional trade flow effect due to CAFTA. However, this study has not estimated the influence of geographical and economic advantages on regional trade flow effect of CAFTA. Hence, it is proposed that future research on regional trade effect should take them into consideration when developing the research model.

Fourthly, this study focuses on the effect of CAFTA on FDI flows of China without estimating the FDI flow effects on various industrial sectors due to the limitation of data. Future research may pay attention to the FDI flow effects of CAFTA in various economic sectors, such as manufacturing, renewable energy, service and others. This will provide a comprehensive understanding on the FDI flow effects of CAFTA.

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