Agricultural Trade, Economic Growth and Free Trade Agreements: Studies of the Indonesian Case

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Abstract

For decades the importance of the agricultural sector in economic development has been overshadowed by the industrialization, and indeed this was the case for much of the 20th century. But the recent revival of the agricultural sector has confirmed its position as a key to growth in many developing countries. One focus of this renewed attention has been free trade agreements, with the hope that these would open markets in large or growing markets in large or rapidly growing countries to the agricultural exports of developing countries.

This thesis is concerned with the potential for agricultural exports, particularly that facilitated through free trade agreements, to contribute to Indonesia's growth. Indonesia's agricultural exports have risen strongly since 2004, and provide a rising share of exports, so these issues are highly relevant to Indonesia.

The objective of this thesis is to examine the impact of agricultural exports on Indonesian economic growth and the implication of the ASEAN-China Free Trade Agreement (ACFTA) on agricultural exports of Indonesia. The study includes 35 of Indonesia's biggest exported agricultural commodities which covers more than 95 per cent of total agricultural exports of Indonesia. The endogenous gravity model shows that Indonesian agricultural exports to China have a positive and significant impact on Indonesian economic growth. On the other hand, the autoregressive distributed lags (ARDL) time series measurement reveals that the ACFTA programs have mixed implication on Indonesian agricultural exports to China both in the short- and long-run. However, tariff reduction under the Early Harvest Program (EHP) has not significantly affected the export growth of agriculture in the short and long run. Furthermore, trade facilitations under the ACFTA programs have also mixed influences on the competitiveness of agricultural exports depend on the commodities.

It is concluded that the ACFTA role has not yet been reflected in the growth of agricultural exports since there is no important agricultural commodities covered by early programs of the ACFTA. Meanwhile the strong growth of agricultural exports should be carefully addressed as an opportunity by Indonesian government to increase its contribution to the economic growth.

Student Declaration

I, Estty Purwadiani Hidayatie, declare that the PhD thesis entitled *Agricultural Trade, Economic Growth and Free Trade Agreements: Studies on the Indonesian Case* is no more than 100,000 words in length, including quotes and exclusive of tables, figures, appendices, bibliography, references, and footnotes. This thesis contains no material that has been submitted previously, in whole or part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Estty Purwadiani Hidayatie

7 July 2014

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“Optimism is the faith that leads to achievement. Nothing can be done without hope and confidence”

Helen Keller

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Table of Contents

List of Tables

List of Figures

List of Abbreviations and Acronyms

ABS	Australian Bureau of Statistics
ACFTA	ASEAN-China Free Trade Agreement
ADF	Augmented Dickey-Fuller Unit Root Test
AFTA	ASEAN Free Trade Agreement
ARDL	Autoregressive Distributed Lags
ASEAN	Association of South East Asian Nations
ADB	Asian Development Bank
BPS	Biro Pusat Statistik (Central Bureau of Statistics)
CACM	Central American Common Market
COMESA	Common Market for Eastern and Southern Africa
CPI	Customer Price Index
CUSTA	Canada-US Trade Agreement
CUSUM	Cumulative Sum Control Chart
CUSUMSQ	CUSUM of squares
DRCA	Dynamic Revealed Comparative Advantage
EHP	The Early Harvest Program
ELG	Export-Led Growth
ERV	Exchange Rate Volatility
EU	European Union
EX	Exchange Rate
FAO	Food and Agricultural Organization
FDI	Foreign Direct Investment
FP	Fiscal Policy
FS	Falling Star
G8	Group of Eight
G20	Group of Twenty Finance Ministers and Central Bank Governors
GAFTA	Greater Arab Free Trade Area
GATT	General Agreement on Tariff and Trade
GDP	Gross Domestic Products
GFC	Global Financial Crisis
GGT	Generalized Gravity Theory
GLE	Growth-Led Export
HS	Harmonized System
HSL	Highly Sensitive Track
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
INF	Inflation Pressure
IV	Instrumental Variables
LdR	Leading Retreat
Lgo	Lagging Opportunity

LgR	Lagging Retreat
LNEHPT	Export Tariff Rates under the EHP scheme in China
LNGDPR	Real GDP of China
LNMFN	Export Tariff rates under the MFN Scheme in China
LNPIEC	Relative Price of Agricultural Products under the SL
LNR	China's exchange rate volatility
LNSG	Export of Agricultural Products under the SL scheme
LO	Lost Opportunity
MERCOSUR	Mercado Comun del Sur (South American Economic Organization)
MFN	Most Favored Nation
MP	Monetary Policy
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
PP	Phillip-Perron Unit Root Test
RER	Real Exchange Rate
RMB	China Renminbi
RP	Indonesian Rupiah
RS	Rising Star
RTA	Regional Trade Agreement
SBC	Schwartz-Bayesian Criteria
SITC	Standard International Trade Classification
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement
ST	Sensitive Track
TFP	Total Factor Productivity
TIG	Trade in Goods
TII	Trade Intensity Index
TRQ	Tariff Rate Quotas
UECM	Unrestricted Error Correction Model
UN	United Nations
UnComtrade	The United Nations Commodity Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UN WEHAB	United Nations Water, Energy, Health, Agriculture and Biodiversity
URAA	The Uruguay Round Agreement on Agriculture
US	United States of America
VAR	Vector Auto-regression
WCO	World Customs Organization
WTO	World Trade Organization
2SLS	2-Stage Least Squares

Executive Summary

Agriculture is a sector that has multiple functions in the economy. However, its importance in economic development has been dwarfed by industrialization, which was seen as the main source for economic growth for much of the 20th century. Beside developing countries hindered by their reliance on agriculture and falling relative prices for their exports, the unwillingness of developed countries to open their market to agriculture have resulted agriculture was neglected in in the literature and practice of development. Nonetheless, renewed attention has been given to agriculture in recent years as a key to growth in many countries, in the contexts of high process for many commodities and the impact of rural development of the poor. One focus of this renewed attention has been free trade agreements, with the hope that these would open markets in large or rapidly growing countries to the agricultural exports of developing countries.

This thesis focuses on the potential for agricultural exports to contribute to Indonesia's growth, and the implications of a free trade agreement on agricultural exports in terms of export growth and competitiveness. Agriculture is an important sector in Indonesia as it contributed around 15 per cent of Indonesia's GDP in 2013, higher than in 2005 in nominal terms, although declining slowly in real terms. In contrast with the share of agriculture in merchandise exports worldwide, which has been declining, Indonesian agricultural exports have risen strongly since 2004 and provide a rising share of merchandise exports, so these issues are highly relevant to Indonesia.

Relevant literature and policy background concerning agricultural trade and growth and the role of initiatives to create freer trade are reviewed in chapters one to three. Four empirical analyses are reported in this thesis.

Chapter Four utilizes a generalized gravity model to study the impacts of Indonesian agricultural exports to China and of ACFTA on Indonesia's economic growth. Such a model is successfully implemented, by standard econometric tests, on quarterly data for the period 1996 to 2012. The analysis finds positive impacts of agricultural exports to

China and the implementation of the ACFTA on Indonesia's growth significant at the 10 per cent.

The second study (Chapter Five) uses autoregressive distributed lag (ARDL) models to undertake a time series econometric study to explore the short-run and long-run effects of the impact of two ACFTA programs on Indonesia's agricultural exports to China. These programs are tariff reductions under the Early Harvest Program (EHP) which was completed in the period 2004 to 2006 and was a program to boost agricultural trade between members. The second program is the Sensitive Track (SL) which started in 2012. This study has also measured other regulations under the ACFTA, such as the Rule of Origin, on the agricultural exports. Co-integration tests are satisfied and there are short-run and long-run effects to be analyzed. The estimation reveals different results of the Early Harvest program and the Sensitive Track program results.

Based on the findings of this study, the impacts of the EHP scheme on Indonesian agricultural export growth in China, to date, have been limited both in the short-run and long-run. The results suggest that the tariff reduction facilitation under the EHP program has no significant impact on the agricultural export growth both in the short-run as well as the long-run. Meanwhile, the MFN tariff is applied to the SL products in the period of study, 1996 to 2012, and this tariff implementation had a negative impact on the agricultural export growth and significant at 5 per cent of the level in the short-run with no significant impact shown in the long-run. This latter result is to be expected, as tariff reductions do not begin until 2012 and the effect of the announcement only.

Furthermore, the implementation of the ACFTA had a positive and significant long-run effect on Indonesia's EHP exports to China, but that in the short-run the impact is negative, but also significant at a 5 per cent level. But no impact of the ACFTA implementation is apparent in either long-run or short-run model for agricultural export growth of the SL products.

The impacts of the ACFTA programs on the competitiveness of agricultural products are examined in chapter six. The analysis uses current price data and a range of standard methods, including the Trade Intensity Index, Dynamic Revealed Comparative Advantage (DRCA) and Market Share Index. The results show that the ACFTA

programs have influenced to only increase competitiveness on certain commodities, mainly vegetable oils. There are only three commodities, related to vegetable oils and fats, under the EHP program which have strong revealed competitiveness, and exports of these products may have been assisted by the ACFTA. While for the rest commodities covered by the EHP, Indonesia has a low comparative advantage. In contrast, the competitiveness of agricultural products under the SL program has been strongly increased, even though there was no tariff reduction facilitation. This program includes the palm oil products. While their market share in China is already high, it is expected to increase further with tariff reductions from 2012, if supply capacity is available in Indonesia.

Finally, Chapter Seven turns to a more detailed analysis of Indonesia's agricultural exports, calculating for the first time price and volume measures for 35 commodities which constitute the bulk of Indonesia's agricultural exports and covers more than 95 per cent of the total of agricultural exports of Indonesia. Analysis of this data has shown since 2001 both the price and volume of these exports have grown strongly, that they are dominated by semi-processed products, mainly palm oils, and that the primary growth markets are ASEAN, China and India. This analysis reveals a narrow basis for Indonesia's agricultural exports, with limited exports to other markets and in products other than palm oils. This narrow base may be part of the reason for the variable results of the modelling studies.

While the issues are complex and the empirical results are mixed, agricultural exports facilitated by free trade agreements have the potential to contribute to Indonesia's growth. The findings show that Indonesia's agricultural export base is very narrow in terms of variety of commodities, and attention needs to be given to building a more competitive base outside of palm oil, in part by initiatives on the supply side. For the same reason the ACFTA has had limited impact on Indonesia's exports to China, because Indonesia has low competitiveness in most of the product areas covered. But this will change as tariffs are reduced to commodities covered by the Sensitive Track, in many of which Indonesia has stronger export potential.

Chapter 1
Introduction

1.1 Introduction

Agriculture is an important sector that has multiple roles in the economy of any nation, especially in developing countries (Timmer, CP 2002). These roles include ensuring food security and poverty reduction in developing countries(Moon 2011), as well as building their capacity to promote industrialisation and economic growth(Timmer, CP 1988; 2005b).Giventhis importance of agriculture, agricultural reforms have been considered worldwide to improve this sector and modernize its functions in the global economy (World Bank 2008). Joining free trade agreements on multilateral, regional and bilateral level constitutes one of these efforts as they allow countries to explore wider markets to export their agricultural products.

Nevertheless, the importance of agriculture has been outweighed by other sectors with industrialisation and modernisation of the global economy. The deceleration of agricultural growth is inevitable as the share of manufacturing and service sectors take precedence over agriculture as the economy grows and matures (CSES 2011). This declining importance of agriculture is evident in the falling rate of agricultural trade growth globally over time and sidelining of agriculture in the economic priorities of governments worldwide. Despite recent efforts at liberalization of agricultural trade, the relationship between agricultural export and economic growth is not as straightforward and has been fiercely debated right from the middle of the eighteenth century. Previous studies suggest that the effect of specialized in export of primary product is detrimental to growth (Thirlwall 2006). This is concordant with the Prebisch-Singer thesis which states that the price of primary products is on a long-run downward trend relative to the price of manufactured goods due to the volatility of primary product prices, which causes greater instability of revenue for exporters of these products (Prebisch 1950; Singer 1950).

As a country with abundant agricultural resources and almost 40 per cent of the population working in the agricultural sector, agriculture is very important for Indonesia because of its significant contribution to economic growth and its strategic role in achieving food security and

poverty reduction. Recently, Indonesia has joined many trade agreements, including multilateral, regional and bilateral agreements, in order to strengthen its position in international trade. Indonesia is a member of the ASEAN-China Free Trade Agreement (ACFTA) signed in 2002 between ASEAN countries and China. The implementation of this agreement is expected to improve the trade and competitiveness of agricultural trade between ASEAN countries and China (ASEAN 2004).

Given the existing consensus on the declining importance of agriculture in the economy, as well as debates over the actual benefits from agricultural exports to economic growth, there is a need to examine whether the efforts of an ACFTA treaty with China will yield the desired results for Indonesia. Economic growth is the primary aim for a developing country like Indonesia that mainly relies on its agricultural sector and has made attempts to improve agricultural trade through trade liberalization.

The first chapter outlines an overview of the thesis. It begins with a brief outline of the research background detailing the role of agricultural trade in the Indonesian economy and its effort towards trade liberalization of agricultural commodities with the ACFTA signed with China. This is followed by a statement of the research problem on debates over the relationship of agricultural exports with economic growth, especially with the declining role of agriculture in the world economy. A brief review of previous studies on the ACFTA is presented and the gap in the literature in relation to the impact of the ACFTA on Indonesian agriculture is highlighted. The general and specific objectives of this study are presented along with a brief description of the research methodology to achieve those objectives. The importance and significance of the thesis are highlighted, followed by the organization of this study at the end of the chapter.

1.2 Research Background

Agriculture has a strategic role in national economic development in a developing country like Indonesia, especially in reducing poverty, providing employment, improving farmers' welfare and maintaining sustainable utilization of natural resources and the environment. The agricultural sector plays a crucial role in the Indonesian economy, making a significant contribution to economic growth, foreign exchange earnings, and food security (Timmer, CP 2005a). The annual growth rate of agricultural output in Indonesia is around 3.5 per cent and the share of the

agriculture in the gross domestic product (GDP) is around 15 per cent throughout the period of 2000-2012. In the past, Indonesia traditionally performed an important facilitating function in international trade as a trade link between ancient India and China because of the location of the archipelago and its sea lanes. Recently, Indonesia has acquired memberships in many trade agreements in an effort to strengthen its position in international trade (Bappenas 2009).

There has been a growing move towards opening the agricultural sector up to foreign trade that has inspired agricultural trade liberalization (WTO 2012b). The shift towards trade liberalization in agriculture was initiated by the Uruguay Round Agreement on Agriculture (URAA) followed by the Doha Round. This agreement has commitments to reduce protection rates and trade barriers on agricultural products, improving market access and establishing the disciplines and rules on various aspects of global agricultural trade (WTO 2012e). One of the main goals of these free trade agreements is to increase agricultural trade between members. With the objective of expanding its presence in international trade, Indonesia has agreed to join trade agreements bilaterally, regionally and multilaterally (Bappenas 2009). The multilateral agreements that Indonesia has joined include the World Trade Organization (WTO), Asia Pacific Economic Cooperation (APEC) and the Group of Twenty Finance Ministers and Central Bank Governors (G20). In terms of the regional trade agreements, one of the trade agreements that Indonesia has signed and implemented is the ASEAN China Free Trade Agreement (ACFTA). Because ACFTA is a regional and relatively close-knit organization, its benefits are exclusive to member countries. Mutual tariff reductions between member countries can make imports of products of non-member countries lesscompetitive, with negative impacts on those countries' total trade volumes and economic welfare (Ahearne et al. 2006).

Agricultural commodities play an important role in the trade of ASEAN countries. Almost all the ASEAN members are developing economies with a high share of the agricultural sector in the economies. The ACFTA agreement has a special program focused on agricultural trade, namely the Early Harvest Program (EHP). The implementation of this agreement is expected to improve agricultural trade in growth and competitiveness between ASEAN and China. As China is a developing country with a growing GDP and huge population, it has become a critical market destination. The immense size and rapid growth of China's markets and industries have fuelled the need for a lot of raw materials and semi-finished materials. As the agriculturally rich nations

of ASEAN can benefit from supplying consumer commodities and raw materials to the growing Chinese industries and markets, Indonesia expects that joining this agreement can broaden its market to China for its agricultural products . This cooperation is expected to strengthen both economies in the future (ASEAN 2004; Cordenillo 2005). The ACFTA agreement with China is a major development in Indonesian trade, particularly for Indonesia's agricultural sector with significant implications for the national economy.

This thesis aims to explore whether improving agricultural exports through trade liberalization with ACFTA will contribute to economic growth in Indonesia. Thus, the research aim of this thesis is twofold, to examine the relationship between agricultural exports and economic growth, and the impact of the free trade agreement on agricultural exports volume and competitiveness.

1.3 Research Problem

One of the core aims of the free trade agreement, establishment is tariff elimination. As part of the Uruguay Round commitment, Indonesia has been reducing its border tariffs, opening its market as well as reducing other domestic distortions, especially in the agricultural sector (Feridhanusetyawan, Pangestu & Erwidodo 2002). The government of Indonesia has also been implementing the agenda of the ACFTA to eliminate tariff barriers, especially import tariffs for agricultural products. Indonesia's involvement in these trade agreements poses a challenge for the agricultural sector as it reduces government protection of domestic products and opens up the market to foreign products. This poses a significant question about whether trade liberalization can have a positive impact on the economy of the countries involved in free trade agreements. In Southeast Asia, evidence shows that the benefit from trade liberalization in non-agricultural goods has far outweighed the benefit of trade liberalization in agricultural goods (Hertel et al. 2000).

For developing countries, another obstacle in expanding agricultural exports comes from capacity constraints that hinder the extension of primary products exports to developed countries ((Todaro 1977). Although the facts show that joining a free trade agreement does not automatically increase agricultural exports, the passion to increase agricultural exports still inspires developing countries, especially those with strong agricultural backgrounds in the Asian region (Anderson, K & Martin 2005).

Agriculture is a sensitive and vulnerable sector,thus restructuring and adjustment to changing market conditions takes a long time (Pupphavesa 2010). Furthermore, although most ASEAN members are net exporters of agricultural products, they are reluctant to open up their domestic market for agricultural trade (Pupphavesa 2010). In view of the distinctive and diverse role of agriculture, Batie and Schweikhardt (2010) identify the issue of agricultural trade liberalization as a 'wicked problem' in the sense that it is 'highly resistant to resolution' as the prolonged WTO multilateral talks, and the view that agricultural trade liberalization is not convincing argument to be followed up. The inclusion of agricultural trade in a free trade agreement does not guarantee that agricultural trade will increase. The evidence from some free trade agreements show the declining trend of agricultural shares in world trade, which is shown by the export of agricultural goods that accounted for 6.3 per cent in 2005 compared to 8.2 per cent of world exports in 1991 (Korinek & Melatos 2009). Widespread evidence shows the same results for agricultural trade under the ASEAN Free Trade Area (AFTA), Common Market for Eastern and Southern Africa (COMESA), European Union (EU) and North American Free Trade Agreement (NAFTA), and only Mercado Comun del Sur/South American Economic Organization (MERCOSUR) that has been shown to have increased agricultural exports (Korinek & Melatos 2009). Despite the great expectations about trade liberalization in agriculture, these obstacles to a fair regime of liberalization for developing countries as well as weak evidence about the success of free trade in agriculture, it is worth asking whether the free trade agreement with China under the ACFTA can deliver the expected benefits for Indonesian agriculture.

There is also declining interest from the government and private sectors in the agricultural sector with declining efforts to boost agriculture (Timmer, MP & de Vries 2009). The rate of growth in agricultural trade is declining globally over time. In fact, the relationship between agricultural exports and economic growth has been debated since the middle of the eighteenth century. In their influential paper, Johnston and Mellor (1961) argued that imposing open trade policy for agricultural sector will improve economic growth as well as the growth of agricultural export. Many subsequent studies argue that agricultural export can play an important role in economic growth and export-led growth from agriculture may represent optimal resource allocation for those countries that have a comparative advantage in agricultural production. For example, the research conducted by Dawson (2005); Levin and Raut (1997); Sanjuán-López and Dawson

(2010); Tiffin and Irz (2006) show a positive link between agricultural exports and economic growth.

In contrast, many prior studies argue that the effect of specialization in the export of primary products is detrimental to growth. This is supported by the Prebisch-Singer thesis which states that the price of primary products is on a downward trend relative to the price of manufactured goods. It is also caused by the volatility of primary product prices as exporters of these products experience greater instability of export revenue. Sachs and Warner (1997a), in their primary analysis, claim a negative coefficient in growth regression when examining the link between agricultural exports and economic growth in 83 countries over the period 1965 to 1990. Similarly, Sala-i-Martin (1997) finds the share of primary products in total exports to be robustly and negatively correlated with growth over many alternative regression specifications. Among other studies, Esfahani (1991) shows that exports of primary commodities have no significant impact on economic growth, while Faridi (2012) reveals a negative relationship between agricultural exports and Pakistan's economic growth. Even if there were gains to be made for Indonesian agriculture from the ACFTA trade with China, it needs to be ascertained whether this rise in agricultural exports leads to economic growth for the whole country.

1.4 Research Gap

Many studies have analysed the impacts of the ACFTA on the economic growth of the member countries and have reached two general conclusions. Most studies have predicted that the ACFTA will stimulate the economies of member countries by reducing trade barriers and transaction costs, thereby promoting the development of bilateral trade. For example, Chirathivat (2002), using a computable general equilibrium model, found that the establishment of the ACFTA will increase the GDP growth of both China and ASEAN by 0.36 and 0.38 per cent, representing $298.6 billion and $178.7 billion worth of gains respectively. Using the gravity model, Devadason (2010) finds evidence to suggest that China's trade has a positive relationship with increasing intra-ASEAN exports. Likewise, there was also no indication to show that import sourcing from China by ASEAN countries reduces intra-ASEAN export flows. China, as the 'core' country of the ACFTA can provide complementary in the export performance of ASEAN.

By implementing the Global Trade Analysis Project **(**GTAP) method to simulate the impact of the ACFTA, Yue (2004) claims that exports between China and ASEAN countries would increase both ways with a complimentary effect in bilateral trade between ASEAN and China, bringing benefits for both parties. Sangsubhan (2010) argues that the implementation of the EHP has brought positive impacts and increasing bilateral trade for Thailand, especially for commodities under Harmonized System code (HS) 01 until HS 08. The trade between Thailand and China was based on complementary benefit and not a competition between the two, where Thai commodities like rice, rubber and tropical fruits were exchanged with cold climate fruits from China. He also finds a positive impact of the ACFTA in Vietnam for the commodities that are not competitive as the Vietnamese consumer can now get commodities, such as beef, dairy products, fruit and vegetables, at lower prices. Using the gravity model, Yang and Chen (2008) predict that the impact of the ACFTA will create a trade diversion effect which will be much larger than trade creation. This condition may cause the impact of the ACFTA to reduce China's future prosperity.

In contrast, some studies argue that ASEAN countries will suffer from this bilateral agreement because of the threat from China as China has a large market with lower labour costs and production costs, as well as a reliable source of human capital. They argue that China's cheaper products will have negative impacts on the total welfare of ASEAN countries or at least on some important sectors in ASEAN countries (Roland-Holst, Azis & Liu 2001; Tongzon 2005). Park (2007) argues that ASEAN needs a transitional period in order to reap the benefits of the ACFTA as ASEAN industries are less competitive than those of China. The un-readiness of ASEAN countries in this liberalization will lead to losses in ASEAN industry. China's relatively lower cost of production compared to ASEAN has decreased competitiveness of ASEAN (Supriana 2013). Batra (2007) compares the impact of the ACFTA for China and other Asian countries, such as India, and finds that tariff concessions on some commodities will have a negative impact on India for marine products, such as fish, molluscs, and vegetables.

In contrast, Yunling (2010) finds that while the overall impact from the implementation of the ACFTA is positive, the benefits are uneven for the member countries. The agreement will increase export growth of Chinese products with comparative advantage, speed up the development of these industries and thus promote the optimization of China's agricultural export structure. However, the impact of the implementation of the ACFTA is uneven across ASEAN

countries due to gaps in development level and differentiation in production cost. Okamoto (2005) analises trading indicators and states that Singapore and Malaysia stand to obtain the benefits of inter- and intra-industry specialization; while Thailand gains the advantage of intra-industry specialization. Indonesia and the Philippines do not stand to gain much from this agreement. In the Philippines, small farmers and producers could suffer from the impact of the agreement because they lack access to a fallback mechanism, such as credit and insurance. The EHP has not been effectively implemented in Laos due to the lack of preparation prior to the signing of the agreement. Although the agreement has provided preferential tariff reductions, the import prices for commodities from Laos are still high because of the high transportation cost.

Furthermore, the homogeneity in production and exports in the region also poses problems for complementary trade. The main agricultural commodities exported from ASEAN countries, including natural rubber, palm oil, coconut oil, spices and pineapples, are produced by almost all ASEAN countries. The similarity of agricultural commodities produced across members is quite pronounced. For example, Indonesia is a major exporter of natural rubber and palm oil while Malaysia is also a major exporter in palm oil (WTO 2009). Hence, theoretically, only countries with lowest cost production will gain from free trade. For example, Sudsawasd and Mongsawad (2007) predict that the ACFTA will reduce the trade balance for Indonesia, Philippines, Singapore and Thailand, but will increase GDP across five ASEAN members (Indonesia, Malaysia, Philippines, Singapore and Thailand). Comparing the effect of the ACFTA on the internal trade of China and ASEAN countries,Supriana (2013) claims the biggest positive impacts of the ACFTA are received by Singapore, Malaysia, Thailand, consecutively in that order, while the impact on Indonesia and the Philippines is negative.

The impact of the ACFTA on Indonesian trade has been perceived to be negative in previous literature. Among the previous studies on the implementation of the ACFTA in Indonesia, Supriana (2011) finds that the diversion and creation effects on Indonesia trade are not significant. In contrast, Yue (2004) argues that the implementation of the ACFTA will increase the exports of Indonesia, but will decrease the welfare of Indonesia by decreasing its GDP. Employing the GTAP model, Ibrahim, Permata and Wibowo (2010) finds that even though the net trade creation is around 2 per cent and exports are likely to increase by 2.1 per cent, the ACFTA imposes negative impacts of 2.3 per cent on Indonesia’s overall tradebalance. In the case of the mutual impact between Indonesia and China, Yunling (2010) mentions that China

stands to gain more benefits than Indonesia since the production level for most commodities in China is much higher than that in Indonesia.

Since every member of the agreement expects to increase its trade, it becomes imperative to examine the impact of the agreement on each specific country with more appropriate methods. The literature shows the research on the impacts of ACFTA is mainly explored by simulation methods such as GTAP or other general equilibrium methods to predict ex-ante impacts. However, the ex-post impacts of the agreements for a specific sector from a simulation method could be undetermined. By using more rigorous econometric methods, it is expected that the ex-post impact of the agreement can be measured and the result will be robust and make a positive contribution to the literature. In the literature related to agricultural exports and economic growth, studies on the impact of agricultural exports on Indonesia's economic growth are scarce. Furthermore, the literature shows that, although the research on the ACFTA is abundant, studies focusing on the impact of the ACFTA programs on related agricultural trade are rare. Thus, this thesis is dedicated to providing a contribution to the literature by exploring the impact of ACFTA programs focusing on agricultural trade between Indonesia and China.

1.5 Research Questions and Objectives

This research examines the impact of Indonesian agricultural exports to China under the ACFTA on Indonesian economic growth. Given the importance of the agricultural sector for the Indonesian economy, this study will also investigate the impact of free trade agreements on agricultural exports. The specific free trade agreement focused on in this research is the ACFTA. Analysis of various indicators of performance and characteristics of Indonesian exports is specifically addressed in relation to ACFTA market coverage. The actual impact of the ACFTA needs to be examined in order to measure whether the ACFTA has fulfilled the benefits expected from its implementation.

This thesis explores the impacts of agricultural exports for economic growth and measures the influence of implementation of free trade on agricultural exports. The aims of this thesis are thus twofold—it attempts to explore the relationship of agricultural exports and economic growth from the view of international trade in bilateral trade scheme and examines whether the trade policy effort to open a wider market for agricultural trade makes a significant impact on

agricultural exports. With regard to this latter aim, the impact of the ACFTA on agricultural exports can be measured from both the overall volume of exports and the competitiveness of specific commodities exported from Indonesia to China. Therefore, this thesis will try to find answers for the main questions on Indonesian agricultural exports to China under the ACFTA as follows:

1. Is agricultural trade still important for Indonesia? To what extent does agricultural export contribute to the economic growth of Indonesia?
2. Do efforts to improve agricultural trade, such as joining a free trade agreement, have a significant impact on the growth of exports and competitiveness of the commodities?
3. How do policy reforms affect agricultural trade in Indonesia and what appropriate policy reforms should be undertaken to improve agricultural trade?

Theoretically, the establishment of a free trade agreement aims to increase trade and competitiveness of the trading commodities between members of the agreement, so this study hypothesized that the ACFTA will increase the volume of agricultural trade and the competitiveness of the agricultural commodities from Indonesia. It aims to portray the development of Indonesian agricultural trade from a real value perspective, investigate the influence of agricultural export on economic growth of Indonesia and to explore the impact of implementation of free trade agreement, in this case ACFTA, on Indonesian agricultural trade growth and competitiveness. This research will further focus on the impact of those programs on agricultural trade growth and competitiveness.

From these research questions, the research objectives are as follows:

1. To empirically investigate the impact of agricultural exports under the ACFTA on Indonesian economic growth;
2. To investigate the impact of the ACFTA programs on the growth of Indonesian agricultural exports to China across the long-run and short-run dynamic of time series study;
3. To examine the impact of the ACFTA programs on the competitiveness of agricultural commodities exported from Indonesia and China;

4. To review the circumstance of Indonesian agricultural exports from the volume chain-link perspective;
5. To analyse policies taken to promote economic growth and trade relations in the agricultural sector in Indonesia, especially those related to the implementation of free trade agreement.

1.6 Research Methodology

Each chapter of the empirical analysis is designed to address a particular research question and objective of this study. As each of these empirical analyses applies its own methodology, they are described within the chapters and the thesis does not have a separate methodology chapter. Briefly, these methodologies can be described as follows:

1. The endogenous gravity theory is implemented in Chapter Four to analyze the impact of Indonesian agricultural exports on Indonesian economic growth under the influence of the ACFTA. The model developed in this analysis is an extension of existing methods reviewing the relationship between trade and growth with inclusion of other relevant variables of crisis, domestic GDP, investment and government reforms. Some other determinants will be incorporated in the model as control and instrumental variables to confirm the goodness of fit of the model. The two stage least square (2SLS) estimation method will be implemented.
2. The Autoregressive Distributed lags (ARDL) modelling approach is employed on import demand functions in Chapter Five to examine the impacts of the AFCTA programs, namely the EHP and the Sensitive Track on the volume of Indonesian agricultural exports to China.
3. The competitiveness measures provided by Trade Intensity Index (TII), Dynamic Revealed Comparative Advantage (DRCA) and Market Share Index will be used in Chapter Six to explore the impact of the ACFTA programs on the competitiveness of specific commodities under the EHP and Sensitive Track.
4. The volume chain-link methodology is applied in Chapter Seven to determine the volume (real value) and price index of Indonesian agricultural exports worldwide. This is applied

to 35 commodities as the biggest agriculture exported products of Indonesia that covered more than 95 per cent of total agricultural exports.

This four-part methodology will clearly bring to the fore the full implications of the ACFTA on agricultural exports in Indonesia. Since this research will focus on the trade relationship between Indonesia and China, the benefit of the free trade agreement will be measured directly against the changes of economic growth and trade growth experienced by Indonesia and also in China, where relevant.

The data used in this thesis are obtained from the databases and resources from the following sources:

- Datastream website
- Tradedata.net;
- World Bank;
- United Nations (UN);
- WTO;
- Food and Agriculture Organization (FAO);
- Asian Development Bank (ADB);
- ASEAN;
- Indonesian Bureau of Statistics (BPS);
- Bank of Indonesia.

Detailed information on the sources and formats of the data extracted will be mentioned with the analysis in each chapter of the thesis.

1.7 Statement of Significance

According to the World Bank (2008), agriculture can be the leading sector for overall growth in the agricultural-based countries by using a growth strategy anchored on agriculture development. Although in Indonesia's case, agriculture has not taken the lead in overall growth, its role in economic growth is important. Indeed, the share of agriculture in Indonesia's trade has been

increasing even when the share of agriculture in global trade has been declining. Although the share of the agricultural exports of Indonesian GDP is relatively small compared to other sectors, it is on a slow upward rise. Furthermore, agricultural exports have been increasing quite significantly to become an important sector in Indonesia's economy. This is mainly due to the fact that the exports of palm oils have been rising, which have become the third largest commodity contributing to foreign exchange earnings in the country. As the agricultural sector has an important role in the Indonesian economy, the pattern of agricultural export performance will help to determine the potential of agricultural products as well as appropriate agricultural policy.

Agricultural exports have been the backbone of the Indonesian economy when the Asian financial crisis hit Indonesia in 1997 (Basri, M.C. 2010). The fact that the agricultural sector excelled during the financial crisis shows that the growth of the agricultural sector is more stable than other sectors (Athukorala, P. et al. 2010). In Indonesia, the agricultural sector proved to be important during the Asian crisis. While other sectors collapsed under the strain of the crisis,Indonesia was able to survive the crisis because of strong agricultural exports (Soesastro & Basri 2005). This denotes that the agricultural sector can be considered a robust sector in crisis and its growth is unlikely to be disturbed by any shocks. As the agricultural sector has been an important part of the country's economy and a significant sector in trade, government trade policy should protect and encourage the agricultural sector.

Many studies in the trade and development literature show that export has been a key role in the growth of a country; however, these are more focused on total exports. There is comparatively less attention on the empirical relationship between agricultural export and economic growth. The contribution of agriculture exports to total exports is particularly beneficial, especially in developing countries (Sanjuán-López & Dawson 2010). As argued by Johnston and Mellor (1961), expanding agricultural exports is one of the most promising means of increasing incomes. In a global environment of lessening attention on the agricultural sector, it is important to measure the impact of agricultural exports on economic growth, especially for a developing country like Indonesia. The exploration of the importance of agricultural exports can hopefully raise more attention to develop this sector for an agriculture-dependant country like Indonesia.

Considering the importance of agriculture in a country's development, good policies and effort from all stakeholders are required to enable the agriculture sector to achieve its optimum role in promoting economic growth and poverty alleviation. The lopsided results from free trade agreements in favour of developing countries make it imperative for developing countries to prevent agriculture to be completely guided by market forces. Government actions are needed to meet the multifunctional complexity of obstacles to the development of agricultural trade. Thus, government intervention in trade and industrial policy for this sector is important and countries need varying degrees of collective action to address widely divergent needs of agriculture. The involvement of Indonesia in many free trade agreements, such as multilateral, regional and bilateral agreements, should be able to force the expansion of agricultural exports yet protect its domestic industry in this area by selectively permitting agricultural product imports. Those determinants should be measured in order to evaluate their impact on the trade, so that in the future most suitable policies can be created to avoid or to reduce negative effects. By enforcing suitable trade policy, better conditions will be provided and the economy, along with the agricultural sector will be improved.

1.8 Thesis Outline

ChapterOneprovides an introduction to the study, outlining the research context of the agriculture sector in Indonesia and liberalization of agricultural trade under the ACFTA. The chapter also outlined the effect of the ACFTA on the agricultural export and its subsequent impact on economic growth. It highlighted the gap in the literature on the ACFTA and agriculture sector. The chapter then highlighted the objectives of the research and methodology to be used for each stage of analysis for measuring the impact of agriculture export on economic growth and the implications of the ACFTA on trade volume and commodity competitiveness. This was followed by a final note on the significance of the study in relation to the effect of liberalization of agricultural trade, and contribution to policy makers to nurture any future developments to boost the agriculture sector.

Chapter Two provides a comprehensive background for this thesis on free trade agreements in the agricultural sector. This chapter is thus set aside for discussing the importance of the

agricultural sector, background on trade liberalization in the agricultural sector and an overview of the ACFTA as the free trade agreement studied in this research.

Chapter Three presents the background of the thesis from Indonesian perspective. The importance of agriculture for Indonesian economic growth, the strength of the agricultural products of Indonesia worldwide and trade policy undertaken by Indonesia and China will be discussed.

Chapter Four presents the empirical analyses of the impact of agricultural exports for economic growth. This chapter will develop the theoretical framework of endogenous gravity theory which will be used to investigate the impact of agricultural export under the influence of ACFTA and global financial crisis on economic growth of Indonesia. Given the debate and even outright rejection of the relationship between agricultural exports and economic growth by many neoclassical economists, the contribution of agricultural export to Indonesian economic growth remains dubious. The examination of this matter of empirical results with statistical and quantitative analysis will be presented to explain the impact of agricultural export in Indonesia on economic growth under the auspices of the ACFTA and global financial crisis.

Chapter Five analyses the implications of ACFTA on the volume of Indonesian agricultural exports to China. The hypothesis is that implementing free trade agreements is positively correlated with bilateral exports in agricultural commodities when accounting for other important factors of trade volume. A theoretical framework combining import demand functions with autoregressive distributive lags (ARDL) is used to examine this presumed positive correlation between free trade agreements and trade in the short- and long-term.

Chapter Six focuses on the analyses of the implications of the ACFTA on the competitiveness of agricultural commodities exported from Indonesia. The competitiveness of different agricultural commodities listed as exports of Indonesia under the ACFTA auspices will be evaluated by measuring their comparative advantage with Trade Intensity Index and Dynamic Revealed Comparative Advantage (DRCA) methods. In addition, the Market Share Index will be used to examine the market positioning of the commodities. This study will examine the impact of these commodities after joining the ACFTA.

Chapter Seven is concerned with the calculation of the chain-linked volume (real value) and the price of agricultural exports. As Indonesia is the biggest producer of many agricultural products, it is important to discover the potential of agricultural products for export purposes. As the presentation in nominal value will lead to biased results, a real value perspective will be better to explain the Indonesian export performance. Unfortunately, agricultural export data provided in real value is not yet available, so will need to be specially calculated for this research. Using the real value will provide a clearer, more accurate picture of the exports, omitting bias caused by inflation (which is one of the disadvantages when using the current value perspective). This study will contribute to addressing the lack of an appropriate measure of agricultural export real value by using a chain-linked volume measures.

Chapter Eight is the final chapter. After a brief review of the findings from the thesis, the chapter reflects on the findings of this study, its implications for the agricultural industry under ACFTA. It ends with remarks, noting some limitations of the present research and recommendations for future research.

Chapter 2

Agriculture, Economic Development and Trade Liberalization: A Critical Literature Review

2.1 Introduction

Agriculture sector plays an important role in economic growth and poverty reduction (World Bank 2008). Nonetheless, in recent time, most developing countries experience lower agricultural growth and a weakening role of agriculture in development. Rapid population growth, declining farm size, falling soil fertility and missed opportunities for income diversification and migration contributes to the decrease of agricultural contribution. In addition, the policy of high taxes on agriculture policy, the policy bias towards urban regions, the lack of government attention, underinvestment and low public spending in agricultural sector also contribute to the low growth of the agricultural sector.

While economies grow, demand for non-agricultural products and services grow faster than for agricultural products yet the share of agriculture in GDP and employment decline over time (Timmer, CP 2002). Indeed, it is a broadly shared view among experts that agriculture has been neglected in the past three decades, during which time investment in rural infrastructure has fallen, reducing the capacity of rural economies to generate incomes and employment (Aksoy, AM 2005b). The neglect of agriculture may be receding and giving way to the realization that the full potential of agriculture in economic development and poverty reduction has not been realized in many of the developing countries (World Bank 2008).

Fortunately, the resurgence of attention on the agricultural sector development has emerged in recent time. One of the renewed interests is trade liberalization in the agricultural sector to accelerate the agricultural trade (CSES 2011).

The purpose of this chapter is to provide a detailed explanation of the background of this research. This background will explore the importance of the agricultural sector, overview of trade in agriculture and trade liberalization in agriculture from the perspective of world trade. Furthermore, discussion about ASEAN-China Free trade Agreement will be presented since this agreement is the focus of this study.

2.2 Importance of Agriculture in Development

Agriculture contribution to development can be in many ways, including as an economic activity, as a livelihood, and as a provider of environmental services (World Bank 2008). As an economic activity, agriculture can be a source of growth for the national economy, a provider of investment opportunities for the private sector, and a prime driver of agriculture-related industries and the rural nonfarm economy. Meanwhile, agricultural production is important for food security because it is a source of income for the majority of the rural poor (Godfray et al. 2010). Agriculture is also a source of livelihoods for an estimated 86 per cent of rural people (Bezemer & Headey 2008). Furthermore, agricultural activities can be an important part in contributing to climate change and environmental service issues (Howden et al. 2007).

This perspective about agriculture as a resource for other sectors has persisted in most development models. There is an argument that this perspective is based on necessity for industrial development and a matter of historical experience (Reynolds 1975). The industries and services linked to agriculture in value chains often account for more than 30 per cent of GDP in transforming and urbanized countries (World Bank 2008). Currently, there has been massive transformation in agriculture in most developing countries (Hayami & Ruttan 1985), but the speed of transformation has varied in different countries (World Bank 2008). For example, in China, India and Indonesia, the share of agricultural employment was roughly same at about 74 per cent in 1961. In 2011, this share had declined to around 40 per cent in China, 35 per cent in Indonesia but 50 per cent in India. This implies that, for various reasons, employment in industry and services in China and Indonesia is growing faster than in India.

Agriculture is also an effective engine for growth for most agriculture-based countries. Two-thirds of the world's agricultural value added is created in developing countries, yet it generates on average 29 per cent of the gross domestic product (GDP) and employs 65 per cent of the labor force in agriculture-based countries (World Bank 2008). Agriculture is also important as it has to meet global food demand that is predicted to double in 2050 due to population growth, along with rising income and urbanization in developing countries (Godfray et al. 2010). In agriculture-based countries, most of the production is generally used to feed the population as food remains imperfectly tradable because of the high transaction cost and prevalence of staple

food that are lightly traded. Agricultural productivity, thus determines the price of food, which in turn determines wage costs and competitiveness of the tradable sectors (Timmer, CP 2000).

2.2.1 *Multiplier Effect of Agricultural Growth*

Growth in both non-tradable and tradable sectors of agriculture also induces strong growth in other sectors of the economy through multiplier effects. Economists, including Johnston and Mellor (1961), Jorgenson (1961); Nicholls (1963); Schultz (1964) argue that the agricultural sector must be viewed as part of the overall economy. They emphasize the importance of interdependence between a country's agriculture and its industrial and service sectors rather than relegating agricultural sector to a mere resource reservoir for other sectors. Although the growth of the agricultural sector is not as fast as other sectors, the multiplier effect of agricultural growth has enhanced other sectors to grow even higher (Haggblade, Hammer & Hazell 1991). The whole process of sectoral transformation creates forward and backward linkages between agricultural and non-agricultural sectors (Ardeni & Freebairn 2002). The market links that connect a dynamic agricultural sector to rapidly growing industry and service sector and new technology transferred from this connection provide opportunities to grow agriculture and other sectors together.

Many studies suggest that the agricultural multiplier effect is significantly greater than one. For example, in rural Africa, typically characterized as closed, non-tradable economies, the agriculture multiplier effect is often between two and three; while in more open economies, for example, some Asian countries, the agricultural multiplier is around two in the early stages of agricultural modernization when productivity gains are the fastest (Timmer, CP 2009). The multiplier effect of the agricultural sectorto other sectors has been shown by Warr (2001), who suggests that the agricultural sector contributes in stimulating growth in the secondary and the tertiary sectors. For example, increased commercial agricultural activities may lead to the expansion of small food processing industries, in turn increasing labour mobility from rural to urban areas. The demand from a growing agricultural sector also feeds into higher growth in non-agricultural sectors. As well as these examples, there is the growing demand for agriculture-related machinery and manufacturing products. Similarly, Anderson, K (1987)shows in South Asia, growth in rural incomes and employment is propelled by an expansion in agricultural

productivity that gives rise to increased demand for household products and agricultural inputs by rural families that can be efficiently produced in rural areas. Rising agricultural incomes are also spent on purchasing industrial products for households and services including education, healthcare as well as financial and domestic services. Furthermore, Pack (2009) notes that in China, Korea and Taiwan, a dramatic increase in agricultural productivity supported the growth of the small and medium enterprise (SME) sector that sold its products to the farms. In addition, the current awareness of climate change has further strengthened the indirect multiplier effect of agriculture by increasing the demand for agro-fuels (World Bank 2008).

2.3 Agriculture and Poverty Reduction

Furthermore, agricultural growth is also noted for its contribution in poverty reduction. Mellor (1976) argues since agriculture employs majority of the population in developing countries, increasing agricultural output would boost the economy and hence reduce poverty. Many studies have come to the conclusion that agricultural growth is highly beneficial for poverty reduction, although the importance of agriculture diminishes as the economy grows and becomes more diversified (Anderson, K, Cockburn & Martin 2011; Bezemer & Headey 2008; Dercon 2009; Dollar, D & Kraay 2001). The importance of agriculture in poverty reduction is derived from the fact that the occurrence of poverty is disproportionately high in the developing countries, which still rely heavily on agriculture for income and employment; the poorest households, that have few assets and low-skilled, rely more on agriculture and facing obstacles in connecting with the non-agricultural economy for income and employment. As a result, poverty in developing countries is primarily rural, as nearly 72 per cent of those in poverty live in rural areas (IFAD 2010).

The contribution of agricultural growth in providing a greater share in the employment of the poor and the unskilled workforce, either directly or indirectly, gives it a crucial role in making economic growth lift the poor out of poverty (Timmer, CP 2005a). The impact of agriculture on poverty reduction depends on the interaction of several effects. First of all, the direct effect of growth in the agriculture sector raises the income levels of those employed in this sector. Second, the benefits from agriculture gains depends on the rate and participation of the poor in agriculture as well as the type of agriculture or the ownership structure in a particular location.

Third, growth in agricultural incomes generally provides increased demand for both rural and urban services, including construction, transport and personal services, in the surrounding areas.

Many empirical studies support the view that the growth in agriculture has been a leading source of poverty reduction in most developing countries as it provides agricultural employment to the poor and contributes to a greater supply of food that lower food prices that benefits both rural and urban poor. For example, Chen, C and Duncan (2008) argue in China, agriculture is recognized as leading source for poverty reduction. The impact of the primary sector on poverty reduction was 3.5 times higher than the impact of either the secondary or the tertiary sectors. Datt, Kozel and Ravallion (2003) claim that growth in agriculture and rural economy had been highly beneficial to reducing rural poverty in India, while Virmani (2004) finds that higher agricultural growth in India has an impact on poverty reduction in addition to its contribution to overall GDP growth. Similarly, De Janvry (2010) argue that agricultural growth reduces poverty in Vietnam.

In contrast, the impact of agricultural growth on poverty reduction varies across countries for several reasons, including the type of agriculture, the relative size and growth rate of agriculture in comparison with the non-agricultural sectors, the level of public and private investment in agriculture and supportive government policies. Mellor, John W (1999) states the marked slowing of poverty reduction in Asia and increasing poverty in Africa is the result of neglect of agriculture by both governments and foreign aid institutions. De Janvry (2010) notes that the positive impact of agricultural productivity growth on poverty reduction was noticeable in developing countries of sub-Saharan Africa and other parts of Asia, but not in Latin America and the Caribbean. Binswanger and Quizon (1986) find that agricultural growth effects of the Green Revolution in India did not benefit the rural poor.

Furthermore, some studies argue that the role of agriculture in poverty reduction is considerably less than those of other sectors. Suryahadi, Hadiwidjaja and Sumarto (2012) argue that the growth of agricultural sector strongly reduced poverty in rural areas, the largest contributor to poverty in Indonesia. However, their study shows that the growth of the service sector has played a greater role in poverty reduction in both urban and rural areas. This is shown by the fact that the growth elasticity of poverty for the service sector is higher than that for the agricultural sector in the pre and post Asian financial crisis era (Suryahadi, Suryadarma & Sumarto 2009). Poverty

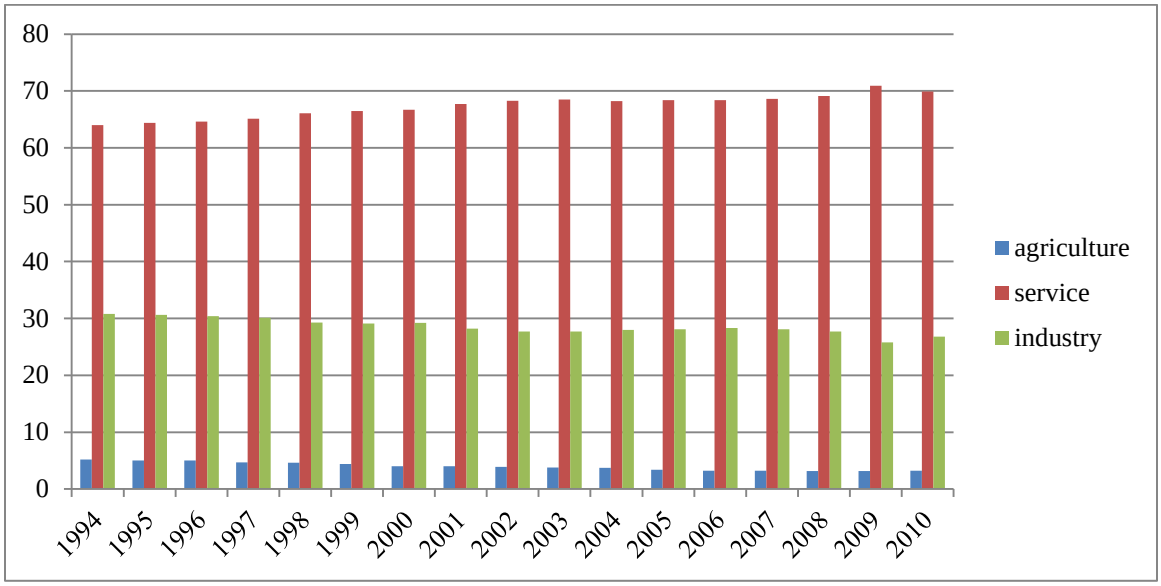
reduction in Latin America has also benefited the most from the service sector, while in East Asia, the growth of the industrial sector has had the greatest effect on eliminating poverty (Hasan & Quibria 2004).

2.4 Declining Share of Agriculture in World Development

One of the features of international trade in the second half of the twentieth century is the remarkable change in its composition marked by an increase in the share of manufacturing products and a sharp decline in the share of agricultural products. The structural transformation of agriculture's role in an economy is signed by the smaller share of agriculture in economic output and labour force as income increased over time (Chenery & Syrquin 1975; Syrquin 1988). The prevailing neoclassical view considers agriculture to be a declining sector, a resource which provides food, labour and perhaps capital to the essential modernization efforts in industry (Little 1982). This view is supported by studies conducted by Clark (1940) and Kuznets (1966).

The neoclassical economists argue that no policy efforts for agriculture modernization were needed because the sector declined naturally. Prebisch (1950) points out the declining terms of trade for traditional products and Hirschman (1958) postulates the lack of direct stimulus in agricultural sector to modern economies as reasons behind the decline of this sector. According to Haggblade, Hazell and Dorosh (2007), the role of agriculture as a generator of overall growth declines as an economy grows. This is marked by a sectoral transformation characterized by falling shares of agriculture in both GDP and employment as the industry and services sectors grow, even when the absolute size of agriculture sector in term of output continues to grow, as shown in Figure 2.1.

Figure 2.1 Value Added Percentage of GDP



Source: World Bank (2012)

The Engel's Law (Houthakker 1957) describes the share of expenditure from people's income on agricultural products fall as the general level of incomes rises, even though the absolute amount of spending continues to increase. The rate at which the share of agricultural sector declines differs between countries and depends on many factors, including how rapidly the alternative sectors of an economy are growing, how equally or unequally non-agricultural income is distributed and how strong the feedback effects of urbanization are on demand for agricultural products (CSES 2011). It is a fact that as an economy grows, demand for non-agricultural products and services grow faster than for agricultural products, while the shares of agriculture in GDP and employment decline over time. Developed countries have experienced this stage of economic development, while Asian economies are now observed to be experiencing this condition (World Bank 2013a).

Indeed, it is a broadly shared view among experts that the agricultural sector has been neglected in the past three decades, during which time investment in rural infrastructure has fallen, reducing the capacity of rural economies to generate incomes and employment. The agricultural sector has been abandoned and neglected for three decades because this sector is believed to be a declining sector (Aksoy, A & Ng 2010). The attention and support to the agricultural sector have declined from both government policy makers and donor organizations since the 1980s.

The neglect of agriculture is likely to associate with a broader shift in economic strategy in many countries which focused on reduction in budget deficits and resulted in a reduction in public investment, especially in agriculture (CSES 2011). Others, including the World Bank, have attributed the falling productivity in agriculture and poor performance of many agricultural development projects to the decline in the global price of food and the rise of East Asia's export-led manufacturing growth. The United Nations Water, Energy, Health Agriculture and Biodiversity (UN WEHAB) Working Group (2002) claims that donor organizations dropped agriculture as priority for world development in the 1990s, when agriculture in the developed countries was considered to be associated with overproduction, environmental pollution and subsidies. This policy is followed by developing countries which also dropped agriculture as a priority. Together, these factors made agriculture a low-priority sector and development strategies were instead focused on export-oriented manufacturing and services as the key drivers of national economic growth.

2.4.1 *Investment in Agricultural Sector*

The results of such abandonment have been observed as a fall in agricultural investment (Kumar 1992) and public sector support for agriculture has substantially declined (Bezemer & Headey 2008). Public investment in agriculture and public support for farmers has fallen around the world, despite the demonstrated high rates of return and the reduction in poverty that come with such investments. The growth of agricultural productivity has significantly slowed down since the 1980s, coinciding with diminished investment in public agricultural research over the last three decades. In line with global trends, the public investment in agricultural sector in developing countries, such as India, Indonesia and China, also fell and this sector drifted into relative policy neglect from the 1990s onward (CSES 2011). India's agricultural growth has decelerated during the same period and this continued up to the middle of the current decade (Orden et al. 2007). Indonesia's agricultural sector has also suffered from policy neglect after the Asian Financial Crisis of 1997 to 1998 because of government's urban bias policy (Suryahadi & Hadiwidjaja 2011). In China, the urban biases in government's development strategy and the policy neglect of agriculture have contributed to the persistence of China's rural poverty (De Janvry & Sadoulet 2009). Institutional reforms have also suffered from policy neglect in China. For example, private ownership of agricultural land is still subject to many constraints which

severely limit economic opportunities available to the rural population. Because private investment has not flowed in to fill the gap, agriculture and the broader rural economy in most countries have suffered from the withdrawal of public investment. Hence, the productivity growth of agriculture is lower (Schreyer 2004).

The result of the policy neglect of agriculture for more than two decades means that this sector now urgently needs new investment and complementary infrastructural and public goods (that is, education, health, research and development, technology and other services) (World Bank 2008). New and innovative technologies and processes are essential in the agricultural sector in field technical methods, improving product quality and protecting the environment. Investment is important in promoting capital formation, as well as replacing or compensating for capital depreciation. To support the promotion of sustained and high-quality economic growth, appropriate and well-designed investment scheme will be needed (World Bank 2005).

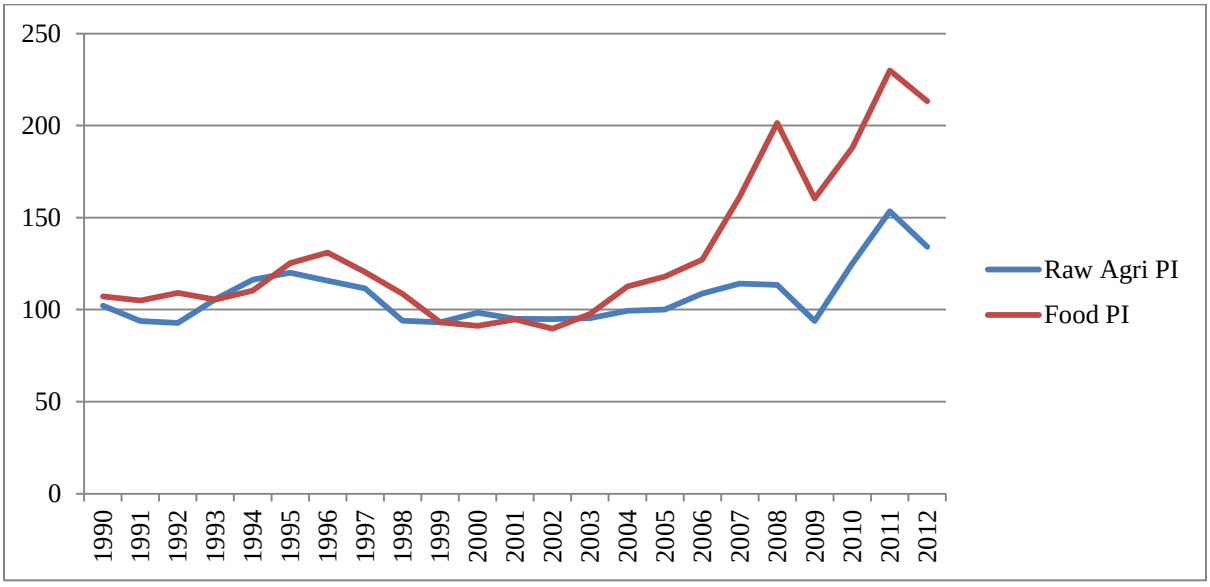
The World Bank (2012) believes that investment in science and technology will be even important in the future, with rapidly changing markets, growing resource insecurity and greater uncertainty. Since science is changing rapidly, it offers new opportunities and possibilities for future agricultural growth. In the developing countries, nearly 94 per cent of agricultural research and development comes from the public sector and did not increase as a share of agricultural GDP (remaining at 0.52 per cent between 1981 and 2000 (World Bank 2008, p. 165). This public sector domination in agricultural research and development is supply-driven, contrary to the necessity of this sector being demand-driven to suit the needs of the farmers and consumers.

Investment in research and development has turned much of developing world agriculture into a dynamic sector, with rapid technological innovation accelerating growth and reducing poverty (World Bank 2008). Total factor productivity (TFP) of agriculture grew at 1 to 2 per cent a year in Asia due to new technology (Rosegrant & Evenson 1995). This growth in TFP of agriculture was responsible for half of the output growth in China and India, and 30 to 40 per cent in Indonesia, reducing pressure on an increasing supply of scarce land. Although agriculture had a declining share of GDP, it is not inherently a declining sector as proved by the rate of labor productivity in the world's agricultural sector that increase at an average 2.4 per cent annually compared to 0.74 per cent in non-agricultural sector (Christiaensen, Demery & Kuhl 2011).

2.4.2 *The Revival of Agriculture*

Fortunately, conditions in the agricultural sector have changed a little in recent years. After being abandoned for decades, therehas been a noticeable resurgence of agriculture, particularly in developing countries where the trade of agricultural products has been increasing. The resurgence of interest in this sector is attributed to the rise in food prices in the mid-2000s (Trostle 2010). The increases in food prices in relation with the pressures of recurrent food crises and food security in some regions, and also the growing demand for bio-fuels, have all contributed to this (World Bank 2013a). In relation to global food security, increasing food prices as well as the increase of agricultural price index in recent years has underpinned the revival of the agricultural sector, but food price increases are significantly higher than raw agricultural price, as shown in Figure 2.2. The data for food price is obtained from the Food and Agricultural Organization Statistics (FAOSTAT (2013)) while the data for raw agricultural price is obtained from World Development Indicators (World Bank 2013b).

Figure 2.2 Food and Raw Agricultural Price Index



Source: (Harrison, Martin & Nataraj 2013)

Figure 2.2 shows that the world index prices of food and agriculture have been increasing over time. Even though the prices were declining during the Asian financial crisis, they rose again after 2002 and were at their peak in 2008. This sharp increase in the agricultural price is also

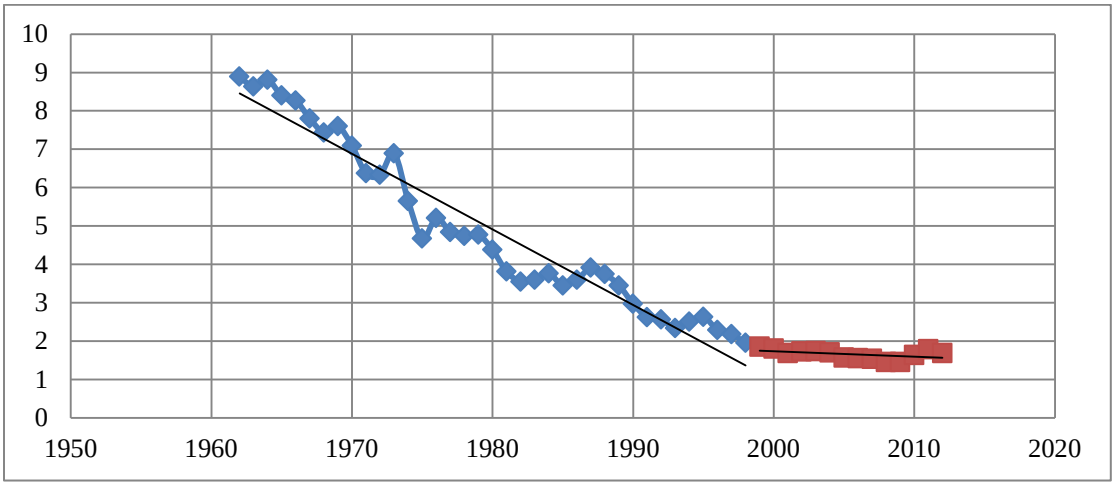
influenced by the real price of crude oil in mid-2008 which was, briefly, at nearly three times its previous record. It seems that rising prices will continue for the foreseeable future with persistent uncertainty on the supply side, including low stock levels, rising projected demand, especially for biofuels and the inherently slow responsiveness of the global food system to supply and demand shocks. The high food price in global markets may reverse their long-term downward trend, creating rising uncertainties about global food security (Rosegrant and others, 2007, cited in World Bank 2008). This has led to a great deal of uncertainty as to whether agriculture is capable of meeting food demand that is projected to increase 70 per cent by 2050 from growth in population and income in developing countries (Hanjra & Qureshi 2010; McCalla 1999). Thus, good policies and sustained investment are required to manage the aggregate response of agriculture to rising demand.

An important part of this resurgence of interest in agricultural development is also due to the efforts to rejuvenate agriculture for economic development as well as poverty reduction from worldwide organizations such as the International Fund for Agricultural Development (IFAD), Food and Agricultural Organization of the United Nations (FAO), Organization for Economic and Cultural Development (OECD), United Nations (UN), United Nations Development Program (UNDP), and the World Bank (CSES 2011). Furthermore, a commitment to the agriculture sector has also increased from the governments, development partners and private sectors (World Bank 2013a). For example, the G8 and the G20 meetings in 2009 pledged funds to support food security and agricultural growth in low-income countries.

2.5 Overview of Agricultural Trade and Economic Growth

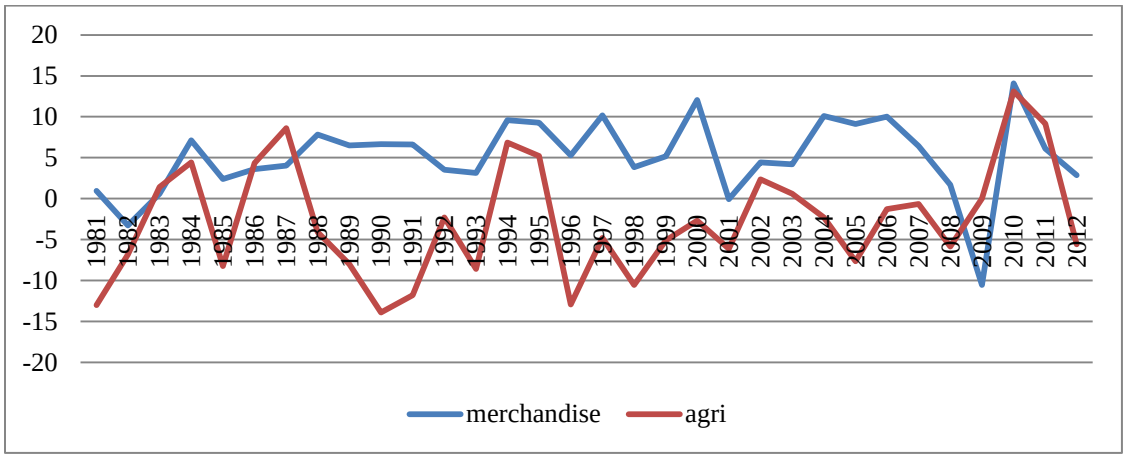
The relationship between agricultural exports and economic growth has been debated since the middle of eighteen century. The neoclassical economists' view that the share of the agricultural sector in economic development is declining in the globalization(Timmer, CP 2002) accompanied with a decreased share of agricultural exports in any economy (Aksoy, A & Ng 2010). Indeed, Data from World Bank (2013b) shows that the percentage of agricultural export in total merchandise exports is declining and the growth of agricultural exports is lagging behind the growth of merchandise exports (Datastream 2012) as shown in Figures 2.3 and 2.4.

Figure 2.3 World Raw Agricultural Exports as Percentage of Merchandise Exports



Source: (World Bank 2013b)

Figure 2.4 Growth of World Merchandise and Agricultural Exports



Source: Datastream (2012)

In contrast, the positive view of the relationship between agricultural exports and economic growth states that agricultural exports can be a source of economic growth. As argued by Johnston and Mellor (1961) in their seminal article 'The role of agriculture in economic development': expanding agricultural export is one of the most promising means of increasing incomes. Moreover, even though a developing country's exports are a small proportion of world trade (as is common), export demand for that country is elastic and policies that seek to stimulate agricultural export are not irrational even when the world conditions are unfavourable,

particularly where few alternatives exist. Agricultural exports therefore can play an important role in economic growth and export-led growth from agriculture may represent optimal resource allocation for those countries that have a comparative advantage in agricultural production. This positive view can be interpreted so that the agricultural sector should open to international trade to earn foreign exchange.

Johnston and Mellor, Jorgenson (1961); Nicholls (1963); Schultz (1964) argue that the agricultural economy must be viewed as part of overall economy and agricultural sector can grow. They emphasize the importance of interdependence between a country's agriculture and the industrial and service sectors rather than assuming agricultural sector as a resource reservoir for other sectors. The market linkages that connect a dynamic agricultural sector to a rapidly growing industry and service sector and new technology transferred from these connections provide an opportunity to grow agricultural and other sectors together.

Previous studies suggest that the effect of specialized in export of primary products is detrimental to growth. This is supported by the Prebisch-Singer thesis (Prebisch 1950; Singer 1950) which states that the price of primary products is on a long run downward trend relative to the price of manufactures. It is also caused by the volatility of primary product prices. Exporters of these products experience greater instability of export revenue. Furthermore, there are some evidences that support this postulation. Sachs and Warner (1997b) analyse the 1970 share of primary exports in GDP to have significantly negative in a growth regression for 83 countries over the period 1965 to 1990. Recent theories focus on the economic effects of natural resources (Lane & Tornell 1996) or on the disincentive to invest in human capital because of higher returns to unskilled labour (Asea & Lahiri 1999). Both of these arguments are open to Easterly et al. (1993) objection that growth performance is much less persistent than these theories imply.

Other possibilities are the trends in the relative price of primary commodities over the recent period have been significantly unfavourable than the long-term average; and the importance of export price volatility.Sprout and Weaver (1992) argue that primary product exports do not affect economic growth while Sala-i-Martin (1997) finds a negative relationship between the two variables. These studies are supported by research conducted by Van den Berg and Lewer (2007). Faridi (2012) implements Johansen's co-integration test to measure the impact of

agricultural and non-agricultural exports to Pakistan's economic growth. The finding shows that agricultural exports have a negative and significant impact on Pakistan's economic growth while non-agricultural exports promote the economic growth.

The result that agricultural exports have a positive impact on economic growth has been found in short-run relationship as shown by Levin and Raut (1997), Tiffin and Irz (2006) and Dawson (2005). The long-term relationship between agricultural exports and economic growth in developing countries exist, according to study conducted by Sanjuán-López and Dawson (2010). Among the literature related to agricultural exports and economic growth, studies in Indonesia's case are scarce.

2.5.1 *Government Trade Policy*

However, the perspective of agriculture as a resource for other sectors has persisted in most development models. Agricultural policy generally is decelerated by the governments of the developing countries who emphasize the reformation and policy on industry or manufacturing sector rather than on the agricultural sector, such as in Japan (Timmer, CP 1988) or India (Ahluwalia 2002).

In contrast, Mellor, J.W. (1995) argues that government intervention is needed to implement agriculture-based strategy to economic growth by opening up the economy to globalization (Grabowski 1994). The strategies which comprise three key elements, that is technological change in agriculture; accelerated growth in employment and an open trade regime, will enhance economic development of a country, a process to transform a low income and traditional society with mainly produce primary products into high income and modern society that produce both primary and industrial goods (Sodersten & Reed 1994).

As these strategies affect different public sector policies, government support is of critical importance as is that of foreign assistance. According to Krueger, Anne O. (1980), one of the government policies on trade that support Mellor's argument is the export promotion program to assist the agricultural exports expansion by opening trade to the world . Furthermore, Krueger, Anne O. (1980) also notes that this policy is not only successful in manufactured exports such as

in Taiwan, South Korea and Brazil, but the policy has also succeeded in agricultural products such as in Taiwan with banana exports, Peru with fishmeal exports, and Central America with raw cotton.

2.6 Agricultural Trade Liberalization

In addition to the attention that has been given from worldwide organizations to the agricultural sector (World Bank 2008), as well as trade policy attention of the governments to expand its exports, governments realise the importance of widening agricultural export markets and linking with world markets by joining regional free trade areas as well as implementing a trade liberalization policy in the agricultural sector to improve their economic development.

In order to gain more market access for agricultural products to the world market, the World Trade Organization (WTO) establishes an agreement in the agricultural sector. Agricultural trade liberalization efforts started in 1986 when the international community puts the agricultural sector under the General Agreement on Tariffs and Trade (GATT). Although one of the objectives of the establishment of the free trade agreements is to support agricultural exports, only a few are dedicated to the promotion of agricultural trade among members.

2.6.1 *Agriculture in World Trade Organization*

The Uruguay Round Agreement on Agriculture (URAA) is a milestone that began a series of international trade negotiations on agriculture under GATT auspices which was established in Uruguay for the period of 1986 to 1994. The agreement also commenced a new round of multilateral trade negotiations at the end of the implementation period of the Uruguay Round commitments for developed countries. The creation of the WTO strengthened the rules of GATT and made it possible for developing countries to join trade talks (Beierle 2002). The Uruguay Round has been the main driving force of agricultural sector liberalization for Asian countries during the past decade. Even though in terms of actual trade liberalization this agreement seems to be limited, its achievement was quite significant.

The URAA enforced trade reform in agriculture commodities to accomplish the reduction of domestic subsidies, export subsidies and market barriers over six years for developed countries

and then 10 years for developing countries (Josling, TE 1994). The Uruguay Round Agreement also introduced tariff rate quotas (TRQ) for a volume of import at a particular rate to create additional market access where tariffs replaced non-tariff barriers. During the URAA, countries agreed to convert all import barriers to their tariff equivalents in a process called 'tariffication' (Aksoy, M & Beghin 2005). Once the tariff equivalents were established, tariffs are supposed to be restricted (Khor 2003). Removing the trade barriers to such trade presents a greater opportunity for future gains. Although the establishment of the Uruguay Round of GATT marked the starting point in agricultural trade liberalization, agricultural protection continues to be the most critical issue in global trade negotiations. Free trade agreements are mostly based on, but not limited to, elimination of tariff barriers between members. They have also expanded the non-tariff barrier reduction and enhanced protection modes, such as regulatory mechanisms, technical barriers to trade, sanitary and phytosanitary measures, as suggested by the Uruguay Round Agreement on Agriculture.

Tariffs on agricultural commodities remain significantly higher than those on manufactured goods almost all over the world, although trade in the agricultural sector comprised only 8.1 per cent of world merchandise trade in 2005 (WTO 2007). Ingco (1995) finds that agricultural protection was fifteen times higher than non-agricultural protection. In fact, many of the agreements do not assist the agricultural sector in their scheme. For example, agricultural tariff rates in the Canada-US Trade Agreement (CUSTA) and NAFTA were already low before entering the agreement, but the non-tariff barrier increased significantly when the tariff rates were reduced (Josling, T. 2011). Similarly,OECD (2004) reports that around 36 per cent and 63 per cent average tariffs are applied to agri-food products by OECD and non-OECD countries respectively. Thus, the agreement has not resulted in tangible trade negotiations and resulted in issues with legal adherence across different countries.

Aksoy, AM (2005a) observes that the lack of agricultural trade liberalization is associated with actual levels of protection because:

1. post-URAA implementation, 70 per cent of the agricultural import tariff remains high;
2. The magnitude of international trade of agricultural commodities is higher in developed countries that have their preferential trade agreement because the tariff barrier is absent among the partner countries;

3. The increasing group of agricultural products, such as fruit and vegetables, has lower protection compared to the declining group, such as coffee and grains, that are facing a high protection level in developed countries;
4. The governments of these countries are unwilling to reduce existing levels of tariff and domestic support for political reasons other than maximizing benefit (Conforti & Salvatici 2004);
5. Developed countries have increased their domestic support for trade distorting subsidies in the form of decoupled payments (Baffes & Meerman 1998).

While mainstream opinion perceives agricultural trade liberalization as a beneficial move for the whole world, the protectionist attitude of developed countries towards their agricultural sector has created obstacles in this direction (Ingco 1995). The implementation of the GATT-URAA agreement did not seem to be as favourable for the developing countries as developed countries acquired most of the benefits (Bouët et al. 2005). Agricultural subsidies implemented by the developed countries to protect their domestic producers make free trade even more unworkable (Moon 2011). In developed countries, the agriculture sector is perceived to hold disproportionately large political power compared to its share in the GDP and the total labour force. Disdier, Fontagné and Mimouni (2008) show that the imposing WTO rules has reduced exports from developingcountries, but not affected the agricultural exports fromdeveloping countries.

2.6.2 *Regional Free Trade Agreements*

As a response to the deficiencies in global trade agreements, many developing countries have agreed on building their own free trade areas spanning the region where these countries can achieve actual trade negotiations and streamline agreements to meet their mutual needs. The growing importance of emerging economies in world agricultural trade is also manifested through changing bilateral trade patterns. Agricultural exports from low-income countries have been increasing rapidly, although they still account for a very small share of trade in agricultural and processed products (Aksoy, M & Beghin 2005). This has also been a motivating factor behind forming regional free trade areas. Regional free trade agreements have become the main form of trade liberalization since the early 1990s (Calvo-Pardo, Freund & Ornelas 2009; Das

2004). Although a regional trade agreement does not follow the WTO principle that all countries should apply the Most Favoured Nation (MFN) tariff to all WTO members, the exemption is permitted by article XXIV of GATT.

In recent times, the regionalism of the free trade phenomenon has been proliferating throughout all parts of the world. This can be seen in many regional organizations established both in developed and developing countries. Chandra and ASEAN (2008) note that regionalism emerged as a new way to respond to globalization and used it to prevent the negative impact of globalization as well as minimize the state's excessive domination.

The expansion of the free trade agreements as the major development in the world economy can be traced back to the Treaty of Rome in 1958. Nowadays, the WTO has accepted around 489 notifications of the regional trade agreement (RTA) (WTO 2012c). In the current market liberalization era, every country joining free trade arrangements under multilateral, regional or bilateral commitments seeks to open its market for products, including agricultural commodities, from other member countries.

2.7 Overview of the ASEAN-China Free Trade Agreement

ACFTA is one of the regional free trade area agreements that have a special program focused on increasing agricultural trade among its members. This agreement was signed in 2002 by ASEAN countries and China. The signing of the agreement on Trade in Goods (TIG) of the Framework Agreement on Comprehensive Economic Cooperation between ASEAN and China at the 10thASEAN Summit in Vientiane, Laos in November 2004 was a milestone which carried out the ASEAN-China free trade agreement for goods. This is set to be established by 2010 for ASEAN 6 (Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand) and China, and by 2015 for the newer ASEAN member countries (Cambodia, Lao PDR, Myanmar and Viet Nam). The ACFTA will be implemented gradually over ten years. ACFTA is the third largest trade agreement in terms of its volume after the European Economic Area and the North American Free Trade Area (Gooch 2010) and the biggest free trade agreement in the world in terms of population size. In 2008, a combined nominal GDP of ASEAN members and the China

was approximately $6 trillion, while the total trade between the countries rose from $55 billion in 2003 to $193 billion in 2008 (Ananta 2009).

This agreement has a specific program focused on agricultural trade, namely the Early Harvest program (EHP) along with other programs under the ACFTA, namely Normal track and Sensitive (SL) and Highly Sensitive tracks (HSL). The Normal, SL and HSL schemes will be implemented at different times after the completion of the EHP stage. These programs focused on agricultural trade in the ACFTA make this free trade agreement unique in comparison to other free trade agreements around the world where agricultural trade often forms a very small portion of the agreement or is even excluded from trade liberalization due to state protectionism of the agricultural sector. In developing countries, agriculture is a significant source of foreign exchange rate earnings and is often the most substantial economic sector, providing large employment opportunities (Pick & Vollrath 1994).

The ACFTA programs are to be implemented along with a set timeline. The EHP is the first program of agricultural commodities with an acceleration scheme for agricultural trade between ASEAN countries and China. The EHP is dedicated to reducing import tariff rates to 0 per cent on certain agricultural products during 2004 to 2006. On the other hand, the ACFTA also has other programs named the Normal Track and the Sensitive Track. The Sensitive Track prevents the reduction of import tariff rates on certain agricultural commodities during 2012 to 2016. These programs contain commodity lists that most members are reluctant to release to free market forces with immediate effect. There are many reasons behind this, but the most common is to protect their own industries, so similar goods imported from other countries facing trade barriers from high import tariff rates are more costly than domestically produced goods. The SL is scheduled to come into force for gradually reducing the tariff rates in 2012 for six ASEAN countries and China while the HSL will start in 2016 (ASEAN 2004).

ACFTA aims to strengthen and enhance economic cooperation, increase trade flow, promote open markets, enhance liberalization, facilitate trade and investment, and promote economic relations to improve the welfare of the members. The agreement aims to achieve those goals by eliminating both tariff and non-tariff barriers in all trade in goods and deepen economic linkages between the parties. According to the ACFTA scheme(ASEAN 2004), ACFTA does not only regulate tariff measures but also Rules of Origin, the Operational Certification Procedure (article

5 of the ACFTA), non-tariff measures, technical barriers to trade, sanitary and phytosanitary measures, subsidies and countervailing measures, anti-dumping measures and intellectual property rights (Article 7 of the ACFTA). The ASEAN-China free trade agreement encourages ASEAN-China trade, indicating the growing economic interdependence between ASEAN and China with the potential to expand their markets.

From the Chinese perspective, the intent behind implementing the ACFTA was mainly driven by political reasons (Yuzhu & Tong 2010). The decision to implement ACFTA was taken to dispel the growing concerns among ASEAN countries that China was an economic threat. The rapid growth of China's economy caused uneasiness with its neighbours. China was as a strong competitor against ASEAN for exports to third markets as well as direct investment from foreign countries. Joining this agreement seemed a favourable option to alleviate such concerns.

China's 'open door' trade policy began with its acceptance into the WTO in 2001. This lowered the import tariff of agricultural commodities and increased access to China's market for foreign agricultural products. In return, China's agricultural products acquired broader access to penetrate foreign markets (Martin 2001). However, lowering import tariffs does not necessarily improve import growth. For example, lowering tariff rates on horticulture and meat products might only affect a small part of the domestic market, such as those firms which only buy and sell high quality products including meat for five star hotels that serve foreigners. Although the tariff has fallen for these commodities, the reduction has not affected general traders and producers. On the other hand, there are commodities called 'national strategic products' in which China has no comparative advantages, but there is strong demand in their domestic market, such as edible oil, rice, maize, sugar, cotton and wool. China has special permission under the WTO terms to protect these commodities by imposing high rates for tariff rate quotas (TRQ) and place a quota on these commodities (Chen, C & Duncan 2008).

According to China's Ministry of Commerce (2012), China has risen to the position of largest trading partner for ASEAN and ASEAN has become the third largest trading partner for China since the implementation of the ACFTA. The trade between ASEAN and China has increased significantly from $7.9 billion in 1991 to $292.7 billion in 2010 and, in the first half of 2011, the bilateral trade was $171.1 billion; an increase of 25 per cent in year on year basis (Ministry of Commerce of China 2012). With more than 500 million people and rich natural resources,

ASEAN could play a crucial role in China's long-term growth. The bilateral trade between China and ASEAN grew by about 28 per cent a year in nominal terms, significantly faster than that of China's total trade, with most of this rapid growth attributable to the ACFTA (Yuzhu and Tong (2010).

2.7.1 *The Early Harvest Program*

The EHP was established to accelerate the implementation of the ASEAN-China free trade agreement. The EHP mainly focuses on agricultural and industrial products. The EHP committed the member countries to eliminate tariffs on agriculture and industrial commodities gradually in 2004 to 2006. The implementation of the EHP program began in 2004 to 2006 with a reduction of export tariffs for certain commodities to zero per cent. This scheme comprises agricultural products in Harmonized System (HS) code 01 until 08 (live animals, meat and edible meat offal, fish, dairy products, other animal products, live trees, edible vegetables and edible fruits and nuts). According to Appendix 3 of the ACFTA (ASEAN 2004), Indonesia and China has agreed to add other specific commodities into the EHP scheme including roasted and decaffeinated coffee (HS 010122000), crude coconut oil (HS 151311000), coconut copra oil (HS 151311000), palm kernel or babasu oil (HS 151321000), palm kernel of babasu oil excluding crude oil (HS 151321000), vegetable fats and oils (HS 151620000), edible preparations of fats and oil (HS151710000) and cocoa powder with added sugar (HS 180610000).

Starting from the 1st of January 2004, the tariffon approximately 600 products (mainly agricultural)were lowered so tariffs reached zero per cent by 1st January 2006 (ASEAN. 2002).The agreement covered products under chapters 01-08 of the Harmonized System at the 8/9 digit level, unless otherwise excluded from a party in its Exclusion List. The chapters are as displayed in Table 2.1 as follows:

Table 2.1Agricultural Products included in the EHP

HS Code	Description
01	Live animals
02	Meat and edible meat offal
03	Fish
04	Dairy products
05	Other animal products
06	Live trees
07	Edible vegetables
08	Edible fruits and nuts

Source: ASEAN (2004)

Table 2.2 Specific Agricultural Products covered by the EHP for Indonesia–China

No	Product Description	HS Code
1	Roasted, decaffeinated coffee	090122000
2	Crude coconut oil and fractions thereof	151311000
3	Coconut copra oil (excl. crude) and fractions thereof	151319000
4	Palm kernel or babassu oil and fractions thereof	151321000
5	Palm kernel or babassu oil (excl. crude) and fractions	151329000
6	Vegetable fats and oils and fractions thereof, hydrogena	151620000
7	Edible prep of fats or oils	151790000
8	Cocoa powder with added sugar or other sweetening	180610000

Source: ASEAN (2004)

Aside from these lists, each ASEAN country and China, in bilateral agreements, are allowed to specify other products covered by the EHP as stated in the protocol of the ACFTA framework.

For Indonesia and China, the negotiation resulted in inclusion of fourteen other products as presented in Table 2.2.

Tariff reduction and elimination have to be implemented for three product categories in accordance with the timeframes under the EHP as explained in the following table. A modality for tariff reduction and elimination of tariff lined placed in the EHP is shown in Table 2.3.

Table 2.3 Tariff Reduction under the EHP

MFN tariff rate	January 2004	January 2005	January 2006
>15%	10%	5%	0%
5%-15%	5%	0%	0%
<5%	0%	0%	0%

Source: ASEAN (2004)

2.7.2 *Normal Track*

The second track was 'Normal Track' which was divided into two tracks, namely Normal Track I and Normal Track II. The Normal Track I regulated applied Most favored Nations (MFN) tariff rates that will be gradually reduced and then eliminated over the scheduled time. It started from July 1, 2005 and reached 0 per cent of all the representative tariffs in 2010 for the ASEAN 6 and China, while the newer members of ASEAN will have to wait until 2015. On the other hand, the Normal Track II listed those products with tariffs had been reduced but not eliminated under the Normal track I. The respective tariff was progressively diminished to zero per cent not later than January 2012 (ASEAN 2004).

2.7.3 *Sensitive Track*

The Sensitive Track has two categories: the Sensitive List and Highly Sensitive List products. In the Sensitive List, ASEAN 6 and China have to reduce the respective applied MFN tariff rates to 20 per cent by 2012, while Cambodia, Laos, Vietnam and Myanmar are required to do that by 2015. Furthermore, tariffs have to be reduced to 0 to 5 per cent no later than 1 January 2018 for

ASEAN 6 and China and by 2020 for the new members of ASEAN. The reduction of applied MFN tariff of less than 50 per centof the Highly Sensitive List has to be applied by 2015 for ASEAN 6 and China and by 2018 for the other parties (ASEAN 2004).

Indonesia has 349 products covered in the Sensitive List including 12 agricultural products (ASEAN Secretariat 2006). Indonesia is currently renegotiating its highly sensitive list. Countries tend to exempt products with high tariffs, although not exclusively (Scollay & Trewin 2006). This involves removing some items and replacing them with others which need agreement from China before the list can be revised. Meanwhile, China has 161 items in its Sensitive List. The Sensitive List of agricultural products is tabulated in Table 2.4 below.

Table 2.4 Sensitive List China-Indonesia

No	China		Indonesia	
	Description	**HS Code**	**Description**	**HS Code**
1	Coffee, not roasted or decaffeinated	09011100	Cloves	090700
2	Decaffeinated	09011200	Crude oil	150710
3	Roasted coffee	09012100	Other	150790
4	Dried pepper	09041100	Shrimps and prawn	160520
5	Crushed or ground pepper	09041200	Active Yeast	210210
6	Durum wheat	10011000	Inactive Yeast	210220
7	Seed of spelt, wheat	10019010	Prepared baking powder	210230
8	Broken rice	10064000	Vegetable material and waste	230800
9	Groat & meal of rice	11031400	Other	230990
10	Pineapples in containers	20082010	Tobacco, not stemmed	240110
11	Pineapples prepared	20082090	Tobacco, partly or wholly stemmed	240120
12	Longan can	20089920		
13	Coconut juice	20098011		
14	Tobacco, not stemmed	240110		
15	Tobacco, partly stemmed	240120		
16	Tobacco, refuse	24013000		

Source: ASEAN (2004)

Furthermore, China put 100 commodities in the Highly Sensitive List with 26 items of agricultural products mainly consisting of maize (HS 10), rice (HS10), flour (HS 11), Crude

soya-bean oil (HS 150710, 150790), crude palm oil (HS 15111000), palm oil (excluding crude & liquid fraction (HS 15119010), palm stearin (HS 15119020), other palm oil (HS 15119090), crude oil (HS 151410), other (HS 151490), cane sugar (HS 170111), beet sugar (HS 170112), other sugar (HS 170199), cigar (HS 24029000) and tobacco (HS 240310, 240391,240399). Meanwhile, Indonesia has 50 items in the Highly Sensitive List including 13 agricultural commodities mainly consisting of seed (HS 1005), rice (HS 1006), sugar (HS 1701), un-denatured ethyl alcohol (HS 2207) and other (HS 2710.90).

2.7.4 *The Impact of the ACFTA for China and ASEAN Countries*

Because the ACFTA is a regional and relatively close-knit organization, its benefits are exclusive to member countries. Mutual tariff reductions between member countries can make imports of products of non-member countries less competitive, with negative impacts on those countries' total trade volumes and economic welfare (Ahearne et al. 2006). Another study conducted by (Batra 2007) compared the impact of the EHP for China and compared its impact for other Asian countries, such as India. The study found that the EHP of the ACFTA that offers tariff concessions on commodities of HS code 1-8 will have a negative impact on India. The implementation of this agreement will reduce the trade on products such as fish, molluscs and leguminous vegetables.

According to Yuzhu and Tong (2010), from the Chinese perspective, joining ACFTA is mainly driven by political reasons. The decision to join is an attempt to dispel the growing concerns among ASEAN countries of China as a threat. The rapid growth of China's economy has caused uneasiness for its neighbours. Economically, China has been raised as a strong competitor for exports from ASEAN to third markets as well as for ASEAN's foreign direct investment attraction. Joining this agreement seemed a favourable option to alleviate such concerns.

The implementation of this trade agreement has increased the presence of China in the trade of ASEAN countries.

Chakraborty and Kumar (2012) note the impact on the balance of trade for ASEAN countries are uneven for period 1995 to 2010; some countries have growing deficit trade while some others have the surplus. Positive trade balances are experienced by Brunei, Malaysia and the

Philippines; while the increasing deficit trade balance are faced by Indonesia, Cambodia, Thailand, Vietnam and Singapore. Although Indonesia held a trade surplus before 2010, it had a deficit in 2010. The inflow of China's cheap products exports is dominant, yet are likely to intensify following the full implementation of the ACFTA.

In terms of agricultural trade between China and ASEAN under the ACFTA agreement, implements the gravity model and argues the free trade agreement and GDP are among factors influencing bilateral trade in agriculture.

2.7.5 *The Impact of the EHP Implementation*

Yunling (2010) analyses the impact of the ACFTA and the EHP on the countries of ASEAN and China. He argues that the effect of the ACFTA and the EHP are positive. However, the benefits are uneven for every country due to competition. In his review, the implementation of the EHP will promote the export growth of Chinese products with comparative advantage, speed up the development of these industries and thus promote the optimization of China's agricultural export.

According to Yunling (2010), the impact of the EHP on ASEAN countries on trade between ASEAN countries and China can be explained as follows:

1. China gains more benefits than Indonesia with the EHP as, for most commodities included in EHP, the production level in China is much higher than that in Indonesia;
2. The effect of EHP seems to be negative despite the market potential provided by the EHP. In the Philippines, small farmers and producers suffer from the impact of the agreement because they lack access to fallback mechanisms such as credit and insurance;
3. The positive impact of the EHP is shown in Vietnam for commodities that are not competitive. The consumer can now get commodities such as beef, dairy products, fruit and vegetables with lower prices. Furthermore, in long-run, the net impact could be positive if the local producers improve resource allocation efficiency. While in short-run, the Vietnamese government should implement relevant policy measures to address the short-term shock;

4. The EHP is an opportunity to develop the agricultural sector as a new source of economic growth and poverty reduction in Cambodia by promoting agricultural exports. The government should employ policies to increase agricultural production and marketing system to assist small farmers to supply agricultural products in an efficient way to be able to compete in local and international market. However, the traders in Cambodia are not aware of this agreement and are thus unready to get the benefitsof the agreement.
5. The EHP has not been effectively implemented in Laos due to the lack of preparation beforehand. Though the agreement has provided preferential tariff reduction, the import prices for commodities from Laos are still high because of the high transportation cost.

Sangsubhan (2010) argues that the implementation of the EHP has brought positive impacts and increasing bilateral trade for Thailand, especially for commodities under HS code 01-08. The trade has increased more than 30 per cent during 2002 to2007 and balance of trade is relatively stable despite the tough competition in the agricultural market. The trade is based on complementary where rice, rubber and tropical fruits from Thailand are exchanged with cold climate fruits from China.

2.8 Conclusion

This chapter provides an extensive background for this thesis comprising a literature review of the importance of the agricultural sector in development and economic growth. The renewed attention from the government and the private sector has reinvigorated the agricultural sector. The revival of agriculture has been marked as agriculture is being included in trade free agreements to increase agricultural trade.

ACFTA is one of the free trade agreements adopted by the Indonesian government that has a special program enhancing agricultural trade between members. It is well known that Indonesia has a foundation as an agricultural country with strong exported agricultural commodities. Hence the impacts of the ACFTA to increase Indonesian agricultural exports should be explored. However, previous studies as explained in the previous sections show the implementation of the ACFTA has different impacts on every member of ASEAN. However the data used in these studies cover exports of general commodities.

While the existing literature, mostly examines the impact of the ACFTA from many points of view, it is hard to find literature that explores the agricultural exports under the specific programs of ACFTA. In contrast, most of the members of ACFTA are producers of agricultural commodities. Hence the agricultural export studies under ACFTA deserve to be examined. Examining agricultural exports in relation to the ACFTA will give a different impression of the ACFTA implementation. The next chapter will present a more detailed study about Indonesian agricultural exports' condition and agricultural trade liberalization undertaken by Indonesian government.

Chapter 3
Indonesian Agriculture and Trade Policy: An Overview

3.1 Introduction

After reviewing the importance of the agricultural sector in economic growth in general in Chapter Two, this chapter will analyse in-depth the condition of the agricultural sector in Indonesia. It is well-known that Indonesia has abundant resources in agriculture. As recorded by FAO (the Food and Agricultural Organization of the United Nations) (FAO 2012), Indonesia is the leading producer for certain agricultural products which should be explored to gain more benefit for economic growth of Indonesia. Despite its strength in agriculture sector, the contribution of this sector to economy is still low in Indonesia, outgrown by industrial and service sectors (ADB 2013). There have been many efforts made by the Indonesian government to apply strategies in trade reform policy to increase agricultural trade and build better economic conditions (Basri, M Chatib & Hill 2009). As the agriculture sector plays an important part in Indonesia's economic development and is a significant sector in the trading sector, the trade policy imposed by the government should protect as well as promote the agriculture sector. The involvement of Indonesia in many free trade agreements should be able to force the expansion of agricultural exports yet protect its domestic industry of agriculture by selectively permitting agriculture product imports.

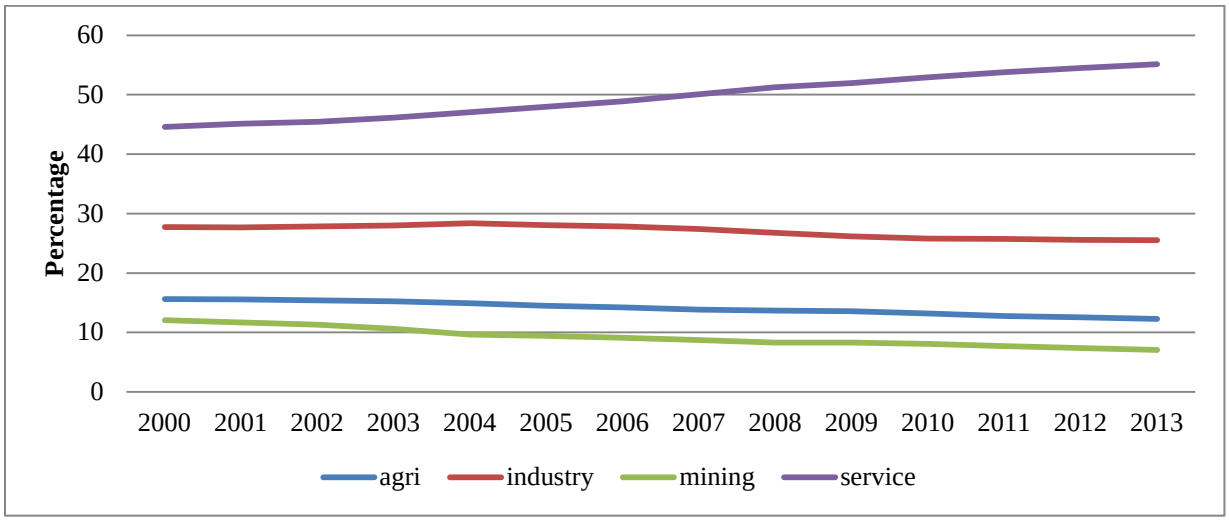
The purpose of this chapter is to provide a detailed explanation of the background of this research from Indonesia's perspective. It will explore the issues of the importance of agriculture in the economy of Indonesia, the strength of Indonesian agricultural exports as well as the composition of agricultural trade. The agricultural trade policy taken by Indonesia's government will also be presented. Finally, a short discussion about trade policy of China as a trading partner will be presented.

3.2 The Importance of Agriculture in the Indonesian Economy

Indonesia is characterized as an agrarian country with around 38.3 per cent of its labour force employed in agriculture sectors in 2010, compared to 12.8 per cent in the manufacturing and 12 per cent in the mining sectors(ADB 2011). Although this percentage shows a sharp decline from the 50.6 per cent recorded in 1993, most people in rural areas still depend on agriculture as their main source of income (Suryahadi, Hadiwidjaja & Sumarto 2012). The role of agriculture in the Indonesian economy is certainly important, since it has not only been a way of life for most Indonesian people, but also as the backbone of the economy especially in the Asian financial crisis era. Despite its diminishing share of GDP, the agriculture sector, however, has contributed, on average, 15 per cent of the GDP during 2000 to 2010 (BPS 2014).

The proportion of trade to GDP in Indonesia during 2008to 2010 was 49.6 per cent(WTO 2011), which is less than the 60.4 per cent in the 2001 to 2003 period. Overall, the trend of the growth in real GDP has been steady over time. The role of agricultural sector in reformation is marked by declining shares of agriculture in GDP when the industry and service sectors grow. Recently, Indonesia has gone through a sectoral reformation as the share of agriculture in Indonesia's GDP has been falling steadily since the 1970s (Elias and Noone, 2011). In line with the global trend, the share of the agricultural sector in Indonesia's GDP is declining over time, as shown in Figure 3.1.

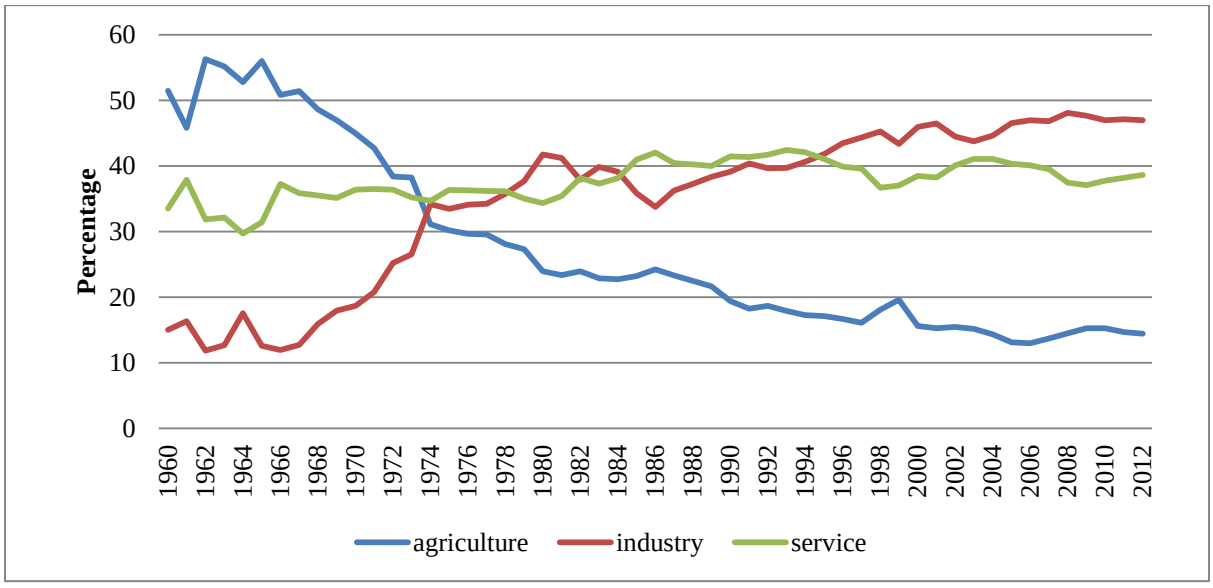
Figure 3.1 GDP Share by Sector



Source: Bank Indonesia (2013)

Correspondingly, the share of another primary sector, mining, has also been declining. But more interestingly, in contrast to global trends, the share of the industry sector in GDP has been decreasing too (Bank Indonesia 2013). Only the services sector has risen in GDP, accounting for close to 50 per cent of GDP in 2000 and more than 55 per cent in 2013. But overall, the share of GDP for agricultural sector has been declining while the industry and service sector have been increasing in the entire period of 1960 to 2012 (Bank Indonesia 2013). Figure 3.2 presents the history of value added per sector as a share of GDP.

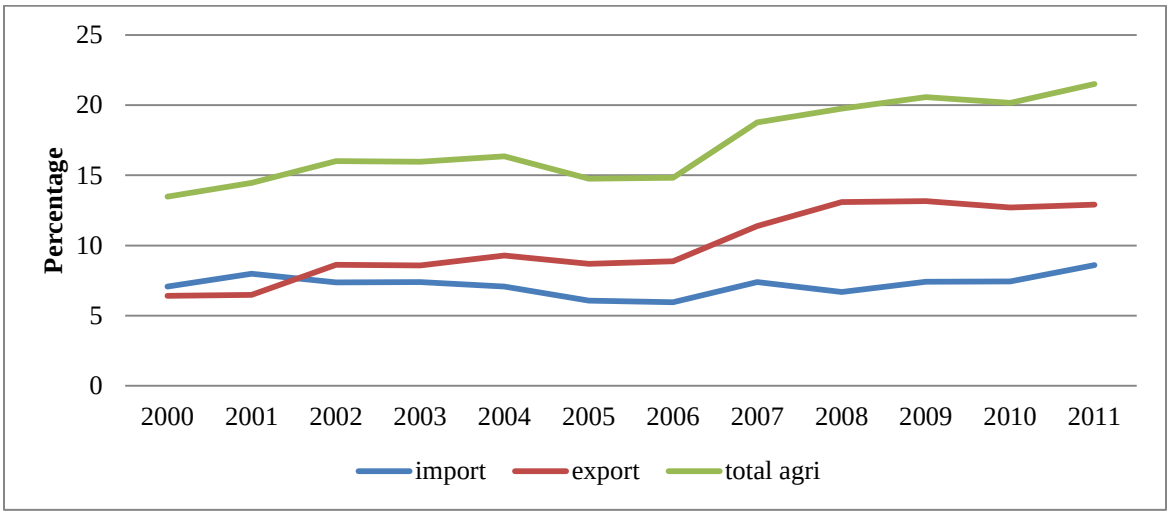
Figure 3.2 Value Added Share of GDP



Source: Bank Indonesia (2013)

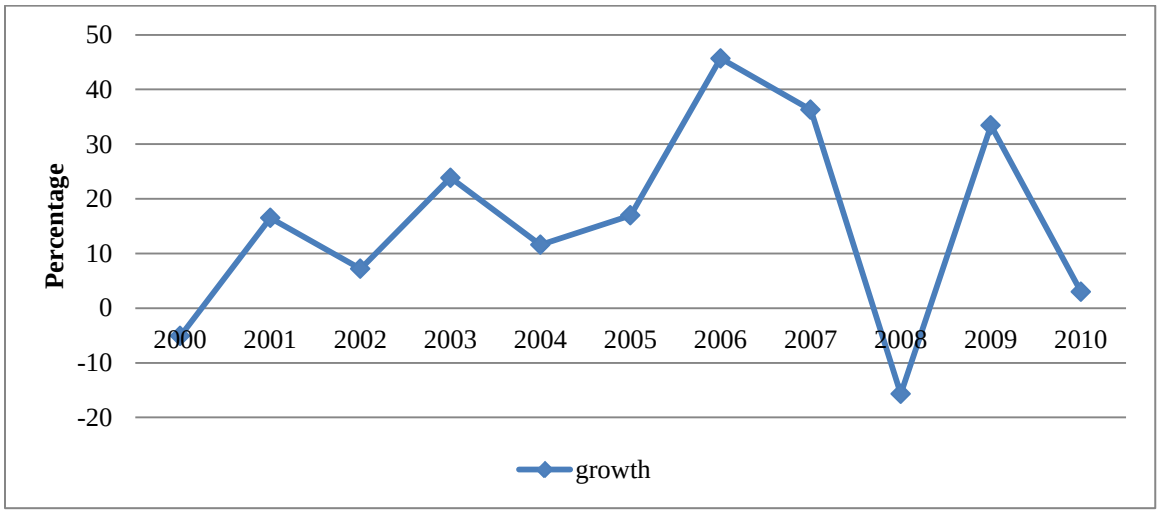
In Indonesia, the importance of agricultural trade is shown by the value of total trade as well as its share in the total trade. It indicates that there is an opportunity to increase government income from this sector. In contrast with the global trend, the share of agricultural exports in Indonesia is increased in 2000 to 2012 (Bank Indonesia 2013). The growth of agricultural trade is increasing as well, although there was a dip in 2008 because of the global financial crisis, but in general the trend is positive as shown in Figures 3.3 and 3.4.

Figure 3.3 Agricultural Trade Share in Merchandise Trade of Indonesia



Source: Bank Indonesia (2013)

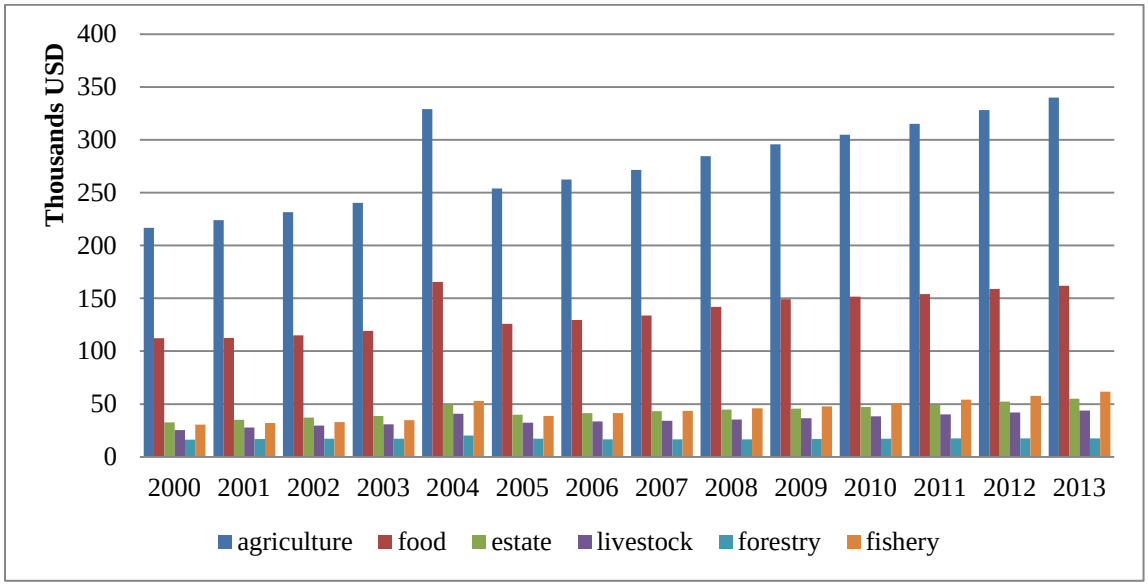
Figure 3.4 Growth of Indonesian Agricultural Trade



Source: Tradedata (2013)

Looking at the GDP of agricultural sub-sectors in Figure 3.5, the food sector is significantly dominating the GDP share of agriculture followed by estate, fishery and livestock (BPS 2014). The forestry sector contributes the lowest share of GDP.

Figure 3.5 GDP by Agricultural Sub-sectors



Source: BPS (2014)

More than 60 per cent of poor people in Indonesia live in the rural area where they mostly rely on the agricultural sector for livelihood (Suryahadi & Hadiwidjaja 2011). Currently, Indonesian agriculture employs almost 40 per cent of the workforce. Meanwhile, the agricultural sector contributes about 14 per cent to the GDP (ADB 2013). This situation implies a relatively low level of labour productivity compared to other sectors. In spite of its significant contribution to the national economic development, agriculture in Indonesia is facing many challenges, especially in the provision of sustainable food to meet the increasing demand from rapid population growth and increasing income of the population.

Some empirical studies have demonstrated that low level of agricultural investment by the private and public sector in Indonesia has become one important factor behind stagnation of agricultural productivity and growth. Fuglie (2004) and Suryahadi and Hadiwidjaja (2011) argue that Indonesian agricultural productivity has been stagnant since the 1990s. Furthermore, the decline in total factor productivity (especially during 1993 to 2000) in Indonesia was due to the downward trend in public spending for agricultural development since the mid-1980s (Simatupang, Rusastra & Maulana 2004). Cervantes-Godoy and Dewbre (2010) as cited in CSES (2011) suggest that agriculture in Indonesia has been badly neglected in recent decades due to the urban bias in government policies, particularly since the Asian financial crisis of 1997

to 1998. The highly inefficient and inequitable instruments of agricultural policy has been demonstrated by a narrowly focused policy based on achieving self-sufficiency and price stability for import-competing commodities, particularly rice, sugar and palm oil, and the use of input subsidies and export taxes (Oktaviani, Setyoko & Vanzetti 2010; Orden et al. 2007). The lack of attention from government has driven investment away from the agricultural sector, thus limiting the agricultural productivity (CSES 2011).

Recently, public spending in this sector has been increasing as the government realized the importance of agricultural research development (Suryahadi & Hadiwidjaja 2011); although it is still lower than other developing countries. The Presidential Decrees no. 77/2007 and 111/2007 regarding Lines of Business Closed and Open with Requirements for Investment have attracted foreign investors to expand the palm plantation, thus agricultural investment increased significantly. The investment in agricultural research and development made by the Indonesian government has increased significantly (Suryahadi & Hadiwidjaja 2011); though it still remains low by the middle-income country standards. In Asia, public spending on agricultural research is dominated by China, followed by India, Pakistan, Malaysia and Indonesia (Beintema & Stads 2008)

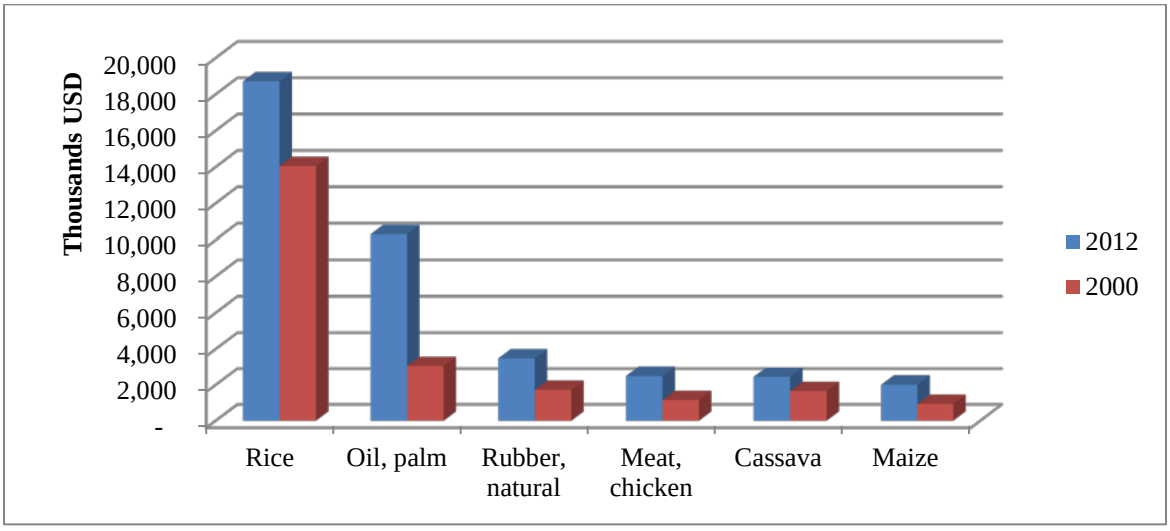
With regards to public investment for agriculture, Suryahadi and Hadiwidjaja (2011) report that the increase in real public spending on agriculture after 2000 was largely a reflection of poorly targeted subsidies. Agricultural production did not increase despite increased public spending. Between 2001 and 2008, real national spending on agriculture increased from Rp 11 trillion to Rp 53 trillion, while the agricultural share of total government spending doubled from 3 per cent in 2001 to 6 per cent by 2008, reaching 1 per cent of GDP, mostly due to increased subsidies. However, public spending for research in other agricultural sectors mostly comes from farmers in Indonesia.

3.3 Top Agricultural Commodities Production in Indonesia

Indonesia is a country with rich resources, favourable for many agricultural commodities. The archipelago has regions with excellent soil and rainfall, making it a key producer of a wide variety of tropical products.

FAO (2012) has made a list of the ten worldwide top- ranked commodities produced in Indonesia, including long-time top ranked commodities, such as vanilla, cloves, kapok fibre, kapok seed in shell, leeks and coconut, which have been joined by some new commodities, such as palm oil and palm kernels in 2010. Although there is a decrease in the number of the top ranking commodities from Indonesia, from nine items in 2000 to eight items in 2011, there is an increase in the total number of commodities in the top ten ranks, rising from only forty-three items in 2000 to fifty items in 2010. Such commodities are also going up to better rankings. In this group are cassava, green coffee, papayas, green chilies and peppers. The increase in demand, better price for the commodities and expansion of productions have created this condition.

Figure 3.6 The Biggest Production of Indonesian Agricultural Commodities by Value (in Thousands USD) Year 2000 and 2012

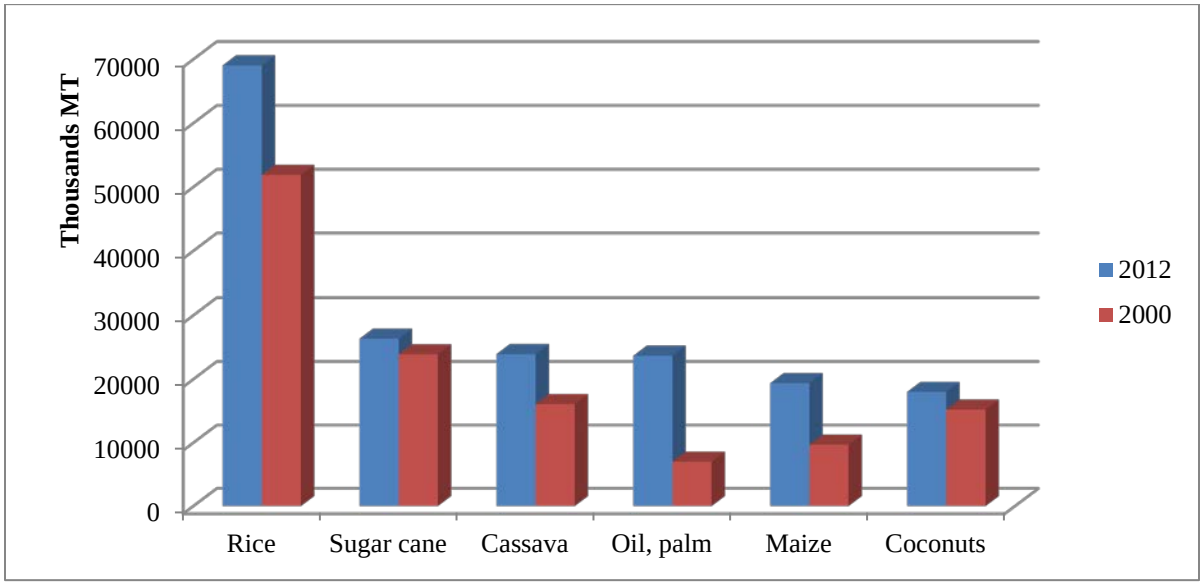


Source: FAO (2013)

Meanwhile, according to FAO (2014) the six biggest agricultural commodities production in Indonesia in 2012 are rice, palm oil, natural rubber, chicken meat, cassava and maize,are based on value in USD, as seen in Figure 3.6. This figure shows the comparison of the commodity values in 2000 and 2012. Rice is the biggest agricultural product production of Indonesia both in 2000 and 2012 while palm oil seems to have the biggest increase in value from 2000 to 2012. The rest of products have only smaller value compare to the first two commodities. Although rice is the most produced agricultural product in Indonesia, the production is mostly for domestic consumption (Orden et al. 2007).

In contrast, palm oil is the third largest agricultural product in Indonesia, but it is mostly exported (Ministry of Industry 2011). The rapid growth of agricultural exports in Indonesia can be attributed to the booming palm oil sector. The investment allocated in the agricultural sectors has been increasing, especially in palm oil industry (Ministry of Industry 2011) leading to increasing production. Higher production and higher demand of these products have led palm oil products to become the third biggest exported commodity from Indonesia (BPS 2014). Thus, palm oil is one of the most important commodities supporting Indonesian exports earning foreign exchange (Pusdatin 2013).

Figure 3.7 The Biggest Productions of Indonesian Agricultural Commodities by Quantity (in Thousand Metric Tonnes) Year 2000 and 2012



Source: FAO (2013)

Figure 3.7 presents the biggest agricultural production of Indonesia in terms of quantity for year 2000 and 2012. Rice is the biggest production in both years, followed by sugar cane, cassava, palm oil, maize and coconut. Palm oil has witnessed strong growth in quantity from 2000 to 2012 while sugarcane seems to have smallest growth in focused years. Although natural rubber is high in value but it is small in production so that it is not in the list of six biggest commodities. But some commodities that have higher value, that is natural rubber, chicken meat, however, have very poor growth in production capacity. This could be a result of change in world demand as well as production conditions, for example, the development of palm plantations are more

preferable than rubber plantations because of its better price that make this commodity more valuable.

3.4 Export-Import Composition in Indonesian Agriculture

According to the WTO (WTO 2012d), Indonesia was ranked twenty-seventh in 2010 as an exporting country of merchandise, improving its former position from thirty-second in 2007 in the world. On the other hand, Indonesia started to import more commercial services and it moved from thirty-second in 2007 to twenty-ninth in 2010 as an importer of commercial services.

Table 3.1 shows the movement of the share of Indonesian exports in total trade of the world. In 2010, Indonesia's share was 1.04 per cent in world total exports for its merchandise trade, increasing from 0.83 per cent in 2005, while its import share was 0.86 per cent increased from 0.64 per cent in 2005 (WTO 2012a). The merchandise trade can be disaggregated into agriculture, fuels and mining, and manufactured products. As shown in Table 3.1, agriculture, fuels, and mining products exports raised their proportion in the total merchandise exports, while manufacturing products exports' share decreased over 2005 to 2010. On the other hand, the share of agriculture imports experienced a stagnant growth in this era, and fuel and mining products imports declined, but the share of manufactured goods imports rose significantly from 54.8 per cent in 2005 to 63.6 per cent in 2010 (WTO 2012d)

Table 3.1 Indonesia's Merchandise Trade Share in the World

Export	2005 (%)	2010 (%)	Import	2005 (%)	2010 (%)
Share of merchandise export in world total export	0.83	1.04	Share of merchandise import in world total import	0.64	0.86
Agriculture product export	16.7	22.8	Agriculture product import	11.5	11.9
Fuels and mining products export	36.1	39.4	Fuels and mining products import	33.7	24.5
Manufactures exports	46.9	37.0	Manufactures import	54.8	63.6

Source: WTO (2012c)

Different scenarios appeared in trade movement. In 2010 Indonesia's merchandise exports reached $157.818 million, while imports were $131.737 million. Both exports and imports of goods and services tended to grow positively between 2000 and 2008, while the growth of exports and imports of merchandise increased steadily until 2007 and rose doubled in 2008 at 18 per cent and 36 per cent, respectively. However, in 2009, with the global financial crisis, all the sectors had a negative trend in their growth. The declining trends were quite large at around –10 per centof exports of goods and services to –29 per centof merchandise imports (WTO 2012a). The crisis which spread quickly tends to reduce trade. In contrast, as shown in Table 3.2, there was volatility of growth. It rebounded quickly with a large disparity in 2010. For example, trade in merchandise had the biggest rebound with 32 per cent and 46 per cent respectively for export and import. This rebound in trade indicated that the effect of the global financial crisis had subsided (WTO 2012d).

Table 3.2 Growth of GDP, Export and Import of Goods & Services and Merchandise

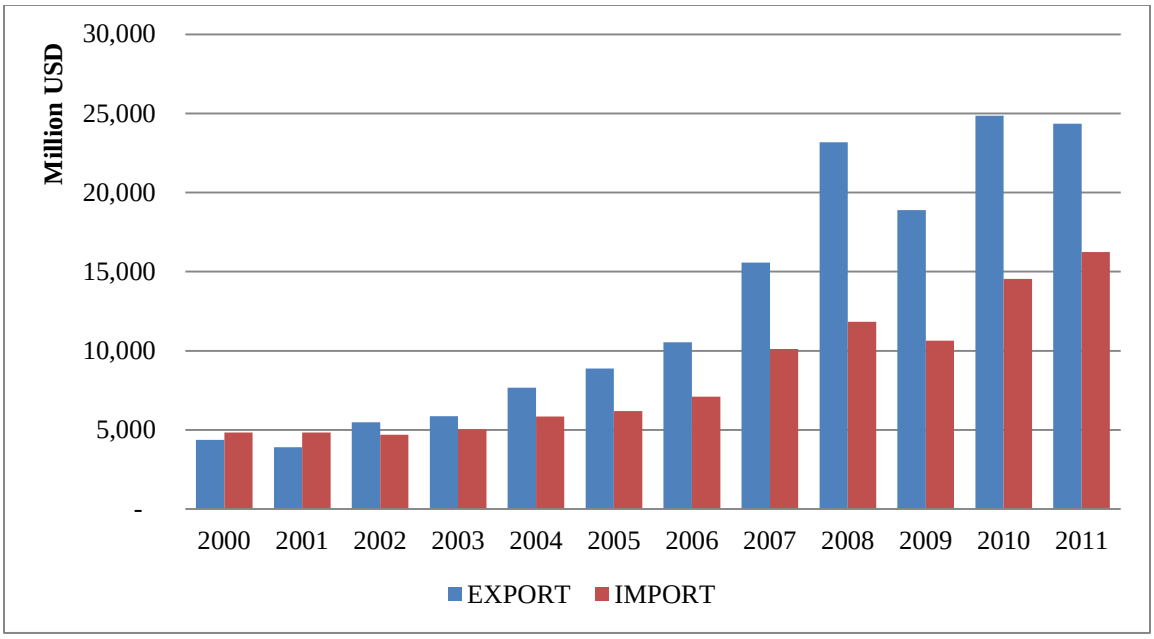
Description	Annual Percentage Change			
	2000–2007	2008	2009	2010
Real GDP (2000=100)	5	6	5	6
Exports of goods and services (volume 2005=100)	7	9	–10	15
Imports of goods and services (volume 2005=100)	9	10	–15	17
Merchandise exports	9	18	–14	32
Merchandise imports	11	36	–29	46

Source: WTO (2012c)

The value of agricultural exports and imports in Indonesia has been increasing, but the trade balance of agricultural commodities is positive. Figure 3.8 presents the value of agricultural

exports and imports from Indonesia (Tradedata 2013). In general, for 2000 to 2011, the value of agricultural exports is higher than the imports. The disparity between export and import value is much bigger over time. This can be explained through Indonesia having a comparative advantage in agricultural products. The slow growth of agricultural imports shows that Indonesia can provide itself complementary commodities of imported products, so the dependence on imported products is not too high.

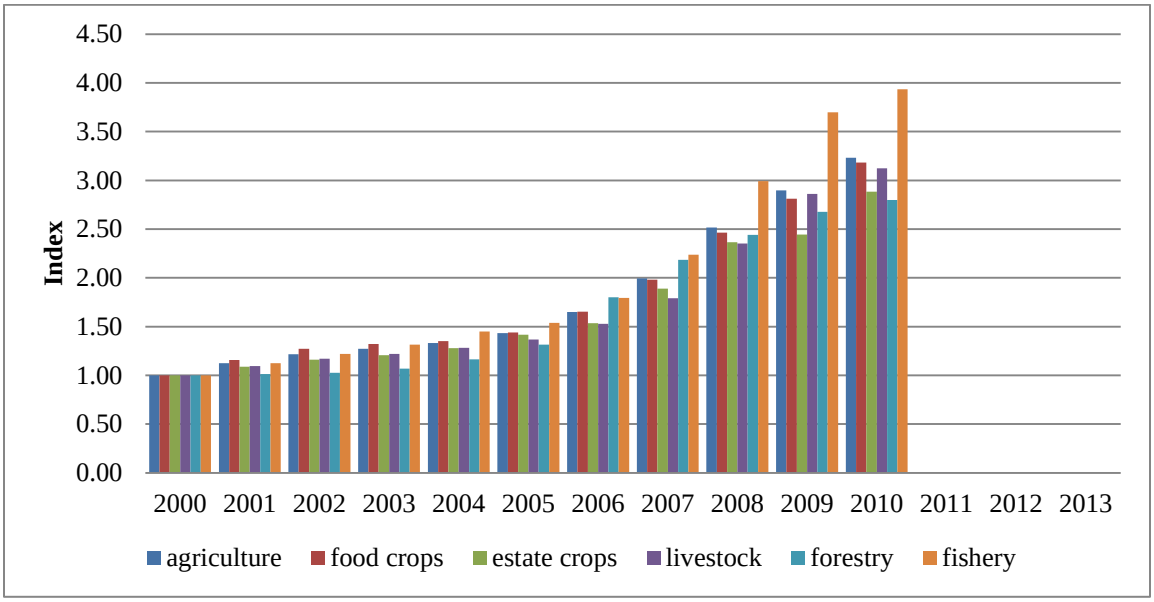
Figure 3.8 Indonesian Agricultural Export-Import Values



Source: Tradedata (2013)

Figure 3.9 presents the agricultural price indexes for 2000 to 2010. It can be seen that the price indexes for all agricultural subsections have been increasing. The striking price index has been occurred in fishery sector, especially in the last three years since 2008; at the same time as the lower price index has been hailed by the forestry sector. The food crops price index in 2010 has increased more than three times since 2000, meaning that the population needs to spend three times their income for food than in 2000 while their income has only increased 1.7 times in terms of GDP per capita in the same period (BPS 2014).

Figure 3.9 Agricultural Price Indexes



Source: BPS (2014)

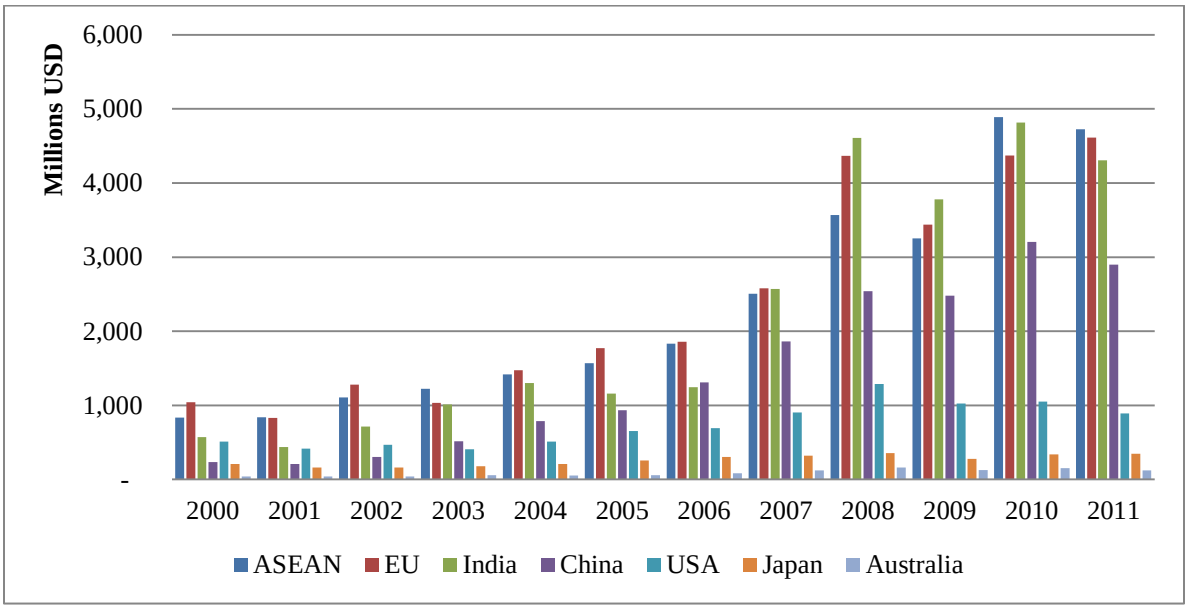
In terms of export structure, overall agricultural exports from Indonesia to all countries have been growing fast during 2000 to 2011. The trend of rising exports has been consistent throughout this period, except in 2009 when the global financial crisis hit. This progressive growth was caused by exports of some important commodities in which Indonesia developed strong capacities as they have better return in value. For the world market, Bappenas (2009) has also recognized the leading products of Indonesian exports.The biggest six exports out of Bappenas are palm nut and kernels (HS 120710), crude palm oil (HS 151110), palm kernel or babasu oil (HS151321), parts used on motor cars (HS 401110), plywood (HS 441222), other yarn of staple fibre (HS 550951). According to the study by Bappenas, it can be seen that the biggest exports of Indonesia to the world are dominated by agricultural products. As it was explained in the previous chapter, agricultural exports from Indonesia are dominated by palm oils. Indonesia's palm oil export has increased significantly since 2000.Rifin (2010)argues that the reasons for these increases are the increase of demand and the increase in export competitiveness of Indonesian's palm oil product compared to Malaysia's products.

Figure 3.10 presents a comparison of the export destinations for Indonesian agricultural products. India and ASEAN are the main export destinations of agricultural commodities from Indonesia, followed by the EU and India (Tradedata 2013).Meanwhile, China has the potential as a new

market for agricultural commodities where the growth trend is going up over time. Growing from $234 million in 2000 to $2,900 million in 2011, China has stayed as the fourth largest export market for Indonesia over this time. Since Indonesia has signed a free trade agreement with China under the ACFTA, it is expected that the exports to China will continue to increase.

The USA and Japan are traditionally the main export markets in Indonesia. USA is the biggest export destination for fishery commodities from Indonesia followed by Japan, but the export value has not changed much from 2000 to 2011. The export share in the USA has been shrinking from 11.7 per cent to 3.6 per cent from 2000 to 2011, while in Japan the export share declined from 4.8 per cent to 1.4 per cent respectively in the same period.

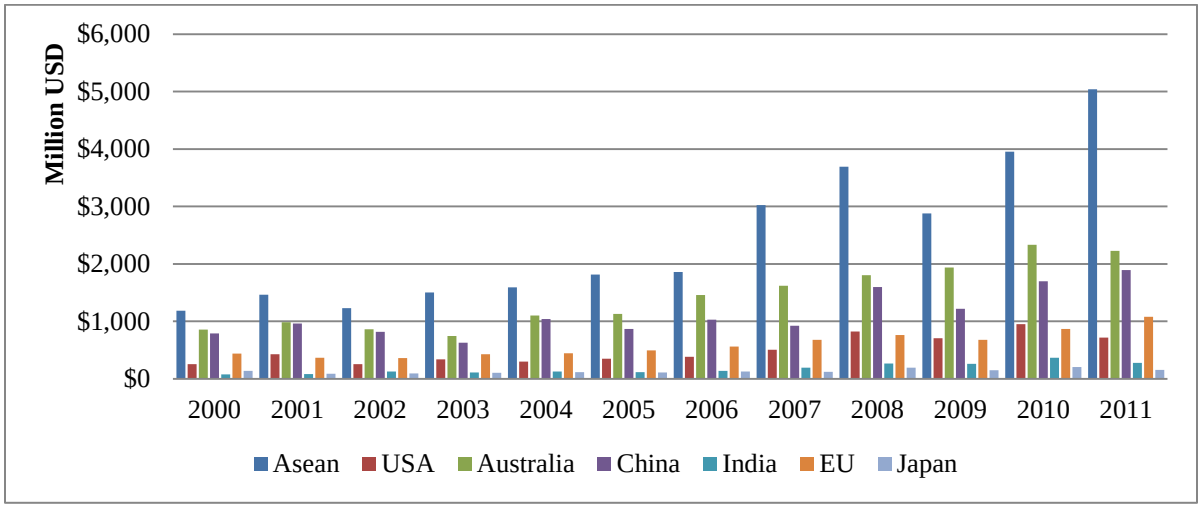
Figure 3.10 Export Destinations of Indonesian Agricultural Commodities



Source: Tradedata (2013) (calculated by author)

Figure 3.11 shows the distribution of Indonesian imports based on country of origin. The average growth of agricultural imports from all countries is 12.62 per cent per year. It can be seen that during 2000 to 2011, ASEAN has been dominating as the source of agricultural imports for Indonesia, followed by Australia. China is the third largest import origin for Indonesian market after ASEAN and Australia. Although the growth in imports from other countries is not as remarkable as the ASEAN countries, the growth of agricultural imports is faster than imports from traditional markets of origin, such as USA, EU, Japan and India(Tradedata 2013).

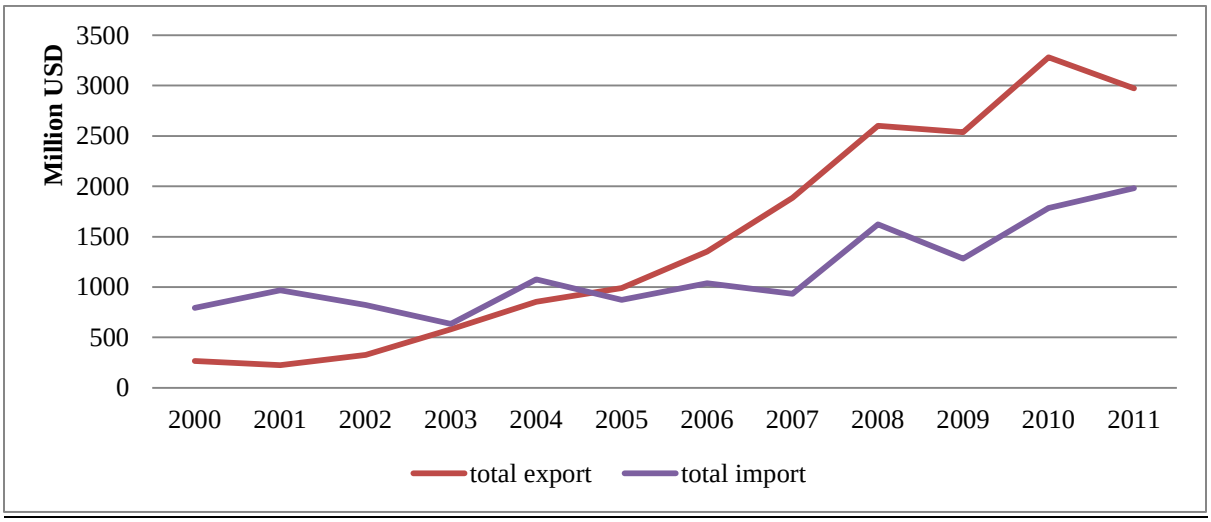
Figure 3.11 Import Origins of Agricultural Commodities to Indonesia



Source: Tradedata (2013) (calculated by author)

Trade balance between Indonesia and China was skewed in favour of China as Indonesia had more imported goods from China than exports. The trade deficit on Indonesia's side was $12.6 billion cumulatively during 2003 to 2009; and the biggest trade deficit occurred in 2008 at around $7.2 billion. In contrast, the trade balance between Indonesia and China in the agricultural sector was positive for Indonesia. Figure 3.12 presents the trend of trade surplus for Indonesia, where the export value of Indonesian agricultural goods to China is bigger than the import value (Tradedata 2013).

Figure 3.12 Agricultural Export and Import from Indonesia to China



Source: Tradedata (2013)

Although Indonesia wants to expand its export, several impediments from the supply side made Indonesia less competitive and limited its export potential (Basri, M & Patunru 2007; Soesastro & Basri 2005). According to Bappenas (2009), the contribution of agriculture to overall Indonesian exports remains small despite the commodities boom. The response of agricultural production to price changes is sluggish. It may take years for estate crops, such as palm oil and rubber, to increase their capacity for exports. Hence, it is not surprising that Indonesia has been unable to fully take advantage of the recent high commodity prices. Furthermore, lower agricultural export growth can be attributed to the reason that Indonesian products do not comply with the international standards of health, safety or environment that leads to rejection by importing countries.

3.5 Indonesian Agricultural Trade Policy

In the past, Indonesia performed as a facilitator in international trade as a trade link between ancient India and China because of the strategic location of its sea-lane in the archipelago. Recently, in an effort to strengthen its position in international trade as well as to encourage its trade and international relations, Indonesia became involved and gained memberships to many trade agreements such as multilateral, regional and bilateral agreements. The multilateral agreements that Indonesia joined includes the World Trade Organization (WTO) and Asia Pacific Economic Cooperation (APEC) and the Group of Twenty Finance Ministers and Central Bank Governors (G20). In terms of regional trade agreements, Indonesia has signed and implemented the following free trade agreements: ASEAN Free Trade Agreement (AFTA), ASEAN-China, ASEAN-Korea, ASEAN-Australia-New Zealand and ASEAN-India.

One of the core ideas of the free trade agreement, establishment is tariff elimination. The government of Indonesia is actively following the agenda to eliminate tariff barriers, especially import tariffs for the agricultural products.

3.6 Trade Liberalization and China trade Policy in Agriculture

This thesis aims to explore the trade relationship between Indonesia and China. A short discussion about China trade policy will be presented as additional background for this study.

China's 'open door' trade policy began when it gained WTO membership in 2001. The open market access has lowered the import tariff of agricultural commodities and increased access to China's market for foreign agricultural products. In return, China's agricultural products have greater access in order to penetrate foreign markets (Martin 2001).

However, according to Chen, C and Duncan (2008), lowering the import tariffs does not necessarily improve import growth. Indeed, China has a comparative advantage for some agricultural products. For example, lowering tariff rates on horticulture and meat products might impact on only a small part of the China's domestic market, such as those who only buy and sell high quality products, such as meat for five star hotels that serve foreigners. Although the tariff has fallen for these commodities, since China export the commodities at below the market prices, the reduction has not affected the traders and producers. For the commodities where China has no comparative advantage, but have strong demand in domestic market, called 'national strategic products' such as edible oil, rice, maize, sugar, cotton and wool, China has special treatments that are allowed under the WTO agreement by imposing higher rates for in-quota tariff (TRQ) and place a quota on these commodities. This trade policy has become the background of the commodities selection involved in the ACFTA programs.

3.7 Conclusion

This chapter has provided an extensive background in this thesis comprising a literature review of the importance of the agricultural sector, the agricultural strength of Indonesia, the terms of trade of Indonesian agricultural product in agriculture and agricultural trade policy on agricultural sector in Indonesia.

Indonesia has very good position in its agricultural trade. While agricultural shares in merchandise export is declining worldwide, in Indonesia it is increasing. Furthermore, the trade balance of agricultural commodities is positive means that exports are bigger than imports. It denotes that agricultural exports have an important position yet potential to contribute more to economic growth of Indonesia.

To explore and enhance the potential exports of agricultural products, the Indonesian government is involved in many free trade agreements to enhance its trade, especially its agricultural trade including the ACFTA. While the potential of agricultural products is very big,

the government expects adopting free trade will boost the trade in agriculture. However, the results of the implementation of the free trade agreement in Indonesia have been rarely measured. This chapter provided a detailed background of this thesis and is the foundation for the next chapters.

Chapter 4

Have Agricultural Exports Under the ASEAN-China Free Trade Agreement Increased Economic Growth in Indonesia?

4.1 Introduction

As identified in Chapter Three, the potential of agricultural exports of Indonesia is promising with its increasing share in merchandise export as well as GDP. Joining the ACFTA is believed can improve the trade which can further contribute more to economic growth.

According to Basri, M.C. (2010), Indonesia becomes one of the fastest growing countries in Asia with economic growth of 6.1 per cent per year and agricultural exports from Indonesia have been increasing significantly. As a consequence, it is important to measure whether agricultural exports to China under the ACFTA can improve economic growth. This chapter is concerned with accomplishing the objective ii stated in Chapter 1: 'to investigate the impact of agricultural exports under the ACFTA on Indonesian economic growth by using a rigorous methodology'. The objective derives from the first research question guiding this thesis: 'Is agricultural trade still important for Indonesia? To what extent does agricultural export contribute to the economic growth of Indonesia?

This chapter implements the generalized gravity model , estimated by the two stage least square (2SLS) to map the impact of agricultural exports under the ACFTA with China on Indonesia's economic growth. The data used in the estimation are derived from the rates of change or growth except for binary variables. Because of limited data availability, the period of study is from 1996 until 2012, with figures derived on a quarterly basis.

The chapter is divided into three parts. The first part presents a comprehensive literature review of previous empirical studies that have yielded disparate results on the relationship between economic growth and agricultural exports. This is followed by an outline of the generalized gravity model that has been used effectively in previous research to map the effect of exports on economic growth and its determinants. The second part of the chapter discusses the methodology used for the estimation elaborating this with a description of the theoretical framework of

generalized gravity models constructed to model the impact of Indonesian agricultural exports on economic growth along with the accompanying statistical tools and data used within the model. The third and final part will present the results of the quantitative analysis, beginning with a presentation of the statistical results of the model and followed by discussion of the impact of Indonesian agricultural exports for economic growth as well as that of other determinants used in the model.

4.2 Literature Review

Most economies depend on a diverse portfolio of unprocessed and processed primary-based exports to generate foreign exchange. Indeed, exports-led growth theory postulating the positive role of general exports in increasing economic growth proved by numerous studies in the literature (Giles & Williams 2000). However, most of these studies account for total exports and do not focus their attention on the study of agricultural exports and economic growth. Despite its declining share of GDP, the lack of attention from governments and private sectors to the agricultural sector is one of the reasons why the research on the impact of agricultural exports for growth is very limited (World Bank 2008).

In their seminal article 'The role of agriculture in economic development', Johnston and Mellor (1961) explain that expanding agricultural exports is one of the most promising means of increasing incomes. Although recent empirical studies in this area are rare, many scholars agree that agricultural export has a positive impact on economic growth in the short-run, for example, Levin and Raut (1997) and Dawson (2005). Similarly, (Sanjuán-López & Dawson 2010) find that there is long-term relationship between agricultural exports and economic growth in developing countries.

Export-led growth from agriculture may provide an optimal resource allocation for those countries that have a comparative advantage in agricultural production. This positive view can be interpreted that the agricultural sector should open to international trade to earn foreign exchange.

On the other hand, there is a contradict view which suggests that the effect of specialized in export of primary product is detrimental to growth. The strongest example of this view is found

in the Prebisch-Singer thesis (Prebisch 1950; Singer 1950) which states that the price of primary products is on a long-term downward trend relative to the price of manufactured goods. This downward slide is also caused by the volatility of primary product prices, consequently exporters of these products experience greater instability of export revenue.

Furthermore, there are many empirical studies that show increasing evidence to support this postulation across the world. In their analysis of the share of primary exports as a percentage of GDP across the world, Sachs and Warner (1997a) find that primary exports recorded a significantly negative coefficient in growth regression for eighty-three countries from 1965 to 1990. Similarly, Sala-i-Martin (1997) shows that the 1970 share of primary products in total exports is robustly and negatively correlated with growth over many alternative regression specifications. Sprout and Weaver (1992) argue that primary product exports do not affect economic growth. Similarly, Esfahani, Sprout and Weaver (1992) examine the causality between economic growth and export of small non-primary primary products in large developing countries. They find small non-primary exports have a positive and significant impact on economic growth while primary product exports do not affect economic growth.

Along with these global studies, research focused on specific countries has also found similar results. In his study, Faridi (2012) implements Johansen's co-integration test to measure the impact of agricultural and non-agricultural exports to Pakistan's economic growth. The finding shows that agricultural exports have a negative and significant impact on Pakistan's economic growth while non-agricultural exports promote economic growth.

4.2.1 *Export-Led Growth Theory Approach*

The neoclassical theory of export-led growth has been used voluminously in the literature on the relation between export and growth. This theory supports the idea that economic growth can be achieved by exports(Adelman 1984). The theories based on that hypothesis can be described as follows:

1. In accordance with the short-run Keynesian arguments, export growth leads to income growth via the foreign trade multiplier effect (Stolper 1947).

2. Foreign exchange from exports can be used to finance imports manufactured and capital goods and technology, which contribute to growth (Chenery & Strout 1966).
3. Competition leads to scale economies, technological advance and growth (Helpman & Krugman 1985).
4. According to endogenous growth theory, the export sector creates positive externalities, such as more efficient production methods, which lead to growth (Balassa, B 1978; Grossman, G.M. & Helpman 1994).
5. The foreign trade multiplier analysis asserts that, given the spending function, an export surplus will have an expansionary effect whose magnitude depends on the marginal propensity to import. Transfer of scarce resources from low-productivity domestic industries to higher-productivity export industries results in an increase in overall productivity, accelerating output growth (McCombie & Thirlwall 1997). A higher level of exports might contribute to economic growth as export revenues provide an important source of foreign exchange, which is crucial when domestic saving are inadequate for making imports of capital goods possible (Bairam & Dempster 1991)
6. Finally, export growth might also trigger economic growth through the expansion of the efficient market size, bringing in substantial economies of scale that accelerate the rate of capital formation and technical change (Reppas & Christopoulos 2005).

There are also further arguments supporting this hypothesis, such as those presented by Ben-David and Loewy (1998); Hart (1983); Lal, D and Rajapatirana (1987). They argue that the increased demand for export creates incentives for specialization in the export sector, scale economies and reallocation of resources from the less efficient non-trade sector to the most efficient trade sector; it ultimately increases productivity and output growth. In particular, it has been argued that higher exports enhance access to advanced technologies, skill improvement, learning by doing, management techniques and entrepreneurial activity (Ben-David & Loewy 1998).

Balassa, BA (1980) states that, in general, the production of export goods is concentrated in the most efficient economic sectors, thus the export expansion helps channel investment in these sectors, which in turn increases the overall productivity of the economy while Tyler

(1981)argues that a large export sector also allows a country to gain from economies of scales and positive externalities that may lead to increased growth. This argument proposes that domestic markets are too small for the optimal scale to be achieved, while increasing returns may occur with access to foreign markets (Giles & Williams 2000). Furthermore, foreign competition increases the pressure on industries exporting goods to keep costs relatively low and to promote technological changes, which in turn improves productivity (Kavoussi 1984; Michaely 1977) and may cause the workers' skill level to rise in the export sector. Kavoussi (1984) also states the growth of exports has a stimulating effect on total productivity of the economy as a whole through its positive impact on higher rates of capital accumulation. Chenery and Strout (1966) propose the 'two-gap model' which states that if the foreign exchange constraint is binding, the growth of exports reduces the foreign exchange constraint, thereby facilitating imports of capital goods and faster growth (Fajana 1979; Voivodas 1974; Williamson 1978). Feder (1983) measures the contribution of exports to economic growth through resource allocation. By dividing the economy into export and non-export sectors, and introducing exports into the production of the non-export sectors, he finds exports have generated positive externalities for the non-export sectors. Athukorala, Premachandra and Menon (1996) state export expansion increases employment and real wages, leading to domestic spending which is becomes source of output growth. Lal, D and Rajapatirana (1987) argue that an outward-oriented strategy of development may provide greater opportunities and rewards for entrepreneurial activity, which is the key to extended growth, as it is the entrepreneur who will seek out risk and opportunity.

While the above arguments support the hypothesis of export-led growth, some other researchers provide only limited support to the export-led growth theory (Chen, EKY 1997; Chow, PCY 1987); and yet others yield mixed results (Kunst & Marin 1989; Nishimizu & Robinson 1984; Oxley 1993; Tybout 1992).

Furthermore, some literature in this area focuses on Indonesia. Most of the studies use co-integration test, error correction models and Granger-causality test to examine the relationship between export and economic growth. Among those studies show that from a range of growth factors, exporting has a strong influence on economic growth (Islam 1998; Jung & Marshall 1985; Piazolo 1996). Xu (1996) examines that the growth of export promotes the growth of the economy of Indonesia. This evidence supports the idea that the export-led growth (ELG) theory is applicable to Indonesia.

On the other hand, some studies on this relationship argue that the growth-led export (GLE) theory is supported in Indonesia. For example,Ahmad, Jaleel and Harnhirun (1996) find that, for Indonesia and other ASEAN countries, economic growth supports the growth of export; and Rahman and Mustafa (1997) argue there are causality from economic growth to export growth both in the short-run and the long- run.

The bi-directional causal relationship between economic growth and export growth in Indonesia is shown by research conducted by Ekanayake (1999). By using annual data from 1960 to 1997 and employing the co-integration test and error correction models to examine the causal relationship between exports and GDP for eight Asian developing countries, he showed that bi-directional causality between those two variables exists in seven out of eight countries considered. A study by Dodaro (1993) also shows the bi-directional causality between these two variables in long-run equilibrium for Indonesia.

4.2.2 *The Linkages of FDI and Growth*

Often times, significant relationships between trade and growth may be due to improvement in total productivity. Solow's growth model attributes economic growth to capital accumulation, labour force growth and technological change (Bhagwati, J. 1998). For developing countries, capital accumulation can be generated by foreign direct investment (FDI) via the lower costs of capital supplies. The impact of knowledge and technology spill-overs and diffusion can improve the transformation of technology. Furthermore, FDI is considered as an important channel of technology spill-overs from developed countries to developing countries through research and development, including human capital development (Grossman, Gene M. & Helpman 1991).

The endogenous growth theory emphasizes trade as the principal channel through which knowledge is transmitted internationally; from which the technological spill-overs could come via imports as easily as exports (Grossman, Gene M. & Helpman 1991). Bhagwati, Jagdish (1994) extends this theory through their 'immiserizing growth theory' that describes FDI flows into a country with import substitution but restrictive trade policies can slow growth. Because FDI has mostly moved into high capital intensity production, these countries lack comparative advantage. On the other hand, the export promotion regime is superior to the import substitution regime in reaping gains from FDI.

Foreign direct investment (FDI) has been a key aspect of increased globalisation in recent decades. Growth in FDI has been higher than growth in international trade. Multinational firms have come to account for about 10% of world output and 30% of world exports, and these firms develop and control a large share of new technologies (Jungnickel 2002). The inflow of FDI increased rapidly during the late 1980s and 1990s in almost every region of the world.

Given appropriate policies and a basic level of development, FDI can play a key role in the process of creating a better economic environment. On the other hand, potential drawbacks do exist, including a deterioration of the balance of payments as profits are repatriated, having negative impacts on competition in national markets (Hansen & Rand 2006). The presence of FDI in a certain industry, however, may exert an adverse effect on domestic firms in that industry. By enjoying better technologies and lower production costs, firms with FDI may cut into the market share of domestic firms without FDI. In a short-run imperfectly competitive market structure, the productivity of domestic firms may be reduced when sales fall, so that fixed costs are spread over fewer units. In the long run, however, the increased competition induced by the increased presence of FDI in domestic industries may force inefficient domestic firms to exit and surviving firms to improve their performance, leading to the potential improvement of social welfare (Buckley, Peter J, Clegg & Wang 2002). At present the consensus seems to be that there is a positive association between FDI inflows and economic growth, provided that receiving countries have reached a minimum level of educational, technological and/or infrastructure development. However, as in many other fields of development economics, there is not universal agreement about the positive association between FDI inflows and economic growth (Hansen & Rand 2006).

Numerous studies on the role of FDI in stimulating economic growth have been conducted. Borensztein, De Gregorio and Lee (1998) argue FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy.De Mello Jr (1997) considers two main channels through which FDI may be growth enhancing. First, FDI can encourage the adoption of new technology in the production process through capital spillovers. Second, FDI may stimulate knowledge transfers, both in terms of labour training and skill acquisition and by introducing alternative management practices and better organisational arrangements. OECD (2002), in a survey, underpins that 11 out of 14 studies have found FDI to contribute positively to income growth and factor productivity. Both

de Mello and the OECD stress one key insight from all the studies reviewed: the way in which FDI affects growth is likely to depend on the economic and technological conditions in the host country. In particular, it appears that developing countries have to reach a certain level of development, in education and/or infrastructure, before they are able to capture potential benefits associated with FDI.

Meanwhile, in addition to the direct capital financing it supplies, FDI can be a source of valuable technology and knowhow while fostering linkages with local firms which can help stimulate an economy (Caves & ebrary 2007). Many policy makers and academics argue that FDI can have important positive effects on a host country's development (Markusen 1995). Based on these arguments, industrialized and developing countries have offered incentives to encourage FDI in their economies.

Foreign firms bring in new production processes or begin to produce new products. These benefits to the country are likely to manifest themselves in relatively high productivity in foreign firms. The effect of FDI from foreign firms to local firms could arise in spillovers. Spillovers are generally measured as the impact of the presence of foreign multinational enterprises (MNEs) on productivity in domestic firms. Positive spillovers could happen from the transfer of technologies from foreign to domestic firms or from the expansion of markets for domestic suppliers of intermediate goods. Negative spillovers could result from increased competition if this forces domestic firms out of business or compels them to operate at a lower scale of production. Evidences show that the productivity of local firms is enhanced because of FDI-induced spillovers (Caves, 1974; Globerman, 1979, Liu et al., 2000) is balanced by other studies finding negligible spillovers (Haddad and Harrison, 1993), or a negative correlation between FDI and the performance of the host country economy (Singh, 1992).

However, the empirical evidence that FDI generates positive spill-overs for host countries is ambiguous. Hanson (2009) finds that the evidence for positive spill-overs is weak, while Görg and Greenaway (2004)argue the effects are mostly negative in this case. Lipsey (2004)has more favourable views and argues there are positive impacts of FDI. Nevertheless, from the survey of macro empirical research, Lipsey concludes that there is no consistent relation between the size of FDI relative to GDP and growth.

The research on the linkages of FDI in primary sectors shows that the impacts of FDI are mostly negative. Alfaro (2003), using cross-countries data for the period 1981 to 1999, claims that the impact of FDI on the primary sector, however, tends to have a negative effect on growth, while FDI in manufacturing has a positive impact and ambiguous in the service sector. UNCTAD (2001) claims, 'in the primary sector, the scope for linkages between foreign affiliates and local suppliers is often limited'. Findlay (1978) and Wang, J-Y and Blomström (1992) argue that the importance of FDI as a conduit for transferring technology relates to the inflow of foreign investment to manufacturing or service sector rather than to the primary sector. Hirschman (1988) notes the linkages between FDI and agriculture sector is weak.

Foreign direct Investment plays a key role in developing an economy. However, There are differences of countries in their ability to attract and handle FDI, which depends on characteristics such as: openness to FDI that is a necessary condition for attracting foreign companies; business environment that is attractive to multinational firms; infrastructure; cost of production; trade regimes; labour force skills and institutional quality. Hence, inflows of FDI differ substantially among countries.

A crude measure of the role of inward FDI is the ratio of the inward stock of FDI to GDP (Lipsey & Sjöholm 2011). Lipsey and Sjöholm (2011) shows that FDI flows to Indonesia have been relatively modest, and lower than would be expected from the country's size. Among the ASEAN countries (Singapore, Thailand, Malaysia, Vietnam, Philippines), the inward FDI as percentage of GDP to Indonesia is the smallest. For example Singapore has the inward FDI as 200.7 percent of the GDP, Vietnam has 57.1 per cent of the GDP, while Indonesia has only 13.5 per cent of the GDP in 2009.

UNCTAD (2010) confirms Indonesia's under-performance in terms of FDI inflows relative to predictions based on a set of country characteristics. This source ranks Indonesia 119th of 141 countries in terms of FDI inflows, but 85th in terms of an estimate of potential inflows based on 12 economic and policy variables. The history of FDI in Indonesia has thus been one of fairly low participation of foreign firms compared with other countries in the region.

4.2.3 *Impacts of Global Financial Crisis on the Indonesian Economy and Trade*

The impact of the global financial crisis on Indonesian economic growth had occurred through trade (Athukorala, P. et al. 2010). The downturn of export growth was reflected in the sluggish growth of the Indonesian economy. However, Indonesia can still increase its economic growth. Compared to other countries in Southeast Asia, the Indonesian economy, anchored essentially by domestic demand, was quite strong with 6.1 per cent growth, which was one of the highest growth countries in Asia, following India and China (Basri, M.C. 2010). Meanwhile, Thailand experienced negative growth in –2.2 per cent, Cambodia at –2.0 per cent, Malaysia –1.7 per cent, Singapore –1.3 per cent and Brunei –1.2 per cent. However, Myanmar, Vietnam and the Philippines had positive growth at 4.4 per cent, 5.3 per cent and 0.9 per cent during the crisis.

It is assumed that Indonesia's relatively good performance was due to the fact, Indonesia's economy is relatively insulated from the weakening global situation (Basri, M.C. 2010). Indonesia's total export share of the GDP amounted to 29 per cent. This figure was much smaller compared to other countries such as Singapore (234 per cent), Taiwan (74 per cent), Korea (45 per cent).

Nevertheless, the weakness of global economic growth had an effect in terms of reducing demand for Indonesian exports. In addition, the decline in global demand had already created a weakness in demand for primary and additional exports and, as a result of this, the prices of commodities and mining products also decreased (Basri, M.C. 2010).

Indonesian exports experienced a sharp decline, especially in the agriculture, oil and gas and mineral sectors, during the crisis. There were two reasons behind this decline: first, to the fall in commodity prices and second to the collapse of demand to the global slowdown. Papanek and Basri (2010) indicate that there was an extremely sharp decline in exports, particularly in current value. The total exports for the first half of 2009 compared to the same period in the previous year declined around –31.8 per cent for current prices but only declined about –19.5 per cent for constant prices. It is suggested that the decline in exports was mostly driven by price rather than volume.

This sharp decline in exports was not only experienced by Indonesia but also China, Singapore, Malaysia and Thailand. The magnitude of the contraction of exports to those countries, including

Indonesia, was similar (Basri, M.C. 2010). However, the impact of the global financial crisis on the Indonesian economy was relatively limited compared to other countries in the region. Basri, M Chatib and Hill (2011) argue that the structure of exports within the economy of Indonesia is relatively small compared to countries such as Singapore, Thailand and Malaysia. In addition, Indonesia was left behind in production networks (Ando & Kimura 2007). As a result, the impact of the global financial on Indonesian economy was also limited. Several impediments from the supply side are the reasons for Indonesia become less competitive and its growth of exports relatively limited; although Indonesia wanted to expand its export share within the economy (Basri, M & Patunru 2007; Soesastro & Basri 2005).

The research shows that the good performance of the Indonesian economic growth was mainly sourced by strong domestic demand (Abimanyu 2007). The GDP data indicate that the growth was dominated by non-tradable sectors such as electricity, gas and water, construction, trade, hotels and restaurants, transportation and communication, financial, ownership and business services as well as the services sector (Basri, M.C. 2010). In a situation where the crisis is still in turmoil and undergoing problems, the big portion of the non-traded sector actually could provide a cushion to lessen the impact of the ongoing global financial crisis.

In conclusion, the global financial crisis mostly affected the developed countries' economic growth. However Indonesia, as well as India and China, showed positive and strong economic growth. Domestic demand supplied most of Indonesia's economic growth while the exports experienced a sharp decline, mainly in primary products such as agriculture, mineral, oil and gas.

4.2.4 *Other Plausible Determinants of the Trade and Growth Model*

Growth models aim to capture structural, dynamic features of economies (Novales, Fernandez & Ruiz 2009). In constructing trade-growth modelling, Rodriguez et al. (2001) argue that inclusion of other essential variables that determine economic growth in a model is important to avoid omitted variable bias. The repeated finding of significant relationships between trade and growth may be a reflection of this situation, thus some of the improvement in total factor productivity is may be due to omitted variables and might be wrongly attributed to trade by the standard statistical estimation methods.

To address omitted variable bias by involving all relevant variables in the regression. Levine and Renelt (1992) have been using the sensitivity analysis of Leamer (1983); (1985a) to review more than fifty determinant variables of growth from the literature that are statistically significant. They do not find a robust independent relationship between any trade or international price-distortion indicator and growth, but they do find a positive relationship between the share of international trade and the share of investment.

Sala-i-Martin (1997) modifies the requirement of Levine and Renelt (1992) studies which asks for 100 per cent of variables to be significant and of same sign in all regression, by reducing it to 95 per cent. He finds twenty-two robust variables that significantly correlated with growth. Among these variables, there are four determinants of growth that related to international trade, namely: years that the economy is open to trade, the foreign exchange black market premium, primary exports and exchange rate distortion. The primary product exports have a negative correlation with economic growth. This study was repeated by Doppelhofer, Miller and Sala-i-Martin (2000). Dollar, D. (1992) integrates exchange rate variable to examine the impact of trade on growth.

Rodrik, D. (2002) and Rodrik, Dani, Subramanian and Trebbi (2002) show that incorporated institutional variables into the growth equation made trade variable insignificant. These institutional variables included the rule of law, property rights and human rights. Rigobon and Rodrik (2005) find that the openness variable has a negative impact on economic growth when including institutional variables while Lee, Ricci and Rigobon (2004) claim the influence of trade on growth is smaller than without institutional variables included.

4.2.5 *Causality between Agriculture Exports and Economic Growth*

The relationship between exports and economic growth has also been examined from the simultaneity problem view. Simultaneity bias can be caused by the interrelationship between dependent and independent variables in a regression equation. Furthermore, this condition may create potential endogeneity bias (Wooldridge 2009). In the growth-trade model GDP, as a function of net exports, is potentially endogenous to bilateral trade flow and vice versa, as proposed by recent literature (Frankel, J & Romer 1996). Frankel, J and Romer (1999) note that while international trade can influence a country income,national income can also be influenced

by the amount that the country's population trade with each other. However, the findings of the relationship between trade and growth with the causality test presented mixed results.

In regard to international trade and economic growth, Van den Berg and Lewer (2007)argue that the relationship is bi-directional. It is highly likely that trade affects, and is affected by, the rate of economic growth as estimated by Granger causality test. Similarly, Chow, PCY (1987) finds significant causality between export and output growth for the small number of countries included in his study. Bahmani-Oskooee, M. (1993) and Ahmad, J. and Harnhirun (1995) employ the unit-root and co-integration tests to confirm the bi-directional Granger causality between export growth and GDP for five ASEAN countries. However, the validity of causality tests has been widely disputed. Leamer (1985b) argues that this test lacks a theoretical foundation. Furthermore, this causality test uses regression to examine the relationship between trade and growth in isolation. This limitation causes the regression to suffer from omitted variable bias. Some other empirical studies using the same methods show little or no evidence of causality between trade and growth as shown by Jung and Marshall (1985), Hsiao (1987), Ahmad, Jaleel and Kwan (1991) and Dodaro (1993).

By implementing the vector auto-regression (VAR) method (Johansen, S 1988), Berg and Schmidt (1994); Van den Berg (1996a, 1997) claim there is little evidence of causality from trade to growth for Asian and Latin America countries. However, the results of the VAR test come as the statistical significance level of overall Granger regression or VAR, not individual regression (van Den Berg 1997).

By using cross-section data, Esfahani (1991) captures the causality possibility by implementing simultaneous equations for modelling output growth, represented by GDP and trade relationship. With the growth of export and growth of import variables as representative of trade, he builds the first equation as a regression between economic growth and export growth and import growth variables as representatives of trade. The second and third equations explain the relationship between export growth and import growth respectively, with output growth as independent variable which captures the reverse effects of growth in trade and investment. He confirms a significant positive correlation between export and output growth. Yet his study also proves the theory of export promotion policy that claims export as a determinant of economic development.

Similarly, Esfahani, Sprout and Weaver (1992) implement the simultaneous equations model consisting of three equations for cross-section data from developing countries which is divided into three samples: small non-primary product exporters, small primary product exporters and large developing countries. They use export growth as representative of trade. From the first equation, they find a significantly positive coefficient for growth of trade for small non-primary product exporters and large developing countries. Significant relationships are also found in other equations which proved that there is a simultaneous relationship between economic growth and export growth. They also argue that primary product exports do not affect economic growth.

The trade growth models of Esfahani, Sprout and Weaver are further explored by Van den Berg (1996a, 1996b) by comparing the single equation and simultaneous-equations estimates. He finds that estimated coefficient for export growths in the simultaneous equations models for the first equations are nearly all larger and more significant than when data is used in the first equation alone. Thus he suggests that the positive coefficient in single equation models may not have been amplified by simultaneity bias.

Frankel, J and Romer (1999) implement the instrumental variables (IV) method to examine the gravity model of trade under liberalization and growth with an assumption of endogeneity occurrence between trade and growth. By using geographic variables such as distance and location to construct an instrumental variable to replace trade variables, the results show a positive relationship. They also use data in terms of level rather than growth rates, arguing that the level rates provide better statistical results.

From the explanation above, it is concluded that the previous studies in economic growth have different findings, although the variables influencing the growth are similar. The inconsistent results arise because of differences in methodologies, countries examined, variable definitions and data sources. A gap in existing research is discernible throughout this review. It appears that only a few studies in the area of free trade agreements have a specific focus on investigating the impact of the agricultural trade under a free trade agreement on economic growth of a specific country. Second, while most of the previous studies focus on the free trade agreements that have been established a long time ago, only a few focuses on the ACFTA. Third, previous studies

generally implement the gravity theory without considering the causality problem that may occur in this model.

4.2.6 *Generalized Gravity Model*

Tran Van Hoa (2002a) introduces a new approach of gravity modelling to examine the relationship between trade and economic growth and their endogenous link from an economic integration theory framework. This method is called the generalized gravity theory (GGT) model which generalizes previous models of growth and trade and incorporates other relevant determinants consistent with the recent literature on growth and trade. Similar to the study conducted by Esfahani (1991), the economic variables in the GGT model are expressed as their rates of change (being planar approximation to any functional form). This is the major feature as well as advantage of this model as it assumes no *a priori* (for example linear or log linear) functional form. Thus, this model can handle data on trade or budget deficit (having therefore negative values) and real rates of interest when inflation exceeds the nominal rates. A relevant study for this nonlinear approach has been conducted by Minier(2007).

By using the GGT model, Tran Van Hoa (2002b, 2004a, 2005b, 2006b, 2008, 2009, 2010, 2012) has extensively examined the relationship between trade and economic growth between two countries. Tran Van Hoa (2006c) examines the impact of trade between China and its trading partners on China's economic growth. Trade (represented by openness or the accumulation of export and import) between China and its trading partners: ASEAN, Japan and the USA, was found to have a positive and significant impact on China's economic growth, while trade between China and its partners in Australia and the EU had negative impacts on China's economic growth. In contrast, the trade has a positive impact on Australia's economic growth (Tran Van Hoa 2008). In another study, Tran Van Hoa (2004c) shows that trade (or openness) between Korea and the USA has a significant negative impact on Korea's economic growth, as does trade between Korea and Europe, but the trading between Korea and Japan has a positive impact on Korea's growth. Tran Van Hoa (2008) also examines the impact of crises and trade reforms in the models. He finds that the Asian crisis had no significant impact on growth in Australia and China. Tran Van Hoa and Tang (2010) find that the Asian crisis and global

financial crisis had a significant negative impact on China's and Korea's growth, while trade reform and WTO membership had positive effects on China's growth (Tran Van Hoa 2004c).

Another significant advantage of this method is that it is historical-data-consistent as all required elastics are estimated from the model and from available official data. The model uses simultaneous-equation class with the incorporation of IVs that affect both trade and growth. This enables the model to acquire asymptotically and statistically desirable and consistent properties of the structural parameters when it is estimated by suitable methods such as 2SLS or other IV methods for credible policy analysis (Frankel, J & Romer 1999). The model can also be extended further into multiple equations depending on the objective of the research (Tran Van Hoa 1992).

To date, it is rare to find studies in modelling growth-trade in gravity theory that consider causality of such multiple variables that can play a role in the relationship between exports and growth. Of the main variables that have been consistently validated in previous research, trade is assumed to be affected by exogenous factors of economic and non-economic activities such as the demand from GDP partners, fiscal policy, monetary policy, inflation pressure (Romer 1993), exchange rate (Rose, A, Lockwood & Quah 2000), industry policy (Otto, Voss & Willard 2003), and population as a proxy for gravity theory (Frankel, J & Romer 1999), crisis, shocks and other reforms (Johansen, L 1982; Tran Van Hoa 2002b, 2004b, 2007, 2009), and free trade agreements (Coe, Helpman & Hoffmaister 2009).

This provides the rationale of this study to develop growth-trade model based on gravity theory considering causality of these other determinants of trade and growth. In addition to the endogenous variables trade and growth, it may incorporate other trade in services (such as education, finance,tourism, labour) and investment (Foreign Direct Investment) and other reform and non-economic events (Johansen, L 1982) that influence trade and growth. Crisis and shock are also included, as they have been recognized in the economic modelling and policy studies as obstacles of growth in the world economy (Johansen, L 1982).

4.3 Methodology

4.3.1 *Agricultural Export-Economic Growth Model Construction*

In this section, we describe the construction of the theoretical framework of generalized gravity model to examine the relationship of agricultural exports to economic growth in Indonesia. Choosing a suitable estimation method for econometric modelling is important. The conditions for the estimation process should hold for consistency and efficient estimation.

This study uses an econometric approach to construct the equation models of empirical economic analysis. The choice of variables incorporated in a model is determined by the economic theory as well as data consideration (Wooldridge 2009). The empirical analysis might deal with testing a certain aspect of economic theory or it might pertain to testing the effects of a government policy. Wooldridge (2009) argues that empirical analysis sometimes uses formal economic modelling but it is more common to use economic theory less formally or even to rely entirely on intuition. Determinants of the model can be obtained by economic reasoning and underlying economic theory.

The constructed model that will be used in this study has employs a partial equilibrium method that is only focused in one area, the relationship between trade and economic growth. Partial equilibrium, as opposed to general equilibrium, allows the study of the impact of a trade policy on one sector of the economy. Koopmans (1965), as cited in Maddala and Lahiri (2009), argues that in specifying an econometric model, it is better to start with a simplified model and progressively construct more complicated models. Thus only the relevant variables with the purpose of the study are picked and the rest of variables related to the economic growth will be put in a basket called “disturbance”. This is the distinction between an economic model and an econometric model (Maddala & Lahiri 2009).

This research uses the generalized gravity modelling approach to construct a simple, flexible econometric model of economic growth of Indonesia in relation to agricultural exports to China under the auspices of the ACFTA. The GGT trade–growth model consists of two implicit functions for growth and trade that show the circular causal relationship between trade and growth, where growth will be represented by GDP and trade will be represented by exports (T).

The trade variable in this research will be represented by the Indonesian agricultural exports to China. The goal of this examination is to measure the impact of the T on economic growth, which is represented by real GDP.

Thus, these equations can be written as:

$$GDP = GDP(T) \qquad (1)$$

$$T = T(GDP)(2)$$

However, this endogenous trade, in Equation (2), is also affected by economic activities, trade related policies and structural change in Indonesia and its trading partners. Since this study is focused on the economic growth model, those variables that influenced trade will become instrumental variables in this equation. As explained in the previous section, crises, shocks, trade reforms and other policy reforms relevant to Indonesia are assumed toaffect economic growth. Indonesian economic growth is assumed to be affected by the crisis, shocks and other policy reforms, so those variables are incorporated into the equation as suggested by L Johansen, L (1982). The GGT model for Indonesian economic growth-agricultural export will be customized with these other determinants that affect the relationship between those two main variables. From the theory and previous empirical research, those instrumental variables consisting of GDP, industry policy, and trade policy and crisis, will be chosen depending on data availability.

As implicit functions imply potentially complex non-linearity, the above model cannot be directly estimated. For empirical implementation, Taylor series planar approximation is used to change the above equations into mathematically equivalents as two stochastic equations with neglecting the second and higher order terms (Baier & Bergstrand 2009). As the focus of this study is to examine the impact of agricultural exports on growth, the equation (1) can be written in planar approximations and in stochastic form simply in terms of the percentage rate of change of all the included econometrically exogenous and endogenous variables, excepting binary variables as follows:

$$Y\% = \alpha_1 + \alpha_2 T\% + \alpha_3 SH + \varepsilon_1 \qquad (3)$$

Where α's are a structural and impact parameter; ε the error terms representing omitted variables outside the model (Frankel, J & Romer 1999) or the disturbances with standard statistical properties; and% denotes the percentage rate of change. It can be seen that equation (3) is linear. As this model is based on trade–growth causality and economic integration theory (Frankel, J & Romer 1996, 1999; Frankel, J, Romer & Cyrus 1996), the instantaneous causality between growth and trade can be observed in this model and also in the sense of Granger (1981) or Engle and Granger (1987) when the variables are either integrated of degree 0 or 1.

Adopting the trade-growth modelling of the generalized gravity theory, the Indonesian economic growth-agricultural export model will be formed customized with the condition impacting the relationship between those variables. As explained in the previous section, crises, shocks, trade reforms and other policy reforms that occurred in Indonesia are assumed toaffect economic growth and will be incorporated into the equation.

To elaborate further, in order to estimate the model, trade policy will be represented by the implementation of a free trade agreement, in this case the ASEAN-China Free trade Agreement (ACFTA); shock or crisis will be represented by the onset of the Asian financial crisis in 1997 and the global financial crisis in 2007; the investment variable will be represented by foreign direct investment (FDI); and the macroeconomic and political conditions are represented by Indonesian reforms that is, the start of reformation by the Indonesian government signalled by the changes by government policy makers and starting of policy reforms in the late 1999 (Bird, Hill & Cuthbertson 2008). Thus, the model of trade-growth of Indonesian agriculture will be derived as:

$$Y\% = \alpha_1 + \alpha_2 T\% + \alpha_3 FDI\% + \alpha_5 AC + \alpha_6 IR + \alpha_7 FTA + \alpha_9 GFC + \varepsilon_1 \qquad (4)$$

Where Y = Growth of the Indonesian economy that will be represented by real GDP

T = agricultural exports of Indonesia to China

FDI = inward foreign direct investment

AC = Asian crisis in late 1997

IR = Indonesian policy reforms in 1999

FTA = free trade agreement (ACFTA) in 2004

GFC = global financial crisis in 2008

α_j = representatives of the coefficient parameters of the variables in each equation respectively

ε_1 = the disturbances representing other unknown factors

The causal hypotheses of those models can be explained as follows: Indonesia's growth is assumed as being dependent on its endogenous variable, trade or export (T), and other exogenous variables such as investment (FDI), trade policies and crisis, which are represented by the occurrence of the Asian crisis, reformation, implementation of the ACFTA and the onset of the global financial crisis. However, this endogenous trade is, in Equation (2), also affected by economic activities, trade related policies and structural change in Indonesia and its trading partners. Since this study is focused on the economic growth model, those variables that influenced trade will become instrumental variables in this equation. Because of a lack of sufficient sampling sizes for the data, Indonesia's trading partner's economic activities will be represented by its GDP data (2002b, 2004b, 2005a, 2006a, 2006b, 2008).

The causality between Indonesia's trade and its trading partner and the trade impact on Indonesian agricultural growth are then based on the testing of the equation (4) by appropriate statistical estimation and conventional testing procedures

The proposed model is expected to assist examination of the factors that influence the relationship between economic growth and agricultural exports in Indonesia. This model is expected to have an output to develop a sound estimation and policy implication to be recommended to the Indonesian government and other countries with similar characteristics

4.3.2 *Estimation of the Model*

The agricultural export model in equation (3) can be regarded as a structural equation with instrumental variables.As explained by many econometricians, this model proved to be better estimated by an instrumental-variable estimation method(Bårdsen 2005; Wooldridge 2009). This method also attempts to solve the omitted variables problem by replacing the unobservable with a proxy variable called an instrumental variable (Wooldridge 2009).

Hence, an instrumental-variable estimator such as two-stage least squares (2SLS) will be used. It is necessary to determine the instrumental variables for endogenous variable, T, to carry out the estimation processes with the 2SLS.

As explained by Wooldridge (2009) and Studenmund (2010), endogenous variables,x_t, are regressed or assumed to have correlation with error or $\text{Cov}(x_t, \varepsilon) \neq 0$. While exogenous variables, z_t, are those that are determined outside of the model and are assumed to be not correlated with the error of the equations model or Cov $(z_t, \varepsilon) = 0$, instrumental variables are exogenous variables that strongly correlate with the endogenous variable. Eventhough the distinction between endogenous and exogenous variables usually depends on how the researcher defines the scope of the research project, they will likely need some testing to ensure that they satisfy the hypotheses.The estimation procedures are undertaken by using the Stata statistical software program.

4.3.3 *Model Robustness Test*

In order to obtain robust results, the model reliability should be conducted to confirm all requirements of the empirical estimation have been addressed. According to Wooldridge (1998), assumptions of independent error, conditionally homoscedasticity and no autocorrelation should be held in order to obtain consistent results from regression. These will have to be tested with appropriate methods. Furthermore, there are some other tests to be conducted to confirm the robustness of the model.

4.3.3.1 Instrumental Variables Tests

The model estimation is constructed as the instrumental variable (IV) method, thus the assumptions of the IV method should be met. According to Adkins and Hill (2008), IVs must be outside the regression model, uncorrelated with the regression error and strongly correlated with the endogenous variable. The IVs used in this equation are based on the theory and previous empirical results. Those IVs are assumed to be exogenous to the model. However, to make sure the result of the estimation is unbiased and consistent, it is necessary to test whether the IVs meet the conditions.

The test is necessary as the macroeconomic environment of every country is different and the influence of these variables will be different across different countries. Thus, relevant procedures are needed to ensure that the variables included in the equation will provide a more precise and consistent outcome of the estimation. The tests include:

i) Instrumental variable validity test.

It has been asserted that one endogenous variable must have at least one valid instrumental variable or more (Baum, Christopher F, Schaffer & Stillman 2011). To test this assumption, a significance test of instrumental variables will be performed on the reduced form equation or the first stage equation from 2SLS estimation (Davidson & MacKinnon 1993). The null hypothesis is that the coefficient of the IVs variables are zero, and the alternative is that at least one of the coefficient is not zero.

ii) Under-identification test

The under-identification test is a Lagrange Multiplier (LM) test of whether the equation is identified, that is. The excluded instruments are relevant and correlated with the endogenous regressors. The null hypothesis is that the equation is under-identified. As the estimation is under robust conditions, this test uses the Kleibergen-Paap statistics (Kleibergen & Paap 2006).

iii) Weak-instrument-robust inference

When the excluded instruments are only weakly correlated with the endogenous regressors, the estimators can perform poorly (Stock, J.H. & Yogo 2005). In addition to being significant or strong IVs, the variables must also be valid in the sense they are uncorrelated with the error term. The over-identifying restriction test for IVs to ensure validity and arrive at weak-robust instrument inference can be conducted by the tests developed by Anderson, TW and Rubin (1949) and Stock, James H and Wright (2000)

4.3.3.2 Model Reliability Test

The performance of the models can also be evaluated by the Friedman-Kydland Criterion data-model consistency (Kydland 2006) where the discrepancy between the actual data and model predictions has to be small. The criterion was encouraged by Milton Friedman (Brueton 1999) to

promote model and reality consistency as economists and policy-makers seemed to have overlooked this in recent years.

4.3.4 *Data*

Although the model incorporates many variables that are assumed to influence trade and growth, the actual model presented in this study will be customized depending on the availability of relevant data. Due to the limitation of data provided, the relevant data to the model equation includes economic growth in Indonesia represented by Indonesia's GDP, trade in Indonesia represented by agricultural exports from Indonesia to China, FDI,exchange rate volatility and trading partner income represented by China's GDP. All data are in real value and are obtained from many sources for quarterly periods from 1996 to 2012. Crises are represented by the Asian crisis in 1997 and global financial crisis in 2008, trade policy is represented by the implementation of ACFTA in 2004and policy reforms after the overthrow of Soeharto's regime in 1999. These events are using dummy variables.

For the Indonesian agricultural commodities exports variables, data was retrieved from Tradedata.net. The figures are in US dollars and volume in kilograms for all agricultural products exported to China from every port in Indonesia on a monthly basis. The agricultural products used in this study follow the Agreement of Agriculture (AoA) with the WTO, consisting of more than 500,000 observations in six-digit Harmonized System (HS) code. In order to provide data that is ready to be used in the modelling estimation, the current value exports should be converted into real value to avoid bias caused by inflation. This conversion has been accomplished with the chain-link volume method mentioned in the previous chapter. Afterwards, the data is accumulated into one variable: total export of agricultural commodities. In terms of time, the monthly data are converted into quarterly ones to be adjusted with availability of other variables. The agricultural export data are then divided by the GDP of Indonesia.

Other macroeconomic data are obtained from the Datastream website. Datastream provides comprehensive and detailed data compiled from all formal resources of the data, such as the IMF, World Bank, OECD and national statistical bureaus. Quarterly data was found to be the most appropriate format in terms of both the availability of the data and richness of information.

Data retrieved from this source relate to the GDP of Indonesia, the GDP of China, the exchange rate and FDI. All the data is valued in US dollars.

This econometric model also uses dummy (binary) variables representing the occurrence of the economic, financial and other major crises, policy shifts or reforms from 1996 to 2012. The qualitative (dummy) variables that are used to represent crises are standard proxies. Other alternative indicators, while possible, are numerous and often severely problematic for their suitable selection and measurements. During the modelling stage, extensive experiments had also been carried with other conventional determinant variables. They were however deleted based on economic plausibility and statistical tests. The reported findings are from the preferred final equations.

This study is focused on getting information about the impact of agricultural exports and the implementation of ACFTA on Indonesian economic growth. In constructing the model, any events occurring in Indonesia that could influences the economic growth of Indonesia have also been incorporated. Specifically, they refer to the onset of the Asian crisis in 1997, the reformation in the Indonesian government and policy reforms initiated in 1999 after the fall of the Soeharto's regime, the ACFTA that started in 2004, and the global financial crisis in 2007. The Asian crisis influence the economy of Indonesia severely, thus this occurrence is included in the model. The Indonesian policy reform is a milestone in Indonesian economic and policy history for a new government that has opened up its economy to the world. The ACFTA is one of trade policy taken by Indonesian government. Since this agreement including the ASEAN members and China, it becomes an important decision has been made in international trade area. The influence is expected to be positive for Indonesian trading. The global financial crisis is one of the crises that affected Indonesia. This crisis is incorporated into the model to measure the impact of this crisis on the Indonesian economic growth. These events are considered as one-off events before and after the occurrence of the events. The value of the dummy variables is 0 before the occurrence of the events and 1 for the years onwards.

All non-binary variables are then converted to their percentage rate of change. The percentage rate of the data is obtained by employing year-over-year change or annualised growth. The use of this percentage measurement is the main feature of the generalized gravity model approach as it

avoids the problem of *a priori* known function and also of logarithmic transformations for negative data (Tran Van Hoa 2010, 2012; 2013)**.** Imposing this procedure will avoid the seasonality effect which is common in time series data, especially agricultural data. Furthermore, the use of this data type may also avoid the problem of non-stationary data that can lead to spurious regression results (Wooldridge 2009).

4.4 Empirical Results and Analysis

4.4.1 *Model Robustness Result*

In order to obtain the best model for Indonesian agricultural exports, numerous experiments were employed to test all the plausible models. All those models are compared to obtain the best statistical efficiency for all parameters and in the sense of conformity with the hypothesis. As the equations are constructed on the basis of hypothesized postulates and empirical evidence, it is important to examine the validity of the variables in the model. As discussed earlier, the evidence from the empirical research and the results of the model estimation can vary between different countries. Furthermore, the estimation methods employed can lead to different results even if the same model and data are being used in the process. Consequently, some scenarios of the structural model specifications are then estimated, and the results are compared to gain the most statistical efficiency.

Comparing the estimation results over two different periods spanning 1996 to 2012 and 2000 to 2012, shows that the former provides a better model with the most statistical efficiency for the estimated parameters that are also in concordance with the hypothesis. After conducting numerous model experiments, insignificant variables that do not change the model estimation results are removed from the model to arrive at the most efficient model. The results for the best model will be reported in this thesis.

Based on the availability of the data, the economic growth-agricultural export model of Indonesia can be constructed as follows:

$$Y\% = \alpha_1 + \alpha_2 T\% + \alpha_3 FDI\% + \alpha_5 AC + \alpha_6 IR + \alpha_7 FTA + \alpha_9 GFC + \varepsilon_1 \qquad (4)$$

The first attempt to estimate the equation leads to the fact that there are heteroskedasticity and serious first or higher autocorrelation-induced or simple Markov's scheme inefficiency problems. To avoid the serial correlation problem, the lagged of the dependent variable will be added as a control variable. Although this correction will reduce degrees of freedom through loss of observations, it may help to omit the serial correlation problem (Pindyck & Rubinfeld 1991).

The heteroskedasticity test for 2SLS used the Pagan-Hall general test. The chi-sq value of the Pagan-Hall test is 39.341, meaning that the null hypothesis of homoscedastic can be significantly rejected. To address this problem, this equation will be estimated by using least squares along with an estimator of its covariance that is consistent, regardless of whether errors are heteroskedastic or not, which is called robust variance-covariance estimator. By using the Huber-White sandwich estimator of the variance of the linear regression, the estimated standard error will be valid (Baum, C.F., Schaffer & Stillman 2003).

Based on those results, the lag of the variable Y will be added into the model to address the autocorrelation, thus, the modified equation will be:

$$Y\% = \alpha_1 + \alpha_2 T\% + \alpha_3 FDI\% + \alpha_4 AC + \alpha_5 IR + \alpha_6 FTA + \alpha_7 GFC + \alpha_8 Y - 1 + \varepsilon_1 \quad (5)$$

4.4.1.1 Significance of Instrumental Variables

Before executing the estimation of the model, the validity of the instrumental variables will be examined. Based on the tests on instrumental variables, the combination of the instrumental variables used on the model in this study met the requirements of instrumental variable validity. The instrumental variables used in this model are Exchange Rate, GDP of China and Population of China.

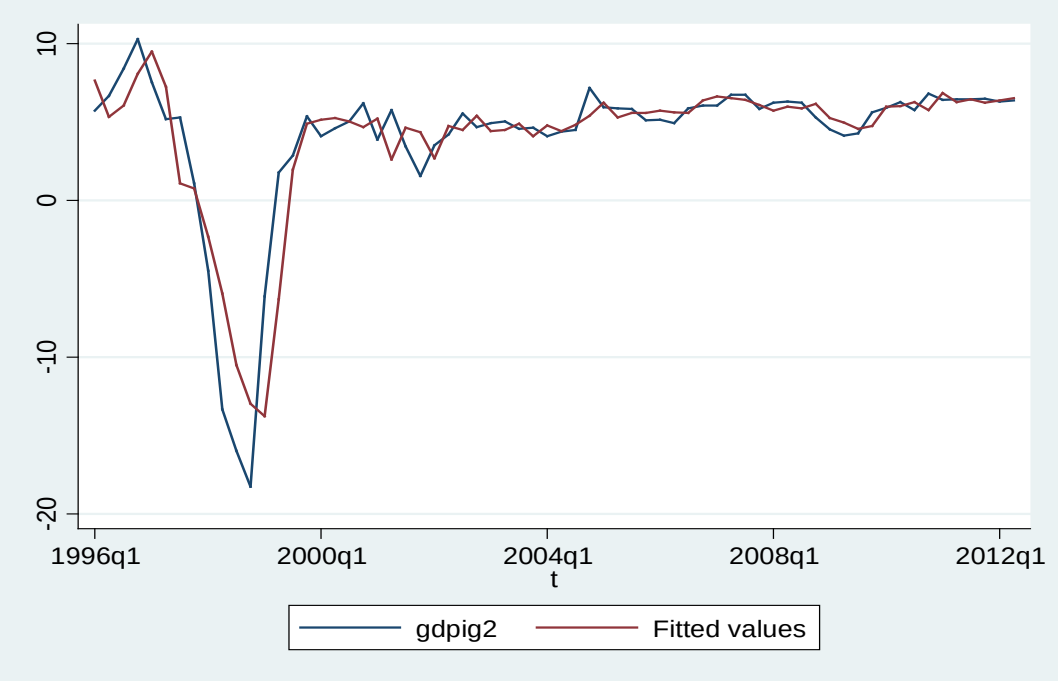
A significance test of instrumental variables is performed on the reduced form equation or the first stage equation from 2SLS estimation (Davidson & MacKinnon 1993). The result shows the F-statistics of the Cragg-Donald statistic (Cragg & Donald 1993) is 18.62 which is statistically significant at 5 per cent.Based on the Kleibergen-Paap rk LM statistic and Wald statistic test for the under-identification test, the instrumental variables are identified and correlated with the endogenous variable since the test reject the null hypothesis of the equation is under-identified at

the 5 per cent level of significance. Meanwhile the weak-identification-robust tests ofAnderson-Rubin Wald test, Anderson-Rubin Wald test (Anderson, TW & Rubin 1949) and Stock-Wright LM S statistic (Stock, James H & Wright 2000) accept the null hypothesis of that all instrumental variables are valid and uncorrelated with the error term at 5 per cent significance level. In conclusion, the exchange rate, GDP, China and population China determinants are significant and valid instrumental variables for Indonesian agricultural exports, so they can be used in the regression model.

4.4.1.2 Model Reliability

The Friedman-Kydland criterion of data-model consistency (Kydland 2006) is used to examine the performance of the models. The discrepancy between actual data of the dependent variable (GDPG2) and its fitted value (the model prediction) will be evaluated. This evaluation can support the reliability of the model when the discrepancy is tight and small. The evaluation will use graphs between GDP growth and predicted GDP growth obtained from the model estimation. The performance is presented in Figure 4.1 below.

Figure 4.1Friedman-Kydland Criterion of Indonesian Economic Growth Model Performance



From the movements or fluctuations of Indonesia's actual economic growth plotted in Figure 4.1, it can be seen that the predicted value from the model imitates the actual data very well throughout this period, showing peaks and turning points in actual growth and export. It can be said that the discrepancy between actual trade and the predicted value is very small and tight. All the variables incorporated in the model have structured a good equation to influence the predicted dependent variable. The other important aspect of this performance property is the fact that all economic variables have been expressed in terms of their rates of changes that are able to omit the possibility of a unit root problem and hence avoid the spurious regression problem. After testing the modelling reliability and predicting criteria described above, it can be affirmed that the estimated economic growth model reveals acceptable statistically reliable results. Thus, it can be confidently asserted that the reliability of the model in predicting the actual data of the dependent variable (economic growth) is high.

4.4.2 *Estimation Results of the Growth-Agricultural Export Model*

Having performed the tests of the requirements for the robustness of the model, the estimation of the model is conducted by employing the 2SLS method. Table 4.1 presents the statistical value from the model estimations by 2SLS.

Table 4.1 shows that the estimation results from 2SLS. The F tests for the structure of the models are significant under the 5 per cent significance level. The R^2 value is 79.6 per cent, while the RMSE value of 2SLS is at 2.388, implying that the model is good enough to explain the economic growth of Indonesia. Almost all independent variables have significant impacts on economic growth. It can be shown that that most of the variables fit the hypothesis and are in concordance with previous empirical evidence.

The parameter of the Indonesian agricultural exports to China (EX), Indonesian policy reformations (IDRF) and the implementation of the ACFTA have positive and significant impacts on Indonesian economic growth at 10 per cent significance level. The economic growth condition in the previous period (GDPI-1) has a positive impact on the present economic growth at 5 per cent level. In contrast, the Asian crisis (AC) has a negative and significant impact while the global financial crisis (GFC) seems to have a negative but an insignificant impact on Indonesian economic growth. The inward foreign direct investment (FDI) provides a

significantly negative influence on economic growth at 5 per cent significance level. The result for each variable is explained in more detail below.

Table 4.1 Estimation Results of Growth-Agricultural Export Model

Variables	2SLS Coefficient (Standards Errors)
Indonesian Agricultural Exports to China (EX)	0.1006 (0.09)*
Inward Foreign Direct Investment (FDI)	-0.001 (–2.29)**
Indonesian Policy Reformations (IDRF)	4.255 (1.82)*
Asian Crisis (AC)	–4.943 (–1.70)*
Implementation of the ACFTA (ACFTA)	0.553 (1.82)*
Global Financial Crisis (GFC)	–0.742 (–1.66)
Economic Condition in Previous Period (GDPI-1)	0.632 (2.98)**
CONSTANT	2.240 (1.17)
R^2	0.796
Adj. R^2	0.772
RMSE	2.388
Model Significance	F (7,58) = (9.38) **

Note: ** significant at 10% significance level; * significant at 5% significance level.

4.4.3 *Implications of Indonesian Agricultural Exports and Economic Growth*

Even though the share of the agricultural sector in the Indonesian GDP is small, it is increasing. Compared to the trend of world trade in agriculture, which is declining, the trend of agriculture in Indonesia performs better as proven from the results in this study. The impact of agricultural exports to China of Indonesia's share of economic growth is positive and significant at the 5 per cent level of significance. The elasticity of agricultural exports implies that a 10 per cent increase in the agricultural exports to China could lead to an increase in the economic growth by 1 per cent.

The fact that agricultural exports have a positive impact on economic growth has proved that agricultural exports have an important role in Indonesian economic growth as states by Johnston and Mellor (1961). According to World Bank (2008), agriculture can be the lead sector for overall growth in the agriculture-based countries by using a growth strategy that has to be anchored on developing agriculture. Although in Indonesia's case, agriculture is not the leader of overall growth, but the role in economic growth is still important. In Indonesia, the agricultural sector has been proven to be important in the Asian crisis era. The economy of Indonesia can survive because of agricultural exports (Soesastro & Basri 2005), while other sectors have collapsed because of the crisis. It denotes that the agricultural sector can be accounted as a robust sector in the crisis and its growth is not disturbed by any shocks.

The increasing attention on the agricultural sector from governments and world organizations also shows the commitment of the importance of the agricultural sector to the economy in general(World Bank 2008). The fact that the agricultural sector is still very important for developing countries should gain more attention for this sector.

North (1959)in his seminal paper reports that a successful agricultural export trade can and has induced urbanisation, improvements in the factor markets, and a more effective allocation of investment funds. His argument reflects the Indonesian agricultural exports. As agricultural exports of Indonesia increase, the multiplier effect of this agricultural growth has generated development in other sectors that lead to the improvement of the general economy.

The fact that Indonesia and China have committed to economically integrate with special programs to boost agricultural trade has lifted the Indonesian agricultural export influence on economic growth in recent times. Furthermore, the rapid growth of agricultural exports of Indonesia can be accredited to the booming palm oil sector. The investment allocated in the agricultural sectors has been increasing, especially in palm oil industry (Ministry of Industry 2011) that leads to increasing production. The higher production and higher demand of these products have lead the palm oil products to be the third biggest exported commodities from Indonesia (BPS 2014); hence its contribution to the Indonesian economy is considered very important.

To compare this finding with others in the literature is difficult as studies investigating the relationship between Indonesian agricultural trade and economic growth have been rarely carried out. Despite its declining share of GDP, the lack of attention on the agricultural sector is one of the reasons why research on the impact of agricultural exports for growth is very limited (World Bank 2008). However, among studies that have been completed, Esfahani (1991) shows exports of primary commodities have no significant impact on economic growth. Sala-i-Martin (1997) and Doppelhofer, Miller and Sala-i-Martin (2000) find that primary commodities have a negative impact on economic growth. Faridi (2012) reveals a negative relationship between agricultural exports and Pakistan's economic growth. Van den Berg and Lewer (2007) argue that the impact of agricultural exports on economic growth is minimal due to the small size of agricultural trade in exports compared to other sectors.

In contrast, this study presents different results from previous studies with a positive impact of agricultural exports for economic growth. This can provide different view in the literature about the revival of the agricultural sector in developing countries.

4.4.4 *Implication of the ASEAN China Free Trade Agreement on Indonesian Economic Growth*

This study employs the extended endogenous gravity theory with the incorporation of the dummy variable of the ACFTA to examine whether joining ACFTA will lead to Indonesian economic growth. The decision of the Indonesian government to join the ASEAN-China Free Trade Agreement appears to be a right choice as the results of this study show that the implementation of the ACFTA has a positive and significant impact on Indonesian economic growth. This is consistent with the theory that postulates the main objectives of the free trade area establishments are to increase trade between members and to improve the welfare and economic growth of the member countries.

Although China is not the biggest export market for Indonesia's products, the trend of exports to China is increasing. The elimination of tariff and non-tariff barriers in trade and other trade and service facilities offered from the ACFTA have boosted the volume of trade. As ACFTA does not only regulate the trade sector, but also the service and investment sector, it can be argued that

the service and investment sectors under the ACFTA have also contributed to improving economic growth (Fukunaga & Ishido 2013; Xiao 2010). Hence this leads to a marked reduction in income gaps that had existed between trading countries (Ben-David 1993; Ben-David & Loewy 1998).

The finding of this study is consistent with numerous other studies that find a positive relationship between trade liberalization and economic growth. North (1959) argues that economic development of a country depends on its ability to become integrated into larger markets of the world through exports. This study supports the hypothesis that integrate with China by joining ACFTA has given Indonesia an opportunity to expand its market to the potential offered by the large market of China. In the field of ACFTA studies, this study is consistent the GTAP estimation study by Chirathivat (2002), and Sudsawasd and Mongsawad (2007) who predicted that the ACFTA will increase the GDP of the ASEAN members and China, but contradicts studies by Yue (2004), Holst and Weiss (2004) that predicted declining GDP of Indonesia as a result of the ACFTA.

4.4.5 *The Role of Foreign Direct Investment in the Economic Growth of Indonesia*

This study uses FDI to measure the impact of inward capital investment flowing to Indonesia. As this study focused on international trade, FDI is the most relevant form of capital inflow for many countries, especially developing and emerging economies. Furthermore, increasing globalisation also led to a growing interest in the activities of multinational companies which is often represented by FDI data.

The result of this study shows that FDI has negative impacts on the economic growth of Indonesia. The inward FDI of Indonesia is very low compared to neighbourhood countries. One reason for the low inflow of FDI is that Indonesia has failed to integrate fully into international production networks. The composition of FDI in Indonesia therefore differs from that in other parts of East Asia, and foreign multinational firms seem often to choose other locations when there are alternatives, especially in the manufacturing area. There are, however, other areas where little progress has been made, leaving Indonesia a less attractive FDI destination than other countries in the region. The continuing poor state of infrastructure is damaging to

Indonesia's ability to attract FDI. The business environment is poorer than in many other East Asian countries. Indonesian institutions and administrative capacity need to be improved further. Despite some progress, corruption remains a larger problem in Indonesia than in most other countries in East Asia. Poor institutions and corruption increase the costs of production.

FDI may be one way to improve infrastructure. Investments by foreign firms in infrastructure, and also in utilities, finance, construction and other non-trade sectors, are affected by various institutional factors such as competition and pricing policies. Complex regulations are often required to attract investments in these sectors. Indonesia has a mixed history in dealing with inward investment in infrastructure projects (Wells and Ahmed 2006). Lack of administrative capacity, poor regulatory structures and corruption are some of the main causes of failing investments in infrastructure.

A series of papers by Ando and Kimura, summarised in Ando, Arndt and Kimura (2006), emphasises the importance of the growth of trade in machinery parts and components, and contrasts that trend in Asian trade with its absence in Latin American trade. When countries are arrayed in order of the importance of machinery and machinery parts and components in their exports, seven East Asian countries are above the median, and only one, Indonesia, is below it.

Faster growth is an important goal of economic policy; it would seem to be in Indonesia's interest to increase inflows of FDI, given the benefits it brings in terms of productivity growth, higher wages and strong employment growth. However, the Indonesian attitude towards FDI has always been rather ambivalent.

Indonesia may reap benefits from FDI and attract more inward FDI if such parameters mentioned by De Mello Jr (1997) have been conditioned. Firstly, a fundamental criterion for attracting FDI is that the host country welcomes such investments. The business environment should be supported by the government. Indonesia does not do well among East Asian countries in the World Bank's rankings for the quality of the business environment. The investment in Indonesia is relatively low because of lack of administrative capacity, poor regulatory structures and corruption (Hansen & Rand 2006). It is therefore more fruitful to consider how the business climate in Indonesia can be made more conducive to FDI. Second, there needs to be moreparticipation in the global production network of the foreign companies from developed countries. Indonesia needs to attract the MNEs to locate their investment in Indonesia by

liberalisation of trade and border procedure and also by investment in infrastructure such as improving the communication sector, the seaports and their supporting infrastructure. Moreover, Indonesia needs to improve the numbers of their skilled people through education. The education enrolment levels and attainment are poor in Indonesia (Barro & Lee 2013). Improved education is important for attracting FDI, but it will also affect Indonesia's absorptive capacity. The better the level of education the more Indonesia will benefit from the presence of foreign multinational enterprises (MNEs). Next, Indonesia needs to improve its technological capacity to encourage MNEs to upgrade production to higher value added activities and to increase spillovers by facilitating knowledge transfers from MNEs to local firms. The very low investment in research and development in Indonesia is an indication of the poor state of technological development and capability. Wells (2007) suggests some policies to improve the investment regime for infrastructure projects: a closer look at international best practice; a ban on equity arrangements under which importantly placed Indonesians to get a share of foreign investments; and the granting of full responsibility to a single government agency to negotiate and conclude agreements with foreign investors. The evidence from the studies surveyed leads to conclude that Indonesia would benefit from higher FDI inflows.

4.4.6 *The Role of Other Factors on Indonesian Economic Growth*

The other variables in the equation consist of the onset of the Asian crisis in 1997, the reformation in the Indonesian government and policy reforms after the end of Soeharto's regime and the occurrence of global financial crisis in 2007. This section discusses the impact of these other variables of significant crises and policy reforms on economic growth of Indonesia based on the estimated results.

4.4.6.1 Crises

It has been proven in the literature that sudden crises, shocks and major policy reform are the source in the fluctuations in economic performance (Johansen, L 1982; Tran Van Hoa 2004b, 2006b, 2006c, 2008). Crises incorporated in this model are the Asian crisis and the global financial crisis. Even though many more other crises have affected Indonesia,their impacts are not significant enough for these to be included in the estimation.

The result shows that Indonesia's economic growth suffered a negative and significant impact from the Asian crisis. Indonesia was one of the Southeast Asian nations that experienced severe conditions caused by the Asian crisis. The crisis that began around July 1997 had a very negative impact on the Indonesian economy. The GDP of Indonesia fell during this crisis. This situation was not only caused by the decline of trade, but an accumulation of many other factors. There was a rapid increase in the price level during the Asian crisis driven by a sharp depreciation of the rupiah, and declining investment that led Indonesia to experience annual net outflows of foreign direct investment until 2001 (Elias and Noone, 2011). The accumulation of these various conditions led to declining economic growth. Recently, the Indonesian economy has grown at around 6.1 per cent, making Indonesia one of the fastest growing countries in Asia following China and India. However, this is lower than the rate of economic growth of 7.2 per cent before the Asian crisis (Basri, M.C. 2010).

The investment share of GDP prior to the crisis was over 30 per cent, however, the rapid outflow of foreign capital contributed to a sharp contraction in investment during the Asian crisis. Between 1997 and 1999, net FDI shifted from an inflow of 2.2 per cent of GDP to an outflow of 1.3 per cent, while the volume of investment fell by 45 per cent(Elias & Noone 2011). Indeed, foreign investment only recently recorded strong growth. In 2010, net FDI inflows increased fourfold to 1.9 per cent of GDP, with the increase broadly spread across industries. Nevertheless, the increase has not been big enough to improve economic growth.

The global financial crisis severely impacted developed countries (Reinhart & Rogoff 2009). However, based on the empirical findings of this study, the global financial crisis did not have a significant impact on the Indonesian economy. This means that Indonesia's growth performance after the crisis was relatively good. The relatively good performance of Indonesia was due to the fact that Indonesia's economy was relatively insulated from the weakening global situation. Basri, M.C. (2010)argues the structure of agricultural exports share within the economy of Indonesia is relatively small compared to countries such as Singapore, Thailand and Malaysia. In addition, Indonesia was left behind in production networks (Ando & Kimura 2007). As a result, the impact of the global financial crisis on the Indonesian economy also became limited.

4.4.6.2 Domestic GDP

The impact of the lag 1 of the GDP Indonesia on recent GDP is highly positive and significant at 5 per cent significance level. In the growth-trade model, the GDP, as a function of net exports, is potentially endogenous to bilateral trade flows, and vice versa, as proposed in the recent literature (Frankel, J & Romer 1996). J Frankel, J and Romer (1999) note that while international trade can influence a country income, national income can also be influenced by the amount that the country's residents trade with each other. Previous research shows that the good performance of the Indonesian economic growth was mainly due to strong domestic demand. The GDP data indicate that growth was dominated by non-tradable sectors, such as electricity, gas and water, construction, trade, hotels and restaurants, transportation and communication, financial, ownership and business services as well as services (Basri, M.C. 2010).

However, the findings of the relationship between trade and growth with causality test in this study present mixed results. In a situation where the external situation is still in turmoil, the non-tradable sector could cushion the economy from the negative impact of the ongoing global financial crisis.

4.4.6.3 Indonesian Policy Reforms

Many policy reforms were undertaken during from 1996 to 2012 in Indonesia. After Soeharto's long period of rule, the election of a new President in 1999 initiated the reform era. Since late 1999, comprehensive reform programs have been commenced by the Indonesian government to build up a strong investment climate in the financial and infrastructure sectors. The new government launched many policy reform packages in government structure, politics, economics and press freedom. This reform era coincides with the aftermath of the Asian crisis that put an end to the continuation of economic growth. As suggested by the WTO (1998), Indonesia encouraged more trade reformation to regain economic growth.

These reform efforts and stronger democratic credentials encouraged economic growth, as shown by the results of this study. The result shows that the variable of government reforms had a moderate effect on growth in the agricultural sector. This means that government reforms to the

economy, particularly the agricultural sector, had a role to play in its growth, Economic growth has been increasing significantly in the wake of the reforms.

The policy reformation in investment led to resurgence in investment (Elias & Noone 2011). Recognizing the importance of investment in the agricultural sector, the Indonesian government increased its public spending to invest in this sector. The government issued Presidential Decree no. 77/2007 and 111/2007 regarding Lines of Business Closed and Open with Requirements for Investment that allow foreign investors to hold 95 per cent shares in a plantation company, including palm plantation company. As a result, foreign investment in food crops and plantation sector increased significantly from less than $200 million in 2003 to around $1200 million in 2007 (Bank of Indonesia 2009). During 2005 to 2011, an average of about 1.5 per cent of public budget was allocated for agriculture, but this can be pegged higher at 2.5 per cent if the public budget for irrigation was included (ADB 2011).

4.5 Conclusion

The main objective of the study in this chapter is to examine the impact of Indonesian agricultural exports to China on Indonesian economic growth under the influence of the ACFTA, taking into consideration the context of regional and global crises and domestic reforms. The empirical result of the model estimation in Table 5.3 shows that the constant of the equation is positive but not as significant as expected. Thus, it can be argued that the Indonesian economy was growing under the influence of focused variables in the model but quite moderate. Among other variables, reform in Indonesian government in early 1999, the implementation of ACFTA, Indonesia's domestic GDP had positive and significant impacts on Indonesian economic growth. However, FDI and the Asian crisis exerted significant negative impacts of Indonesian economic growth, but the negative impact of the global financial crisis was not as significant.

This means that the impact of Indonesian agricultural exports to China on Indonesian economic growth is positive but not significant. Although exports are growing fast, the small share of agricultural exports to China compared to other sectors may be the reason behind the lower impact. Although agricultural trade has been accelerated by tariff reduction facilitation under the ACFTA scheme, it has not been strong enough to dramatically increase the impact of agricultural

exports on growth. In contrast, the implementation of the ACFTA has a significant and positive impact on economic growth. This indicates that economic integration has successfully influenced economic growth.

Meanwhile, the Asian crisis in mid-1997 has negatively affected Indonesian economic growth to a significant extent, whereas the global financial crisis in mid-2007 had no significant impact on growth. The reformation in Indonesian government beginning in late 1999 significantly improved economic growth because the policy reform packages successfully attracted investments to improve the economy after the Asian crisis and long regime of President Soeharto. On the other hand, FDI has a negative impact on economic growth, caused by the fact that FDI resulted in more outflows than inflows in Indonesia.

This chapter presented an analysis of Indonesia's economic growth in relation to its agricultural exports to China. However, the agricultural export data used in this chapter are based on whole agricultural exports to China. Hence, it is important to further explore the issue by dividing the agricultural exports under the ACFTA to examine the more disaggregated influence of the ACFTA on agricultural exports. The next two chapters will examine the impact of the ACFTA on Indonesian agricultural exports to China in terms of their volume and competitiveness, respectively.

Chapter 5

The Implication of the ASEAN-China Free Trade Agreement on the Growth of Agricultural Exports from Indonesia to China

5.1 Introduction

China is the third biggest market for Indonesian agricultural exports (BPS, 2014) . The Indonesia government hopes that acquiring greater access to China through the ACFTA will further encourage agricultural exports.

The aim of this chapter is to analyse the impact of the ASEAN-China Free Trade Agreement (ACFTA) programs for the growth in volume of agricultural commodities exported from Indonesia to China. This chapter intends to address research objective III: 'To investigate the impact of the ACFTA programs on the growth of Indonesian agricultural exports to China across the short- and long-term accounting for the effect of other control variables of partner GDP, crises, exchange rate volatility'. The objective derives from research question II: "Do efforts to improve agricultural trade, such as joining a free trade agreement, have a significant impact on the growth of exports and competitiveness of the commodities?".Hence, this chapter presents the statistical and quantitative analysis conducted on Indonesian agricultural exports to China under the ACFTA programs. The statistical analysis will test the hypotheses, whether the ACFTA programs have positive impacts on Indonesian agricultural export growth in China.

Chapter four showed that the ACFTA increases Indonesian agricultural exports to China in general. However, not all of these agricultural commodities are included in the ACFTA program. Furthermore, the ACFTA has different schemes for certain agricultural products. So, this chapter intends to explore the impacts of the ACFTA programs on relevant agricultural commodities covered under them. In order to achieve this objective, two programs of the ACTA will be investigated in this chapter: the Early Harvest Program (EHP) and the Sensitive Track (ST). For the EHP scheme, the impacts of EHP's export tariff reduction and other trade facilities for related Indonesian agricultural export to China will be examined. For the ST scheme, the sensitivity on Most Favoured Nation (MFN) tariff and other trade facilities for related agricultural products will be measured as tariff reductions do not begin on this scheme until

2012. In addition, other variables that influence Indonesian agricultural exports to China will be examined as control variables. It will also test the hypothesis that the occurrence of crisis, especially the global financial crisis, will negatively affect the exports of agricultural commodities of Indonesia. To examine these questions, the autoregressive distribution lag (ARDL) model on export equations will be employed as it is considered more appropriate for the purpose because ARDL can deal with stationary data occurring at different levels and dummy variables used in the model. As the impacts of free trade agreement will vary over different time spans, this study will use time series econometric analysis to examine the short-run and long-run impact of the ACFTA.

5.2 Literature Review

5.2.1 *Impact of Free Trade Agreements on Agricultural Exports*

Gains from trade have been well analysed in the international trade theory. The traditional theory from the comparative advantage of Ricardo emphasizes technological differences as the cause of trade; the Heckscher-Ohlin-Samuelson model postulate differences in factor endowments, and some alternative models are generated by varying assumptions about the number of goods and factors (Krugman, PR 1987). Linder (1961) and Vernon (1966) point out endogenous technological change while Spence (1976) and Dixit, AK and Stiglitz (1977) highlight the role of increasing returns as a cause of international trade. Dixit, A and Norman (1980), Lancaster (1980), and Krugman, P (1979) explain that not only underlying differences but also economies of scale have led to arbitrary specialization by nations on products within monopolistically competitive industries. Feenstra (2006) determines gains from trade in monopolistic competition models can be arising from three sources: (i) price reductions due to increasing returns to scale; (ii) increased product variety available to consumers; (iii) self-selection firms with only the most efficient firms surviving after trade liberalization

Trade also brings winners and losers as stated in the Stolper-Samuelson Theorem (Samuelson 1962) that an increase in the relative price of a good will increase the real return to the factor used intensively in that good. Jones (1965) called the formulation of this theorem the “magnification effect”. Any change in the product prices has a magnified effect in the factor

prices. Whether the product price change is due to export opportunities for a country (the export price goes up) or due to lowering import tariffs (so the import price goes down), the magnification effect says that there will be both winners and losers due to this change. In the Hecksher-Ohlin model, the abundant factor gains from trade (through the rise in the relative export price, increasing the real return to that factor, used intensively in exports), while the scarce factor loses from trade (through the fall in the relative import price, lowering the real return to that factor).

To achieve Pareto gains from trade, that is a situation that everyone gains, the government has ability to redistribute income from the winners to the losers. This mechanism is called lump sum subsidies (Dixit, A & Norman 1986). This analysis can be extended to cover tariff reform by multiple countries. This method is adopted by the World Trade Organization (WTO) to reduce barriers to trade among its member countries. The fundamental principle of WTO is "Most Favoured Nation" (MFN) that states all countries members should be treated equally. Thus multilateral tariff reduction should be applied for all members.

On the other hand, there are regional agreements or preferential agreements where a group of countries decide to completely eliminate all tariffs between them, without eliminating tariffs on goods imported from the rest of the world. The forms of these agreements include Customs Union and Free Trade Area. Because such agreements involve only partial elimination of tariffs, they can lead to unexpected results. Viner, Jacob (1950) points out that the countries left out of the union and even the countries inside the union, can become worse off.

To measure the impact of free trade agreements on agricultural trade, literature, mostly focuses on trade creation and trade diversion as the consequences of the establishment of the free trade agreements. Such research mostly uses gravity theory with aggregate data for the analysis, and makes general conclusions for countries and general commodities included in the model. In general, the findings present that the establishment of the free trade agreement increases agricultural trade between members of the agreements and also expand trade with non-member countries.

The positive effects of trade creation indicate the promotion of trade due to a shift of consumption from high-cost domestic products with low-cost imported products from abroad (Viner, J. 1983). Baldwin (2004) is of the opinion that trade liberalization, whether it originates

from regional or multilateral agreements, will also enhance more liberalization of trade with non-members of the agreement. This reflects the spill-over efficiencies caused by free trade agreements enabling members to increase export sales to non-partner exporters.

Conversely, the difference in tariffs applied to partners and non-partners will change the direction of trading trend, and impose negative effects of trade diversion which refers to the replacement of exported products that are low-cost from non-member countries with exported products from partner countries that are high-cost. Therefore, trade diversion would reduce the welfare effects due to the changes in supply orientation to a relatively more expensive source.

Panagariya and Krishna (2002) note that there is tendency to ignore possible welfare losses derived from free trade agreements, especially with respect to non-member countries. They argue that the concepts of trade creation and trade diversion are central to the policy debates about free trade agreements and that the empirical analysis of these concepts by sector is important. According to Viner, J. (1983), reducing tariff barriers through formation of the free trade agreements will not necessarily improve welfare. The overall impacts can be positive, negative or neutral depending on the size or the magnitude of trade creation and trade diversion as indicators to measure the impact of free trade arrangements (Krueger, A.O. 1999; Viner, J. 1983).

An example of this theory is a research about ASEAN Free Trade Agreement (AFTA) conducted by Korinek and Melatos (2009). Their study finds that fully implemented AFTA has encouraged members to decrease their export of agricultural products to non-AFTA countries.

Lumber and McKoy (2008) argue that the establishment of free trade agreements increases intra-bloc trade in agricultural and food products sectors. By using a gravity model and panel data of the logarithm of the nominal value of the agricultural exports between two countries, their study examines thirteen free trade agreements. They find that membership of a free trade agreement is associated with increased intra- and extra-bloc trade in developing countries (for example, NAFTA and EU) leading to trade creation in these sectors, but trade diversion also happens in some free trade agreements in developing countries. Here, they find that the establishment of the Common Market for Eastern and Southern Africa (COMESA) has diminished exports and export of food, but increased agricultural trade with non-member countries in Africa region. This finding is in agreement with Clarete and Roumasset (1990) and Shane et al. (2009) who argue

that there has been trade creation of agricultural trade as a result of Mercado Comun del Sur/South American Economic Organization (MERCOSUR), Central American Common Market (CACM**),** South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA),Greater Arab Free Trade Area **(**GAFTA).

Koo, Kennedy and Skripnitchenko (2006) apply the gravity model toanalyse agricultural trade in 1999 and find evidence of trade creation among members of the free trade agreements on an aggregate level. Their study also finds that trade between member and non-member countries has also been enhanced, as bilateral trade was increased even when countries were not members of the same free trade agreements. Furthermore, the results show that agricultural trade creation was not significantly detected in individual free trade agreements such as the European Union (EU), North American Free Trade Agreement (NAFTA) and Andean Pact, but statistically significant in the ASEAN members. The increasing trade between ASEAN members and non-members countries are also significant, whereas trade diversions exist in Andean Pact and NAFTA.

Other studies also support the increasing agricultural trade as a result of the establishment of the Free Trade Agreements. For example, Zahniser and Coyle (2004) use time series data of combined exporting-country GDP with preferential trade agreement membership and find evidence of trade creation and trade diversion in NAFTA.

A recent study focused on trade creation and trade diversion on agricultural trade was conducted by Vollrath and Hallahan (2010). Using gravity theory, they examine the impact of mutual membership of free trade agreements for the exporters and importers compared to an asymmetric membership of free trade agreements where the exporters and importers do not belong to the same free trade agreements. The findings show that mutual membership typically increased agricultural trade while asymmetric membership reduced agricultural trade. The finding also focuses on the impact of WTO on agricultural trade. The result shows that the WTO has enhanced trade between members and reduced trade with non-member countries.

It can be summarized from these explanations that the impact of free trade agreements is mostly on agricultural trade examined from the trade creation and trade diversion view. The majority of studies find that there is trade creation in agricultural trade when a free trade agreement is imposed.

5.2.2 *Export Function*

Most of these empirical studies mentioned earlier evaluate the impacts of free trade agreements on agricultural trade using two main methods: computer simulation studies of general equilibrium effects and gravity theory (Burfisher, Robinson & Thierfelder 2001). The ex-ante studies with computable general equilibrium (CGE) models use various simulation methods to analyse a calibrated model economy for a particular base year. The literature on this method is common. For example, the free trade agreements of Chile are estimated to benefit many sectors of Chile by doing CGE simulations (Chumacero, Fuentes & Schmidt-Hebbel 2004). Paiva (2005) confirms that the membership of the free trade agreements positively affect agricultural trade among members where the impacts of the free trade agreements are broadly simulated by implementing the CGE methods.

However, this method has been criticized for lacking detailed, up-to-date policy coverage and product desegregation(Aksoy, AM 2005b). In response, researchers have used econometric methods with historical time series and cross-sectional data to analyse the impact of the free trade agreements on trade and welfare. The most commonly used of these methods is gravity theory, but this model requires aggregate data for analysis, making it difficult to exploit variations in the extent of trade liberalization across goods or industries. Also, the aggregate data is sourced from the bilateral trade of both countries such that it becomes difficult to separate the impact on a specific country in a two country model (Clausing 2001).

This study intends to examine the impact of ASEAN, China Free Trade Agreement (ACFTA) on the agricultural exports from Indonesia to China. To undertake this examination, the export demand function will be used as the volume of exports depends on the trading partner's income from the point of view of bilateral trade and relative price of the traded goods (Goldstein & Khan 1985; Hickman & Lau 1973; Houthakker & Magee 1969). Unlike the gravity model that takes the model as an *ad hoc* representation, the current approach is developed on more grounded economic theory of demand. The demand theory postulates that trading partner's income has positively influenced the exports while price has negative impact on exports (Senhadji & Montenegro 1998). The demand function, both export and import, are widely used to examine the trade in models examining two countries. For example, Bahmani-Oskooee, Mohsen (1998) implement demand model to examine trade elasticity's in less developed countries and find

devaluation can improve trade. A research conducted by Karemera and Koo (1994) analyses the trade effects of removing tariff and non-tariff barriers between the USA and Canada by using seemingly unrelated regression to estimate the import demand model. From their findings, they conclude that the US exports of Canadian goods are more sensitive to domestic and bilateral export prices than Canadian exports of the US goods. They also find that tariff and non-tariff elimination would increase the bilateral trade volume across all commodities traded. Clausing (2001) explores tariff variation at the detailed commodity level with US export data from 1989 to 1994 and finds that tariff liberalization has an impact on the growth of US exports but with little evidence of trade creation.

The construction of agricultural export demand model for Indonesian agricultural exports to China must also consider any other determinants that may affect the export of agricultural products from Indonesia to China. These determinants are listed as follows.

5.2.2.1 Relative Price Index

One of determinant influenced export demand is relative price (Goldstein & Khan 1978). While the demand theory assumed that demand responds negatively on the price, the empirical results shows responses are mixed depend on countries (Goldstein & Khan 1985; Hickman & Lau 1973; Houthakker & Magee 1969). The recent studies, for example, Wang, X and Reed (2013) argue that fishery imports to the US are insensitive to price.

The significant impact of relative price of agricultural commodities can be related to the change in food and agricultural products' prices in the mid-2000s. Timmer, MP and de Vries (2009) argue that market price of basic food commodities reflect the undervaluation of agriculture by both the public and private sectors. The recent price rises in food and agricultural products have influenced the movement of agricultural exports (WTO 2012e).

Goswami and Nag (2012) find that monetary shocks or over-expansionary monetary policy results in overshooting of primary commodity price, while real shock in terms of rise in the production of primary commodity mitigates the volatility of primary price. Thus, to address such agricultural price volatility, policy towards improvement of agricultural sector should be employed, such as increasing the production and greater access to the international market.

Furthermore, the implementation of fiscal policy and the autonomous rise in export can also undershoot the volatility of the agricultural price.

From this discussion, it is apparent that there is a relationship between the relative price index and agricultural trade. This means that relative price index is a significant factor in international trade and must be included within the export volume estimation model. The relative price is measured as the export price index deflated by an index of domestic prices.

5.2.2.2 Trading Partner's income

As explained in the previous section, one determinant of export demand equation is trading partner income. Hoque and Yusop (2010) note that the higher income elasticity of exports indicates that higher income leads to higher consumption demand. This higher consumption demand is mainly translated into higher exports rather than consumption of domestically produced products because consumable domestic goods produced as a percentage of GDP were gradually decreasing. They could not keep pace with higher consumption demand because investments were diverted towards more lucrative export-oriented sectors. Baek and Koo (2011) argue there is positive long-run impact of the United States' GDP on Indonesian agricultural exports. Because of a lack of sufficient sampling sizes for the data, Indonesia's trading partner's income in this study will be represented by its GDP data (2002b, 2004b, 2005a, 2006a, 2006b, 2008). China's real GDP will be used as a proxy for China's income.

5.2.2.3 Tariff Reduction

The main characteristic of free trade establishment is export tariff reduction, so the impact of free trade agreements can be examined from the relationship between export tariff and real value of the export. When a country joins a regional trade agreement, it undertakes partial reforms of its tariff where it reduces its tariff for trade with members of the agreement but maintains a high tariff for other countries outside the union. Ju and Krishna (2000) develop the theorem of partial tariff reform to analyse whether a country stands to gain or lose from tariff reduction under free trade agreements.

The impact of tariff reduction has been reported to have a positive impact on increasing trade in some studies. For example, a recent study conducted by the OECD examined a large number of RTAs and focused on the reduction of tariff lines to zero as a result of RTAs to find that RTAs have contributed to agricultural trade liberalization (OECD 2010). Similar findings showing the responsiveness of export and demand of exports to the tariff reduction and the free trade agreement preference are reported by Fukao, Okubo and Stern (2003), McDaniel and Agama (2003) on the basis of export demand model for NAFTA.

Susanto, Rosson and Adcock (2007) examine the impacts of the US-Mexico trade agreement under NAFTA. By using the import demand equation, the empirical findings suggest that US agricultural imports from Mexico have been responsive to tariff rate reductions applied to Mexican products. The results indicate the occurrence of trade creation rather than trade diversion. A different study using general equilibrium simulation also finds that tariff reduction in trade liberalization affected agricultural products and timber in bilateral trade between Canada and the USA (Boyd, Doroodian & Abdul-Latif 1993).

On the other hand, some other studies find that tariff reduction only delivers small benefits to agricultural trade between Mexico and the US (Doroodian, Boyd & Piracha 1994). In their study on exports from Bangladesh, Hoque and Yusop (2010) find that trade liberalization represented by a non-tariff barrier has a low positive impact on aggregate export in the long-run while the tariff reduction increases export substantially in the short-run but insignificant in the long-run.

As explained in the previous chapter, the ACFTA has three different programs. Due to the data limitation, there only two groups of ACFTA that can be examined, namely the EHP and the SL groups. Hence, the structural equations based on export demand theory for the both programs should be established. The EHP started reducing its export tariff in January 2004 and a zero percent export tariff was established since 2006. As a proxy for the tariff reduction of EHP scheme, the MFN tariff will be multiplied by tariff reduction of EHP scheme. China will start reducing its export tariff for the sensitive and highly sensitive lists commodities under the ACFTA schemes after 2012 and 2016 respectively. Thus, the MFN tariff variable will represent the tariff determinant of the SL group in the equation. For this research, export tariff for each group will be added to the model. The purpose of this addition is to examine the influence of tariff changes into agricultural exports.

5.2.2.4 Exchange Rate Volatility

The attention to the importance of exchange rate volatility has been increased since the occurrence of a currency crash in Thailand and the Asian financial crisis (Poon, Choong & Habibullah 2005). It is argued that the rapid increase in exchange rate volatility following the collapse of Bretton-Woods system in 1971, has had significant adverse effects on international trade, especially in emerging economies with underdeveloped capital markets and unstable economic policies (Prasad et al. 2003).

The empirical results of exchange rate volatility in numerous studies have been mixed, and no firm conclusion has been reached as to its definitive impact (Poon, Choong & Habibullah 2005). It has been hypothesized that exchange rate risk can actually increase trade flows, as exporters and exporters opt to increase the volume of trade to attain a certain income, making up for a decrease in the per unit value of goods (Bahmani-Oskooee, Mohsen & Hegerty 2009). A number of studies have also recognized the volatility of real exchange rate as additional variable affecting export demand (Arize 1995; Moran 1989). However, Kristinek and Anderson (2002), and Doroodian Sr, Jung and Boyd (1999) find that exchange rate volatility can influence the volumee of agricultural trade. Choudhry (2005) argues that exchange rate volatility has enhanced international trade flows from Canada, Japan and New Zealand to the United Kingdom. Baek and Koo (2011) state the exchange rate has a positive and significant impact on agricultural export from the USA to Canada and Indonesia. De Grauwe (1988) and Giavazzi and Giovannini (1989) consider that exchange rate volatility induces producers to export more goods to avoid a drastic decline in their revenue stream, thus, increasing trade. Doyle (2001) proposes that exchange rate volatility enables multinationals to diversify exchange rate risk through international intra-subsidiary changes in trade leading to more trade. Poon, Choong and Habibullah (2005) argue that exchange rate volatility has positive, but insignificant impact on exports in Indonesia.

On the other hand, some studies have dismissed the positive impact of exchange rate volatility. According to McKenzie (1999), previous studies tend to favour that higher exchange rate volatility is detrimental to exports. Some theoretical studies have supported the hypothesis that an increase in exchange rate volatility might affect trade adversely; since risk-averse exporters face greater risk and uncertainty with regard to profit earned, they reduce the supply of

tradegoods (Arize 1995; Chowdhury 1993; Cushman 1983; Ethier 1973). Comparing the impact across the US economy, Cho, Sheldon and McCorriston (2002) report that exchange rate volatility has a greater negative impact on agricultural trade compared to other sectors, a finding that was affirmed in a later study by Kandilov (2008). In particular, Davis et al. (2014) report that exchange rate volatility has a negative impact in the long-run but no impact in the short-run.

A number of empirical studies have found cases where a rise in exchange rate volatility may have positive or negative implications on exports and imports, depending on the products and countries (Asseery & Peel 1991; McKenzie 1998). Bahmani-Oskooee, Mohsen and Xu (2012), for example, report varied impacts of positive, no impact and negative responses on trade for industries between China and the USA, as well as with trade between Japan and China (Bahmani-Oskooee, Mohsen, Hegerty & Xu 2012). Langley et al. (2000) find exchange rate volatility had a positive impact on poultry exports from Thailand while Bonroy, Gervais and Larue (2007) argue that exchange rate volatility has a positive relationship with pork exported to the US, but a negative impact on pork exports to Japan.

In the ACFTA studies, Yusoff and Sabit (2014) explain that exchange rate volatility may significantly affect exports from the ASEAN countries to China, while Chit, Rizov and Willenbockel (2010) find that total elimination of exchange rate volatility would have increased intra-regional trade of the ACFTAA by 5 per cent. Siregar and Rajan (2004) find that exchange rate volatility has detrimental impacts on Indonesian exports and exports.

Maskus (1986) suggests that the responsiveness of bilateral trade to exchange rate volatility could vary because of trade openness which can vary by sector, and other factors such as the use of long-term contracts. This is particularly true for agricultural products where some commodities are more protected than others and when biological and marketing lags require producers to make output decisions before exchange rates are realized(Davis et al. 2014). M Anderson, M and Garcia (1989) point out that many studies examined trade flows at more aggregate levels, disregarding the fact that exchange rate impacts could differ by commodity.

As the exchange rate volatility has an influence on agricultural trade, this variable will be added into the demand model. The volatility of the real exchange rate will be represented by the logarithms of standard deviation of real exchange rate obtained by GRACH method.

5.2.2.5 Crises

Chavas (1983) argues that structural change may influence export demand. The structural changes can be formed in trade policy or crises. Furthermore, as shown by much research, occurrence of a shock or crisis may also affect the trend of exports (Tran Van Hoa 2008, 2009). To examine the recent crises, the global financial crisis (GFC) and the Asian crisis will also be incorporated as control variables.

5.2.3 *Timespan of the Free Trade Agreement Impacts*

Previous studies on the relationship between agricultural trade and trade liberalization have mostly focused on trade creation and trade diversion under free trade agreements, but it is hard to find studies examining the long-run and short-run impact of free trade agreement on agricultural trade, especially for the ACFTA and Indonesian agricultural trade. Most studies of regional trade agreements make an implicit assumption that trade flows immediately increase to a new level with a free trade agreement (Sun & Reed 2010). They do not allow free trade agreement to impact to vary over time. This assumption also rules out the possibilities that the trade effects of the agreements may increase slowly over time (Magee 2008).

Using cross-sectional time series data, Krueger, A.O. (1999) finds that the establishment of NAFTA had no impact on bilateral trade flows. A similar finding is reported by Gould (1998) in a study using the gravity model to examine aggregate bilateral trade of NAFTA countries. Burfisher, Robinson and Thierfelder (2001) argue that these findings discrediting the impact of trade liberalization are caused by the fact that the time period of establishment of NAFTA was not long enough to observe discernible impacts.

As has been explained before, the impact of trade liberalization is not immediate, but is more apparent over the long-term, so it is important to distinguish the impacts of a free trade agreement from the perspective of short-run and long-run dynamics. Hinojosa-Ojeda and Robinson (1992) argue that the use of short-run, Keynesian macroeconomic trade multipliers in a model seeking to analyse the long-term benefits of trade liberalization seems inappropriate. Since the model involves only aggregating and macroeconomic trends, it cannot capture any of the structural changes and gains from trade liberalization as predicted by neoclassical trade

theory. This argument is supported by the fact that free trade agreements often have a mechanism of gradual reduction in tariffs over time rather than eliminating trade barriers immediately, so the price support for increasing trade occurs over time (Frankel, JA, Stein & Wei 1997; Magee 2008).

To overcome this problem, phase-in effects have been applied in the trade model equation to observe the implementation of free trade agreement clauses over time in studies by Baier and Bergstrand (2007); Rose, AK (2004) and Grant, J.H. and Lambert, D.M. (2008). In order to examine the varying impact of free trade agreement over time, Grant, J.H. and Lambert, D.M. (2008) examine the lagged trade effects as an indicator of the transitional effects resulting from phase-in periods of regional trade agreements and find significant statistical results for the lagged time trade effects. Proposing a comparison of different time spans to examine the impact of the free trade agreements over time, Vollrath (2012) began his study using a comparison of 21-year period (1975 to 1994) and 31-year period (1975 to 2005) data. While the study found non-significant impacts of free trade agreements on agricultural trade in the 21-year period for CACM, ASEAN and NAFTA, different results were reported in the 31-year period, leading to the conclusion that a longer timeframe of ongoing free trade agreement results in significantly bigger magnitude of trade creation in those free trade agreements.

Furthermore, many other studies in the literature focus on the long-term impact and ignore comparisons with short-term effects. These studies show that the impacts of free trade agreements on trade are typically more pronounced during the first 10 to 15 years rather than afterward (Baier & Bergstrand 2007; Grant, Jason H. & Lambert, Dayton M. 2008). Vollrath's (2012) extensive study analysed eleven RTAs that covered around 78 to 92 per cent of world agricultural trade during the 1975 to 2005. This comprehensive study gives strong evidence for the claim that the impacts of the free trade agreement are more discernible in the long-run. Susanto, Rosson and Adcock (2007) argue that the first six years of NAFTA increased exports by 5.31 per cent, which was higher than the last six years of NAFTA which only increased exports by 2.62 per cent.

Considering that the impact of the free trade agreements can occur over a long period, recent free trade agreement studies that find insignificant results may be flawed in that they only analyze current data for a short-term. While there are a large number of studies researching the impact of

free trade agreements, only a few have focused on comparing the short-run and long-run impacts of free trade agreements on agricultural trade. Bahmani-Oskooee, Mohsen and Ratha (2004) argue that short-run results can differ significantly from long-run results, so it is crucial to incorporate long-run dynamics in the model. Research on short-run and long-run impact of the ACFTA will be especially useful as it has been recently established. Therefore, the estimation model must incorporate tools to forecast the impact of the free trade agreements in long-term as well as the short-term by enabling the integration of data over different time periods. The next section describes the estimation technique using ARDL as an appropriate tool for this purpose.

5.2.4 *Rationale for Autoregressive Distributed Lags Approach*

In general, previous studies focused on the impact of free trade agreements use data in level or logarithm type in a regression, but they ignore potential unit-root non-stationary features of the variables in the model. Using non-stationary data in level without co-integration may lead to the possibility of spurious regression, creating biased results (Granger & Newbold 1974). Some studies examine the impacts of the free trade agreements considering the unit root problem of the variables may estimate the impacts from the perspective of long-run and short-run dynamics.

More recent research considering the unit root and co-integration problem tends to use the Johansen method (Johansen, L 1982; Johansen, S 1988) under the equally restrictive assumption that all variables entering the model contain a unit root. The problem here is that in the presence of a mixture of I (0) and I (1) regressors, statistical inference based on conventional likelihood ratio statistics for co-integration is no longer valid (Harris 1995; Hassler 1996; Rahbek & Mosconi 1999). Rahbek and Mosconi (1999) demonstrate that the presence of stationary explanatory variables as extra regressors leads to nuisance parameters in the asymptotic distribution of the trace statistic. However, both intuition and some previous evidence, suggest that the standard demand equation is characterized by a mixture of I (0) and I (1) regressors. For example, the income and relative price are expected and usually found to be integrated in order one, while the volatility measure is level stationary (De Vita & Abbott 2004).

Engle and Granger (1987)suggest that a different way to address the problem arising from non-stationary time series is to estimate a sufficiently complex dynamics specification that includes lagged dependent and independent variables where the series are co-integrated (that is, the

ARDL model). The ARDL bounds test approach has several advantages over Johansen's co-integration method. First, the ARDL determines the co-integration, relation in small samples more efficiently (Ghatak & Siddiki 2001; Tang 2003a), whereas co-integration methods of Johansen, S (1988) and Engle and Granger (1987) require a large sample for validity. Pesaran and Shin (1998) argue that the ARDL is more robust and performs better for small or finite sample sizes than other co-integration techniques. Several previous studies, however, have applied the ARDL approach to relatively small sample sizes. Gounder (1999); (2001) uses a small sample size of around twenty-seven observations for a co-integration test using the ARDL method to empirically test various growth hypotheses in Fiji. Similarly, Pattichis (1999), Mah (2000), Tang and Nair (2002) and Tang (2003a) also applied the ARDL method with small sample sizes to examine export demand functions.

Second, Johansen's method requires the variables to be integrated with variables in the same order for the co-integration test, while the ARDL approach can be applied irrespective of whether the regressors are I (1) or I (0) or mutual co-integrated, in which the dependent variables must be I (1). If the nature of the stationary of the data is not clear, then the use of the ARDL Bounds test is more appropriate. A unit root test is not necessary if a conclusion can be made from the ARDL bounds test for co-integration (Pesaran, Shin & Smith 2001).

Third, compared to the limited choices in Johansen's method, a large number of choices can be made with the ARDL method, in terms of the decisions regarding the number of endogenous and exogenous variables, if any, for inclusion, as well as the treatment of deterministic elements (Pahlavani, Wilson & Worthington 2005; Pesaran & Shin 1998). This means that dummy variables can be included in the co-integration process in ARDL while this is not permitted in Johansen's method. Pesaran, Shin and Smith (2001) argue that the asymptotic theory developed in the ARDL approach is not affected by the inclusion of such 'one-zero' dummy variables. Moreover, the ARDL permits a diverse number of optimal lags in the order of vector auto-regression (VAR) and the optimal number of lags to be used (Pahlavani, Wilson & Worthington 2005).

Pattichis (1999) applies the ARDL approach on export demand function to examine the long-run price and income elasticity of export demand of disaggregated agricultural products in Cyprus after the implementation of the Common Agricultural Policy. Marashdeh (2005), Pahlavani,

Wilson and Worthington (2005), Narayan and Smyth (2005) also use two dummy variables to capture both the long-run and short-run impacts in their ARDL model of the budget deficit in Lebanon, income growth in Iran, and trade liberalization and the economic growth in Fiji, respectively. Bahmani-Oskooee, Mohsen and Hegerty (2009) use the ARDL method of the export demand model to measure the impact of exchange rate volatility on commodities trade between the USA and Mexico under the NAFTA agreement. Hoque and Yusop (2010) employ the export demand equation estimated by the ARDL method to examine the impact of trade liberalization on exports from Bangladesh. The finding shows that trade liberalization represented by non-tariff barriers has a low positive impact on aggregate export in long-run while the tariff reduction increases export substantially in short-run, but is insignificant in long-run.

5.3 Methodology for Agricultural Exports Model

The research objective being addressed in this chapter is to investigate the impact of the ACFTA and its programs for Indonesian agricultural export growth. Thus the hypothesis related to this research objective is that implementing the ACFTA and its programs are positively correlated with exports of agricultural commodities when accounting for other important factors of export growth.

5.3.1 *Construction of Agricultural Exports Model*

This study will use the dynamic demand model to examine the impact of the ACFTA on agricultural exports from Indonesia to China. The research objective in this chapter is to investigate the impact of the ACFTA on Indonesian agricultural trade growth. Furthermore, it intends to compare the impacts of the programs covered by the ACFTA implementation on agricultural exports of Indonesia. Thus, the hypothesis related to this research objective is that implementing free trade agreements is positively correlated with bilateral exports in agricultural commodities when accounting for other factors of trade volume.

When testing this hypothesis, one must consider the argument developed by Baier and Bergstrand (2007) that the effect of free trade agreements on trade flows is underestimated in

papers that do not account for other factors of trade volume. They argue that if a model does not take into account the fact that free trade agreements may also be correlated with other factors that affect trade flows, the estimate of the effect of free trade agreement on trade volume would be incorrect. This study tests whether the presumed positive correlation between free trade agreements and trade can also be found in the agricultural export sector when moderated by a range of control variables.

The export equation for agricultural export is derived from demand theory that export demand depends proportionally on income measured as the exporting country's GDP and inversely proportional to relative prices (Goldstein & Khan 1985; Tang 2003a). Following Gould (1998); Karemera and Koo (1994), the export demand of agricultural goods will be represented by the real exports value.

This will also explore the impacts of other determinants assumed to influence the exports as control variables in the models. The control variables incorporated in the model includes GDP of trading partners, relative export price index, exchange rate volatility, tariff reduction, free trade agreement, and crises which is represented by Asian crisis and global financial crisis.

The hypothesis of the impact of other determinants in the model on the Indonesian agricultural exports can be defined as follows. The export demand theory postulates that the GDP of trading partner has a positive impact on exports, while the price increase would be expected to reduce the volume of exports**.** The impact of real exchange rate volatilityon volume of export is expected to be negative. Tariff reduction is expected to have a positive impact on the growth of exports while the crises are expected to have negative impacts.

Following Bahmani-Oskooee, Mohsen and Hegerty (2009), the export model is constructed by incorporating all variables explained previously and forms the equation as follows:

$$LNE_i = \alpha_1 + \alpha_2 LNGDPR_i + \alpha_3 LNPI_i + \alpha_4 lnR + \alpha_5 T + \alpha_6 FTA + \alpha_7 AC + \alpha_8 GFC + \varepsilon_i \,, \qquad (1)$$

Where LNE denotes the dollar volume of agricultural exports from Indonesia to China, LNGDPR denotes China's GDP as a proxy of partner's income, LNPI is relative export price

calculated as an agricultural export price index from Indonesia to China deflated by China's consumer price index, LNR is volatility of real exchange rate, T represents the tariff, FTA represents dummy variable of ACFTA, AC and GFC are dummy variables represents Asian crisis and global financial crisis, ε_i is the variance of the mode, and α_t are constants.

This model is used to construct the Indonesian agricultural export model in general. In next section, the model will represent more specific agricultural exports under the ACFTA programs.

Dummy variables will be used to represent the implementation of the ACFTA in 2004 and the crises represented by the Asian crisis (AC) occurred in 1997 and global financial crisis (GFC) in 2008. These events are represented by dummy variables which are denoted as "zero" before their occurrence and modified to "one" onwards. The use of dummy variables to capture the impact of trade liberalization has been widely used in the literature. Santos-Paulino and Thirlwall (2004) use two dummy variables to capture short-run policy impacts. Ho and Wong (2008) employ two dummy variables to measure long-run and short-run of policy impacts.

5.3.2 *Estimation Approach for the Agricultural Export Model*

The ADRL bound test approach, developed by Pesaran and Shin (1998), is a recent development in the co-integration approach that has been widely accepted in the literature. This method is used to test for the existence of a long-run relationship and to estimate the long-run and short-run impact for an equation incorporating dummy variables, such as trade liberalization or other structural changes. The method uses the unrestricted error correction model (UECM) for co-integration estimated by least square. From the ADRL, a dynamic error correction model (ECM) can be derived by following a simple linear transformation (Banerjee et al. 1993), where the ECM integrates short-run dynamics with long-run equilibrium without losing long-run information (Shrestha & Chowdhury 2005). Based on the formula developed by Pesaran and Pesaran (1997), and Pesaran, Shin and Smith (2001), the augmented ARDL $(p, q_1, q_2, .., q_k)$ the model can be written as:

$$\phi(L,p)y_t = c_0 + \sum_{i=1}^{k} \beta_i(L,q_i)x_{it} + \delta' w_t + u_t, \quad t = 1,..,n \,(2)$$

Where y_t is dependent variable, c_0 is the constant term, x_{it} are the independent variables, L is lag operator, and w_t is the s x 1 vector of deterministic variables, including intercept terms, dummy variables, time trends and other exogenous variables with fixed lags. The unrestricted ECM version of the selected ARDL model can be obtained by re-expressing the previous equation in terms of lagged levels and first difference of $y_t, x_{1t}, x_{2t}, \dots, x_{kt}$ and w_t:

$$Dy_t = c_0 + c_1 t + \lambda_{yx} z_{t-1} + \sum_{i=1}^{p-1} \gamma_i Dy_{t-1} + \sum_{i=0}^{p-1} \gamma_i Dx_{t-i} + \delta_t w_t + u_i, \quad (3)$$

Where D denotes the first difference operator, t is the trends, the coefficient γ_i represents the short-run dynamics of the model's convergence to equilibrium, and $z_t = (y_t', x_t')$.

Integrating the agricultural export equation to the UECM model following Pesaran, Shin and Smith (2001), the UECM version of the ARDL model of agricultural export demand model for this study can be expressed as follows.

$$\begin{aligned} D(LNEG)_t \; = \alpha_0 &+ \sum_{i=1}^{n1} \alpha_1 \, D(LNGDPR)_{t-i} + \sum_{i=1}^{n2} \alpha_2 \, D(LNR)_{t-i} + \sum_{i=1}^{n3} \alpha_3 \, D(LNPIEC)_{t-i} \\ &+ \sum_{i=1}^{n4} \alpha_4 \, D(LNEHPT)_{t-i} + \alpha_5 (LNEG)_{t-1} + \alpha_6 (LNGDPR)_{t-1} + \alpha_7 (LNR)_{t-1} \\ &+ \alpha_8 (LNPIEC)_{t-1} + \alpha_9 (LNEHPT)_{t-1} + \alpha_{10} (EHP)_t + \alpha_{11} (AC)_t + \alpha_{12} (GFC)_t \\ &+ \varepsilon_t \end{aligned} \quad (4)$$

$$D(LNSG)_t = \beta_0 + \sum_{i=1}^{n1} \beta_1 D(LNGDPR)_{t-i} + \sum_{i=1}^{n2} \beta_2 D(LNR)_{t-i} + \sum_{i=1}^{n3} \beta_3 D(LNPISC)_{t-i}$$
$$+ \sum_{i=1}^{n4} \beta_4 D(LNMFN)_{t-i} + \beta_5 (LNSG)_{t-1} + \beta_6 (LNGDPR)_{t-1}$$
$$+ \beta_7 (LNR)_{t-1} + \beta_8 (LNPISC)_{t-1} + \beta_9 (LNMFN)_{t-1} + \beta_{10} (AC)_t$$
$$+ \beta_{11} (GFC)_t + \varepsilon_t \quad (5)$$

In the first equation, LNEG denotes agricultural exports under the EHP program, LNGDPR represents real GDP of China as Indonesia's trading partner, LNR is exchange rate volatility, LNPIEC is relative export price index for the agricultural commodities under the EHP program, LNEHPT is tariff rates under the EHP program, EHP is the implementation of the EHP program, AC and GFC represent Asian crisis and global financial crisis consecutively.

For the second equation, LNSG denotes agricultural exports under the Sensitive and Highly Sensitive Lists (SL) program, LNPISC represents relative export price index for the agricultural commodities under the SL program, and LNMFN is tariff rate under the SL program.

These models are derived from the agricultural export model (equation 1) from previous subsection. The first equation is for the EHP model to examine the impact of tariff reduction and other non-tariff barrier under the EHP, while the second equation represents the SL model to examine the impact of tariff MFN on the export of commodities under the Sensitive Track programs.

In the EHP model, parameter α_i $(i = 1 - 4)$ explains the short-run dynamic coefficient, while the parameter $\alpha_i (i = 5 - 12)$ explains the long-run multipliers of the equation.For the SL model, the parameter β_i $(i = 1 - 4)$ explains the short-run dynamic coefficient, while β_i $(i = 5 - 11)$ explains the long-run multipliers of the equation.

The problems associated with the unit root test support the use of the ARDL bounds testing procedure suggested by Pesaran, Shin and Smith (2001). To implement the ARDL bounds test approach, the Wald-coefficient test /F statistic is used to test the significance of the lagged levels

of the variables in the conditional UECM. The lags of the model can be selected by employed Schwartz-Bayesian Criteria (SBC), as suggested by Pesaran and Smith (1998), as it often has a more parsimonious specification compared to other model specification criteria. Thus, the above equations are estimated by the least square method to get a general ARDL model. Then, from the general ARDL estimate, a parsimonious model can be obtained by following Hendry (1995) general-to-specific modelling approach through a process of elimination of insignificant variables and lags from the model.

There are three steps to execute the ARDL bounds test. The first step is to determine the existence of the long-run co-integrating relationship among the variables in the equation. The long-run level relationship between the variables is determined by the Wald-coefficient test or F test. A joint significance test is performed in order to test the null hypothesis of no co-integration by setting the coefficient of all the variables, the one lagged level variables equal to zero (Tang 2003a). The F statistics obtained from this test will then be compared to the bound critical values for upper and lower bands of the I (1), I (0) variables tabulated at Pesaran, Shin and Smith (2001) with the appropriate significance levels. If the estimated F statistic appears larger than the upper bound of the critical value, then the null hypothesis of no co-integration is rejected, which suggests that the variables included in the model are co-integrated. If the estimated F-statistic is smaller than the lower bound of critical value, then the null hypothesis of no co-integration cannot be rejected, which implies that the variables are not co-integrated. However, if the computed F-statistic falls in between the upper and lower bounds, then the decision is inconclusive regarding the null hypothesis of non co-integration. Here the order of integration of the explanatory variables I (d) must be known for any conclusion. In this situation, if the variables are I (0) then the variables are co-integrated on the basis of the lower bound; conversely, if the variables are I (1) then the variables are not co-integrated on the basis of upper bound (Shrestha & Chowdhury 2005; Tang 2003a).

If a long-run relationship is found in the first step, this means that the second step has to be executed (Marashdeh 2005). The second step is to estimate the elasticity's of the long-run relationship and determine their values. The long-run elasticity's are calculated from the estimated respective coefficient of the one lagged level explanatory variable divided by the coefficient of the one lagged level dependent variable and then multiplied with a negative sign

((Barsden et al. 1989) cited in Tang (2003a)). The long-run value for the dummy variable is used directly from the estimated equation without dividing by the lag one level dependent variable (Choong et al. 2005). If there is a long-run relationship between the variables, this indicates the existence of an error correction representation.

The final third step is to estimate UECM model. The coefficient of the first differing variables in the estimated UECM represent short-run elasticity's(Tang 2003a). The UECM result indicates the speed of adjustment back to long-run equilibrium after the short-run shock. When there is more than one coefficient in a particular variable, they are added and their joint significance is tested using the Wald-coefficient test. To ascertain the goodness of fit of the ARDL model, relevant diagnostic tests and stability tests are conducted. The diagnostic tests examine the normality, serial correlation, ARCH and heteroskedasticity associated with the model. The structural stability test is conducted by employing the Cumulative Sum Control Chart (CUSUM) and CUSUM of Squares tests.

5.3.3 *Non-stationary Time Series*

The use of econometric technique to analyse time series data is commonly based on the assumption of data stationary (Gujarati 2006; Hill, Griffiths & Lim 2011; Wooldridge 2009). As a general rule, non-stationary time series data will obtain a significant regression even when there is none, leading to a problem called 'spurious regression' (Hill, Griffiths & Lim 2011). In these cases, t-statistics obtained are not reliable because the least square estimator and least square predictor do not have their usual properties (Gujarati 2011).

The problem caused by non-stationary variables can be avoided if the series is co-integrated (Engle & Granger 1987). It denotes that even though two or more series are non-stationary they nevertheless move closer together over time, so that the difference between them is stationary. To test the order of integration of the variables used in this study, the Augmented Dickey Fuller (ADF) (Dickey & Fuller 1979) and Phillips-Perron (PP) (Phillips & Perron 1988) unit root tests will be conducted. The null hypothesis for this test is that the data has unit root or non-stationary time series.

5.3.4 *Data*

Data required for establishing the export demand model in this study consists of observations on agricultural export commodities from Indonesia to China in real value (chain-linked volume) which is grouped based on the ACFTA programs, the relative export price, real exchange rate, GDP of China, crisis and China's import tariff rates for the commodities under the EHP and SL schemes. As it studies, Indonesian agricultural exports under the ACFTA programs of the tariff sensitivity of the EHP tariff reduction and the MFN tariff for the SL schemes, data for commodities under the EHP and SL programs and the dummy variable of the implementation of the EHP and crisis/shock will also be implemented. All data is derived on a quarterly basis covering the period from the first quarter in 1996 until the second quarter in 2012, making up sixty-six time series observations. The variables are measured as natural logarithms so that their differences approximate growth rates, except for the dummy variables. The source of the data for each variable varies, as explained below.

a. Real Value of China Agricultural Exports from Indonesia

For this study, the agricultural exports will be represented by the agricultural exports from Indonesia to China. The real value of agricultural exports is obtained by converting the data from nominal to real value by imposing the volume chain-linked methods. Due to limitations in availability of agricultural export data, the ACFTA groups will be represented by the EHP and the SL. The data for agricultural export commodities are retrieved from Tradedata.net (Tradedata 2013).

b. Gross Domestic Product of China

Real GDP of China represents the trading income partner as required in the demand model. The data is in USD basis, and retrieved from the Datastream website (Datastream 2012)in quarterly basis.

c. Relative Prices

Relative prices for the EHP and the SL commodities are obtained by calculating the export price index of agricultural exports from Indonesia to China deflated by China's consumer price index (PI). The export price indices for EHP and SL groups are calculated by the volume chain-link method. The data for the export price index is obtained from the Tradedata.net, while China's consumer price index is obtained from the Datastream website.

d. Real Exchange Rate Volatility (RER)

Exchange rate volatility is a measure that intends to capture the risk faced by the exporters/exporters due to unpredictable fluctuations in the exchange rate. For this study, the real bilateral exchange rate of China (RMB) against Indonesian currency (RP) is used. Data is retrieved from Datastream website. The volatility of real exchange rate is measured by the conditional variance of the first difference of the natural log of real exchange rate that is obtained by employing the GARCH model proposed by (Bollerslev 1986). In this study, the conditional variance of GARCH (1, 2) model is used.

Following Bollerslev (1986), the GARCH method is implemented to address relationships that may exist among the different measures of variation and covariation. Such questions are difficult to answer using conventional volatility models, but they are relatively easy to address using this realized volatilities and correlations method.

e. China Import Tariff Rates

The China import tariff rates for EHP is measured by the average of weighted export tariff for every agricultural commodity under the EHP, multiplied by the volume of exports for the related commodities. The export tariff receives special treatment under the EHP from China. Data for tariff rates is retrieved from Tariff Analysis Online from World Trade Organization website (WTO 2014).

The import tariff rates for the Sensitive Track (SL) program is represented by the average of weighted tariff for every agricultural commodity under the SL scheme multiplies by volume of exports for the related commodities. Tariff rates under the SL scheme in China are represented

by MFN tariff lines as the SL program has no special tariff reduction from 2012 until 2016. The tariff for these commodities follows the MFN rates during the time period when this study was conducted. The data for the SL MFN tariff rates is retrieved from Tariff Analysis Online from World Trade Organization website (WTO 2014).

5.4 Empirical Results and Analysis

The purpose of this section is to present the results of the empirical estimations on testing of the hypothesis that the ACFTA implementation has a positive relation with agricultural exports from Indonesia to China. The results are also separated for Indonesia's agricultural exports with export tariff reduction under the EHP and the SL commodities exports with the relative price and MFN tariff. Previous studies of Frankel, JA, Stein and Wei (1997); Magee (2008); Sun and Reed (2010), explore this issue in other contexts, find that the impact of the free trade agreements were not immediate but significant in the long-term. The short-run and long-run effects of the ACFTA have also been examined, especially because the ACFTA has not been in operation long enough compared to other established free trade agreements. Although there are voluminous studies focused on the impact of the ACFTA, it is hard to find studies focusing on agricultural trade, especially in the time series analysis. Thus, this study is intended to address the limitation of past literature in the time series analysis of the impact of the ACFTA on agricultural trade.

5.4.1 *Unit Root Test Results*

Although the bounds test is applicable irrespective of whether the variables are I (0) or I (1), the implementation of unit root tests in the ARDL modelling procedure is still necessary to ensure that none of the variables is I (2) or beyond because the computed F-statistics are not valid in the presence of I (2) variables (Pesaran, Shin & Smith 2001). To this end, the Augmented Dickey Fuller (ADF) and the Phillips-Perron tests have been employed in order to explore all the time series data properties included in the equation, as suggested by Enders (1995). The tests are performed on the variables at level and first difference, with optimal lag length for each test determined automatically by the E-views 7 software. The null hypothesis for these tests is the data series have unit root. A series is stationary if the null hypothesis is rejected in ADF or PP tests. The unit root test results are presented in Table 5.1.

Table 5.1 Unit Root Test of Variables in Exports Models

Variable	Augmented Dickey-Fuller		Phillips-Perron	
	I(0)	I(1)	I(0)	I(1)
LNEG	–2.538	–11.544**	–2.069	–7.979**
LNSG	–3.227*	-	–5.615**	-
LNGDPR	–2.435	–9.005**	–2.435	–9.010**
LNMFN	–2.946	–6.805**	–3.889*	-
LNEHPT	–2.284	–2.083*	–1.417	–8.705**
LNR	–2.589	–6.039**	–1.814	–6.033**
LNPISC	–1.614	–8.765**	–1.503	–8.789**
LNPIEC	-3.402*	-	–3.164	–12.370**

Notes: - ** Significant at the 5% level; * significant at the 10% level

All variables are in natural logarithms. LNEG denotes export of agricultural products under the EHP scheme, LNSG is export of agricultural products under the SL scheme, LNGDPR is real GDP of China, LNMFN is export tariff rates under the MFN scheme in China, LNEHPT is export tariff rates under the EHP scheme in China, LNR is China's exchange rate volatility, LNPISC is relative price of agricultural products under the SL scheme, LNPIEC is relative price of agricultural products under the EHP scheme.

Based on the ADF unit root test, the variables LNEG, LNGDPR, LNMFN, LNEHPT, LNR, LNPISC are I (1), meaning they have a unit root in level. The ADF test accepts the null hypothesis for every variable at 5 per cent and 10 per cent level of significance. However, these variables are stationary at first difference as the test strongly rejects the null hypothesis at the 5 per cent level of significance for all variables except for LNEHPT at the 10 per cent level of significance. Variables LNSG and LNPIEC are I (0) or stationary in level at 10 per cent level of

significance. For comparison, the PP unit root test reveals that the variables LNEG, LNGDPR, LNEHPT, LNR, LNPISC and LNPIEC are I (1) or have a unit root in level as the PP test fails to reject the existence of unit root at both 5 and 10 per cent level of significance. In addition, variables LNSG and LNMFN are I (0) or stationary in level at 5 per cent level of significance. Thus, it can be concluded that the natural logarithm data are mixed in I (0) and I (1). Obviously, the mixture of both I(0) and I(1) variables provides a good rationale for using the ARDL bounds test approach as suggested by Pesaran, Shin and Smith (2001)

5.4.2 *ARDL Bounds Test Results for the EHP and SL Models*

The model equation used in this study covered the implemented variables in a different order, I (1) and I (0) and dummy variables are used as the sign for structural breaks and seasonal time based on time series data. As explained in the literature review, Johansen's co-integration estimation does not allow dummy variables and requires all variables to be in the same order in their system, so it is more appropriate to use the ARDL method.

To get parsimonious models, the maximum lag length in the ARDL model is selected by employing the Schwartz-Bayesian Criteria (SBC). The maximum lag length of 2 is chosen and implemented for in the SL model and maximum lag length 4 is chosen in the EHP model. Based on these models, the long-run existence of the EHP and the SL export demand models are examined. In this study, the null hypothesis of $\alpha_i = 0,$ (i = coefficient for variables in logarithm) for equation of the EHP model and $\beta_i = 0,$ (i = coefficient for variables in logarithm) for the SL model will be tested by the Wald test. These are the coefficient of the one lagged level variables included in the models including the dummy variables for the ACFTA.

This study has also employed Hendry's General to Specific approach (1991) to arrive at a parsimonious specification of the model. The initial optimal lag length based on the SBC is implemented and eliminates the variables which are not significant, except for the level variables and the intercept. The final models for the EHP and the SL are then re-examined for their long-run significance. The co-integration relationships are present in both models proved by the fact that the F statistics values that are higher than the Pesaran's Table of bound critical values. The F statistics of the Wald test on the level variables have stronger results as compared to the previous models. This confirms the existence of the long - run relationship between the variables used in

the EHP and SL models. The EHP model confirms the existence of both the constant and intercept, while the SL model confirms only the existence of constant. The estimated F statistics of each model are compared with the Pesaran's bound critical values are to test whether the long-run coefficient are jointly equal to zero, as suggested by Pesaran, Shin and Smith (2001). The calculated F statistics for the co-integration tests for both models and the related critical values of Pesaran's table are displayed below in Table 5.2.

Table 5.2 ARDL Co-integration Bounds Test

Model	Pesaran Critical value bounds of the F-statistics				Wald test F- statistics
	10% level		5% level		
	I(0)	I(1)	I(0)	I(1)	
EHP	2.782	3.827	3.189	4.329	4.472 (k=5)**
SL	2.262	3.365	2.649	3.805	3.542 (k=5)*

Note: * : significant in 10% level of significance;
** : significant in 5% level of significance

It can be seen that the calculated F statistics for both models are higher than the upper bound Pesaran critical values bounds at the 10 per cent level of significance. The calculated F statistics for EHP is 4.47 that is greater than 4.34 at the 5 per cent upper critical value, while the SL model is significant at the 10 per cent level of significance as the calculated F statistics of 3.54 is higher than the Pesaran's table value at 3.37. This implies that the null hypotheses of no co-integration can be rejected. Instead, we have evidence of long-run relationships between the variables for both the EHP and SL models. Following Tang (2003b), the existence of a co-integrating relation indicates that the EHP and SL export demand functions are stable over the sample period.

After finding the existence of a long-run relationship in the EHP and the SL models and obtaining the long-run coefficient, the UECM version of the ARDL models are estimated. The error correction term indicates the speed of adjustment restoring the equilibrium in the dynamic

model. The UECM coefficient of the error correction term to represent the speed of the relationship adjustment returns to its equilibrium path, and it should have a statistically significant coefficient with a negative sign. Banerjee, Dolado and Mestre (1998) state a highly significant error correction term is further proof of the existence of a stable long-term relationship. The results are explained in detail in the next section.

5.4.3 *Final EHP and SL Exports Models*

By implementing the Henry's General to Specific approach, the insignificant variables will be removed. The crises variables (GFC and the Asian crisis) are removed from the model as they are insignificant in the short-run and long-run in both models. The maximum lags imposed for the models in four, based on the SBC. The constant, trend and seasonal dummy variables are incorporated in the model. After the selection of the relevant variables, the final models are presented below.

The final UECM for the EHP export model is structured as below:

$$\begin{aligned} D(LNEG)_t = \beta_1 + \beta_2 LNEG_{(-1)t} + \beta_3 LNGDPR_{(-1)t} + \beta_4 LNEHPT_{(-1)t} + \beta_5 LNR_{(-1)t} \\ + \beta_6 LNPIEC_{(-1)t} + \beta_7 ACFTA_{(-1)t} + \beta_8 D(LNEG)_{(-1)t} + \beta_9 D(LNGDPR)_{(-3)t} \\ + \beta_{10} D(LNR)_{(-1)t} + \beta_{11} D(LNPIEC)_{(-1)t} + \beta_{12} D(LNEHPT)_{(-2)t} \\ + \beta_{13} D(ACFTA)_{(-2)t} + \beta_{14} trend + \varepsilon_t \end{aligned} \quad (6)$$

Where $D(LNEG), D(LNGDPR), D(LNR), D(LNPIEC), D(LNEHPT), D(ACFTA)$are variables in first differences of LNEG, LNGDPR, LNR, LNPIEC, LNEHPT, andACFTA. ACFTA denotes the implementation of the ACFTA.LNEG denotes export of agricultural products under the EHP scheme, LNGDPR is real GDP of China, LNEHPT is export tariff rates under the EHP scheme in China, LNR is China's exchange rate volatility, and LNPIECis relative price of agricultural products under the EHP scheme.

This model has significant coefficient of constant (9.87***) and trend (0.04***) at the 1 per cent significance level. The expected negative sign of the error correction term $LNEG_{-1}$ in the short-run UECM is highly significant (–0.73***) at the 1 per cent level of significance, confirming that a long-run equilibrium relationship exists between the variables. The error correction coefficient is –0.73 which suggests that, once shocked, deviation from the long-term equilibrium path is corrected by around 0.80 per cent over the following year. The fit of the model is quite good as R squared value of this model is measured at around 0.63 and the F statistics of this model is significant at the 1 per cent level of significance (6.36), *** both indicating the model construction can be accepted.

The final UECM for the SL export model is structured as follows:

$$D(LNSL)_t = \alpha_1 + \alpha_2 LNSL_{(-1)t} + \alpha_3 LNGDPR_{(-1)t} + \alpha_4 LNSLT_{(-1)t} + \alpha_5 LNPISC_{(-1)t} + \alpha_6 LNR_t + \alpha_7 ACFTA_t + \alpha_8 D(LNSL)_{(-3)t} + \alpha_8 D(LNGDPR)_{(-1)t} + \alpha_7 D(LNR)_{(-2)t} + \alpha_8 D(LNSLT)_{(-3)t} + \alpha_9 D(LNPISC)_{(-3)t} + \alpha_{10} D(ACFTA)_{(-2)t} + \varepsilon_t \quad (7)$$

$D(LNSL)$, $D(LNGDPR), D(LNR), D(LNSLT), D(LNPISC), D(ACFTA)$ are variables in first differences of LNSL, LNGDPR, LNR, LNSLT, LNPISC, and ACFTA.LNSG is export of agricultural products under the SL scheme, LNGDPR is real GDP of China, LNMFN is export tariff rates under the MFN scheme in China, LNR is China's exchange rate volatility, and LNPISC is relative price of agricultural products under the SL scheme.

From the estimation with OLS, the error term $LNSG_{-1}$ in the SL, it is found that the UECM is statistically significant at the 1 per cent level of significance with a negative sign (–0.811***), confirming that a long-run equilibrium relationship exists between the variables. This error correction coefficient indicates that the disequilibrium is a short-run phenomenon and movement to reach equilibrium is fast. The model fit is quite good as the R-squared value is 0.65 and the F

statistic of the model is statistically significant at the 5 per cent level of significance, both of which suggest that the model can be accepted. In this model, the constant coefficient (13.17***) is significant at the 1 per cent level of significance, but this model has no significant trend.

5.4.3.1 EHP Model Validity

Diagnostic test for normality of the residuals, serial correlation, heteroskedasticity and misspecification of functional form are conducted to the Error Correction Model of the EHP. The results are displayed in Table 5.3. The White heteroskedasticity and Breusch-Godfrey serial correlation tests disclosed no significant evidence of bias from standard assumptions, while the Jarque-Bera normality test accepts the null hypothesis that residuals are normal.

Table 5.3 Validity Checks for the EHP Model

Test	Hypothesis	F-statistics	P-value
White heteroskedasticity	H0: residuals are homoskedastic	0.487	0.921
Breusch-Godfrey serial correlation LM test	H0: No autocorrelation exists	0.022	0.996
Jarque-Bera normality test	H0: Residuals are normal	0.111	0.946

Since the stability of the export demand models is essential for making an effective trade policy, the cumulative sum of recursive residuals (CUSUM) and the CUSUM of squares (CUSUMSQ) tests are applied to test for the parameter stability over the sample period. Figure 5.1 and 5.2 plot the CUSUM and CUSUMSQ for the EHP model. The results clearly indicate that the preferred specifications pass the CUSUM and the CUSUMSQ tests of parameter stability at 5 per cent critical bounds. The CUSUM test detects systematic changes in the regression coefficient, while the CUSUMSQ test is particularly useful in capturing sudden departures from the constancy of regression coefficient.

Figure 5.1CUSUM of the EHP Model

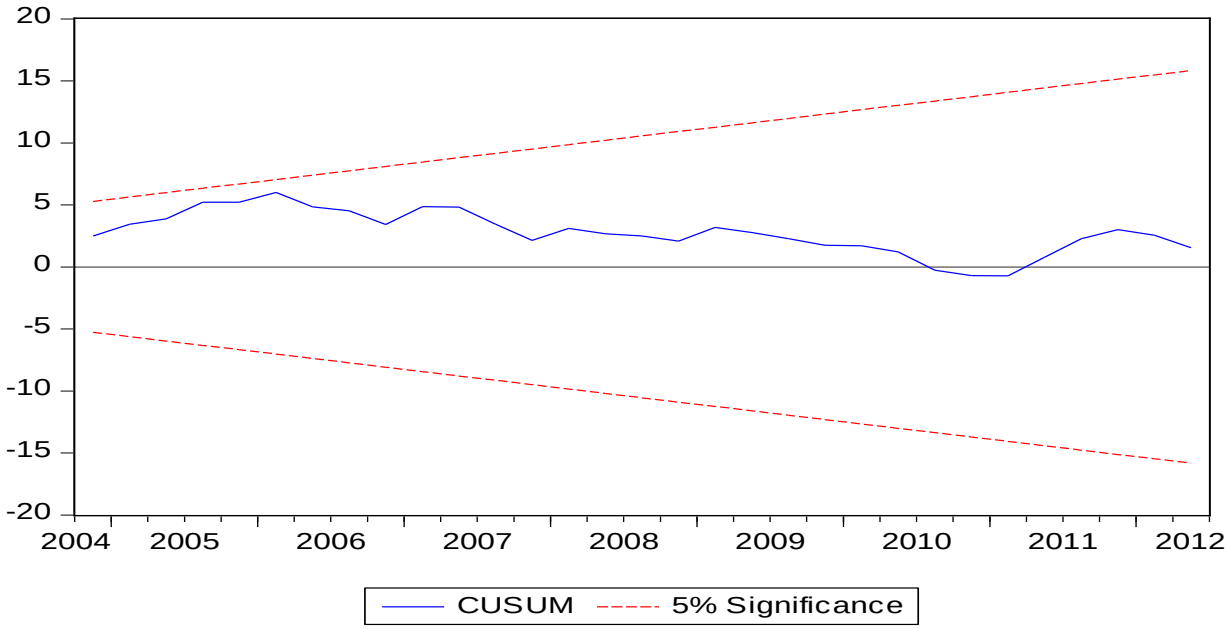
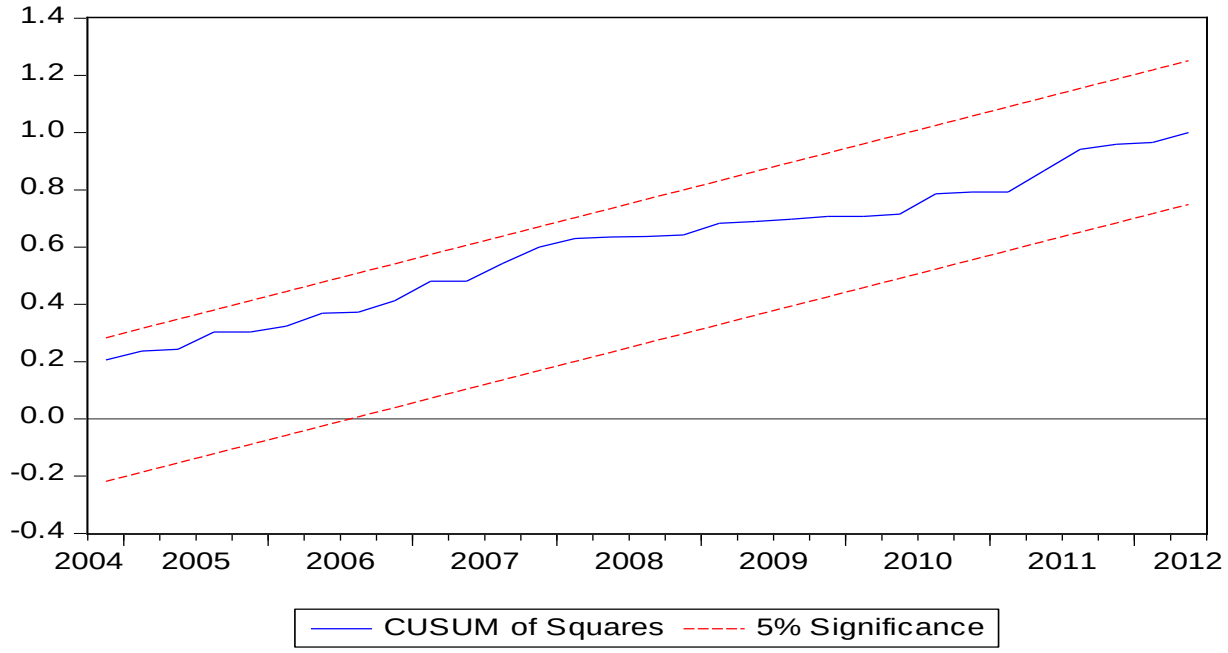


Figure 5.2 CUSUM of Squares of the EHP model



5.4.3.2 SL Model Validity

The SL Error Correction Model validity has been tested by conducting the Jarque-Bera normality test of residuals, the Breusch-Godfrey serial correlation LM test, and the White heteroskedasticity test. The results are displayed in Table 5.4. All tests accept the null hypothesis, which means that the residuals are normal, homoscedastic and no autocorrelation exists. Since none of these tests disclose any significant evidence of bias from standard assumptions, this indicates that the models pass all the diagnostic tests. As a result, it can be concluded that the empirical validity of the models is confirmed by these diagnostic tests.

Table 5.4Validity Checks for the SL Model

Test	Hypothesis	F-statistics	P-value
White heteroskedasticity	H0: residuals are homoscedastic	1.094	0.388
Breusch-Godfrey serial correlation LM test	H0: No autocorrelation exists	0.926	0.436
Jarque-Bera normality test	H0: Residuals are normal	0.102	0.636

The stability of the SL export demand model is analyzed by employing the CUSUM and the CUSUMSQ tests over the sample period. Figures 5.3 and 5.4 plot the CUSUM and CUSUMSQ for the SL model respectively. The results clearly indicate the absence of any instability of the coefficient during the investigated period as provided by the plots of the two statistics that are confined within 5 per cent critical bounds pertaining to the parameter stability. Given that the diagnostic tests fulfill the requirements of model validity, the validity of this model is accepted.

Figure 5.3 CUSUM of the SL Model

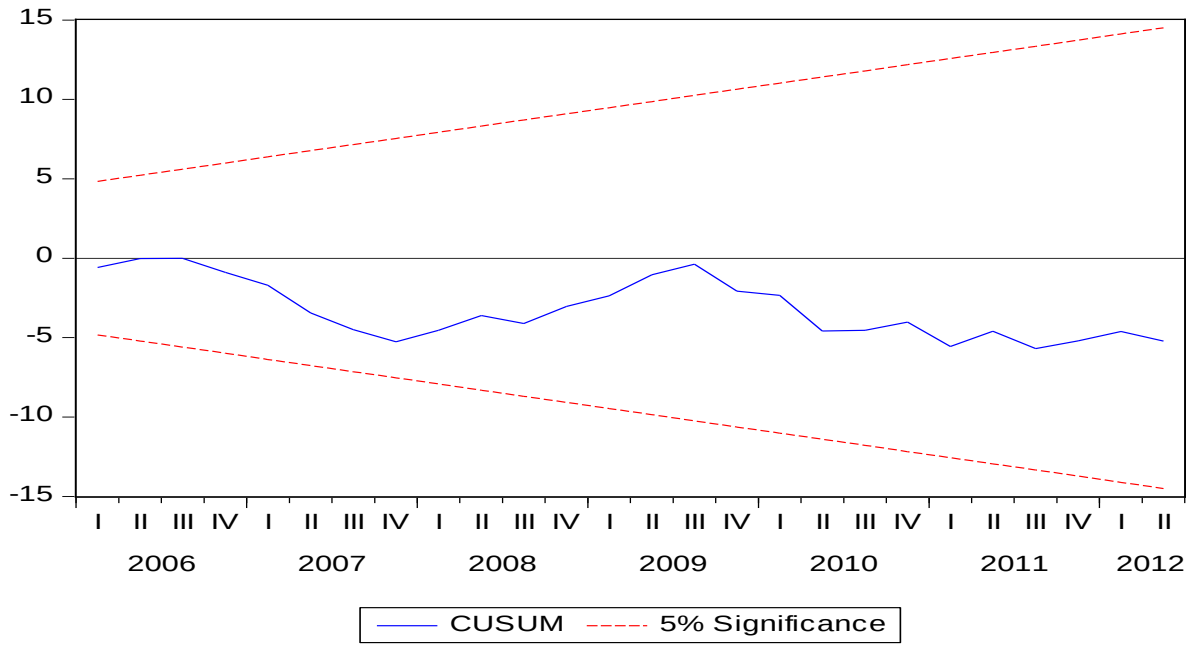
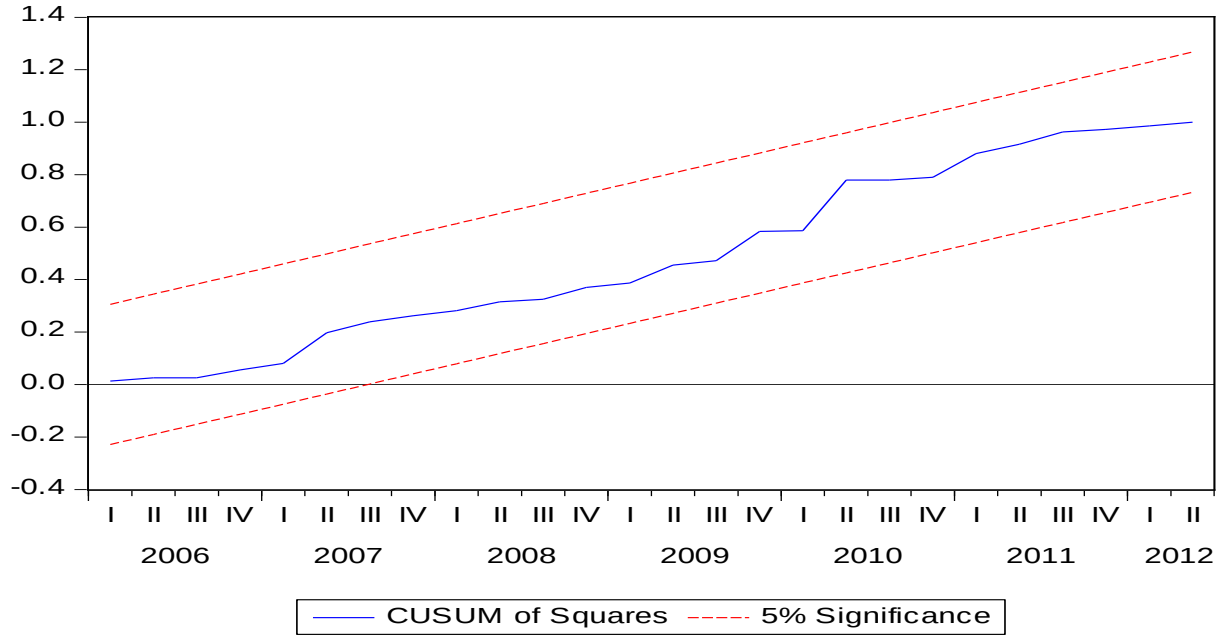


Figure 5.4CUSUM of Squares of the SL



5.4.4 *Long-run and Short-run Dynamics of the EHP Demand Functions*

From the UECM model of the EHP demand function, the coefficient determinants of the long-run and short-run models can be obtained. The long-run elasticity's of the variables in the EHP

model are obtained by normalizing the coefficient of co-integrating variables (LNGDPR, LNEHPT, LNPIEC, LNR, ACFTA) on coefficient of the lag one level dependent variable of $LNHP_{-1}$ (Indonesian agricultural export to China of EHP products). The short-run elasticity's are represented by the coefficient of the respective first different variables. The estimated long-run and short-run coefficients of the variables in the EHP model are presented in Table 5.5.

Table 5.5 Long-run and Short-run Results of the EHP model

Variable	Coefficient	Standard Error	t-value
Long-run			
LNEHPT	–0.0153	0.018	–0.853
LNPIEC	–0.632	0.256	–2.115**
LNGDPR	15.369	4.814	3.193***
LNR	–0.527	0.249	–2.115**
ACFTA	0.643	0.257	2.499**
Short-run			
D (LNEHPT)	0.015	0.029	0.519
D (LNPIEC)	–0.542	0.236	–2.292**
D (LNGDPR)	–0.875	5.333	–0.164
D (LNR)	0.114	0.314	0.363
D (ACFTA)	–1.377	0.438	–3.146**
R-Squared	0.633		
Adj. R-Squared	0.533		
F-statistics	6.363***		
DW-statistics	1.54		
No. of observation	62		

Note: * : significant at 10 per cent significance level
** : significant at 5 per cent significance level
*** : significant at 1 per cent significance level

The EHP of the ACFTA is focused on facilitating trade of selected agricultural products by gradually reducing export tariff to zero per cent over 2004 to 2006. The main objective of this model is to study the impact of the EHP implementation on agricultural exports from Indonesia to China that is represented by tariff reduction (EHPT) and other ACFTA implementation.

However, other variables predicted to influence the export are also included in the model as control variables. The response of the independent variables in the model equation on agricultural exports from Indonesia to China under the EHP program can be explained as follows.

The long-run dynamics of Indonesian export of EHP agricultural products is also determined by significant variables of LNPIEC (relative export price), LNGDPR (GDP of China), LNR (exchange rate volatility) and ACFTA (implementation of ACFTA). On the other hand, the LNEHPT variable (export tariff reduction of the EHP program) is not significant. From the long-run perspective in Table 5.5, the coefficient of LNEHPT indicates that the response to the implementation of the EHP with reduced export tariff from China does not have a significant impact on increasing Indonesian exports to China of agricultural commodities under the EHP program.

From the short-run perspective, Table 5.5 shows that the first difference of implementation of the ACFTA (D(ACFTA)) has a significant impact on EHP agricultural export growth from Indonesia as well as the change in relative price (D(LNPIEC)). However, the export tariff reduction under the EHP scheme (D(LNEHPT), China's income (D(LNGDPR)) and exchange rate volatility (D(LNR)) have no significant impacts on EHP agricultural export from Indonesia to China.More detailed explanations about the impacts of individual variables on the EHP exports from Indonesia to China are given below.

5.4.4.1 ACFTA

The implementation of ACFTA was begun on the 1st of January 2005. The trade liberalization dummy variable (ACFTA) represents the implementation of ACFTA rules other than tariff reduction. The results show that the ACFTA has positive and significant impacts of Indonesian agricultural export growth in China in the long-run according to the EHP model estimation. From the finding in Table 5.5, the implementation of the ACFTA will increase Indonesian export for the EHP agricultural commodities by around 0.64 per cent.

On the other hand, in the short-run, trade liberalization dummy (D (ACFTA)) shows significant negative impact on Indonesian exports to China of EHP agricultural products. This determinant has reduced the growth of export of agricultural commodities under the EHP from Indonesia to

China for –1.4 per cent. The implementation of other programs under the ACFTA, such as Rules of Origin and the Operational Certification Procedure, provide the standards for commodities exports to be fulfilled in the short-run, need to be adjusted by Indonesian exporters. This result is consistent with the Disdier, Fontagné and Mimouni (2008) study which shows that the implementation of these rules have a negative impact on agricultural exports from developing countries.

5.4.4.2 Tariff Reduction under the EHP

Theoretically, free trade areas involve only partial eliminationof tariffs, and they can lead to unexpected results. As explained by Viner (1950), the countries left out of the union and even the countries inside the union can become worse off. Thus it is possible that a country could lose out from joining the union.

The contribution of agriculture to overall Indonesian exports remains small, despite the commodities boom. Agricultural production naturally responds sluggishly to changes in prices. Thus it is not surprising that Indonesia has been unable to fully take advantage of the recent high commodity prices. Moreover, the low agriculture export growthcould also be attributed to rejections by importing countries, for the reason that Indonesian products do not comply with the international or health, safety, and environment standard (Bappenas 2009).

The implementation of the EHP program aimed at reducing China's export tariff to zero per cent for the EHP commodities in the period of 2004-2006. The estimation of the model as displayed in Table 5.5 shows that tariff reduction has the same impact both in the shortrun and the longrun. There is no significant impact of the EHP implementation on Indonesian exports to China for the EHP's agricultural products. In fact, the reduction of China's export tariff for the agricultural commodities under the EHP program tends to decrease the Indonesian EHP agricultural exports to China, which is shown by the positive sign of the coefficient of the D(LNEHPT) though not to a significant extent. Furthermore, the volume of Indonesian agricultural exports tend to be decreasing even though China's export tariff is reduced to zero per cent for the commodities under the EHP program. Although the percentageof change is not significant, 1 per cent of China's export tariff reduction tends to reduce Indonesian exportsof the EHP products by 0.01 per cent. This result contradicts the objective of the EHP program under the ACFTA to increase

agricultural trade between ASEAN countries and China in the longrun. This finding is consistent with a study conducted by Vanzetti et al. (2011), who point out that Indonesia experiences a trade reduction for certain agricultural commodities such as paddy rice, other cereal, oilseeds, vegetable and fruits and other crops.

Tariff reduction on certain agricultural commodities under the EHP scheme produces a loss on the Indonesian side. This condition can be further explained by looking into the details of the trading agreement between Indonesia and China under the auspices of the ACFTA. First, the types of commodities agreed for tariff reduction in the EHP program are not Indonesia's superior products and not widely produced for export in Indonesia. Instead, Indonesia has heavily imported these commodities, especially for agricultural commodities under the HS code 01 to 08(BPS 2014). Second, according to Chen, C and Duncan (2008), China has comparative advantage on some of these agricultural commodities, thus lowering the export tariff does not necessarily increase import demand for these products from China's side. For example, lowering export tariff for horticulture and meat commodities will not change the domestic demand as China has enough production of these commodities at a relatively low price. Third, in contrast to the second reason, the commodities in which China has no comparative advantages, but has strong demand in the domestic market are called 'national strategic products', such as edible oil, rice, maize, sugar, cotton and wool. China's government imposes special treatments that are allowed under the WTO accession by imposing higher rates for in-quota tariff (TRQ) and place quota on these commodities (Chen, C & Duncan 2008). These restrictive conditions from the Chinese side could have contributed to the low demand for Indonesian exports despite the incentive of reduced tariffs.

5.4.4.3 Relative Price Index

The relative price for EHP products (LNPIEC) is also significant in the long-run at 5 per cent significance level. The sign of coefficient is negative, indicating that the reduction of price will increase the demand of agricultural export for the EHP products. The coefficient of relative price at around –0.69 is inelastic, which suggests that a 1 per cent decrease in relative prices will

increase the growth of the EHP agricultural export from Indonesia to China by 0.69 per cent. This result was expected and is in accordance with the theory.

The change in the relative price index, (D(LNPIEC)), in the short-run also showed a similar outcome as the long-run. The reduction of the relative price significantly increased the growth of Indonesian agricultural exports under the EHP program at the 5 per cent significance level. The negative coefficient of –0.542 denotes 1 per cent decrease in the relative price will enhance the export growth by 0.54 per cent.

5.4.4.4 Exchange Rate Volatility

The volatility of exchange rates has a significant negative impact at the 5 per cent level of significance on the growth of Indonesian exports to China of the EHP agricultural commodities in the long-run. As expected, the coefficient is negative, which means that the higher volatility of exchange rate will depress the growth of Indonesian EHP agricultural exports to China. Lowering the exchange rate volatility of 1 per cent will increase Indonesian EHP agricultural export to China by 0.53 per cent in the long-run. This result is consistent with Yusoff and Sabit (2014) who find that a 1 per cent increase in exchange rate volatility will decrease exports from the ASEAN members to China under the ACFTA by 0.21 per cent. In terms of global studies, De Grauwe (1988), Cushman (1983), Ghosh et al. (1997) and Arize (1995) claim that exchange rate volatility has a significant negative impact on international trade in general, while Cho, Sheldon and McCorriston (2002) find a negative impact of exchange rate volatility on agricultural trade.

However, in the short-run, the exchange rate volatility does not have a significant influence on the Indonesian agricultural export growth to China. This result is contrary to the extant evidence that shows significant and negative impact on agricultural export demand growth. It is also contrary to a previous study by Maskus (1986) which suggests that exchange rate volatility has a negative impact on agricultural trade in the short-run.

These results can perhaps be justified by an explanation of the exchange rate policy taken by the Chinese government. The Chinese government's decision to change the exchange rate system from a fixed to floating rate in the 1980s caused volatility in the RMB exchange rate. But the Chinese government also pegged the exchange rate to the US dollar, which ensured that the exchange rate was not too volatile (Huchet-Bourdon & Bahmani-Oskooee 2013). The relative

stability of the currency in the short term could have resulted in insignificant effect of exchange rate, whereas greater volatility of the exchange rate in the long-term results in significant negative impact on the growth of Indonesian agricultural exports to China.

5.4.4.5 Trade Partner's Income (Real China's GDP)

The variable of partner GDP, representing China's income tends to support Indonesian exports to China for the EHP group of agricultural commodities. The income elasticity is quite high — 15.37 and significant at the 5 per cent level of significance. China's real GDP (LNGDPR) has a positive and significant impact on the agricultural exports from Indonesia in the long-run, indicating that a rise in real income of China leads to an increase in Indonesian agricultural exports to China through the increased purchasing power of foreign consumers.

This finding is consistent with a study conducted by Yusoff and Sabit (2014) who argue the China's real GDP could significantly affect the bilateral exports of ASEAN countries to China. However, in the short-run, the role of China's GDP growth is not significant in improving Indonesian agricultural export growth in China for EHP commodities. Even though economic theory postulates that income of trading partner is a dominant factor for increasing trade, the trading partner's income does not seem to be a significant determinant for these agricultural commodities,.

5.4.5 *Long-run and Short-run Dynamics of the SL Demand Model Functions*

Unlike the EHP program that facilitates trading between Indonesia and China by reducing export tariff to zero per cent in the 2004 to 2006 period, the tariff of all commodity exports under the Sensitive Track scheme in the ACFTA can only be reduced after 2012 and 2016. As there is no export tariff reduction for the commodities under the Sensitive Track during the time period in which this study is conducted, the proxy for tariff for the SL commoditiesused in this model is the average of weighted related MFN tariff multiplied by the volume of exports. This means that the construction of the SL demand model will use the MFN tariff for all related commoditiesunder this scheme.

Table 5.6Long-Run and Short-run Results of the SL model

Variable	Coefficient	Standard Error	t-value
Long-run			
LNSLT	–0.004	0.163	–0.023
LNPISC	–0.2618	0.149	–1.758*
LNGDPR	11.249	4.503	2.498**
LNR	–0.607	0.238	–2.550**
ACFTA	–0.138	0.265	–0.519
Short-run			
D (LNSLT)	–0.320	0.105	–3.052**
D (LNPISC)	–0.492	0.285	–1.725*
D (LNGDPR)	–5.809	5.672	–1.024
D (LNR)	–0.638	0.317	–2.013**
D (ACFTA)	0.385	0.419	0.920
R-Squared	0.651		
Adj. R-Squared	0.547		
F-statistics	6.268***		
DW-statistics	2.163		
No. of Observations	62		

Note: * : significant at 10 per cent significance level
** : significant at 5 per cent significance level
*** : significant at 1 per cent significance level

Table 5.6 displays the statistical measures of the SL Unconditional Error Correction Model of ARDL approach. The long-run elasticity's of the variables in the SL model are calculated. In general, the long-run empirical results of the SL model show that relative price (LNPISC), China's GDP (LNGDPR), exchange rate volatility (LNR) is significant in influencing the growth of Indonesian export to China for SL agricultural commodities at least at the 10 per cent level of significance. This is broadly consistent with the theory. However, contrary to expectation, the main variables of implementation of the ACFTA and export tariff variables do not have a statistically significant influence in stimulating the growth of exports.

The short-run perspective presents a slightly different result from the long-run. While implementation of the ACFTA (D(ACFTA)) is again found to have no significant impact on the

growth of exports, the variable of China's GDP (D(LNGDPR)) is also found to be insignificant. Meanwhile, export tariff ((D(LNSLT)) along with other variables of relative price (D(LNPISC)), and exchange rate volatility (D(LNR)) have significant impacts on Indonesian agricultural export to China for the SL commodities in the short-run.

5.4.5.1 ACFTA

The core variable in the demand model is the implementation of the ACFTA. Surprisingly, this variable does not have a significant impact on the growth of SL agricultural exports from Indonesia to China both in the long-run and short-run. In the long-run, the implementation of the ACFTA tends to cause a decline in the exports, although not significantly. In the short-run, the ACFTA is able to amplify the exports by 0.39 per cent, but this is not enough to significantly raise the volume of exports. This result is inconsistent with a study by Vanzetti et al. (2011) who find that the implementation of the ACFTA will increase trade in particular agricultural commodities, such as vegetable oils and fats, by 0.8 per cent but decrease other processed agricultural products by 0.1 per cent. Although the present study does not differentiate between specific product categories, the discrepancies recorded by Vanzetti et al. are quite similar to those in this study.

Palm oil products constitute one of the main commodities under this scheme as they have a very high demand, but this commodity is also fraught with environmental sustainability issues. While the ACFTA rules for all commodities must comply with the general WTO rules, there are specific requirements for certain commodities that also need to be satisfied. For example, palm oil products need to acquire a certification to meet the requirement of the Malaysia-based Round Table on Sustainable Palm Oil (Pusdatin 2013). The adjustment period required by the exporters to fulfill the requirement of the ACFTA can be responsible for this condition. Disdier, Fontagné and Mimouni (2008) argue that this kind of additional requirement slows down exports from developing countries.

5.4.5.2 Tariff Reduction under MFN Tariff Rates

As there is no export tariff reduction for the commodities under the Sensitive Track during the time period in which this study is conducted, the proxy for tariff for the SL commoditiesused in this model is the average of weighted related MFN tariff multiplied by the volume of exports. As shown in Table 5.6, the response of Indonesian exports to China of the SL commodities for the MFN tariff is not significant in the long-run. Even though the sign of the coefficient is negative, implying that the reduction of the export tariff will increase the export, it is not able to raise the export volume significantly. The reduction of 1 per cent MFN tariff will increase Indonesian exports 0.004 per centof the SL agricultural products.

As many countries adopt protectionist strategies for their agricultural sector, export tariffs for agricultural products are usually bigger than those for manufactured goods (Hoekman & Nicita 2011), causing the agricultural export tariff to remain high in the long-term(May 2011). The Chinese government also uses the instrument of export tariffs to protect their strategic agricultural products, including vegetable oils (Chen, C & Duncan 2008). But vegetable oils, especially palm oils, are the main agricultural products exported from Indonesia included in the SL program under the ACFTA. Hence, protectionist strategies by the Chinese government could be the reason why the reduction of the MFN tariff has not had any substantial impact on improving the export volume of these commodities.

A different result is obtained from the analysis of short-run dynamics of tariff reduction. Indonesian exports to China of SL commodities seem to be very sensitive to the reduction of MFN tariff in the short-run. Table 5.6 shows that the change of MFN export tariff is statistically significant in influencing the exports at 5 per cent level of significance. Decreasing 1 per cent of the MFN tariff will lift the exports by 0.32 per cent. Thus the volume of exports is more sensitive to MFN tariff reduction in the short-run rather than the long-run.

Although the focus of this study is the impact of the ACFTA and tariff sensitivity, the model also incorporates other variables that influence the exports of the SL commodities. The empirical results for the other variables are explained in the following section.

5.4.5.3 Relative Price Index

The estimation results show that Indonesian exports to China of the SL agricultural products have responded positively to the relative price index in the long-run and short-run. Reduction of relative price index of the SL commodities has significantly influenced the growth of SL exports at 10 per cent significance level; and the coefficient of the relative price is inelastic in both the long-run and short-run. The negative elasticity of export demand growth in the long-run and short-run, with respect to relative price, implies that the real appreciation of relative price adversely affects the exports. While an increase of 1 per cent in relative price may reduce 0.004 per cent of the exports in the long-run, the escalation of 1 per cent of relative price will decrease the exports by 0.49 per cent in the short-run. This also means that the impact of relative price in the short-run is relatively bigger than in the long-run.

5.4.5.4 Exchange Rate Volatility

The results show that SL agricultural commodities exports from Indonesia to China have responded negatively to the volatility of the exchange rate in the long-run and short-run. The impact is statistically significant at 5 per cent significance level for both estimations. In the long-run, the elasticity on exchange rate volatility is –0.61 per cent, which implies that increasing 1 per cent of exchange rate volatility will depress the exports by 0.61 per cent. This is consistent with Cho, Sheldon and McCorriston (2002) who reveal that reduction in exchange rate volatility can increase bilateral trade. On the other hand, increased volatility in the exchange rate of its currency can make a country less competitive (Aghion & Howitt 2009) resulting in fewer exports. Aghion and Howitt (2009) further report that volatility of exchange rate is more pronounced in developing countries, making them less competitive. This finding, however, contradicts Lal, AK and Lowinger (2002) who claim that there is no significant impact of any change in the exchange rate on trade balance of Indonesia with the rest of the world.

Similarly, in the short-run, the elasticity of the experts on exchange rate volatility is negative at –0.64, suggesting that upturn in volatility of 1 per cent will decrease the growth in SL agricultural exports from Indonesia to China by 0.64 per cent. The finding of negative impacts of bilateral exchange rate volatility on exports is consistent with many other previous studies, such as Yusoff & Sabit, 2014, Bénassy-Quéré and Lahrèche-Révil (2003), Baak, Al-Mahmood and Vixathep

(2007) and Chit (2008). A study by Cushman (1983) indicates the exchange rate volatility has a significant negative effect on trade, as does another study by Pick and Vollrath (1994). In relation to Indonesia, Siregar and Rajan (2004) find the exchange rate volatility has detrimental impacts on Indonesian exports of all commodities.

Ghosh et al. (1997) and Arize (1995) explain that increasing exchange rate volatility causes negative effects on trade in the long-run, while Maskus (1986) mentionsthe volatility of exchange rate has reduced US agricultural trade in the short-run.

5.4.5.5 Trade Partner's Income (Real China's GDP)

The finding also reveals that any increase in China's income will increase the SL agricultural exports from Indonesia to China. China's income is found to be the most dominant variable in the model in terms of its influence on the SL agricultural exports from Indonesia to China in the long-run as it has the biggest coefficient compared to other variables. The result shows that a 1 per cent increase in China's real GDP could increase the SL agricultural exports significantly by 11.04 per cent in the long-run. This is by far the highest value of positive impact recorded for any variation on the SL exports.

In contrast, the finding does not show any significant influence of China's GDP on Indonesian exports of SL agricultural commodities in the short-run. The elasticity sign is negative, which implies that China's income affects Indonesian exports adversely, but the impact is not significant. In numerical terms, a 1 per cent increase in China's GDP has only reduced the exports by 0.49 per cent. This number is far smaller compared with the positive and significant impact of China's income on the SL exports in the long-run.

5.5 Conclusion

This chapter presented the results of the study on the trade volume of Indonesian agricultural real exports to China under the ACFTA programs for both the EHP and the SL products. To undertake this examination, two ARDL models based on the export demand functions for EHP and SL schemes have been built. Apart from the ACFTA variable, other variables assumed to influence the growth of the agricultural exports have been incorporated into the models,

including export tariff, China's income represented by China's real GDP, relative price index, exchange rate volatility and crises. The findings reveal that the co-integrations exist for both EHP and SL models implying that there are long-run and short-run effects. The ARDL bound test is applied to determine the variables that influence the growth of the exports for both ACFTA programs.

The econometric test results show that the implementation of the ACFTA has a positive and statistically significant impact in boosting the growth of the EHP agricultural exports from Indonesia to China in the long-run. In contrast, the finding reveals a reverse result for the short-run. Meanwhile, there is no evidence of a statistically significant impact of the ACFTA on the SL agricultural commodities both in long-run and short-run conditions.

The implementation of tariff reduction under the EHP scheme has no significant success in improving the growth of Indonesian exports to China for the EHP agricultural products both in long-run and short-run dynamics. Furthermore, the growth of the SL commodities exports from Indonesia to China shows no significant response to a reduction of the MFN tariff in the long-run. However, in the short-run, the change in MFN tariff has a favorable significant impact on the growth of SL exports.

The performance of the relative price index in the EHP and SL model is favorable. The variable of the relative price index has played a critical role in driving up the growth of agricultural exports from Indonesia to China under the ACFTA. This variable has significantly affected the export growth for the EHP and SL agricultural commodities, both in the short-run and long-run. This makes the relative price index a key determinant in the models that affects the growth of exports. This suggests that increasing the relative price index will substantially reduce the growth of the exports.

The variable of exchange rate volatility has a significantly negative influence on the growth of EHP and SL exports in the long-run but presents a different behavior in the short-run. While the exchange rate volatility has a negative and significant impact on the SL export growth in the short-run, there is no significant evidence that this variable has an impact on the EHP export growth in the short-run.

Among other variables that influence China's export demand from Indonesia, the income of China or the real GDP is found be one of the most powerful determinants of the growth of

exports for both the EHP and SL agricultural products. It has the biggest coefficient compared to other determinants. The empirical results disclose that the China's income (GDP) has a positive and statistically significant impact on increasing the growth of export for the EHP and SL commodities in the long-run, but there are no significant impacts on both in the short-run.

From the foregoing explanation of findings in this chapter, it is concluded that the growth of Indonesian agricultural exports to China for the EHP and SL commodities depends on the variables examined in both the models albeit to different degrees. As the EHP and SL consists of a bunch of agricultural commodities, more detailed examination of every single commodity under the EHP and the SL schemes will be employed in the next chapter. This will be done to identify the kind of commodities that have actually experienced growth by measuring their comparative advantages under these schemes.

Chapter 6

Has the ASEAN-China Free Trade Agreement Increased Competitiveness of Agricultural Exports From Indonesia to China?

6.1 Introduction

The establishment of the ACFTA has an objective to increase trade between its members as well as to improve the competitiveness of the commodities traded under such agreement (ASEAN 2004). These objectives are pursued by Indonesia by joining this agreement. As a country with abundant agricultural resources to be exported, it is expected that this agreement can improve market access to China's market, increase trade flow as well as the competitiveness of agricultural products.

With the proliferation of free trade agreements, it has become critical for countries to ensure that their products are competitive enough to capture their share of trade in a global market. As a result, it is necessary to grasp the concept of comparative advantage as a measurement to analyse the trade pattern and competitiveness of the commodities in penetrating a new market. With regard to this study, this analysis is concerned with precisely this matter of ascertaining the competitiveness of Indonesian agricultural products in their efforts to penetrate China's market under the ACFTA.

In relation to the measurement of the influence of the ACFTA, Chapter Five presented the mixed empirical results from the examination of the impacts of the ACFTA programs to increase the growth of pertained agricultural commodity exports from Indonesia to China. The agricultural products' export growth has different responses on the trade facilitation under the ACFTA. Thus, for comprehensive measurement, it is important to investigate the impacts of the ACFTAfrom a point of view of their competitiveness.

As the exports in the previous chapter were treated as groups of commodities under the EHP and Sensitive track, it is important to separate the groups into single commodities to identify the commodities that have responded well to the agreements from the view of the competitiveness and those that have failed to do so.

This chapter aims to convey the analysis of the impact of the ACFTA on relative competitiveness of Indonesian agricultural products export to China. This is related with the specific objective III): 'to examine the impact of the ACFTA programs on the competitiveness of agricultural commodities traded between Indonesia and China.' The objective is derived from research question II: 'Do efforts to improve agricultural trade, such as joining a free trade agreement, have a significant impact on the growth of exports and competitiveness of the commodities?'.

6.2 Literature Review

6.2.1 *Concept of Agricultural Competitiveness*

Increasing global competition and growing openness of national economies generated the importance of international competitiveness for enhancing trade and economic growth and standards of living (Wahyuni & Kee 2008). This concept is often used to evaluate the macroeconomic performance of a country (Rachman 2005). OECD glossary of the statistical items defines competitiveness (in international trade) as a measure of a country's advantage or disadvantage in selling its products in international markets (OECD 2009). According to Porter (1998), the meaning of competitiveness at the national level is national productivity, while Hawkins (2006) describes competitiveness as the ability of a country to increase its share of the domestic and export market. All this implies that the issue of competitiveness is the key factor in the present trading system. Thus the government, has to, somehow, build competitiveness in agriculture as well as other sectors or the country will lose its opportunity to capture the maximum benefit resulting from trade liberalization.

Competitiveness is a relative measure (Esterhuizen 2006). The analysis of competitiveness differs greatly and depend on what sectors of the economy is being examined, whether they are individual, firm level, sector level and whole economy level (Drescher & Maurer 1999; Frohberg & Hartmann 1997; Porter, M 1990). Thorne (2005) analyses the competitiveness of cereal production in selected EU countries during 1996 to 2000 using strategic management theory. Profitability was selected as a measure of competitive performance and cost of production, value of output and partial productivity indicators were examined as possible sources of competitive

performance. Indicators based on absolute production and market share give little information on the competitive position of a product, sector, or supply chain in an economy, so indicators that compare one sector relative to others should be considered instead. Success in export markets, measured by rising market share, is an indicator of an economy's level of global integration (Nabi & Luthria 2002). However, success in export markets needs to be interpreted carefully. For instance, the loss of some market share in trade may not signify loss of overall competitiveness, especially when there is a rising share of other products signalling an upward movement in the value chain. A proper picture of competitiveness requires specifying the relevant market shares, the cause of changes in shares and the changes that are desirable for national welfare.

The competitiveness measures of agricultural products in this study will be examined by their comparative advantage. Pappas et al. (1994) explain that comparative advantage is a central concept in conventional neoclassical international trade theory. They define comparative advantage as the ability of a country to produce a commodity at a relatively low price on the basis of factor endowment and price prevailing in a pre-trade situation. This differential ability arises from relative differences in resource endowments, preferences and tastes. Therefore, comparative advantage is defined not only in terms of the assumptions of pure competition, but also in term of pre-trade relative prices. Also, the range of technologies made available via adaptive research and development investments to suit different relative factor scarcities destabilizes comparative disadvantage (Alston, Beddow & Pardey 2009; Hayami & Ruttan 1985).

The classical theory of comparative advantage predicted that gains from exchange, maximizethe welfare and free trade would lead to world economic prosperity. The notion of comparative advantage as a determinant of international trade was popularized by Ricardo (1891). He evokes factor endowments on physical and natural influences to describe how a country specializes in production of those goods that it produces most efficiently, and resorts to the import of goods otherwise. Thus, as long as the opportunity cost of one good differs across different regions, each country has a different comparative advantage in the production of goods. Agriculture has declined in the process of globalization as industrialization with other sectors, such as mining, manufacturing or services, experience expanded export-led trade (Anderson, K 1987; Corden 1984). According to Eifert, Gelb and Ramachandran (2005), comparative advantage in the

agricultural sector can vary depending on many determinants: factor endowment, which can change substantially as the economy grow at varying rates; difference in productivity and costs which are determined by business environment, infrastructure and institution; difference in technologies that can influence the supply side of the market; difference in preferred tastes that may alter the demand side; and dynamic economies of scale in which newcomers may lose out to existing players for market access.

In practice, researchers mostly use Ballasa's Revealed Comparative Advantage to measure comparative advantage. Following(Balassa, B 1965, 1978, 2008), a country's relative export performance in individual product categories reflects its 'revealed' comparative advantage (RCA). Technically, the doctrine of RCA argues that if a country's share in world exports of a particular good is greater that its overall share in total world exports, then the country has an RCA in exporting that good. In other words, if a country can produce a good at a lower relative cost than other countries, then that country should devote more of its scarce resources to the production of the goods for international trade. Through trade, that country can obtain other goods at a lower price (opportunity cost) in exchange for the good in which it has a comparative advantage.

The most famous and extensively cited literature in this area is a research conducted by Vollrath (1988) who analyses international competitiveness in agriculture. He observes that the pattern of agricultural competitive advantages of high-income countries showed an increasing trend, while the competitiveness of low-income countries showed a declining trend and middle-income countries experienced little change. Other researchers examine the comparative competitiveness in the agricultural sector in specific regions or countries. Estherhuizen (2006) and Edwards and Schoer (2001) applied this method on the competitiveness of export commodities in African countries.

A great deal of research has also been done on the impact of establishment of free trade agreements on the comparative advantage of certain industries or commodities. Abidin and Loke (2008) examine the revealed comparative advantage of Malaysian exports in the manufacturing sector and find that this is shifting manufacturing source-based to resource-based manufactured exports. Banterle and Carraresi (2006) use several trade competitiveness indices, such as RCA, the Vollrath Indices, Net Export Index and Grubel-Lloyd index, to assess the comparative

advantage of the prepared meat sector in EU countries. The result shows that the implementation of the free trade agreement has different impacts for the member countries, where Italy, Spain, Ireland, Austria, Germany and France have positive competitive performance while Denmark, Belgium and the Netherlands have negative competitive performance. Thorne (2005) analyses the competitiveness of cereal production in selected EU countries during 1996 to 2000 from the point of view of strategic management theory. Profitability was selected as a measure of competitive performance and cost of production, value of output and partial productivity indicators were examined as possible sources of competitive performance.

6.2.2 *Competitiveness of Commodities under the ACFTA*

The literature on the competitiveness of exported commodities under the ACFTA, especially agricultural products, is available although there are too few. They mainly concentrate on the grouping of the commodities based on the Standard International Trade Classification (SITC) or Harmonized System (HS) codes in general. These focus on the comparative advantage of a country to the world. There are only a few that concentrate on the comparative advantage in bilateral trade, especially for agricultural commodities. Based on the measurement technique, the previous literature will be discussed in the following section.

a. Comparative Advantage: Trade Intensity Index Approach

Trade Intensity index can provide the measurement of the nature and importance of secular changes in bilateral trade flows. The intensity of trade refers to a tendency from two countries to trade more or less heavily with each other based on factors such as their global importance in world exports and imports. The measure has been used since the 1960s in numerous analysis of the direction and level of international trade, for example Kojima (1964), Drysdale and Garnaut (1982), and Anderson, K (1983). Specifically, this index can highlight the relative importance (seemingly minor) changes in trade between countries that have relatively small shares in global trade. If the trade intensity index takes a value above unity, the countries have greater bilateral trade than would be expected based on the partner's share in world trade. When computed for a single point in time, the measure is of limited utility because it does not incorporate the influence of factors such as distance and languages on trade. However, analysis of changes in this index

over time can show whether two countries are experiencing an increased or decreased to trade with each other (Yeats 1998).

The literature shows the findings on comparative advantage are vary. By using the trade intensity index, Yeats (1998) shows that in Mercosur's intra-trade, the most rapidly growing products are generally goods in which members do not have a comparative advantage and have not been able to export competitively to outside market. In his study in countries in Pacific rims, Anderson, K (1983) finds that Japan has a strong and increasing comparative disadvantage in food vis-à-vis manufacturing, while the resource-rich developed countries have maintained a strong comparative advantage in food despite increases in their manufacturing comparative advantage. Thailand, Philippines has retained their strong comparative advantage in food; Malaysia has increased its comparative advantage in food; while Indonesia has reduced its comparative advantage in food as petroleum exports has expanded. In agricultural commodities, the Southeast Asian countries have comparative advantage prominently in timber, rubber and sugar rather than food staples. Widyasanti (2010) used the export intensity index to examine the comparative advantage of Indonesian commodities exports in ASEAN countries under the AFTA circumstances. Her result shows that Indonesia has increasing export intensity index to the ASEAN countries which means that AFTA has helped Indonesia to export more to other ASEAN countries. It can be concluded that export intensity of Indonesia is continuously increasing. Other ASEAN countries, such as Malaysia, Singapore and Thailand has also been experiencing an increase of export intensity index under the AFTA auspices.

Several studies on the comparative advantage of commodities under the ACFTA program have different results. Several methods are used in measuring the comparative advantage. In terms of implementation of ACFTA, Widyasanti (2010) argues that exports intensity of Indonesia to China is increasing for the commodities of ores, slag and ash (HS code 26), foodstuffs, footwear, metals, mineral products, plastics and rubber, and skin/leather products after the implementation of ACFTA. In addition, the share of mineral fuels, oils and product, and animal/vegetable fats and oil are increasing from 26.1 per cent and 12.8 per cent in 2004 to 39.2 per cent and 18.2 per cent in 2008. This structure of commodities is slightly changes compare to the commodities exported to China before the implementation of ACFTA. Before ACFTA, wood and wood articles were among the top ten export commodities to China.

Shohibul (2013) investigates the comparative advantage of trade between ASEAN countries and China for primary and manufactured products under the ACFTA, to find that the comparative advantage for food and animals (SITC 0), beverages and tobacco (SITC 2) is negative for all countries. Inedible crude materials have a negative comparative advantage for China, Malaysia, the Philippines and Singapore while it is positive for Indonesia and Thailand. It seems that trade specialization advantage also existsin Indonesia, Malaysia and Singapore, while disadvantage appeals for China, the Philippines and Thailand for the inedible crude materials. Indonesia and Malaysia have a comparative advantageofproduct groups of mineral fuels, lubricants and related materials (SITC 3) and, animal and vegetable oils, fats and waxes (SITC 4), while Singapore has comparative advantage in SITC 3 and the Philippines in SITC 4. Indonesia also has comparative advantage in chemical and related product groups (SITC 5) and manufactured goods classified chiefly by material (SITC 6), however, Indonesia has a comparative disadvantage in machinery and transport equipment (SITC 7) and miscellaneous manufactured articles (SITC 8).

Yunling (2010) argues that the implementation of the EHP will promote the growth of China's export products with comparative advantage. Bappenas (2009) compares the revealed comparative advantage between Indonesia, Malaysia and China over the period 2000-2006 for agriculture, mining and manufacture sectors. The number of Indonesian products with RCA>1 remained steady in the case of agriculture, but increased in the mining sector and decreased in the manufacturing sector. For Malaysia, revealed comparative advantage is increasing in manufacturing sector, especially for medium-technology products. In contrast, China has a very high share of products with comparative advantage in almost all sectors far exceeding the equivalent Figures for Indonesia and Malaysia. More than 45 per cent of its products have more than one RCA, but most of them are in the low-technology group. This situation shows China as main competitor in the region.

Tambunan (2010) analyses the relative competitiveness of agricultural commodities from the ASEAN countries and China under ACFTA by calculating the RCA index. The findings reveal that Thailand and China are more competitive than Indonesia in vegetables. In the Chinese market, it is difficult for vegetables from Indonesia to compete with vegetables from a local source and Thailand. For fruits, Indonesia may face no difficulties in competing with local fruits, but has to face competition from the Philippines. Indonesia is the leading country for live

animals and its level of competitiveness is the same as China in this category, however, it seems to be deteriorating. Indonesia has the strongest competitiveness in fish. This study covers only the HS 01-08 covered in the EHP scheme. As the EHP has also covered the extended commodities agreed bilaterally with Indonesia and China's government, thus more expanded study is needed to examine the impact of the EHP.

The measure of the RCA provides insight into the static competitiveness of commodities through a comparison of the share of the commodity in domestic exports with that of the world as a whole. The indicator is, however, less suitable for the analysis of changing competitiveness over time. As a result, various attempts have been made to either create composite or 'dynamic' RCA indicators (Valentine & Krasnik 2000) or to deconstruct changes in domestic share of world trade (Tsikata 1999). The next section describes the idea behind the model of dynamic revealed comparative advantage (DRCA).

b. Dynamic Revealed Comparative Advantage Approach

The dynamic comparative advantageportrays the comparative advantage from dynamic point of view. Although some products may not constitute a large share of exports in a country, there are several reasons to identify dynamic products in exports (Valentine & Krasnik 2000). First, if above-average growth in these products continues for an extended period, these items may eventually become an important source of a country's export earnings. In addition, if the dynamic products have specific production characteristics, this could also convey important information on export opportunities in relation to other similar goods. Finally, there is an obvious interest in identifying dynamic products to focus future multilateral or bilateral negotiation on removal of trade barriers on such products in export markets.

The advantage of using the dynamic RCA as described by Widyasanti (2010)is to identify dynamic products on the basis of their growth rate of RCA over a given period. In addition, DRCA is more informative than static RCA in explaining the competitiveness of export products.

Furthermore, DRCA has an additional function asmarket share indicator that measures market share positioning (Estherhuizen 2006). This is able to provide information on product positioning in the export destination countries, according to some criterias that cluster products in different

positions in the market. A country's firms and industries are considered as 'competitive' in products in which their market shares are on the rise. Therefore, DRCA is more useful than traditional RCA, particularly if the study is going to identify the market position of the export products. The combination of market attractiveness and business strength attributes to position the product in question into one of these six categories: 'Rising Star' (RS), 'Falling Star' (FS), 'Lagging Retreat' (LgR), 'Lost Opportunity' (LO), 'Leading Retreat' (LdR) and 'Lagging Opportunity' (LgO).

The DRCA is a modification of static RCA, and it is currently not as commonly used as static RCA. Some researchers have used the DRCA, for example, Edwards and Schoer (2001), examine the competitiveness of the commodities in South Africa, and Widyasanti (2010) examine export competitiveness of Indonesia. In Indonesia's case, Bappenas (2009) has employed the DRCA to measure the competitiveness of Indonesian exports commodities in the world market; and also identifies the position of the Indonesian export products dynamics in world market for agricultural, mining and manufacturing sectors. Of the total 4,930 products identified, 4.77 per cent are classified as 'Rising Star', 13.89 per cent as 'Falling Star', 21.42 per cent as 'Lost Opportunities', and 59.92 per cent as 'Retreat' products. The agricultural commodities that are categorized as 'Rising Star' are at 2.0 per cent, while 14.5, 13.8, and 69.6 per cents are grouped as 'Falling Star', 'Lost Opportunities' and 'Retreat' commodities.

Another study in Indonesia by Widyasanti (2010) implements this method to examine Indonesian export commodities to China under the ACFTA. Widyasanti (2010) examines the DRCA of Indonesian exports under the ACFTA for 2000 to 2006. She categorizes all of exports commodities into 16 groups, including animal/vegetable oils, foodstuffs, and vegetable and animal products. Widyasanti reveals that Indonesia has superior commodities for export in the groups of minerals, plastics and rubber, and footwear which are categorized as 'rising star' products in the DRCA. On the other hand, animal/vegetable oils and foodstuff are categorized as 'lagging opportunity' products, live animals and animal products along with vegetable products are in the group of 'lagging retreat'.

c. Market Share Index Approach

The other competitiveness measure that has been largely used in the literature is the market share index. Along with other global studies, studies on the ACFTA using this measure have been conducted by Chakraborty and Kumar (2012) and Widyasanti (2010). Chakraborty and Kumar (2012) analyse the market penetration of ASEAN members in China's market and vice versa. Their finding shows that the export shares of ASEAN countries in China's trade basket are relatively higher during 1995 to 2010, especially in Indonesia, Malaysia and Vietnam, while for the other countries the export shares look stable. Furthermore, their result presents that the trade balance of ASEAN countries in the China's trade view tends to be positive for Brunei, Myanmar, Singapore and Vietnam, and negative trade balance for the rest of ASEAN members. Nonetheless, the shares of ASEAN countries' trade in China market are very small, even after the implementation of the ACFTA.

Widyasanti (2010) examines the market share of Indonesian commodities in China's market and finds that eight groups of commodities are increasing their market share. Among these groups, only the animal/vegetable oil and foodstuff have increased market share while vegetables have a stable market share and animal products have decreased market share. This study does not mention the specific program of the ACFTA to which these commodities are related, thus it is hard to say the exact impact of the ACFTA programs since the ACFTA have specific agricultural commodities under its program.

6.2.3 *Gaps in Literature*

Studies focused to examine the competitiveness of the agricultural commodities under the ACFTA have been explained in the previous section. However, there are several shortcomings or gaps in these studies. First, these studies do not analyse the competitiveness of products under the specific regulatory mechanisms of the EHP or the SL under the ACFTA programs that these agricultural commodities are related to. Since all agricultural commodities are not covered in the agreement, and every program under the ACFTA has specific agricultural commodities, it is important to identify the impact of specific ACFTA programs on related agricultural commodities. Second, while the EHP has generic commodities of HS code 01-08 under its scheme, the EHP scheme has also expanded the commodities under its scheme depending on the bilateral agreement between China and each ASEAN country. For the Indonesia-China

agreement, there is no study that examines the competitiveness of the extended agricultural commodities. Third, the ACFTA has other programs outside the EHP program which are very hard to find in studies in this area, especially in the agricultural export competitiveness. These reasons motivate this research to fill up these literature gaps.

6.3 Methodology

Considering the various methods implemented in previous studies, a range of methods will be employed in this study to analyse the competitiveness of agricultural export of Indonesia under the ACFTA auspices. The methods of RCA and DRCA used to examine the agricultural export competitiveness were briefly reviewed in the previous section in terms of their significance and relevance, but this section explains the construction of estimation models with these methods.

6.3.1 *Comparative Advantage from Trade Intensity View*

Comparative advantage is an important concept central to economic theory. A better understanding of how it pertains to the actual world is useful for identifying the consequences of policy shifts and clarifying economic welfare. The aggregate comparative advantage can identify the overall direction and thrust in which a country's investment and trade should take in order to exploit international differences in product and factor supply and demand. On the other side, disaggregated measured of comparative advantage may be used to evaluate socially desirable specialization patterns along narrow product lines (Vollrath,1991)

Balassa (1965) explores to determine patterns of comparative advantage. Balassa contends that comparative advantage can be "revealed" through examination of real world country/commodity trade patterns because actual exchange reflects relative costs as well as differences in non-price factors.The concept of revealed comparative advantage relates to the relative trade performance of individual countries in particular commodities (Balassa, B 1977, 1979, 1986). This is assumed to reveal the comparative advantage of the trading countries on the assumption that the commodity pattern of trade reflects the inter-country differences in relative costs as well as non-price factors. The factors contribute to movements in revealed comparative advantageoreconomic-structural change, improved world demand and trade specialization. The revealed comparative advantage measures the competitiveness of a commodity by comparing a

country's share of the world market for the commodity to its share of all traded goods. The country is said to have a comparative advantage in that commodity if the RCA index exceeds 1, this means that the commodity is more important for the country's exports than for the exports of the reference countries.

The primary role of the revealed comparative advantage is to quantify the commodity-specific degree of comparative advantage, rank countries by the degree of comparative advantage and provide a distinction between countries that enjoy a comparative advantage in some commodities and those that do not(Buckley, P.J., Pass and Prescott (1988). Furthermore, revealed comparative advantage can be employed to analyse shifts in comparative advantage, trade patterns and structural adjustment in individual industries, countries and regions (Chow, P, Kellman & Shachmurove 1994; Rana 1990; Yamazawa, Hirata & Yokota 1991).

Revealed Comparative Advantage (RCA) is comparative advantage indicator derived from real world post-trade observations. The properties of various revealed comparative advantage indexes intended to approximate actual comparative advantage have been analysed by many economist including Hillman (1980), Bowen (1983), Ballance, Forstner and Murray (1985), Yeats (1985), and Vollrath (1991).

One of the alternatives of the RCA is proposed by Kunimoto (1977). Heprovides a foundation from which to evaluate trade intensity indexes. His formula is equivalent to the ratio of actual-to-expected trade. In an attempt to provide an intuitive economic interpretation, Kunimoto focuses on a specific index characterizing trade between two countries, i and j. This measure is called the geographical intensity index. This index measures bilateral trade intensity relating one country's exports to another country's imports. It is not a measure of global trade intensity or revealed comparative advantage.

Kunimoto (1977, p.16) observes that impediments and inducements to international trade can be conceptually divided into two categories: 'those which influence the levels of total exports and imports of the countries in the world and those which influence their geographical distribution".

Kunimoto hypothesizes a world in which there is no geographical specialization of international trade. In such a hypothetical world, factors which affect the direction of world trade are absent. He reasons that when countries' trade are distributed according to their partners' shares in world trade, deviations of trade intensity index from unity identify the presence of factors which

influence the direction of international trade flows among countries without affecting the levels of trade of the countries in the world.

Global trade intensity indexes of the RCA type can also be cast within the actual-to-expected trade framework. Numerous factors promote or hamper country trade with the rest of the world of a specified commodity. It is helpful to categorize impediments and inducements of country trade with the world into two categories, one which includes the real economic determinants of comparative advantage and the other which contains determinants such as imperfect information and government interference that skew and distort the market causing actual trade market to depart from optimal patterns. To the extent that fundamental economic forces of supply and demand dominate distortionary influences, global revealed comparative advantage intensity measures reflect actual comparative advantage (disadvantage).

Trade intensity is an index of bilateral trade intensity relating to another country's imports. It measures whether or not a country exports more to a given destination than the world does on average. The expression is defined by the following equation:

$$TII_{ij} = \frac{\frac{X_{ij}}{X_{iw}}}{\frac{M_{wj}}{M_{ww}}}$$

where X_{ij} is the dollar value of exports of country/region i to country/region j, X_{iw} is the dollar value of the exports of country/region i to the world, X_{wj} is the dollar value of the world imports to country/region j, and X_{ww} is the dollar value of world imports. An index of more than one indicates that trade flow between countries/regions is larger than expected given their importance in the trade or it indicates a comparative advantage in the trade of the commodities.

This study will employ this formula to measure the comparative advantage of the agricultural exports commodities from Indonesia to China under the ACFTA auspices. Thus the $X_{ij}$is certain agricultural commodities export values from Indonesia to China, X_{iw} is the agricultural commodities export values from Indonesia to the world, X_{wj} is the import value of the agricultural commodities from the world to China and the M_{ww} is the value of agricultural commodities in world market. There are only commodities including in the ACFTA program that will be observed. The data is obtained from the UNComtrade website.

6.3.2 *Dynamic Revealed Comparative Advantage*

A useful extension of the simple export market share indicator provided by DRCA is market positioning. This method measures the market positioning of a country's product in a certain destination. Thus, it is capable of comparing export performance among countries. While the RCA shows the level of static comparative advantage for commodities by comparing the share of commodities in the domestic market destination with that of the world as a whole, the DRCA presents the change in comparative advantage over time. An export product is considered 'dynamic' in world trade if its market share is growing faster than the world average. In a matrix of the share of a product in world trade and the share of exports in world trade of the specific products, market position relates product-level market shares to the dynamism of exported products in world trade in an attempt to indicate how a country is positioned for growth in the world market.

Valentine and Krasnik (2000) provide a positioning matrix scenario to analyse the competitiveness of the products under evaluation. With this matrix, the position of the commodities in country's destination export market is categorized into six different ranks. The combination of market attractiveness and business strength attributes position the product in question into one of these six categories. These are RS, FS,LgR, LO, LdR and LgO. The positioning matrix is given in Table 6.1.

Table 6.1 Positioning Matrix of Export Competitiveness

	Share of product in a country's export		**Share of product in world's export to country's destination**	**Position**
Increasing RCA	⇧	>	⇧	Rising stars

	⇧	>	⇩	Falling stars
	⇩	>	⇩	Lagging retreat
Decreasing RCA	⇩	<	⇧	Lost opportunity
	⇩	<	⇩	Leading retreat
	⇧	<	⇧	Lagging opportunity

Source: Valentine and Krasnik (2000)

The DRCA matrix consists of market attractiveness and business-strength information.The former is calculated on growth in demand for a product in certain market destination, while the latter is measured based on growth in the country's market share of a particular market destination.

$$DRCAj = \frac{\Delta RCA_j}{RCA_j} = \frac{\Delta\left(\frac{X_{ij}}{\sum_j X_{ij}}\right)}{\frac{X_{ij}}{\sum_j X_{ij}}} - \frac{\Delta\left(\frac{X_{wj}}{\sum_j X_{wj}}\right)}{\frac{X_{wj}}{\sum_j X_{wj}}}$$

Where:

$DRCA_j$= dynamic RCA index

X_{ij} = export of commodity j of Indonesia to destination country (China)

X_{wj}= exports of commodity j of world to destination country (China)

The first term of the right hand side refers to the export share of commodity j in the reporting country's total export to the destination market. The second term reflects the growth in share of commodity j in world trade.

The ideal market positioning is to have the highest share of exports as 'rising stars', signifying that the country is gaining market share in fast-growing products. 'Lost opportunity' is the least desirable as it is correlated with decreased market share in dynamic products despite the country's strength in these products. 'Falling stars' are also undesirable, although less so than lost opportunity, since market shares are rising, even if not in dynamic products. Meanwhile, 'retreat' may be undesirable or desirable depending on whether the movement is away from stagnant products and towards growth in dynamic products.

In this analysis, growth is calculated based on mean annual growth in the periods 2000 to 2004 and 2005 to 2011 to compare the index before and after the ACFTA commencement. For example, if a commodity's share in Indonesian export is rising faster than its share in world export, the commodity's position is categorized as a 'rising star'. On the contrary, a particular commodity is categorized as a 'falling star" if Indonesia has specialized in the commodity that is diminishing in importance in international trade (falling denominator).

6.3.3 *Market Share Index*

Another tool to examine the competitiveness of agricultural commodities exports is the market share Index. Siggel (2006) states that competitive analysis can be conducted from a productive approach and a market approach. In the market approach, one of the most common measurements is that of the market share (Fagerberg 1988; Hatsopoulos, Krugman & Summers 1988; Török 2008). The market share effect shows that the country's export growth is caused by an increase in market destination imports. The market size effect results from a shift in world demand (Tyszynski 1951). When a country has a greater market share or experiences an increase in market share, it can be inferred that the country is competitive with regard to the product in a certain period and area.

In this study, the market share index is used to analyse the source of growth of agricultural exports from Indonesia to China vice versa. This method analyses exports as a share of the entire imports of the destination country. From this, it can be seen the proportion of exports occupying the market. The formula of this method is defined as:

$$MS_{ij} = \frac{X_{ij}}{M_j} \times 100\%$$

Where:

MS_{ij} = Market Share of country i in country j

X_{ij} = Exports of country i to country j

M_j = Imports of country j

6.3.4 *Data*

The export agricultural data used in this chapter are retrieved from the UNComtrade based on current price data. Because of limitations in the availability of the data, the analysis only covers annual data from 2000 to 2012. The commodities investigated in this chapter are those included under the Early Harvest Program (EHP) and the Sensitive Track (SL). However, not all of the commodities under these programs are examined in this research, and the analyses only extend to those commodities that are highly treatable between two countries. These commodities in focus are considered to be representative agricultural products under the EHP and the SL programs.

The commodities under the EHP include products under HS 01 (live animal), HS 02 (meat and edible meat offal), HS 03 (fish), HS 04 (dairy products), HS 05 (other animal products), HS 06 (live trees), HS 07 (edible vegetable), and HS 08 (edible fruits and nuts). Specific agricultural products under the EHP cover eight products that are grouped into four groups: HS 1513 (vegetable oil), HS 90122 (roasted coffee), HS 151620 (vegetable fats and oils and their fraction), and HS 151790 (edible prepared fats, oil). HS 1513 consists of crude coconut oil (HS 151311), crude palm kernel (HS 151321), palm kernel or babassu oils (HS 151329). However, the data for HS 90122 (roasted coffee) could not be collected as it was unavailable, so it is excluded from this research.

The agricultural products under the Sensitive track programs include HS 200820, HS 151110 and HS 151190. The Sensitive track products will be represented by processed pineapples (HS 200820) which consist of pineapples in containers (HS 20082010) and pineapples prepared (HS 20082090), crude palm oil (HS 151110) and palm oil excluding crude and liquid fraction (HS 151190). These commodities are chosen because of their high export values.

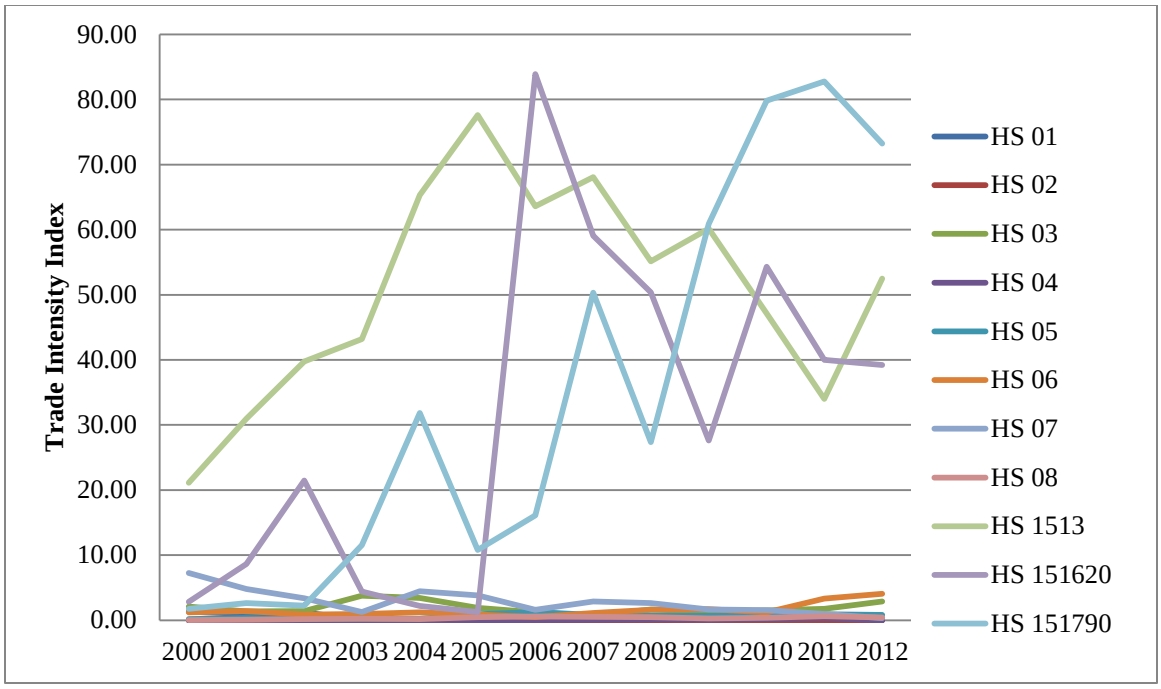
6.4 Empirical Results and Analysis

This section provides empirical results regarding the competitiveness of agricultural exports from Indonesia to China under the auspices the ACFTA. This study examines the impact of the competitiveness of Indonesian exports before and after joining ACFTA. It also investigates the impact on agricultural exports, which have tariff reduction facilities and those that do not. This study is different from previous studies as it is dedicated to exploring the impact of the programs under the auspices of the ACFTA on certain agricultural products that are listed under the EHP and SL programs. In this case, there will be a comparison of comparative advantage between agricultural products under the EHP and the Sensitive track (SL). The first two parts present the result and analysis of the RCA estimation for EHP and SL agricultural exports from Indonesia to China respectively. The next two subsections discuss the result and analysis of the DRCA estimation for EHP and SL agricultural exports from Indonesia to China. The final analysis will discuss the results from the measurement of market share index for both EHP and SL groups together.

6.4.1 *Trade Intensity Index for the EHP Commodities*

By exercising the trade intensity index (TII) on the exported agricultural products from Indonesia to China, the comparative advantage of the commodities can be measured. Thus the impacts of the EHP on agricultural competitiveness can be revealed. The TII is defined as the ration of a particular commodity's share in a country's exports to that commodity's share in country's trading partner share in the world. The more a ratio exceeds (is less than) unity, the stronger a country's apparent comparative advantage (disadvantage) in that commodity in partner's country. It means that the country has greater bilateral trade than would be expected based on the partner's share in the world. The trade intensity index measurement results for the agricultural commodities included in the EHP scheme for 2000 to 2012 are shown in Figure 6.1.

Figure 6.1Trade Intesity Index for the EHP Products for Period 2000-2012



Source: (UNComtrade 2013) calculated by author

As explained previously, a commodity has comparative advantage in the market if the TII if the index is more than 1, than Indonesia has greater bilateral trade than would be expected with China compare to China's share in the world. From this graph, it can be seen that among these commodities, there are three commodities under the EHP have very high of the TII Index along the period 2000 to 2012 including vegetable oils (HS 1513), vegetable fats and oils and their fraction (HS151620), and edible prepared of fats, oil (HS 151790). They show a very high improvement in their TII indices. Although Indonesia already had some comparative advantage in these commodities in the 2000s, Indonesia had a very strong comparative advantage in China's market in 2012. This means that for those commodities, Indonesia has greater bilateral trade with China and increasing exports to China under the ACFTA auspices. These commodities have a strong growing TII index, as shown in Table 6.2.

Table 6.2 Trade Intensity Index for Indonesia's Agricultural Exports of EHP to China

Indonesia's Agricultural Exports of EHP to China											
Year	HS 01	HS 02	HS 03	HS 04	HS 05	HS 06	HS 07	HS 08	HS 1513	HS 151620	HS 151790
2000	1.29	0.00	2.12	0.01	0.21	1.23	7.24	0.04	. 13	2.82	1.76
2001	0.95	0.00	1.39	0.09	0.33	1.43	4.82	0.11	30.95	8.62	2.63
2002	1.23	0.01	1.41	0.00	0.21	0.86	3.36	0.19	39.77	21.48	2.27
2003	0.02	0.00	3.80	0.01	0.21	0.99	1.25	0.23	43.17	4.43	11.53
2004	0.16	0.00	3.43	0.00	0.25	1.22	4.44	0.20	65.30	2.18	31.82
2005	0.03	0.00	1.92	0.01	0.93	0.90	3.80	0.47	77.62	1.27	10.78
2006	0.33	0.00	1.22	0.04	1.26	0.50	1.59	0.56	63.61	83.91	16.13
2007	0.06	0.00	0.68	0.07	0.84	1.14	2.87	0.52	68.06	59.05	50.31
2008	0.05	0.00	1.66	0.12	0.72	1.62	2.63	0.47	55.14	50.37	27.39
2009	0.02	0.02	1.32	0.07	0.68	1.72	1.65	0.27	60.16	27.61	60.87
2010	0.03	0.03	1.50	0.21	1.08	1.23	1.58	0.38	47.13	54.32	79.80
2011	0.02	0.01	1.75	0.35	0.93	3.34	0.96	0.64	33.98	39.98	82.76
2012	0.03	0.01	2.91	0.01	0.84	4.07	0.31	0.41	52.50	39.19	73.23

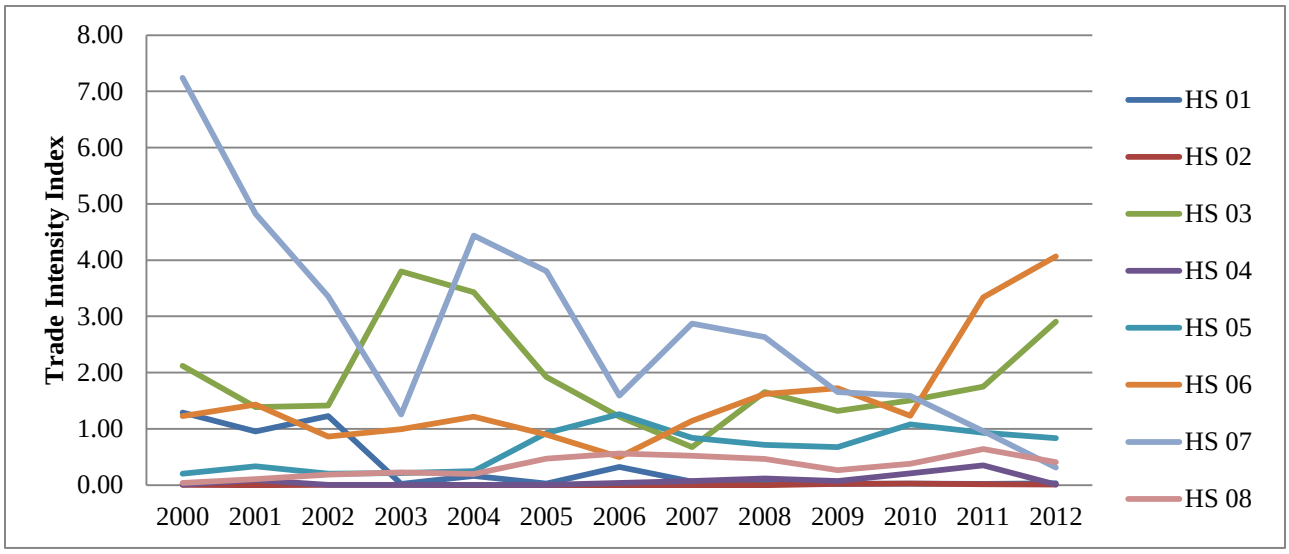
Source: UN Comtrade (calculated by author)
Note: Red signs increasing TII

In 2000, these commodities were already competitive with the TII index for HS 1513 is 13, HS 151620 is 2.82 and HS 151790 is 1.76. In 2005, the index for HS 1513 reached its peak at 77.62, a big increase from 43.17 in 2003; after that it declined and achieved 52.50 in 2012. A similar trend is also discernible for vegetable fats and oils (HS 151620) for which trade intensity indices rose significantly in 2006, the index has been sharply climbing to 83.91 but then it decreased slowly to 39.19 in 2012. Similarly, the TII for HS 151790 got its first peak in 2007 by 50.31. This index has been continuously increasing and in 2012, it reached 73.23. This means that Indonesia has greater trade than it is expected with China.

The most striking growth in comparative advantage appears for edible prepared fats or oil products (HS 151790) with momentous growth of TII index from 1.76 in 2000 to 73.23 in 2012 while its first peak was at 2007 by 50.31 bounced from 1,613 in 2006. This shows that Indonesia dominates the exports of vegetable oils to China.It seems that the implementation of the EHP is likely to have significant impacts on improving the Indonesia's export to China's market for these three commodities.

The contrasting condition occurs for the rest of the commodities that have a very low index. They are mostly agricultural commodities under HS 01-08 commodities. To get a more detailed picture of the trade intensity index for these commodities, Figure 6.2 displays the TII for agricultural commodities under HS code 01-08. This graph presents that of these commodities have comparative advantages in China's market as their trade intensity index are more than 1, including fish (HS 03) and live trees (HS 06), although the index for HS 03 remains stable over-time.

Figure 6.2 Trade Intensity Index for EHP Agricultural Commodities under HS 01-08 for Period 2000-2012



Source: UNComtrade (calculated by author)

Furthermore, the implementation of the EHP appears to have no impact on those commodities. In fact, live animal exports (HS 01) from Indonesia to China or perhaps even falling in terms of their comparative advantage. In the 2000s, Indonesia had a comparative advantage for this commodity in China's market with the trade intensity index of more than 1, however, the trade intensity has been decreasing sharply in recent times to reach 0.03. This result is consistent with Tambunan (2010) who finds a decreasing comparative advantage of live animals from Indonesia.

Indonesia did not have a comparative advantage in China's market for meat and edible meat offal (HS 02) and dairy products (HS 04) at any time during the same period. There is practically no export of these commodities from Indonesia to China even though the EHP has facilities to

improve these exports. It is likely that Indonesia has a very weak positioning in the animal farming sector for exports. As such, Indonesia has no comparative advantage of other animal products (HS 05). Even though there is a slight increase in the trade intensity index after the implementation of the EHP, it is not enough to bring comparative advantage for this product. This means that the export of such Indonesian commodities is less than expected.

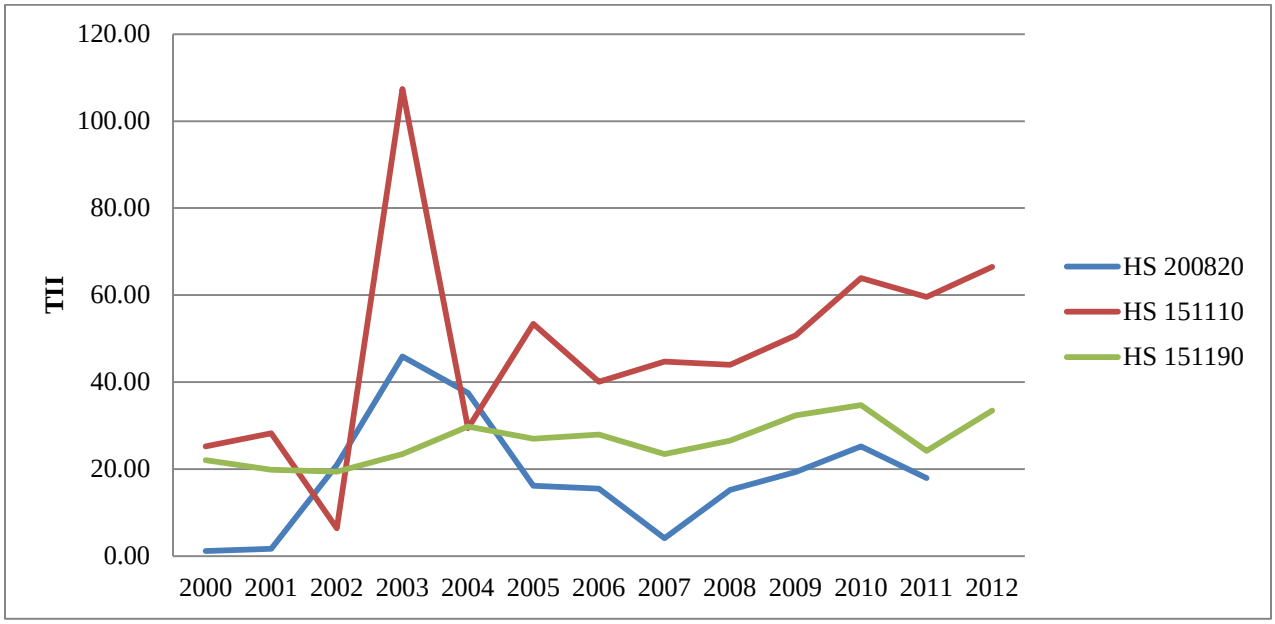
Edible vegetables (HS 07) have a very strong TII in the 2000s, but the comparative advantage has dropped significantly since 2010 and Indonesia does not have a comparative advantageof this product in China any more. The EHP has not been able to lift its comparative advantage back. The EHP has also no significant impact on creating a comparative advantage for edible fruits and nuts.

This implies that Indonesia has no comparative advantage in China's market for these commodities with trade intensity indices under 1, such as, live animals (HS 01), meat and edible meat offal (HS 02), other animal products (HS 05), edible vegetables (HS 07) and edible fruits and nuts (HS 08). Although the EHP has been employed to improve these exports, the effort has not strong enough to lift their export intensity to China.

6.4.2 *Trade Intensity Index for SLCommodities*

The trade intensity index for the SL products groups for 2000 to 2012 are presented in Figure 6.3 below.In general, the trends of the trade intensity index for processing pineapples and palm oil are increasing. The trade intensity index for processing pineapples has increased from 1.14 to 17.96, while palm oil has increased from 22.05 to 33.49 during 2000 to 2012. For both commodities, Indonesia has greater bilateral trade than it is expected with China. Both commodities have a comparative advantage in the Chinese market at the beginning of the study period, although the ACFTA regulations prevented the tariff reduction at that stage, and the expansion of exports in these products to the Chinese market show upward trends. It can be said that the import tariff rate is not the only determinant of the magnitude of exports of these commodities to China's market. There are any other factors that determine these exports with stronger stimulus.

Figure 6.3 Trade Intensity Index for the Sensitive Track for Period 2000-2012



Source: Uncomtrade, calculated by author.

Meanwhile, for crude palm oil (HS 151110), Indonesia has large greater bilateral trade with China, as Indonesia is able to dominate the Chinese market in 2000. The trade intensity index for this commodity is 1,988.54 in that year. However, the comparative advantage is declining over time. Though this product has bigger comparative advantages compared to other commodities in the period of this study, the restriction on tariff reduction active until 2016 has influenced the volume of its exports to China.

6.4.3 *Dynamic Revealed Comparative Advantage for the EHP*

While the RCA shows the level of static comparative advantage for commodities by comparing the share of commodities in the domestic market destination with that of the world as a whole, the DRCA presents the change in comparative advantage over time. Furthermore, it provides product positioning in the export market countries, as it specifies some criteria to cluster products according to their position in the market based on market attractiveness and business-strength information. As stated in the previous section on the methodology used for DRCA, market attractiveness is measured by the growth in demand for a product in certain market

destinations, while business-strength is assessed by the growth in the country's market share of a particular market destination.

The DRCAs are divided into two group periods: first is the group before the implementation of the EHP for 2000 to 2003 and the second group is for the period of the implementation of the EHP afterwards during 2004 to 2012. Both groups are then compared to examine whether the implementation of the EHP brought positive impact on competitiveness of agricultural commodities under this scheme.

Table 6.3 presents the D RCA of the commodities under the EHP scheme. Similar to the previous section, there are eleven commodities chosen as representatives of the EHP products. The table is divided between Indonesia's share growth and China's share growth. Indonesia's share growth means the growth of a commodity export's share, compared to the whole exports from Indonesia; the latter means the growth of a commodity export's share in China compared to the whole exports shipped to China. A commodity is classified as increasing its RCA if it is grouped to 'RS, 'falling star' and 'lagging retreat'; and the remaining are declared as decreasing RCA or declining its comparative advantage.

The first two columns of Table 6.3 reveal the results from 2000 to 2003, while the other columns list those for 2004 to 2012. The position of each commodity depends on a comparison between the growth share of exports in the origin country (Indonesia) and that in the market destination (China). The positions indicate the commodities with increased competitiveness in China's market and those that fell behind.

Table 6.3Exports Share Growth from Indonesia to China

	2000 to 2003	2004 to 2012

HS	Indonesia Market	China Market	Status	Indonesia Market	China Market	Status
01	–1.28	0.07	Lost opportunity	0.03	0.00	Rising star *
02	–0.03	–0.14	Lagging retreat *	0.35	0.02	Rising star *
03	0.14	–0.06	Falling star *	–0.07	–0.04	Leading retreat
04	–0.27	–0.04	Leading retreat	0.16	0.08	Rising star *
05	–0.09	–0.10	Lagging retreat*	0.07	–0.08	Falling star *
06	–0.01	0.06	Lost opportunity	0.11	–0.04	Falling star*
07	–0.43	0.16	Lost opportunity	–0.06	0.09	Lost opportunity
08	0.51	–0.10	Falling star *	0.13	0.06	Rising star *
1513	0.31	0.07	Rising star*	0.06	0.04	Rising star *
151620	0.03	–0.12	Falling star *	0.37	0.13	Rising star *
151790	–0.25	–0.88	Leading retreat	0.41	0.20	Rising star *

Source: UNComtrade (2013), calculated by author.
Note: * is increasing DRCA

To examine whether the dynamic RCAs have been changed since the implementation of the EHP scheme, the same iteration procedure has been taken to get the DRCA indices for 2004 to 2012. From Table 6.3, it can be seen that most of the commodities have moved to a position of increasing DRCA. HS 01, HS 02, HS 04, HS 05, HS 06, HS 08, HS 1513, HS 1516HS 151790 have changed to rising star position in this period. There are only two commodities whose positions have remained the same; HS 03 is in leading retreats and HS 07 in lost opportunity positions.

During 2000 to 2003, HS 01, HS 06 and HS 07 have declined comparative advantage with ‘lost opportunity’ status. This means that the growth of these commodities in the whole of Indonesian exports is declining or negative, while the share of these commodities in the whole exports in China’s market is growing. ‘Lost opportunity’ is considered the lowest position of competitiveness in the hierarchy of dynamic comparative advantage. This means that the

commodities lost their opportunities to expand their exports in China's market, yet they are not able to keep pace with the growth of total exports in Indonesia.

In the same period, commodities under HS 02 and HS 05 take their position as 'lagging retreat'. Although this position is categorized as possessing an increasing RCA index, it is undesirable because it indicates that the growth of exports of these commodities has been decreasing in both the Indonesian and Chinese market. Nonetheless, the result shows that the declining share growth in Indonesia's export is not as low as the declining growth in China's market.

Next, commodities under HS 03, HS 08 and HS 151690 in the DRCA show positions that fall under 'falling star'. But despite the negative connotation in its name, 'falling star' position is grouped as an indicator of increasing comparative advantage. This position means that the commodities have an increasing growth share in Indonesian exports as a whole, however, the export share growth in the whole China's export is declining. This is perhaps because it has become difficult for these commodities to expand their market penetration in China due to downturn in Chinese growth. To distribute the growing exports' share in Indonesia, these commodities need to be exported to other countries which have growing imports of these products.

With regard to the next category, products under HS 04 and HS 151790 show that their dynamic comparative advantage is in the 'leading retreat' position. This is an undesirable position because it shows a declining RCA. It means that both Indonesia's export share and China's export share growth are dropping, with these commodities' share of Indonesia's total exports growth declining faster than the latter.

Finally, the position for dynamic RCA for HS 1513 is categorized as a 'rising star' during 2000 to 2003. This is a desirable position in the DRCA matrix as it means that HS 1513 has become a favourite export commodity for this period.

In sum, from the growth of export share perspectives analysed here in the DRCA, it shows that the EHP program has increased the export share of these commodities both in the export origin country and market destination country. The most outstanding improvements have been established for the commodities HS 01, HS 06, and HS 07 as they emerged from declining growths under 'lost opportunity' to garner the position of 'rising star'. This denotes that the

commodities were able to lift their share in Indonesia's total exports with positive growth overtaking the growth rate of the export share in China's market.

6.4.4 *Dynamic Revealed Comparative Advantage for the SL*

While the import tariff reduction program for agricultural trade under the EHP scheme seems to be successful, the study further explores the pattern of the commodities under the Sensitive track that were not allowed to drop their import tariff rates until 2012 the Sensitive list and 2016 for Highly Sensitive List. Table 6.4 presents the DRCA for the Sensitive and Highly Sensitive Lists.

Table 6.4 DRCA for Sensitive Track Exports Share Growth from Indonesia to China

HS	2000 to 2003			2004 to 2012		
200820	1.01	-0.22	Falling star*	0.05	0.16	Lagging opportunity
151110	0.57	0.09	Rising star*	-0.06	-0.01	Leading retreat
151190	0.20	0.18	Rising star *	0.04	0.00	Rising star*

Source: UNComtrade (2013), calculated by author.
Note: * increasing RCA

From 2000 to 2003, processed pineapples (HS 200820) were in the 'falling star' position. This indicates that this product's share has been growing in Indonesian total exports, but the growth of a share for this product in China's total imports has been declining. It might be either because the import value of this product is steady but the total import value is increasing, or the import value of this product is declining.

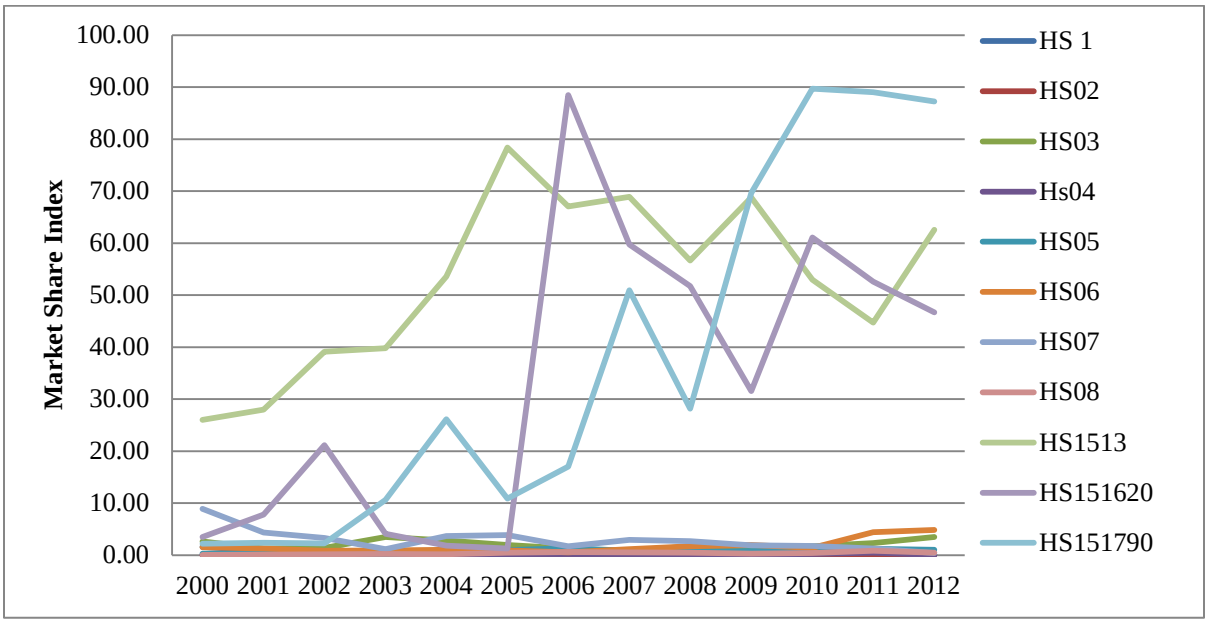
The products under the highly sensitive list, such as crude palm oil (HS 151110) and palm oil, excludingcrude and liquid fraction (HS 151190), have been categorized in the 'rising star' position during 2000 to 2003. This is a good sign showing that Indonesia has a comparative advantage of this product. The share of these commodities exported to China, as part of Indonesia's total exports, was increasing. This is possible due to increasing supply supported by growing production of these commodities in Indonesia, as well as increasing demand for bio oils

from Chinese customers. From the Chinese perspective, the import share of palm oils in China's total import has been growing and the growth of a share in Indonesian total export is higher than that of China. The demand for bio oils is increasing recently due to its utility as a substitute for mineral oil (Ministry of Industry 2011).

6.4.5 *Market Share Index of Indonesian Agricultural Exports to China*

The growth of market share indices for commodities under the EHP variability during the period under focus can be seen from Figure 6.4. There are only three commodities that have a wider market share in China's market: vegetable oil (HS 1513), vegetable fats and oils and their fraction (HS151620), and edible prepared fats/oil (HS 151790).

Figure 6.4 Market Share Index for the EHP for Period 2000-2012



Source: UNComtrade (2013), calculated by author.

The market share index measures the share of Indonesian agricultural commodities exports in China's total import of the same commodities. The purpose is to examine the penetration of Indonesian exports in China's market with the implementation of the ACFTA. The market share index for certain commodities under the EHP program is presented in table 6.5 as follows.

Table 6.5 Market Share of Indonesia's Agricultural Exports in China (EHP Products)

Year	HS 1	HS 2	HS 3	HS 4	HS 5	HS 6	HS 7	HS 8	HS 1513	HS 151620	HS 151790
2000	1.59	0.00	2.61	0.01	0.25	1.51	8.90	0.04	25.98	3.47	2.16
2001	0.86	0.00	1.25	0.08	0.30	1.29	4.36	0.10	27.97	7.79	2.38
2002	1.21	0.01	1.39	0.00	0.20	0.85	3.30	0.19	39.11	21.13	2.23
2003	0.02	0.00	3.50	0.01	0.20	0.92	1.16	0.21	39.77	4.08	10.62
2004	0.14	0.00	2.81	0.00	0.21	1.00	3.64	0.16	53.58	1.79	26.11
2005	0.03	0.00	1.94	0.01	0.94	0.91	3.84	0.48	78.36	1.28	10.88
2006	0.34	0.00	1.28	0.04	1.33	0.53	1.68	0.59	67.05	88.46	17.00
2007	0.06	0.00	0.68	0.07	0.85	1.16	2.91	0.53	68.87	59.75	50.91
2008	0.06	0.00	1.70	0.12	0.74	1.67	2.70	0.48	56.65	51.75	28.14
2009	0.03	0.02	1.51	0.08	0.77	1.97	1.89	0.30	68.80	31.57	69.61
2010	0.03	0.03	1.69	0.23	1.22	1.38	1.78	0.43	52.98	61.06	89.71
2011	0.03	0.02	2.31	0.46	1.23	4.39	1.26	0.84	44.72	52.61	89
2012	0.04	0.01	3.46	0.01	1.00	4.85	0.37	0.49	62.54	46.69	87.24

Source: UNComtrade (2013), calculated by author

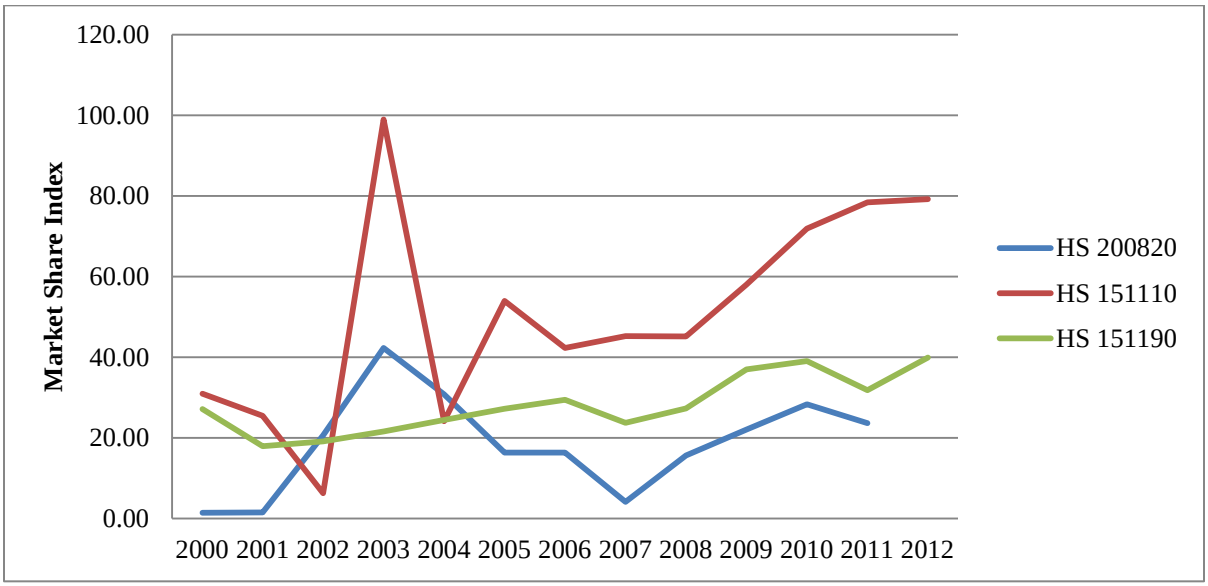
Although Indonesia already has a significant share in China's market for these products, the fast growth in these shares is likely to be induced by the beginning of the EHP scheme. The category of edible prepared fats, oil (HS 151790) from Indonesia has dominated almost 90 per cent of China's market in recent years. This stupendous growth started after the end of the EHP period

in 2007. Beginning with a 50 per cent market share in China's fats and oils, the share dropped to 28 per cent when the crisis hit in 2009.However, the year after that market share rose to 69 per cent andfinally climbing back to 90 per cent in recent years.

In contrast, other Indonesian commodities have a very small market share in China's market even though the EHP has been implemented. Moreover, some of these commodities lost their market share after the implementation of the EHP, such as live animals (HS 01) and edible vegetables (HS 07). Currently, Indonesia has almost no export of live animals to China as the market share has declined from 1.59 per cent in 2000 to 0.04 per cent in 2012, while the share for edible vegetables dropped from 8.90 per cent to 0.37 per cent in 2012. On the other hand, fish (HS 03) and live trees (HS 06) have slightly increased from 2000 to 2012 from 2.61 to 3.46 per cent and from 1.51 to 4.86 per cent, respectively.

In terms of the program of Sensitive Track, the market shares of commodities in China have been increasing. The results are illustrated below in Figure 6.5.

Figure 6.5 Market Share Index for the Sensitive Track for Period 2000-2012



Source: UNComtrade (2013), calculated by author.

Although there was a declining trend in the market share of Indonesian commodities in China's market for processed pineapples (HS 200820) from 2003 to 2007, they have been increasing after 2007. The highly sensitive list products in this study, crude palm oil (HS 151110) and palm

oil, excludingcrude and liquid fraction (HS 151190), tend to be acquiring more market share in China's market. In 2003, the crude palm oil products from Indonesia occupied almost 100 per cent of China's market. Although the share dropped in the following years, it has been on an upward trend in recent years, and the share of export in China's market has reached almost 80 per cent. This means that these commodities under the sensitive list have performed well despite the fact that the ACFTA has impeded tariff reduction for these commodities.

6.5 Conclusion

The objective of the EHP is to reduce the tariff barrier for these commodities in the period from 2004 to 2006, so that at the end of 2006 the import tariff rates become zero per cent. Although the reduced tariffs were expected to make Indonesian exports more favourable to China, the competitiveness of agricultural products from Indonesia has experienced no change, especially for commodities under the HS code 01-08. The commodities of code HS 01 to 08 constitute animal and horticultural products, areas in which China has a strong comparative advantage(Chen, C & Duncan 2008). So China is not as concerned that their domestic market will be penetrated by foreign products in these categories as domestic producers will be able to deal with the competition.

The trade intensity indexes for some Indonesian commodities exports are greater than unity, especially for palm oil commodities. It means that Indonesia has greater bilateral trade with China than would be expected based on China's share in world trade. However, for some other products such as commodities under HS code 01,02,04,05,and 08, the trade intensity indexes of Indonesian exports are below the unity, which means that the export intensity to China is under the expectation.

Meanwhile, China doesn't have comparative advantagein some agricultural products such as edible vegetable and animal oils, sugar, cotton and rice, but these have high demand in domestic market. These commodities called 'national strategic products' are given high protection by the Chinese government with high rates of TRQ, or placed in the Sensitive track of the ACFTA. The implementation of the EHP scheme has only raised the competitiveness of products for

HS1513, HS 151620 and HS 151790, all of which are actually bio oil products and allied commodities.

There are many other factors influencing the growth of bio oil exports from Indonesia to China. The increase in the exports for bio oil groups is mostly caused by strong demand for bio oil, the position of Indonesia as the biggest producer of palm oil and the spike in the bio oil prices. According to the World Bank (2008), the spike in the bio oil prices in 2008 has mainly influenced the trend of bio oil exports. This explains the growing exports for the bio oil from Indonesia to China in this chapter. Indonesia is the biggest producer of palm oils in the world (FAO 2012; WTO 2014), and the rise in exports of these products shown in the study come from the volume and the price as explained in the Chapter Four.

In contrast, the competitiveness of the agricultural commodities under the Sensitive Track has been increasing in the period from 2000 to 2012. This scheme includes processed pineapples (HS 200820), crude palm oil (HS 151110) and palm oil, excluding crude and liquid fraction (HS 151190). These commodities experienced increasing RCA index and market share index in the period from 2000 to 2012. However, the DRCA index shows that the position of pineapples (HS 200820) and crude palm oil (HS 151110) is declining. The DRCA shows that the index for these commodities fell from the increasing star before the implementation of the ACFTA to declining star after the implementation of the ACFTA, but palm oil products, excluding crude and liquid fraction (HS151190) continued as a ‘rising star’. This condition can be explained by the strong demand for these commodities as Indonesia is the biggest producer of palm oil and alsoamajor producer of pineapples. For these commodities, relative reduction of tariff doesn’t influence on the competitiveness.

Through the implementation of the EHP has improved the competitiveness of certain commodities that have received tariff reduction, others have experienced no growth. The competitiveness of original agricultural commodities under HS code 01-08 showed no responses to the preferential tariff reduction offered by the EHP program. There are some reasons behind this condition,for example, China’s production of these commodities is bigger than Indonesia’s and China has a strong comparative advantage for these commodities. China has also employed trade policy to protect agricultural products in which they have not comparative advantage, but have strong demand in their domestic market.

On the other hand, contrary to expectation, improved competitiveness is discernible even for commodities under the Sensitive track which do not enjoy import tariff reduction. This means that the competitiveness of commodities is more dependent on intrinsic strengths of Indonesia's production capacity as observed in the stupendous growth vegetable oil exports from Indonesia to China. This also means that free trade agreement is likely to be less influential in this matter as commodities under EHP that enjoy tariff reduction that have experienced little or no change, whereas some, such as vegetable oils, under SL have grown even without tariff reduction.

Chapter 7
Indonesian Agricultural Export Performance: A View from a Real Value Perspective

7.1 Introduction

In addition to the mixed results of studies in previous chapters on the growth and competitiveness of Indonesian agricultural exports under the influence of the ASEAN-China Free Trade Agreement, and the contribution of agricultural exports to China on Indonesian economic growth, studies about the condition of the Indonesian agricultural exports will be elaborated in this chapter. While the agricultural exports in the aforementioned chapters are in 'bulk' or 'groups' of commodities; this chapter will discuss the performance of agricultural exports in detail from the view of commodities to understand the overall condition of Indonesian agricultural exports in general. Imposing the real value of export is important as the use of current prices can often give misleading and non-accurate estimations, especially in periods of crisis with unstable prices and high inflation. The problem is the available on actual exports is influenced by both price and volume changes, and such data free of these influences is not available at the disaggregate level. Thus to address the lack of this appropriate data, the chain-linked volume method will be applied to construct such data of chain-linked volume and price of the exports. Using the chain-linked volume as real value ('volume') as a measure will provide a clearer and more accurate picture of the exports, omitting bias caused by inflation or price interference, which is one of the disadvantages when using the current value perspective.

The aim of this chapter is to accomplish the research objective stated in Chapter One: 'to overview the condition of Indonesian agricultural exports from the chain-linked volume perspective'. Furthermore, it can support a more detailed interpretation of the results from the preceding chapters.

This study will examine the biggest agricultural exported products which cover more than 95 per cent of the total agricultural exports of Indonesia. These consist of thirty-five commodities. The terms used to describe agricultural products in this chapter are based on the Agreement on Agriculture (AoA) of World Trade Organization(WTO 2012e). Under this agreement, fish products (HS 03) are not included as agricultural products. The study will focus on exports to all

countries and some major market destinations for Indonesian agricultural exports such as ASEAN, India, China, the US and Japan.

Volume index numbers such as chain-linked volume or the Laspeyres index have been key indicators for annual policy reviews (Boyle 1987). Furthermore, analysis of volume index numbers of agricultural outputs and inputs has attracted attention of the agricultural economist for decades (Boyle 1988). This method has been widely implemented into the national accounts of developed countries over the past few years, and such data are available in these countries, including the members of the European Union (Brueton 1999), Australia (ABS 1998), and a number of OECD countries (Schreyer 2004). Unfortunately, there is no satisfactory disaggregate level of either agricultural export real value or export price index for Indonesia. The Indonesian Statistics Bureau (BPS) (BPS 2014) publishes quantity data in kilograms for individual export item but does not publish an aggregate volume index. BPS has published wholesale price indices, but only for a few agricultural products. This raises the need for an appropriate measurement of agricultural export volume.

This study will attempt to address the lack of an appropriate measure of agricultural export real value by using a chain-linked volume measures. This method is using unit values (export value in dollars divided by the export quantity in kilograms) to construct a disaggregate measure of monthly agricultural exports at constant prices. The agricultural commodities are at a very detailed level at nine-digit level of HS code, where products are reasonably homogenous. If the fixed prices hold, movements in export value can only be due to quantitative changes. This is equivalent to measuring export volume by constructing a weighted average of export quantity indices, with the weights being the value share of each item in total agricultural export. Once a volume index has been constructed, an implicit export price index can be derived simply by dividing the export value by export volume.

This chapter pursues this goal with the application of the chained-link volume method so that the real value of export can be isolated from the interference of price. The first part of the chapter will explain the methodology of chain-link volume and price index used for this purpose and the second part will present the result of chain-link volume and the price index for Indonesian agricultural exports.

7.2 Literature Review

7.2.1 *Importance of Real Value Calculation*

Imposing the real value of trade in calculating economic growth is important as the use of current value can often give misleading and non-accurate estimations, especially in periods of crisis with unstable prices and high inflation. An example of such a miscalculation from current value was demonstrated during the Asian crisis when Indonesia experienced a slowdown in non-oil exports (Rosner 2000). Despite the enormous depreciation, the non-oil export performance, measured in dollars, did not accelerate during the first two years of the Asian crisis, even when non-oil exports dropped sharply during the second year of the crisis. Rosner (2000) argues that main reason for this was the fact that Indonesia suffered a massive deterioration in export prices between 1997 and 1999. The export prices of major non-oil export products from Indonesia experienced a sharp drop following the world market prices, which had fallen steadily since the onset of the crisis. This contradicted the theory that the export quantity can be expected to rise following a currency depreciation. James (2000) argues that if Indonesia's non-oil export values were deflated using an import price index for the United States, the non-oil exports in constant price rose 1.58 per cent instead of falling when it was measured by current dollars. From this example, it becomes evident that an analysis of the export performance must distinguish between price movements and quantity movements.

The reason for having either chain volume or constant price estimates in the national accounts is to provide a time series of expenditure and production aggregates which are free of the direct effects of price change or inflation. All the current price aggregates of expenditure and production appearing in the national accounts are estimates of the sums of the values of individual transactions (ABS 2003). This should happen at the lowest level of aggregation available for national account, because the price indices used at this level of aggregation have to be considered like elementary price indices and they may or may not be constructed with the same index number formula as the national accounts use for higher level aggregation (Schreyer 2004). Chapter XVI of the System of National Accounts (SNA 1993) on price and volume measures describes the higher the level of aggregation at which national account index numbers

set in, the more the overall growth rate of GDP is shaped by the index number formulae that are present in the elementary price indices used in the accounts (United Nations 2014a).

7.2.2 *Chain-linked Volume Measure*

Real value measures are commonly approached by constant price measures. However, in recent years, this method using a five year rebasing is considered inefficient (Aspden, ADB & UN ESCAP 2000). As the System of National Accounts 2008 (SNA 2008) (United Nations 2014b) recommends rebasing every year and linking the resulting indices to form annually reweighted chain volume measures, many countries moved on to the method of chain volume measures with annual rebasing (annual chain-linking) to calculate their national account (United Nations 2012).

In general, annually linked and re-weighted chain volume measures are considered to more accurately reflect volume changes over time (ABS 1998). It provides better indicators of movement in real output and expenditure because they take account of changes to pricing relativities that occur from one period to the next by compiling indices between consecutive periods and annually updating the base period. This maximizes the number of commodities common to both periods and enables more value comparisons to be made (ABS 2003). In practice, the advantage of annual chain volume measures depends on the variability of the price and volume relativities between the component series (ABS 1998). Thus, chain volume measures are believed to provide better measures than constant price estimates.

This method uses unit values (export value in dollars divided by the export quantity in kilograms) to construct an aggregate measure of monthly agricultural exports at constant prices. If the fixed prices hold, movements in export value can only be due to quantitative changes. This is equivalent to measuring export volume by constructing a weighted average of export quantity indices, with the weights being the value share of each item in total agricultural export. Once a volume index has been constructed, an implicit export price index can be derived simply by dividing the export value by export volume. The next section describes the methodology used for formulating the China volume measure on Indonesian exports in this thesis.

7.3 Methodology

7.3.1 *Constructing a Volume Index*

The Australian Bureau of Statistics (ABS 1998) describes the procedure of constructing a volume index is given by the ratio of the two homogenous quantities in period 1 and 2 (quantity relative). The value of the index in the period 1 is usually set as 100 and the next period index will be the percentage increase or decrease in the volume of production. It can be formulated as below:

$$QI_t = \frac{Q_t}{Q_{t-1}}\ x\ 100,\ \ t\ is\ the\ current\ \ period$$

For two or more commodities, it is necessary to introduce a weighting scheme. To construct a volume index, one simple way would then be of value of the commodities at their prices in one or other period and divide the total value of their combined production in the second period by that in the first. The same prices must be used for both periods to ensure that the index only reflects changes in quantities produced. The other way is to calculate the ratio of the quantities or quantity relatives first for each commodity separately. One would expect a volume index to be some kind of average of these quantity relatives. It can be shown that the index from previous way are equivalent to weighted averages of the quantity relatives which use the total values of each commodity in one or other period as weights (ABS 2003).

There are several ways of measuring the volume change depending on the choices of whether the period of price is the first or the second. Index number theory offers a wide range of tools to this end (Diewert 2005). One of those theories is the Laspeyres volume index method (Allen 1949) that uses the first period of price in its calculation.

The Laspeyres volume index method measures the percentage change in the total value of production holding prices constant at their year 1 levels. It is also equal to a weighted arithmetic average of the quantity relatives for each of the commodities using the values produced in the

first year as weights (Brueton 1999). A period-to-period Laspeyres volume index formula for rebased volume estimates is given by:

$$QI_t = \frac{\sum q_t p_{t-1}}{\sum q_{t-1} p_{t-1}}$$

Where t is the current period under consideration, and t-1 is the period before the current period and the base period for values in period n.

As the weights of a chain volume index change from period to period due to annual rebasing, a time series of chain volume indices has no fixed base period in the sense in which a constant price estimate or fixed-weight volume index does (Schreyer 2004). However, chain volume measures must have a reference period, in which the index equals 100. It is also worth noting that the chain volume measure in the reference period, expressed in dollar terms equals the corresponding current price value.

7.3.2 *Chain-linked Volume Formula*

The basic idea of a chain-linking is to update the base year at a higher frequency and link the short-term movements. In some countries, the updating is done on an annual basis. In that case, period to period changes of volumes (the links in the chain) are calculated using the prices (and hence weights) of the previous year. The Laspeyres chain-linked volume also estimates period-to-period volume indices of an aggregate by expressing the value of the aggregate in each pair of consecutive period in the prices of the earlier period, and then dividing the value of the later period by the value of the earlier period. This is equivalent to weighing together the period-to-period volume indices of the elementary components of the aggregate with the current price values of the earlier period (United Nations 2014b)

The period-to-period indices from the previous chapter are compounded to form a long, continuous chain volume time series that is called a Laspeyres chain volume index. This is achieved using the following formula:

$$LI = \prod_{i=r+1}^{t} QI_t = \frac{\sum q_1 p_0}{\sum q_0 p_0} x \frac{\sum q_2 p_1}{\sum q_1 p_1} x \ldots x \frac{\sum q_t p_{t-1}}{\sum q_{t-1} p_{t-1}} = \prod_{i=r+1}^{t} \left(\frac{\sum q_i p_{i-1}}{\sum q_{i-1} p_{i-1}} \right)$$

This index, then references to the current price value of the latest base year, that is, the second last year for which there is an annual value. In general, chain volume estimates are not additives, that is, the accounting relationships that apply to current price data do not generally apply to their chain volume counterparts. Only the values in the reference year and the following year are additive. So, by ensuring that the latest base year coincides with the reference year, the Australian Bureau of Statistics (ABS 2003) presents a formula to annual chain Laspeyres volume measure in year t, L_t^{cv}, as given by:

$$L_t^{cv} = \sum q_r p_r \, x \, LI \; = \sum q_r p_r \, x \prod_{i=r+1}^{t} \left(\frac{\sum q_i p_{i-1}}{\sum q_{i-1} p_{i-1}} \right)$$

Where L_t^{cv} = chain lasypeyres volume measure at year t

p_{i-1} = prices in year i-1, the base year for values in period i

p_r = prices in year r, the reference year

q_i = quantities in year i

q_{i-1} = quantities in year i-1

q_r = quantities in year r, the reference year

Another way to express the Laspeyres chain-linked volume index is given by the United Nations Statistic Division (United Nations 2012). They present the formula for annually-chained Laspeyres volume index as below:

$$L_t = \left[\frac{\sum p^0 q^1}{\sum p^0 q^0}\right]\left[\frac{\sum p^1 q^2}{\sum p^1 q^1}\right] \ldots \left[\frac{\sum p^t q^{t+1}}{\sum p^t q^t}\right]$$

$$= \left[\frac{\sum p^0 q^0 \left(\frac{q^1}{q^0}\right)}{\sum p^0 q^0}\right]\left[\frac{\sum p^1 q^1 \left(\frac{q^2}{q^1}\right)}{\sum p^1 q^1}\right] \ldots \left[\frac{\sum p^t q^t \left(\frac{q^{t-1}}{q^t}\right)}{\sum p^t q^t}\right]$$

$$= \left[\frac{\sum p^1 q^1 \left(\frac{p^0}{p^1}\right)}{\sum p^0 q^0}\right]\left[\frac{\sum p^2 q^2 \left(\frac{p^1}{p^2}\right)}{\sum p^1 q^1}\right] \ldots \left[\frac{\sum p^{t+1} q^{t+1} \left(\frac{p^t}{p^{t+1t}}\right)}{\sum p^t q^t}\right]$$

Where$\frac{\sum p^n q^{n+1}}{\sum p^n q^n}$is unchained Laspeyres volume index

The chain volume measures can also be expressed in dollar terms by multiplying the index value for the period in question by the current price estimate of value in the reference period.

7.3.3 *Chain-linked Export Price Index*

A chain-linked price index (PI) is an index obtained by dividing a current export price value by its corresponding chain-linked export value estimate (ABS 1998). A chain-linked price index is a derived measure in contrast to direct measures of price change in which current price estimates are converted to estimates at constant prices. The formula for the price index measure for the period t is derived as:

$$PI_t = \frac{CV_{\ t}}{CLV_t}$$

WherePI_t = chain-linked price index;$CV_{\ t}$ = current value; CLV_t = chain-linked value at period t.

A weakness of using unit values to measure export index is that changes in unit values can reflect either true price changes or a change in the mix items exported under a given export line (IMF 2010). However, for homogenous commodities, such as agricultural products, it is

reasonable to assume that a given export line will track the same item over time, but for heterogeneous products, such as manufactured goods, the aggregation will be bias. To avoid this bias, it would be necessary to have direct price observations for individual export items and identify export items with as much detail as possible. To minimize aggregation bias, the analysis in this study will be conducted at the most detailed level possible with Indonesian agricultural export data.

7.3.4 *The Classification of Agricultural Commodities*

Inthe next section, agricultural products will be determined according to the WTO Agreement on Agriculture (AOA) (WTO 2012e) based on Harmonized System (HS) code. The HS provides a nomenclature for classifying internationally traded goods. The definitions of HS commodity groupings up to the 6-digit level are established by the World Customs Organization. This agreement covers two-digit Harmonized System (HS) code 01 to code 24 excluding fish and fish products and a number of manufactured agricultural products.

The HS provides a nomenclature for classifying internationally traded goods. The definitions of HS commodity groupings up to the 6-digit level are established by the World Customs Organization, excluding fish and fish products and a number of manufactured agricultural products, as follows:

- HS chapters 1 to 24 include live animals, animal products, vegetable products, animal or vegetable fats and oils, prepared edible fats, animal or vegetable waxes, [prepared foodstuffs, beverages, spirits and vinegar, tobacco and manufactured tobacco substitutes; less fish and fish products
- HS code 2905.43 (mannitol)
- HS code 2905.44 (sorbitol)
- HS heading 33.01 (essential oils)
- HS heading 35.01 to 35.05 (albuminoidal substances, modified starches, glues)
- HS code 3809.10 (finishing agents)
- HS code 3823.60 (sorbitol)
- HS headings 41.01 to 41.03 (hides and skins)

- HS heading 43.01 (raw fur skins)
- HS headings 50.01 to 50.03 (raw silk and silk waste)
- HS headings 51.01 to 51.03 (wool and animal hair)
- HS heading 52.01 to 52.03 (raw cotton, waste and cotton carded or combed)
- HS heading 53.01 (raw flax)
- HS heading 53.02 (raw hemp)

This research will segregate the agricultural commodities based on the HS classification into four broad subsectors following Regmi et al. (2005).

i) Bulk commodities such as rice or coffee;

ii) Horticultural products such as fruits, cut flowers, tomatoes or spices;

iii) Semi-processed commodities such as vegetable oils or live animals;

iv) Processed products which consist of goods that require extensive processing prior to consumption and are much closer to the consumer's kitchen table such as processed fruit, processed meat and beverages.

Those groupings are based primarily upon the relative dependence of production upon land availability, geography and climatic conditions. The bulk and horticulture groups are more reliant on these factors compared to semi-processed and processed categories which undergo some transformation prior to their final use and, in principle, can be produced almost anywhere. Furthermore, this agricultural grouping has also been used by the Organization for Economic Co-operation and Development (OECD) and Food and Agriculture Organization of the United Nation (FAO) to analyze agricultural sectors in their study (OECD & FAO 2007). Table 7.1 and 7.2 below present the list of the grouping system for these commodities.

Table 7.1 Agriculture Commodities Groupings Based on AoA (Primary Bulk and Horticulture Groups)

Primary bulk		Horticulture	
Description	**HS code**	**Description**	**HS code**
Coffee	09011	Planting material	0601-0602
Tea	0902	Cut flowers/plants	0603-0604
Coffee mate	0903	Vegetables	0701-0709
Wheat	1001	Roots, tubers	0714
Rye	1002	Coconut	08011
Barley	1003	Brazil nut	08012
Oats	1004	Cashew nuts	08013
Corn	1005	Other nuts	08021-08025,08029
Rice	1006	Fruit	0803-0810
Sorghum	1007	Frozen fruit	08119
Other grains	1008	Dried fruit	08131-08135
Soybeans	1201	Pepper	09041-09042
Peanuts	1202	Vanilla	0905
Oilseeds	1204-1207	Cinnamon	09061-09062
Cotton linters	14042	Cloves	0907
Cocoa beans	1801	Nutmeg	09081
Tobacco	24011-24013	Mace	09082
Cotton	5201-5203	Cardamom	09083
Hemp	5302	Other seeds	09091-09095
		Other spices	09101-09105
		Spice mix	091091,091099
		Hops	12101,12102
		Stone fruit	12123
		Sugar beet	121291
		Sugarcane	121292

Source: (WTO 2012e)

Table 7.2 Agriculture Commodities Groupings Based on AoA (Semi-processed and Processed Groups)

Semi-processed	Processed

Description	HS code	Description	HS code
Live animals	0101-0106	Fresh, chilled meat	0201-0208
Pig fat	0209	Processed meat	0210
Hairs	0501-0503	Dairy products	0401-0406
Animal products	0504-0511	Eggs and products	0407-0408
Dried, shelled beans	0713	Honey	0409
Coffee husks	09019	Other animal products	0410
Grain flours, groats	1101-1103	Processed Vegetables	0710-0712
Starch	11081	Processed fruit	0811-0812,0814
Inulin	11082	Coffee	09012,09014
Wheat gluten	1109	Processed grains	1104-1107
Copra	1203	Other Vegetables	1212
Soy flour & meal	1208	Fish and animal oils	1504,1517
Sowing seeds	1209	Prepared meats	1601-1603
Roots, seeds cut/crushed	1211	Sugar, sweeteners	1701-1704
Straw, husks, fodder	1213,1214	Chocolates	1806
Gum, lac, plant extracts	1301,1302	Flour preparations	1901
Furnishing material	1401-1404	Pasta	1902
Animal fat	1501-1503,1505,1506	Tapioca	1903
Vegetable oils	1507-1516	Other preparations	1904-1905
Inedible fats, oils	1518	Prepared Vegetables	2001-2005
Crude glycerol	1520	Prepared fruit	2006-2009
Wax	1521	Extract, essences, broths	2101-2106
Degras	1522	Beverages	2201-2208
Sugar	17011	Vinegar	2209
Cocoa products	1802-1806	Tobacco products	2402-2403
Grain products	2301-2303		3502
Oilseed cake	2304-2306		

Table 7.2 continued

Table 7.2 continued

Semi-processed		Processed	
Description	**HS code**	**Description**	**HS code**

Plant waste material	2308		
Pet food material	2309		
Glycerol/sorbitol/mannitol	2905		
Special plant oils	33011-33013,33019		
Proteins/gelatins/starches	3501-3505		
Amylaceous substance	38091		
Fatty acids, alcohols	3823-3824		
Hides, skins	4101-4103		
Fur	4301		
Silk	5001-5003		
Wool	5101-5103		
Flax	530		

Source: (WTO 2012e)

7.3.5 *Data*

The agricultural trade data used in this study is provided by Tradedata.net. The data consist of six-digit code of HS retrieved monthly for the period from 1991 to 2012. The agricultural export data are presented in monthly current price term. Variables used for this study are value of export in US dollars and volume represented by weight and quantity. For this study, the limitation of the agricultural commodities is based on the agricultural definition on AoA from the WTO. The agricultural products under this scheme are divided into four groups, namely, horticulture, primary bulk, semi-processed and processed products.

More detailed data is needed to get accurate results from changing the current value to the real one. To get a clearer description of the trade, quarterly data is better. So, after getting the chain-linked value and chain-linked price for every month data, the data is grouped into quarterly batches.

There were many unavailable data along the period of 1991-2000 which might be caused by the data was not well documented or the trade was not stable. The gap of trade between consecutive months was large with some months recording little value or no trade at all while other months

recorded a large value. However, after 2000, the export data was more stable in terms of the amount of exports and the variety of commodities.

Raw monthly data for all agricultural products exported from every port in Indonesia is collected. The data contains more than 500,000 individual export records, so these will be aggregated for each commodity. To organize the data, the six-digit code HS data was first grouped into agricultural data as a whole. This yielded data with 435 codes, showing the main commodities that could be picked as the sample for this study. Twenty out of 435 commodities covered more than 95 per cent of the total value of exports for the period 2000 to 2011.

Table 7.3 Groups of Agricultural Products

No	Group	Description	HS
1	1	Pepper of the genus piper (excl. crushed or ground)	090411
2	1	Manioc (cassava) fresh, chilled, frozen or dried, whether or not sliced or in the form of pellets	071410
3	1	Coconuts (excl. desiccated) fresh or dried, whether or not shelled or peeled	080119
4	1	Desiccated coconuts, fresh or dried, whether or not shelled or peeled	080111
5	1	Nutmeg	090810
6	1	Nuts, fresh or dried, whether or not shelled or peeled (excl. coconuts, brazil nuts, cashew nuts, almonds, hazelnuts or filberts, walnuts, chestnuts, pistachios & macadamias)	080290
7	1	Cashew nuts, in shell, fresh or dried	080131
8	1	Cloves, whole fruit & stems	090700
9	2	Cocoa beans, whole or broken, raw or roasted	180100

Table 7.3 Continued

Table 7.3 Continued

No	Group	Description	HS
10	2	Coffee (excl. roasted & decaffeinated)	090111
11	2	Black tea (fermented) & other partly fermented tea, whether or not	090240

		flavoured, in immediate packings of a content exceeding 3kg	
12	2	Cotton, carded or combed	520300
13	2	Cotton yarn waste (incl. thread waste)	520210
14	2	Tobacco, not stemmed or stripped	240110
15	2	Tobacco, partly or wholly stemmed or stripped	240120
16	3	Crude palm oil, whether or not refined but not chemically modified	151110
17	3	Palm oil & its fractions (excl. crude palm oil) whether or not refined but not chemically modified	151190
18	3	Crude palm kernel or babassu oil, whether or not refined but not chemically modified	151321
19	3	Crude coconut (copra) oil, whether or not refined but not chemically modified	151311
20	3	Other industrial monocarboxylic fatty acids and acid oils from refining (excluding stearic acid, oleic acid and tall oil fatty acids)	382319
21	3	Chemical products and preparations of the chemical or allied industries (incl. those consisting of mixtures of natural products; excl. goods of 3821.00.10, 3824.81-83 & 3824.73-79), not elsewhere specified or included	382490
22	3	Cocoa butter, fat and oil	180400
23	3	Palm kernel or babassu oil & its fractions (excl. crude palm kernel or babassu oil) whether or not refined but not chemically modified	151329
24	3	Industrial fatty alcohols	382370
25	3	Oil-cake and other solid residues of palm nuts or kernels, from the extraction of vegetable fats and oils	230660
26	3	Vegetable fats & oils & their fractions, partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised, whether or not refined but not further prepared	151620

Table 7.3 continued

Table 7.3 continued

27	3	Coconut (copra) oil & its fractions (excl. crude coconut (copra) oil) whether or not refined but not chemically modified	151319
28	3	Methanol (methyl alcohol)	290511
29	3	Stearic acid	382311

30	4	Edible mixtures or preparations of animal or vegetable fats or oils or of fractions of different fats or oils (excl. partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised fats or oils & margarine)	151790
31	4	Pineapples otherwise prepared or preserved, nes	200820
32	4	Seaweeds & other algae, of a kind used primarily for human consumption, fresh, chilled, frozen or dried, whether or not ground	121220
33	4	Unstuffed pasta, cooked or otherwise prepared	190230
34	4	Food preparations of flour and meal	210690
35	4	Cigarettes containing tobacco	240220

Source:Tradedata (2013), calculated by Author
Note: 1 horticulture; 2 primary bulk; 3 semi-processed; 4 processed agricultural products

The rest only had a small share in the aggregate agricultural export and the data only had an incomplete time series. Many of these products also included semi-processed products. Thus, some other data are taken to fulfil the list of agricultural commodities as covered by the AoA of the WTO. Those selected are in the top list of export values in each group of commodities. Due to the availability of the data, 35 commodities are chosen as representative of the agricultural products, namely, eight products of horticulture, seven products of primary bulk, fourteen products of semi-processed group and six products of processed group. The chosen commodities are listed in the Table 7.3.

Data from export trade with China, which is the focus of this study, is compared with those of some other countries such as US, Japan, ASEAN and India, which are the other biggest export destinations for Indonesian agricultural products. Furthermore, aggregate exports to the world will also be examined to get a big picture of agricultural export patterns. This will be followed by review of exports to the world excluding China to examine the impact of the export to China on general agricultural exports.

Despite the availability of detailed raw data obtained from Tradedata.net, the data contain significant errors, particularly in the quantity variable. For example, there is an inconsistent quantity unit for the time series data. For more recent data, kilograms were uniformly used as the measure of quantity; however, some of the older data either used tonne or kilograms. To respond to this data error, a system of data cleaning is imposed. It is assumed that the export values for

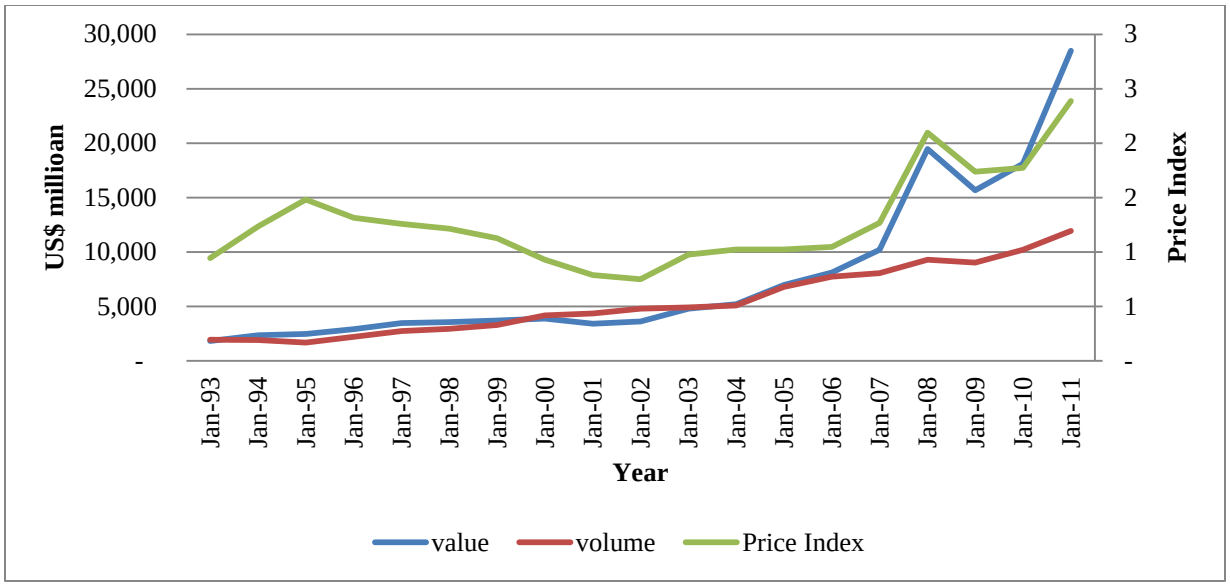
each HS line in each month are correct and that all problems lie in the quantity variable. In the event of an excessive month-to-month change in the unit value, it will be assumed that the unit value in the previous non-zero month is the correct unit value, and a new cleaned quantity is defined by dividing the current month's current value by the previous month's unit value.

7.4 Empirical Results and Analysis

The method described in the previous section is applied to get the chain-linked volume measure of agricultural commodities exported from Indonesia. The chain-linked volume method divides the nominal value in the real value that is represented by the chain-linked volume (volume) and price index. From this, the source of the export value can be determined whether the volume or price. This is very important in order to avoid bias due to inflation.

The results will touch on many critical aspects of Indonesian agricultural trade. The first subsection will cover the general patterns of agricultural trade in Indonesia, followed by a description of the main export destinations for Indonesian agricultural exports. The next two sections will then focus on export quantities of specific agricultural commodity groups and the export destinations of these groups will be a discussion of the export quantities of agricultural commodities and comparison of major export. The results will be explained in terms of real value (volume value), current value and index price in level to destinations, such as to the world, a world without China, China, India, the US, Japan and ASEAN.

Figure 7.1 Indonesian Agricultural Exports to Major countries in Value, Volume and Price Index for period 1993-2011

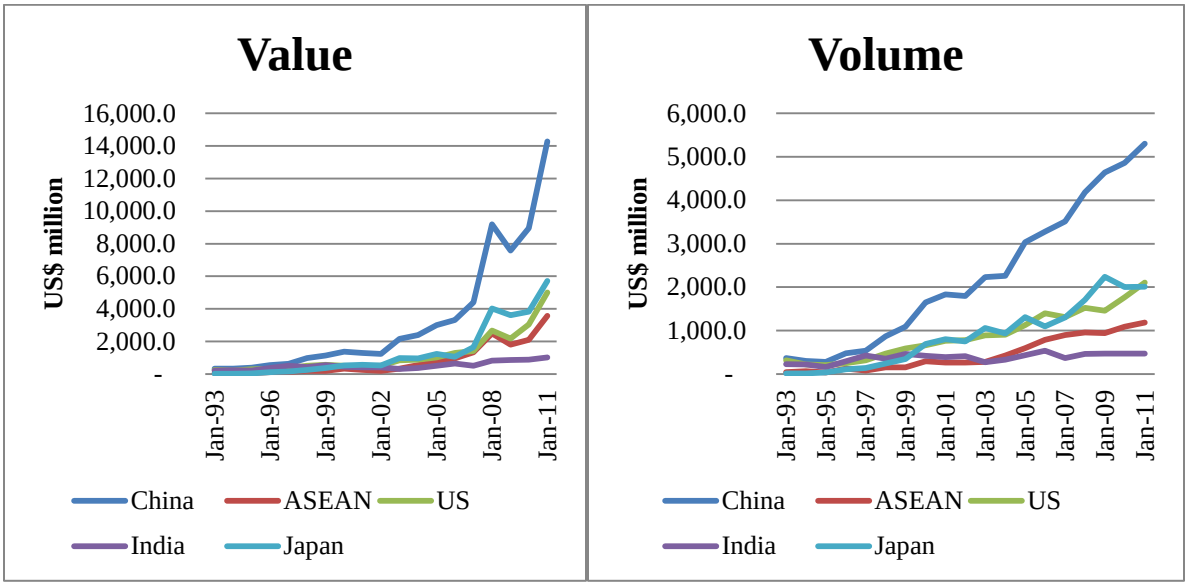


Source: Tradedata (2013) (calculated by author)

7.4.1 *Major Markets for Indonesian Agricultural Exports*

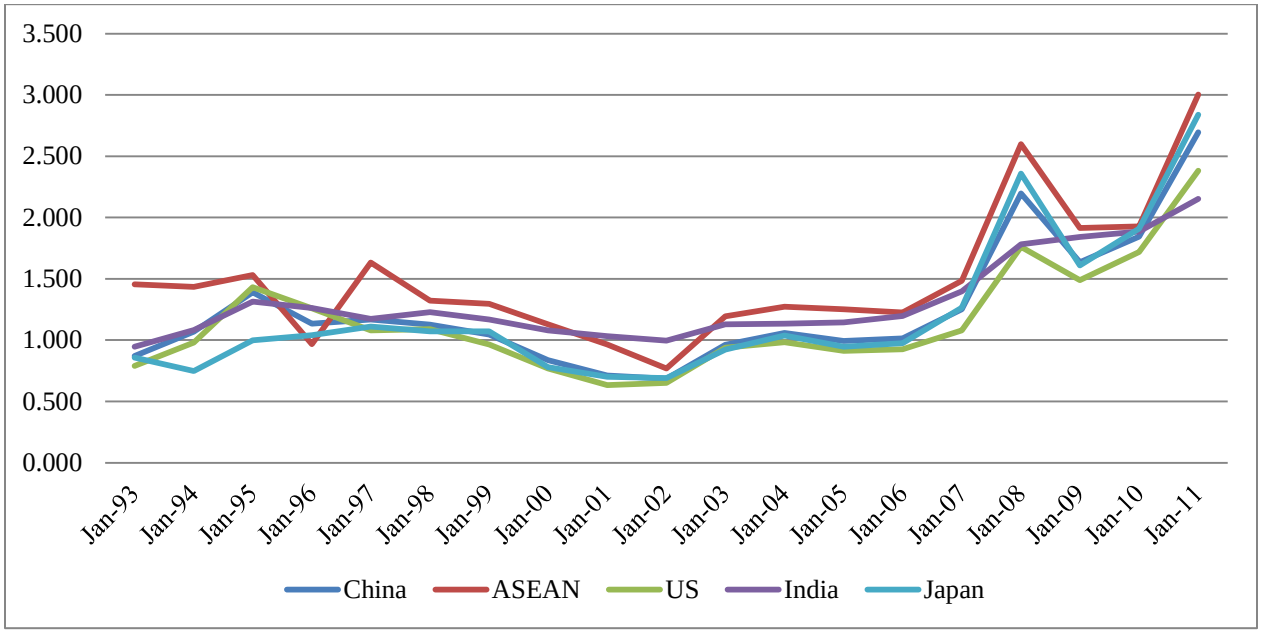
Indonesia has been exporting its agricultural products to market destinations, including the USA, EU and Japan (Basri, M. Chatib & Hill 2008). More recently, some new export markets such as China, India and ASEAN countries have outweighed the importance of the more traditional markets. Figure 7.2 displays the value and volume trends of the Indonesian agricultural exports to these destinations. From these graphs, the export patterns to India, ASEAN and China are similar to the export patterns to the world in terms of value, volume and price index. This figure reveals that, before the 2000s, agricultural exports from Indonesia has similar trends in all these major countries. However, in 2000s and onwards, the exports of agricultural commodities to India, ASEAN and China have been highly increasing. India has become as a main agricultural export destination recently. The exports to India has increased and become the biggest exports since 2007, followed by exports to ASEAN and China. The gap between the exports to the new markets and traditional markets has been wider over time, especially after 2006. Figure 7.2 shows that the volumes of exports tend to be lower than the exports' values. This might be caused by the influence of price and inflation in the exports' value.

Figure 7.2 Indonesian Agricultural Exports by Destinations



Source: Tradedata (2013) (calculated by author)

Figure 7.3 Indonesian Agricultural Exports Price Index by Destinations



Source: Tradedata (2013) (calculated by author)

Meanwhile, the patterns of the price index for these export destinations can be shown in Figure 7.3. The price trends in India, ASEAN and China are similar, however, there are rising patterns after 2006 and spiking until 2008 then going down and climbing again in 2010.

On the other hand, the patterns of export prices to the USA and Japan grow steadily over this period. In the beginning of the period, the export price in Japan tends to have a spike, however, this might be caused by the poor recording of the data at that time. The difference of patterns between exports to India, ASEAN and China, and exports to the US and Japan may be due to the type of commodities exported to these countries. The similarity of price patterns shows the similarity of agricultural products exported to these countries.

Table 7.4 Annual Growth of Exports to Major Destination Countries

Country	Value ($m)		Volume ($m)		Price Index	
	1992–93 to 2002–03	2002–03 to 2010–11	1992–1993 to 2002–03	2002–03 to 2010–11	1992–93 to 2002–03	2002–03 to 2010-–11
China	17.8	34.3	20.2	19.7	–1.9	12.2
ASEAN	13.0	25.1	11.0	11.4	1.8	12.3
US	3.5	16.3	1.8	7.3	1.8	8.4
India	56.8	24.6	55.7	8.3	0.7	15.1
Japan	2.6	15.5	1.8	3.2	0.8	11.9

Source: Tradedata (2013) (calculated by author)

From the view of value, volume and price, the more detailed picture of the Indonesian agricultural exports growths of its major export destinations is presented in Table 7.4. In general, the agricultural exports mostly grew from the first period, 1992–1993 to 2002–2003, to the second period, 2002–2003 to 2010–2011 in terms of all variables.

The exception is exports to India, which has a different pattern from others. India is the biggest market for agricultural product from Indonesia (Tradedata 2013). The exports to India has been growing fast since the period 1992 to 2003, when the growth of value and volume were more than 50 per cent: 56.8 and 55.7 per cent per year consecutively. However, the growth decreased

sharply in the next period: 24.6 per centin value and 8.3 per centin volume. Meanwhile the export price had remarkable growth from 0.7 per cent to 15.1 per cent in the same period. Since agricultural exports to India, it tends that the fluctuation in price has more influence than the volume of the exports.

Among others in the second period, 2002 to 2011, the growth of agricultural exports' value to China has been the biggest, reaching 34.3 per cent, an increase of almost twice from 17.8 per cent in the first period. However, the growth of volume declined from 20.2 to 19.7 per cent from first to second period. In contrast, the export price index improved greatly from –1.9 to 12.2 per cent in the same period.

Meanwhile, the growth of exports to ASEAN has been shadowing the growth of exports to China. The export value grew from 13 per cent in the first period to 25.1 per cent in the second period while the export volume seems stagnant in around 11 per cent per year in the same period. The export price increased impressively from only 1.8 per cent a year in the first period to 12.3 per cent in the second period. Although Indonesia has a trade agreement with the other ASEAN countries in AFTA, the increasing of export value to ASEAN tends mainly being caused by the price.

In terms of quantity, Table 7.5 presents the value, volume and price index of the Indonesian exports to major export destinations. At the beginning of 1992–1993, Indonesia exported agricultural products to India and China with a very small value, being $11 million and $65 million. But later in the period, both countries received a many-fold increase of imports from Indonesia. The value of exports to these countries becomes $ 5,703 million and $3,563 million in 2010-11. This amount is far higher than the value and volume of exports to other countries, except forASEAN, which reached $5,015 million in 2010–2011. Japan is the smallest market destination with the export value increased from USS65 million to $281 million in the same period. Meanwhile, agricultural exports to the US grew from $215million to $1,020 million in the same period. It is important to note that the exports exclude fish commodities as the main exported commodities to the USA is fish products, especially prawns (BPS 2014).

Table 7.5Total Indonesian Agricultural Exports to Major Destination Countries (in $ million)

Country	Value ($m)			Volume ($m)			Price Index		
	1992-93	2002-03	2010-11	1992-93	2002-03	2010-11	1992-93	2002-03	2010-11
China	65	336	3,563	45	281	1,186	150	120	300
ASEAN	247	834	5,015	313	889	2,106	80	90	240
US	215	305	1,020	227	270	474	90	110	220
India	11	979	5,703	13	1,062	2,009	90	90	280
Japan	69	89	281	85	102	130	80	90	220

Source:Tradedata (2013) (calculated by author)

Export volume to India grew very fast in this period from only $13 million in 1992–1993 to $1,062 million in 2010–2011, followed by ASEAN with similar amount and China third. The agricultural price indexes multiply around three times for countries except for China, which multiplied twice in the period 1992–2010. However, the agricultural export price index for China is the highest one.

7.4.2 *Trends of Exports for Two Groups of Major Markets Countries*

This section will explain the performance of the two groups of major export market destinations in the same period of study of the previous section. The first group is the new growing market countries, including India, ASEAN and China; the second group consists of existing export markets such as the USA and Japan.

Indonesian agricultural exports to these major destinations contribute more than 55 per centof total Indonesian agricultural exports worldwide with a value of $15,582 million out of Indonesian total agricultural exports worldwide at $28,486 million. Furthermore, the value of export from India, ASEAN and China only is aggregated to around $14,281 million as shown in Table 7.6, which is more than 50 per cent of the total exports. The growth of export value is remarkable as it grew annually from 20.9 per cent in the first period to 26.7 per cent in the second period. This denotes that the exports to these countries have dominated the agricultural exports from Indonesia.

Table 7.6 Indonesian Agricultural Exports to Two Market Groups

China, ASEAN and India				US and Japan		
Period	**Value ($m)**	**Volume ($m)**	**Price Index**	**Value ($m)**	**Volume ($m)**	**Price Index**
1992–93	323	370	0.9	284	312	90
2002–03	2,150	2,232	1.0	394	372	110
2010–11	14,281	5,301	2.7	1,301	604	220
Average Annual Rate of Change (% pa)						
1992–93 to 2002–03	20.9	19.7	1.0	3.3	1.8	1.5
2002–03 to 2010–11	26.7	11.4	13.7	16.1	6.3	9.3

Source: Tradedata (2013) (calculated by author)

Although the amount of export value has reached the remarkable amount and its growth is significant, the volume of exports has only been a third of the value in 2010–2011 that records $5,301 million (Table 7.6). The volume has indeed increased over time, however the growth of volume has been slowing down from the first period at 19.7 per cent to 11.4 per cent in the second period. This condition is contrary to the export price behavior which grew substantially from the first period, at 1.0 per cent growth annually, to 13.7 per cent annually in the second period.

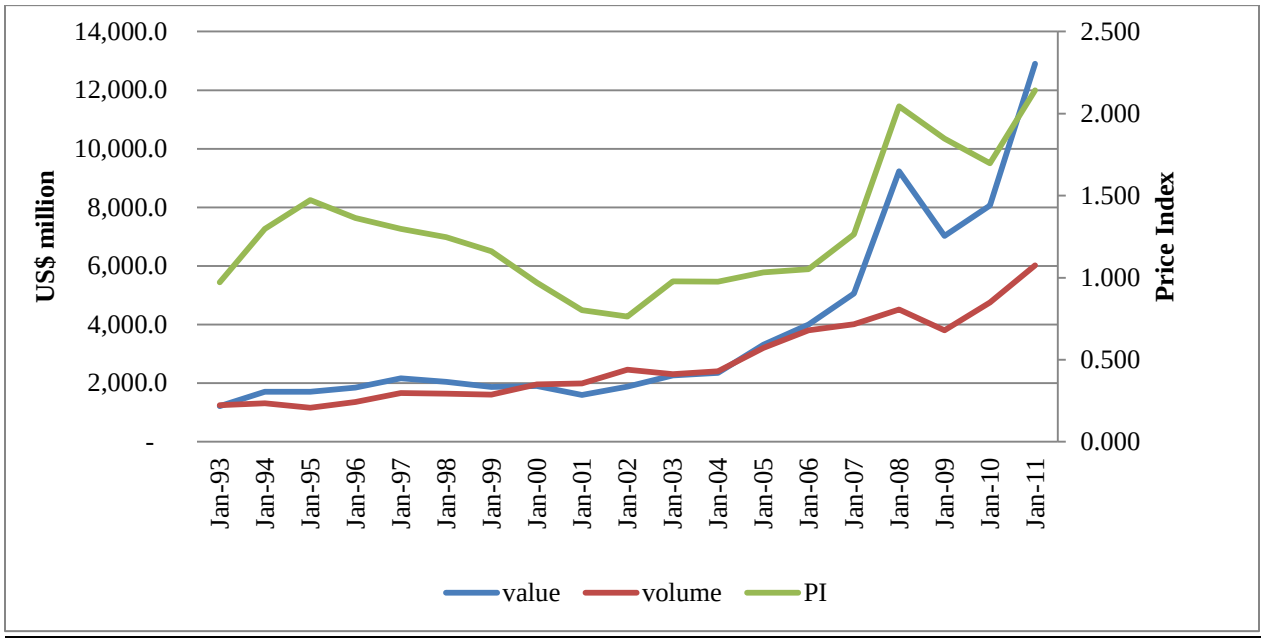
Furthermore, the agricultural exports' value and volume in the US and Japan started from $284 million and $312 million in 1992–1993 and expanded to $1,301 and $604 respectively, as displayed in Table 7.6.

However the growth of value and volume of exports to these countries has been slow, especially in the first period that recorded 3.3 and 1.8 per cent per year, and the price has grown at 1.5 per cent. In the second period the growths reached 16.1 and 6.3 per cent per year in value and volume, and 9.3 per centof the price. This condition is in great contrast with the exports to India, ASEAN and China, which grew faster after the 2000s. The background of these patterns can be tracked to the type of commodities exported to these countries.

7.4.3 *Indonesian Agricultural Export Worldwide Excluding Major Exports Destinations*

On the other hand, Indonesian agricultural exports to the rest of the world, excluding the major export markets, have also shown a similar pattern as the patterns of exports worldwide as well as the exports to the major countries, as presented in Figure 7.4. The chain-linked volume method has successfully explained the influence of volume and price to the export value. The trends of the export value and volume have been consistent from the beginning of the period under study until 2006; since then the discrepancy of the trends of exports value and volume becomes bigger. The trend of export value has been increasing higher than the volume of exports. As shown in the Figure 7.4, after 2006 the trend of export value follows the pattern of the price while the volume has not been impacted by the price. It can be concluded that for Indonesian exports, excluding the major destinations, the export price has more impact on rising the export value which makes the value of export seems higher than the volume which has been grown slower.

Figure 7.4Agricultural Exports Worldwide excluding Major Destinations by Volume



Source: Tradedata (2013) (calculated by author)

The more elaborate presentation of the agricultural exports worldwide excluding the major destinations is shown in Table 7.7. Compared to exports to the major countries, the starting amount of exports, in terms of value and volume, for the rest of the world (excluding the major

countries) are bigger. In 1992–1993, the export value is $1,216 million and export volume is $1,250 million. However, in 2010–2011, the value of export is only $12,904 million, which is lower than exports to major countries and the volume of export is $6,025 million. This indicates that the growth of export to the rest of the world is going slow. Nonetheless, asdemonstrators in Table 7.7, the sluggish growth occurs only in the period of 1992-93 to 2002-03 at 6.4 and 6.3 per centannually, while in period 2002-03 to 2010-11, the growth increase three times and reach 24.3 per centin value and 12.7 per cent for volume of exports. The growth of export price has been climbing from 0.1 per cent in the first period to 10.3 per cent in the second period, with the price index increase twice from 1.0 in 1992 to 2003 to 2.1 in 2010–2011.

Table 7.7 Indonesian Agricultural Exports Worldwide Excluding Major Destinations

Period	Value ($m)	Volume ($m)	Price Index
1992–93	1,216	1,250	100
2002–03	2,259	2,311	100
2010–11	12,904	6,025	210
Average Annual Rate of Change (% pa)			
1992–93 to 2002–03	6.4	6.3	0.1
2002–03 to 2010–11	24.3	12.7	10.3

Source: Tradedata (2013) (calculated by author)

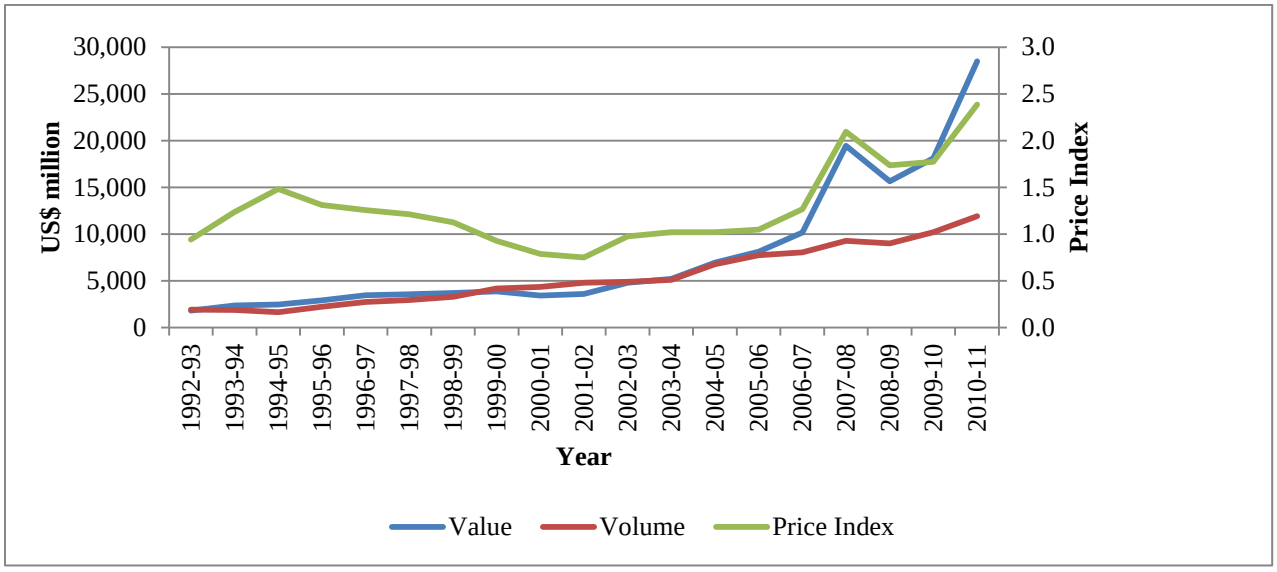
Hence, the pattern of Indonesian agricultural exports to the rest of the world tends to be similar with the exports to the major market countries[1]: India, ASEAN and China, as well as to the general agricultural exports worldwide. It seems that exports to certain countries such as members of the European Union have influenced the patterns of these exports.

[1]It is important to notes that exports, excluding focused major countries in this study, have substantial export markets such as the EU. However, the data is not available for the 27 different countries members of EU, thus the EU is not included in a major market destination in this study.

7.4.4 *Performance of Indonesian Agricultural Exports Worldwide*

Figure 7.5 demonstrates the value, volume and price of the Indonesian agricultural exports to all market destinations. From this figure, volume, price index and value have generally been increasing over the period 1992 to 2012, although price index has become more volatile. Price index has to be increased before experiencing decline from 1997 to 2000 because of the Asian crisis. The reform policies conducted after the crisis might stabilize the price index from 2000 to 2006. The price index of Indonesian agricultural exports has been rising from 2006 afterwards. The value tends to have a similar trend with the volume until 2006. The wide discrepancy occurs between price index with volume and value from 1992 to 1997. In line with the declining price index, the gap became smaller until 2006. Starting around 2007, the trend of value has been increasing; imitating the trend of the price index; while the volume trend has been steady with a wider gap with the price index.

Figure 7.5Indonesian Agricultural Exports Worldwide by Value, Volume and Price Index from 1992-2011



Source: Tradedata (2013) (calculated by author)

The pattern of value has been consistent with the volume until 2006, when the value grew very high and left the volume behind. This is caused by the influence of the combination of the price and volume growths which have been increasing at the similar high rates from 2002–2003 to 2010–2011.

The picture of the agricultural condition is more clearly described in Table 7.8. From this table, the value of Indonesian agricultural exports increased significantly from $1,822 million in 1992–1993 to $28,486 million in 2010–11 that grew 10.2 per cent in the first period from 1992–1993 to 2002–2003 and 24.9 per cent per year in the period from 2002–2003 to 2010–2011. The volume grew 9.8 per cent and price index grew 0.4 per cent in 1992–1993. From 1992–1993 to 2010–2011, volume and price index have been growing strongly in similar rates at 11.7 and 11.8 per cent annually. Thus, the increasing agricultural export of Indonesia is influenced by the increase of the volume and price index in recent time.

Table 7.8 Indonesian Agricultural Exports Worldwide

	Value ($m)	**Volume ($m)**	**Price Index**
1992–93	1,822	1,933	90
2002–03	4,802	4,914	100
2010–11	28,486	11,930	240
Average Annual Rate of Change (% pa)			
1992–93 to 2002–03	10.2	9.8	0.4
2002–03 to 2010–11	24.9	11.7	11.8

Source: Tradedata (2013) (calculated by author)

The phenomenon of the highly increasing of the agricultural price recently has caused the government and the private sector to put more attention on the agricultural sector. Since the spike in the price is caused by the lack of attention to the agricultural sector; and agriculture lagged behind in the technology and information sector has caused the production of the agricultural commodities to slow down while the demand is increasing (World Bank 2008).

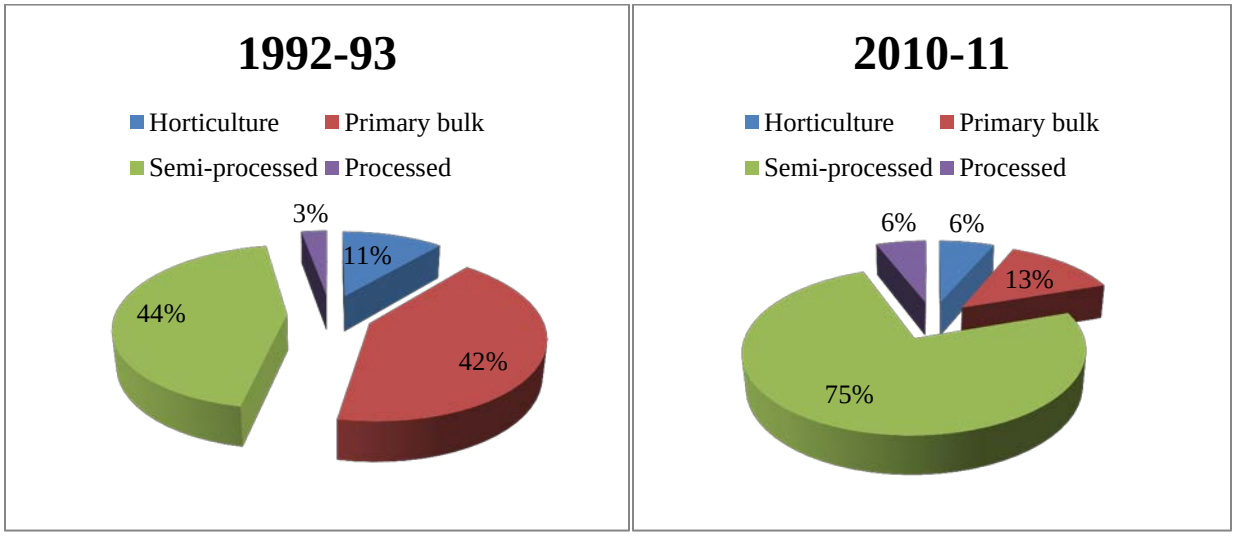
7.4.5 *The Behaviour of Exports for Agricultural Commodities Groups*

Based on the agricultural classifications of the AoA of the World Trade Organization(Regmi et al., 2005), the agricultural products are grouped into four clusters: horticulture, primary bulk,

semi-processed and processed commodities. The volumes of these groups are then used to describe their exports performances.

To examine the change of composition of Indonesian agricultural exports over time, a comparison between the exports composition in 1992–1993 and 2010–2011 is presented in Figure 7.6. The first pie chart displays the agricultural product's composition in 1992–1993 by volume. It is apparent that semi-processed and primary bulk products dominate the exports in this year. The percentages of these groups are similar at 44 and 42 per cent. Horticulture is third with 11 per cent share of the exports and processed group is the lowest with only 3 per cent share of exports.

Figure 7.6 Indonesian Agricultural Exports 1992–93 and 2010–11



Source: Tradedata (2013) (calculated by author)

Almost twenty years later, the composition of Indonesian agricultural exports changed significantly. In 2010–2011, semi-processed products increased its share in total agricultural exports of Indonesia to 75 per cent. The primary bulk group loses its share to 13 per cent and the horticulture shrunk to 6 per cen. Meanwhile the processed group's share has grown to be 6 per cent. This demonstrates that Indonesia has gained strength in producing semi-processed products of agriculture.

The raw agricultural products, such as horticulture and primary bulk, tend to be declining in exports, while the industrial, agricultural products, such as semi-processed and processed

products, has the possibility to be increasing in the future. This can be shown by comparing the export growth among the agricultural groups from 2002–2003 to 2010–2011. All groups have remarkable growth in export value compared to the growth from 1992–1993 to 2002-2003 as presented in Table 7.9.

Table 7.9 Total Export of Indonesia Worldwide by Commodities

Period	Horticulture			Primary Bulk		
	Value ($m)	Volume ($m)	Price Index	Value ($m)	Volume ($m)	Price Index
1992–93	275	218	126	761	808	94
2002–03	250	537	47	1,052	981	107
2010–11	748	764	98	3,155	1,588	199
Average Annual Rate of Change (% pa)						
1992–93 to 2002–03	–1.0	9.4	–9.48	3.3	2.0	1.30
2002–03 to 2010–2011	14.7	4.5	9.73	14.7	6.2	8.01
Semi-processed				**Processed**		
	Value ($m)	Volume ($m)	Price Index	Value ($m)	Volume ($m)	Price Index
1992–93	738	852	87	47	55	86
2002–03	3,377	3,258	104	123	138	89
2010–11	23,392	8,879	263	1,190	698	170
Average Annual Rate of Change (% pa)						
1992–93 to 2002–03	16.4	14.4	1.81	10.0	9.6	0.37
2002–03 to 2010–11	27.4	13.3	12.37	32.9	22.5	8.43

Source: Tradedata (2013) (calculated by author)

However, since the value is influenced by price, the explanation of exports behaviour will focus on volume and price. Hence the source of export growth can be determined. The processed group has the highest growth in export volume of 22.5 per cent per year, followed by semi-processed group by 13.3 per cent. Meanwhile, horticulture and primary bulk groups have the lowest growth of volume at 4.5 per cent and 6.2 per cent per year. In contrast, the lowest growth of agricultural

price is gained by primary bulk and processed groups at around 8 per cent followed by horticulture. The semi-processed group experiences the highest growth in price at 12.37 per cent per year.

In the period from 2002–2003 to 2010–2011, the export volume of semi-processed products is only one third of the export value, declining from the previous period which was almost one to one of this comparison. The rapidly increasing price has heavily influenced the value. There are different stories for the other groups. Horticulture's export value and volume have remained steady for both periods, denoting that the price growth is steady as well. The groups of primarily bulk and processed have export volume is half of the value in the same period; while the balance is one to one in the previous period. Hence, price significantly influences all the agricultural groups, except for horticulture, in the period of 2010 to 2011.

Overall, the bright future of agricultural exports of Indonesia may be attributed to the processed and semi-processed group. The production and demand are better for the processed products group followed by the semi-processed group. Recently, the amount of exports of processed products has not as much as semi-processed group, however the future of the processed products to be exported is widely opened.

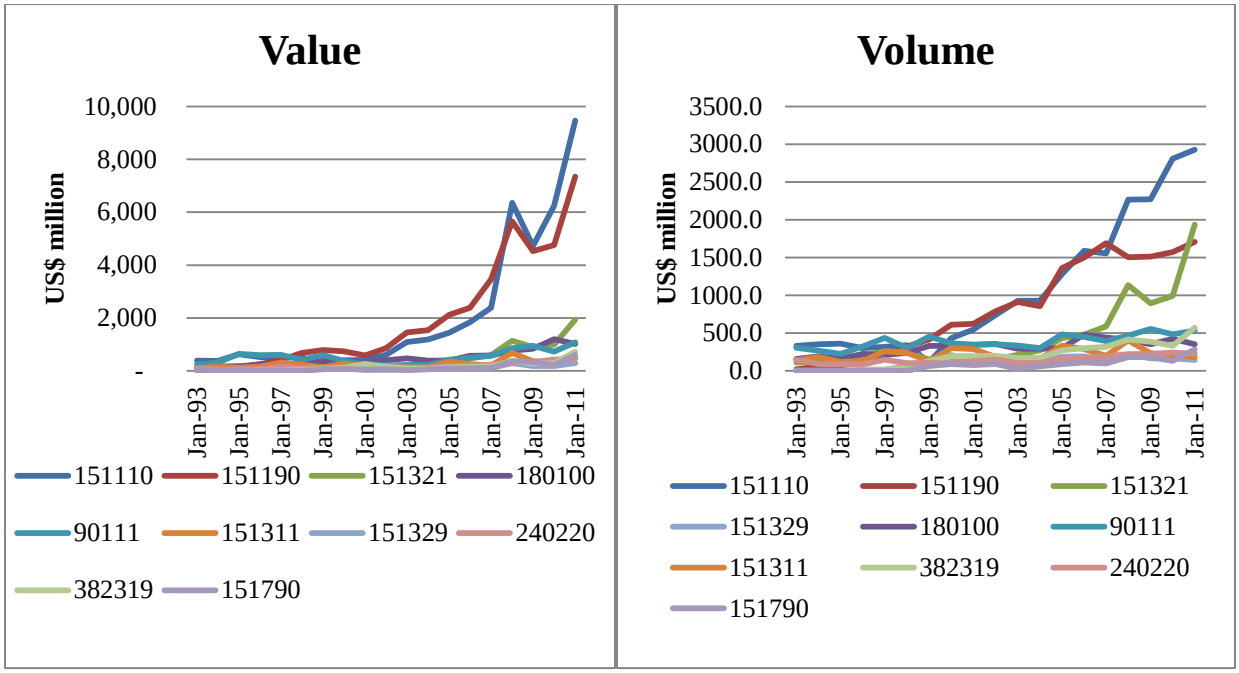
7.4.6 *Composition of Biggest Indonesian Agricultural Exports Worldwide*

The remarkable growth of the Indonesian agricultural exports cannot be separated from the types of agricultural commodities produced in Indonesia. Based on the agricultural classification of the WTO, the dominant export products of Indonesia are currently perennial crops such as palm oil and its family: cocoa, coffee and coconuts. Furthermore, some manufactured agricultural products are also becoming rising stars in supporting exports to the world.

Figure 7.7 shows the ten biggest exported agricultural commodities based on value and volume, which orderly consist of crude palm oil (HS 151110), palm oil and its fractions (HS 151190), crude palm kernel or babasu oil, whether or not refined, but not chemically modified (HS 151321), palm kernel or babasu oil (HS 151329), cocoa beans, whole or broken, raw or roasted

(HS 180100), coffee, excluding roasted and decaffeinated (HS 090111), crude coconut (copra) oil, whether or not refined but not chemically modified (HS 151311), cigarettes containing tobacco (HS 240220), other industrial mono-carboxylic fatty acids and acid oil from refining (HS 382319) and edible mixtures or preparations of animal or vegetable fats or oils (HS 151790).

Figure 7.7 Value and Volume of Ten Biggest Indonesian Agricultural Exports Products Worldwide



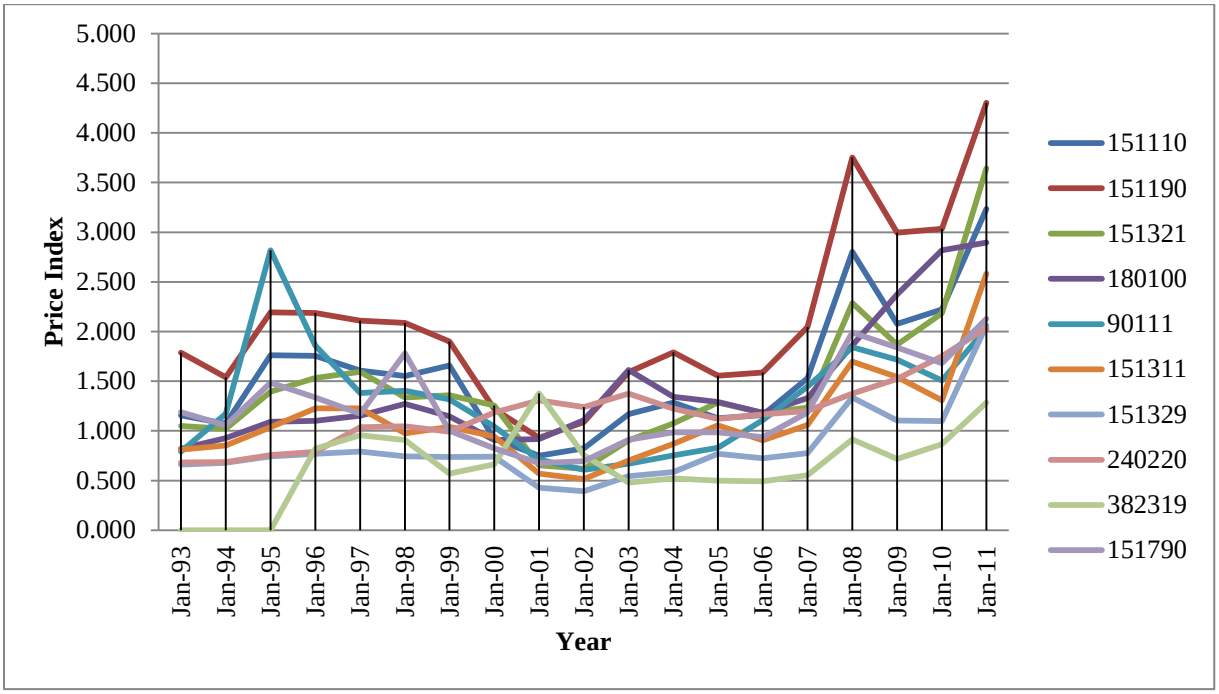
Source: Tradedata (2013) (calculated by author)

Almost all of the biggest exported commodities are from the semi-processed group with only a small number of representatives from the primary bulk group and processed group commodities. There is no product from the horticultural group in the ten biggest exported products. With the exception of coconut which is mostly produced for the domestic market, their production is driven by external markets.

Palm oil products have dominated Indonesian agricultural exports. Crude palm oil (HS code 151110) and palm oil and its fractions (151190) have the biggest export value; far higher than other commodities (see Figure 7.8). In terms of volume, three out of ten biggest agricultural commodities have been standing out in exports after the 2000s onwards namely, crude palm oil

(HS 151110), palm oil and its fractions (HS 151190) and crude palm kernel or babasu oil (HS 151321).

Figure 7.8 Price Index of Indonesian Agricultural Exports Products Worldwide



Source: Tradedata (2013) (calculated by author)

Nevertheless, the rapid increases of export values of crude palm oil and palm oil have been influenced by the rising of the price of these products. As shown in Figure 7.8, the price of both commodities has been increased greatly since the end of 2006. This price rise has forced the export values of the commodities.

The domination of palm oil products makes sense since Indonesia has become the largest producer and exporter of palm oils in the world with more than 70 per cent of its production exported (Pusdatin 2013). The main destination countries are India, The Netherlands, Malaysia, Italy, Singapore, Germany and China. Export to India accounted for 46 per cent of the total in 2006 to 2010.

Table 7.10 Growth of Value, Volume and Price of Ten Biggest Agricultural Products of Indonesia

Products	Value ($m)	Volume ($m)	Price Index

	1992–93 to 2002–03	2002–03 to 2010–11	1992–93 to 2002–03	2002–03 to 2010–11	1992–93 to 2002–03	2002–03 to 2010–11
Crude palm oil (HS 151110)	11.0	31.1	10.8	15.4	0.1	13.6
Palm oil (HS 151190)	43.6	22.5	45.2	8.2	–1.1	13.2
Crude palm kernel (HS 151321)	6.8	31.9	8.4	10.8	–1.50	19.0
Cocoa bean (HS 180100)	14.0	10.1	6.6	7.0	–2.3	7.6
Coffee (HS 090111)	–0.7	21.7	1.0	5.9	–1.7	14.9
Crude coconut oil (HS 151311)	–1.4	22.5	0.0	4.1	–1.4	17.7
Palm kernel or babasu oil (HS 151329)	33.9	21.1	36.5	2.6	–1.9	18.1
Cigarettes (HS 240220)	3.6	16.2	-3.4	10.6	7.3	5.0
Other industrial mono fatty acids (HS 382319)	20.6*	31.5	29.1*	16.2	–6.5*	13.1
Edible prep. of animal/ veg fats/oils (HS 151790)	84.0	48.2	89.0	33.2	–2.6	11.2

Source: Tradedata.net (calculated by author)

Notes: * 1995-96 to 2010-11 Due to the availability of the data
Red color: increasing growth

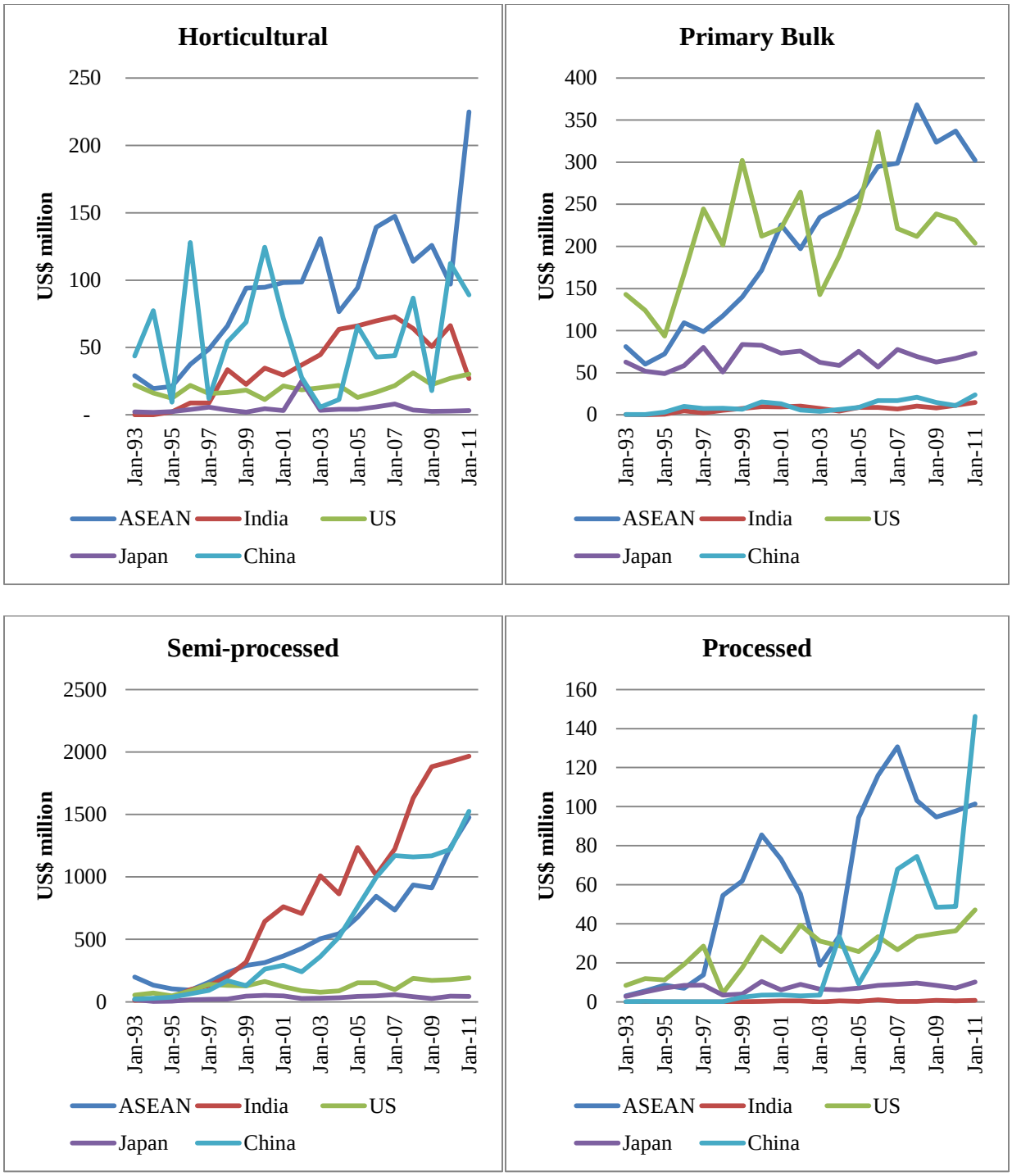
In general, the growth of export value, volume and price for the ten biggest exported agricultural commodities tend to be increasing from the first period (1992–1993 to 2002-2003), to the second period (2002–2003 to 2010-2011). Table 7.10 presents the growth performance of the ten

biggest commodities. Among these commodities that have strong volume growth inthe first period, Palm oil (HS 151190), palm kernel or babasu oil (HS 151329), other industrial monocarboxylic fatty acid ((HS 382319) and edible mixtures or preparations of animal or vegetable fats or oils (HS 151790) have smaller growth rates of volume in the second period but increasing price growth rates. This may indicate that the production of these commodities has not addressedthe demand that caused the price to increase or the volume of exports are already high in first period, thus the growth is slower, even though the amount is higher than the previous period. Hence, the value of exports is mostly influenced by the increasing growth of its price. Cocoa bean (HS 180100) has been declining in value, but increasing growth in volume and price. This indicates that the production of cocoa has been expanding to meet the increasing demand. Cigarettes containing tobacco (HS 240220) are the only product with declining growth of price from first period to second period.

7.4.7 *Commodities by Countries*

Figure 7.9 shows the exports from Indonesian to five major export destinations for agricultural groups for a period from 1992 to 2011. First, horticultural products are mainly exported to ASEAN followed by India. The trend of horticultural exports to China is volatile and the volume of export has been remained small. Japan and the USA are among the smallest market. Second, different trends occur in the primary bulk group. The USA and ASEAN are the biggest export markets for primary bulk products, followed by Japan. ASEAN has a positive trend that is increasing while the United States has very low growth over the period after a significant increase in 1995. China and India are the smallest export major destination for this group. Third, India, ASEAN and China are superior export markets for semi-processed products with India as the biggest market while the USA and Japan are inferior markets. Last, for processed products, ASEAN is the biggest export market, followed by the USA and China. The export trends of ASEAN and China are positive and increasing for this group. Meanwhile India and Japan are smaller export markets for this product group and their export trends are flat.

Figure 7.9 Agricultural Groups Exports Volume by Countries



Source: Tradedata (2013) (calculated by author)

In conclusion, during 1992 to 2011, ASEAN tends to be the major export market for almost all agricultural groups' exports from Indonesia. China seems to be a growing market for all

agricultural groups except for the primary bulk. India is the superior export market in terms of volume, although only for semi-processed products. The USA is one of the main export markets; however the volume of exports to this country has remained small. Among other, Japan is the lowest rank export destination for Indonesian agricultural products.

7.4.8 *Review of the ACFTA and the Pattern of Indonesian Agricultural Exports to China*

While Indonesia has plenty of agricultural products, its export is narrow in terms of variety of commodities. There are only 35 commodities that cover almost 95 per cent of total agricultural exports with six-digit HS code (Tradedata 2013). From these commodities, the biggest agricultural products included in the ACFTA program are limited.

Table 7.11 Biggest Exported Products in ACFTAPrograms

Group	Early Harvest Program	Normal Track	Sensitive Track
Horticulture	—	—	Pepper, excluding crushed or ground (HS 090411)
Primary Bulk	—	—	Coffee, not roasted or decaffeinated (HS 090111), tobacco, partly stemmed (HS 240120)
Semi-processed	Crude coconut (copra) oil, whether or not refined but not chemically modified (HS 151311), coconut (copra) oil & its fractions, exclude crude coconut oil (HS 151319), crude palm kernel or babassu oil (HS 151321), palm kernel or babassu oil & its fraction, exclude crude palm oil (HS 151329), vegetable fats and oils (HS 151620);	—	Crude palm oil (HS 151110), palm oil, excluding crude & liquid fraction (HS 151190)
Processed	Edible mixture of preparation of animal or vegetable oils or fats (HS 151790)	Food preparations of flour and meal (HS 210690)	Pineapples otherwise prepared or preserved, nes (HS 200820).

Source: ASEAN website (2004)

There are only six commodities that are added in the EHP, one commodity in the Normal Track and six commodities under the Sensitive products. These commodities are listed in Table 7.11. The rest of the biggest exported commodities of Indonesia are excluded from the agreement.

As explained in Chapter Two, the EHP scheme of the ACFTA has a list of agricultural products consisting of products in two digits: HS code 01 to 08 and specific products listed in the Appendix Three of the ACFTA agreed by Indonesia and China as additional products to be covered under the EHP (refer to Table 2.1 and Table 2.2). These specific products consist of fourteen products which, among others, include eight agricultural products. From those products registered in the EHP scheme, six specific products are included in the top thirty-five biggest commodities listed in this study as semi-processed group such as: crude coconut (copra) oil, whether or not refined, but not chemically modified (HS 151311), coconut (copra) oil and its fractions, exclude crude coconut oil (HS 151319), crude palm kernel or babassu oil (HS 151321), palm kernel or babassu oil & its fraction, exclude crude palm oil (HS 151329), vegetable fats and oils (HS 151620); and listed as processed group: edible mixture of preparation of animal or vegetable oils or fats (HS 151790). While Cocoa powder with added sugar or other sweetening (HS 180610) and roasted and decaffeinated coffee (HS 090122) are not in the top exported products of Indonesia. These products experienced a tariff reduction as trade facilitation under the EHP program in the period from 2004 to 2006.

Meanwhile, the ACFTA has the Sensitive track, as explained in Chapter Two. The Sensitive track is divided into the Sensitive List and Highly Sensitive List that implements tariff reductions in 2012 and 2016 respectively. Some of the agricultural products listed under this program have been included in the top thirty-five biggest exported products including, in the Horticultural group: pepper, excluding crushed or ground (HS 090411); primary bulk group: coffee, not roasted or decaffeinated (HS 090111), tobacco, partly stemmed (HS 240120); semi-processed group: crude palm oil (HS 151110), palm oil, excluding crude and liquid fraction (HS 151190); the processed group: pineapples otherwise prepared or preserved, NES (HS 200820).

Only one out of thirty-five biggest exported commodities are included in the Normal Track, namely, food preparations of flour and meal (HS 210690). However, the export data is not available for the whole period, hence the Normal Track is not included in the study. The rest of

the biggest exported commodities from Indonesia are not covered by the ACFTA program, hence they are employed the MFN import tariff.

7.4.8.1 Indonesian Agricultural Exports to China

In general, the agricultural exports in this study covered about 90 per cent of the total agricultural exports from Indonesia to China. Table 7.12 presents the evolution of the Indonesian agricultural exports to China from the value, volume and price views in the period from 1992 to 2011. Although the pattern of exports to China resembled the export pattern to the world the decrease in the price index in 2000 was deeper than the world's.

The value of exports has increased significantly from only $65.1 million in 1992–1993 to $ 3,563.4 million in 2010–11. The average annual growth has improved doubled from 17.8 per cent for the period from 1992–1993 to 2002–2003 to 34.3 per cent in 2010–2011. The price has a significant contribution to this export while the volume of exports increase has not been as high as the value's. The price index grew from 1.5 per cent to 3 per cent and the volume grew from $44.7 million to $1,186.3 million for the period 1992–93 to 2010–2011. The price index growth rate increased from –1.9 per cent to 12.2 per cent, while the volume growth rate decreased from 20.2 per cent to 19.7 per cent in the same period.

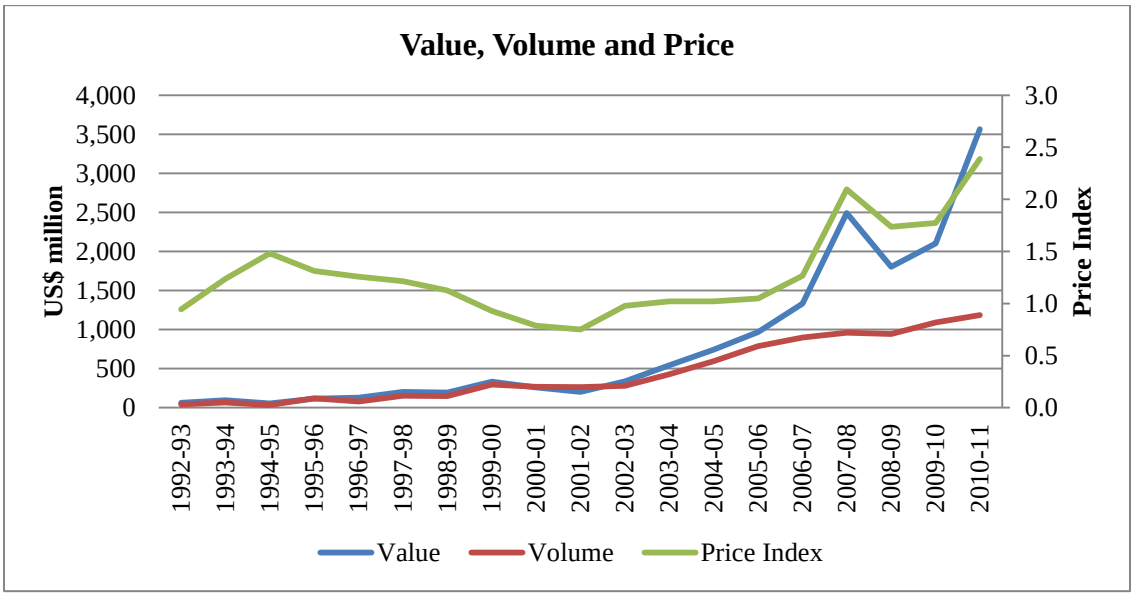
Table 7.12 Total Agricultural Exports of Indonesia to China

Period	Value ($m)	Volume ($m)	Price Index
1992–93	65.1	44.7	150
2002–03	336.2	281.2	120
2010–11	3,563.4	1,186.3	300
Average Annual Rate of Change (% pa)			
1992–93 to 2002–03	17.8	20.2	-1.9
2002–03 to 2010–11	34.3	19.7	12.2

Source: Tradedata (2013) (calculated by author)

This condition is more clearly shown in Figure 7.10. This graph shows that agricultural exports from Indonesia to China have been increasing significantly since the end of 2003. This is coincidental with the implementation of the ACFTA. The value and volume of Indonesian export to China have been parallel until around 2003 which the value of exports is then spiking up left the volume behind. The agricultural price has been increased from this year and has been increasing rapidly on 2006 onwards and has influenced the pattern of the exports from Indonesia to China significantly. Meanwhile, the volume growth is not as high as other variables.

Figure 7.10 Indonesian Agricultural Exports to China



Source: Tradedata (2013) (calculated by author)

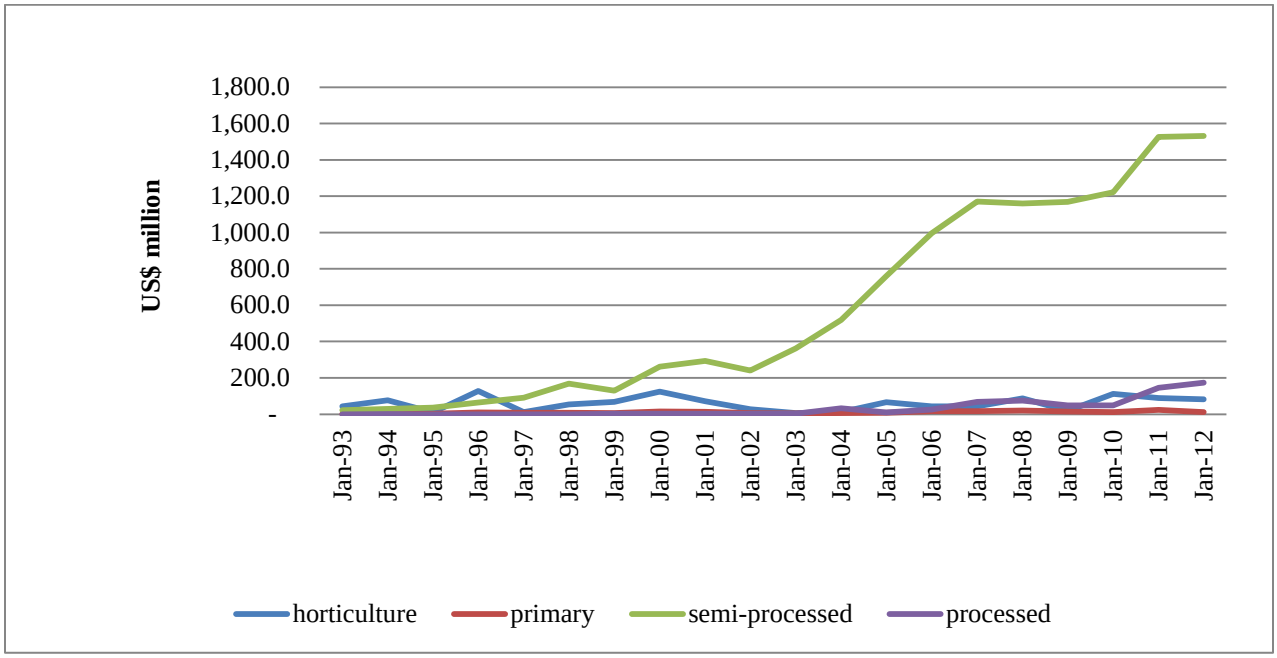
7.4.8.2 Exports to China: Commodities Groups

Indonesia has exported mainly the semi-processed group of commodities to China, as presented in Figure 7.11. This graph demonstrates that the volume of semi-processed group has been substantially growing far beyond the other groups of horticulture, primary bulk and processed products. This shows that the exports of Indonesian agriculture are mainly the products from the semi-processed group. The implementation of the EHP scheme which has mainly driven the

trade of the agricultural products under the HS code 01-08 seems to have no success in improving Indonesian exports of these products.

However, there are five commodities of semi-processed groups under the EHP scheme. Since the volume of semi-processed group has grown higher than other groups, there is possibility that the semi-processed commodities under the EHP have also driven this growth. Thus a more detailed examination of the semi-processed commodity needs to be undertaken.

Figure 7.11 Exports to China by Volume of Commodities Groups



Source: Tradedata (2013) (calculated by author)

A more detailed description of the agricultural groups' exports phenomenon is displayed in Table 7.13. This table presents the value, volume and price of the horticulture, primary bulk, semi-processed and processed groups for three different periods: 1992 to 1993, 2002 to 2003 and 2010 to 2011. It also presents the growth of these variables for two periods: 1992–2003 to 2002-03, and 2002–2003 to 2010–2011. The latter might also capture the influence of the ACFTA, since this agreement was signed in 2002.

Table 7.13 shows that, in terms of exports value and volume, all groups have been growing in from the period from 1992–1993 to 2010–2011. However, the smallest value and volume of

exports over the period has been attached to horticultural and primary bulk groups. During this period, the value of exports for these groups started with a very small number. Although the growth rates are remarkable, especially for the period from 2002–2003 to 2010–2011, the value and volume still remains relatively small in number. In contrast, the growth of the price index has been declining from 2.9 per cent to –10.3 per cent in the same period. The price index of the agricultural group went down from 90 in 1992–1993 to 50 in 2010–2011 that means the value of exports has been stagnant over the period.

Table 7.13 Agricultural Exports of Indonesia to China by Commodities

Period	Horticulture			Primary Bulk		
	Value ($m)	Volume ($m)	Price Index	Value ($m)	Volume ($m)	Price Index
1992–93	40.9	43.7	0.9	0.7	0.6	120
2002–03	7.2	5.8	1.2	7.4	4.2	170
2010–11	46.7	89.0	0.5	56.4	23.9	240
Average Annual Rate of Change (% pa)						
1992–93 to 2002–03	–15.9	–18.3	2.9	27.0	22.1	4.0
2002–03 to 2010–11	26.2	40.7	–10.3	29.0	24.2	3.8
Semi-processed				**Processed**		
	Value ($m)	Volume ($m)	Price Index	Value ($m)	Volume ($m)	Price Index
1992-93	23.4	22.6	1.0	0.0	0.0	129
2002-03	318.4	361.7	0.9	3.2	3.4	95
2010-11	3,180.9	1,525.9	2.1	279.4	146.3	191
Average Annual Rate of Change (% pa)						
1992-93 to 2002-03	29.8	31.9	–1.6	52.3	57.1	-3.0
2002-03 to 2010-11	33.3	19.7	11.4	74.7	60.0	9.2

Source: Tradedata (2013) (calculated by author)

The substantial growth of value, volume and price are experienced by the processed group exports. The processed product group has been growing from a very low base. Although the number is small, the growth of value and volume reached 52.3 per cent and 57.1 per cent in the period 1992–1993 to 2002–2003 and jumped to 74.7 per cent and 60 per cent in the period from 2002–2003 to 2010–2011. Furthermore, the price index for this group has been growing significantly, especially in the recent period, to about 9.2 per cent.

There were different conditions for semi-processed group exports. Their value and volume significantly increased from $40.9 million and $43.7 million in 1992–93 to $3,563 million and $1,525.9 million in 2010–2011. The growth of value was remarkable with 29.8 per cent in the first period and 33.3 per cent for the latter period. However, the growth of volume has been declining from 31.9 per cent to 19.7 per cent in the same period. In contrast, the growth of price index has been expanded substantially by 11.4 per cent in the period of 2002–2003 to 2010–2011. The pattern and number of the value, volume and price of this group looks similar to the pattern of the general agricultural exports from Indonesia to China, as shown in Table 7.1. It seems that general agricultural exports are heavily influenced by the exports from the semi-processed group.

The increasing volume and price, especially in the period from 2002–2003 to 2010–2011, has substantially influenced the value of exports. The exception is for the horticultural group which has been declining in its price index, which then influenced the value of the exports, although the volume had remarkable growth by more than 40 per cent in the recent period. This is important to note that the commodities included in the Horticultural group are mostly the core commodities under the EHP programs of the ACFTA which is intended to be improved. However the trade facility of the EHP has not been able to increase the export significantly, as found in the previous chapter. The explanation in this section supports the results from the previous chapters.

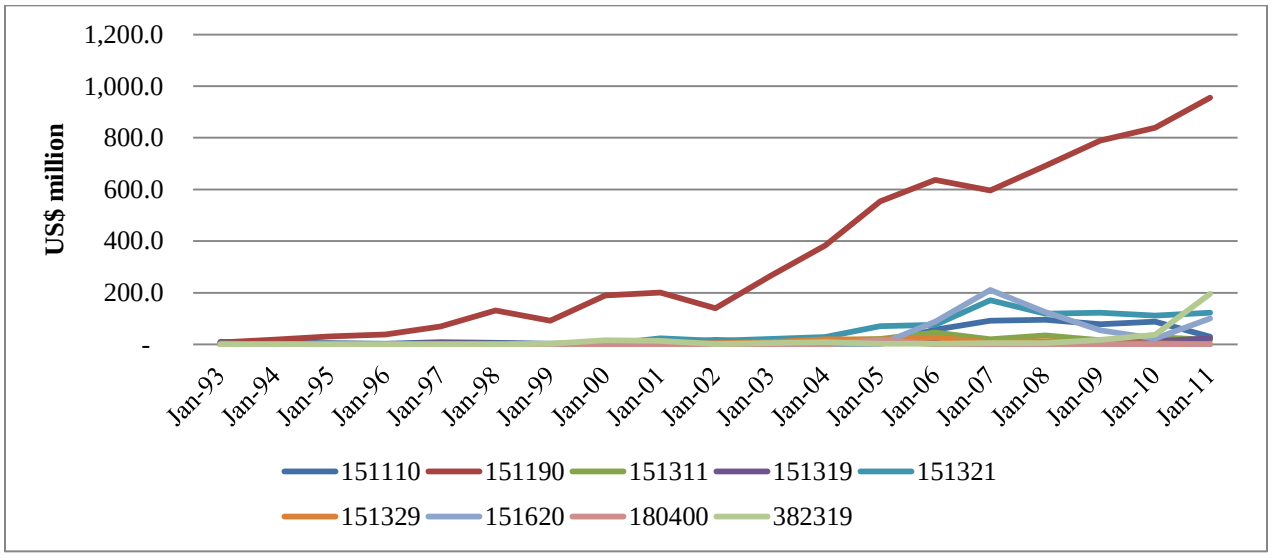
From this explanation, it is clear that the Indonesian agricultural exports to China have been growing significantly for the most of groups of commodities. From the first period, 1992–1993 to 2002–2003, to the second period, 2002–2003 to 2010–2011, the volume of exports grew for horticulture, primary bulk and processed groups but declining for the semi-processed group. Although the semi processed group has the highest amount. For the same periods, the price

indexes for horticulture and primary bulk have been decreasing while for semi-processed and processed groups have been increasing.

7.4.8.3 Semi-processed Commodities Exports to China

As explained in the previous section; that semi-processed exports have dominated the agricultural exports from Indonesia to China. Thus the more detailed examination of individual commodity of semi-processed group needs to be undertaken. This is important in relation to the implementation of the ACFTA since there are five commodities of the semi-processed group that are included in the EHP scheme. By disaggregating the semi-processed group into single commodities, it will be clear what commodities have increased exports.

Figure 7.12Semi-processed Exports from Indonesia to China by Volume



Source: Tradedata (2013) (calculated by author)

Figure 7.12 illustrates the biggest exported nine commodities under the semi-processed group by volume. The figure shows that there is only one commodity that is exported to China in large number. Palm oil, excluding crude, and liquid fraction (HS 151190), has been the main agricultural product that influenced the pattern of agricultural exports from Indonesia to China. In relation to the commodities under the ACFTA program, palm oil (HS 151190) is included in

the Sensitive Track that has not yet been treated with trade facilitation in the period of study. On the other hand, other commodities under the EHP scheme tend to have become stagnant. These findings support the results of the impact of the ACFTA as explained in previous chapters.

7.5 Conclusion

This chapter provides an analytical description about the agricultural exports of Indonesia. From the explanation in the previous sections, it can be concluded that, in general, Indonesian agricultural exports have been increasing in the period from 1992 to 2011. The application of the volume chain-link method to explore the real value of Indonesian exports has separated the export value from the influence of price. Hence, it can be examined that mostly agricultural export volume and price have been increasing.

Furthermore, it can also be concluded that more than 50 per cent of the Indonesian agricultural exports are only exported to the three biggest countries: India, ASEAN and China. Indonesia tends to lose its market share in the USA and Japan as the growth of exports to these countries are sluggish and the amount of volume and value remained small and stagnant over the period.

In terms of the agricultural group exports, Indonesian exporthas been dominated by the semi-processed group. Furthermore, the varieties of superior export commodities are limited to vegetable oils, especially the groups of palm oils, which are included in the semi-processed group. Indonesian exports are mainly supported by palm oils in terms of volume and value. Hence, the increase of Indonesian agricultural exports has been heavily influenced by these commodities, especially crude palm oil (HS 151110) and palm oil and its fraction (HS151190).

Although other agricultural groups have only small value and volume of exports to China, their growth are very strong. As the export volumes start, on average, at a very low base, the export volumes of these groups are still overshadowed by the semi-processed commodities. Considering their high growth, there is a potential benefit to develop their exports to China that can be gained by Indonesian government.

Nonetheless, the high growth in the exports seemed to have a little influence of the ACFTA. It can be shown by the fact that the EHP, as part of the ACFTA program, that was created to boost agricultural trade, does not cover the palm oil products of the crude palm oil (HS 151110) and

palm oil and its fraction (HS151190). The increasing exports mainly dominated by these, both products that have no trade facilitation yet in the ACFTA. In contrast, the EHP has only included products with very small contributions to exports. The narrow range of products for exports and low coverage of the EHP on superior agricultural products of Indonesia supports the empirical findings of ACFTA that was examined in previous chapters.

Chapter 8
Conclusion and Policy Implication

8.1 Chapter Aims and Description

This study has examined the potential for economic growth of agricultural exports from Indonesia to China, especially those under ACFTA. Specifically, this study questions whether agricultural exports still have an important impact on economic growth of Indonesia as well as the impacts of the effort of joining the ACFTA on the agricultural exports. There are five objectives for this research:

1. To empirically investigate the impacts of agricultural exports and the ACFTA programs on Indonesian economic growth by using rigorous methodology;
2. To investigate the impact of the ACFTA programs for Indonesian agricultural export growth;
3. To examine the competitiveness of agricultural export commodities under the ACFTA;
4. To overview the condition of Indonesian agricultural exports from the volume and price perspective; and
5. To learn the policy implication of the implementation of the ACFTA. Mostly, the objectives are examined in every different chapter due to different methodologies used to exercise theirs.

This final chapter provides summary of the research and policy implications developed in this thesis. The chapters in this thesis are divided into two parts: the first three chapters reviewed the literature and policy background concerning agricultural position in development and growth and trade liberalization in the agricultural sector. The other part consists of empirical studies concerning the agricultural exports of Indonesia under the auspices of the ASEAN-China Free Trade Agreement (ACFTA). Chapter Four examines the impact of Indonesian agricultural exports to China on the economic growth of Indonesia. The impacts of the ACFTA programs on related agricultural commodities exported from Indonesia to China are discussed in Chapter Five for the growth of exports and Chapter Six for the competitiveness of the agricultural products.

Chapter Seven is dedicated to study in price and volume perspective on Indonesian agricultural exports.

8.2 Research Summary

8.2.1 *Background of Agricultural Trade Development*

After being abandoned for decades because its importance in economics and development was overshadowed by the importance of the industrialized sector, the agricultural sector has been given renewed attention as a key to growth in many countries. The resurgence of the agricultural sector sheds light on the importance of improving this sector to meet its many functions; from providing food for the increasing population, poverty reduction, increasing economic growth and addressing environmental sustainability and climate change issues.

Chapter Two provides an overview of the agricultural sector revival; that the importance of the agricultural sector has been given attention in the position of development and in trade liberalization. This chapter also discusses the ACFTA. This provides an explanation of the background for this study and the rationale for this study. One of the ways to improve the agricultural sector is trade liberalization. The initial effort for agricultural liberalization is the establishment of the Uruguay Round Agreement on Agriculture (URAA); however, many developing countries are unsatisfied with the progress of this agreement (Hathaway & Ingco 1995). As a result, they establish free trade agreements among themselves. The ACFTA is a free trade agreement that has a special program focusing on agricultural trade, namely, the Early Harvest Program (EHP) as well as other programs: the Normal Track and the Sensitive Track. There is a huge literature studied on the ACFTA but only a limited number of them discuss the agricultural trade in relation to the programs of the ACFTA. This study, therefore, attempts to add to the literature in this area.

Chapter Three provides an overview of the Indonesian agricultural sector. Indonesia is a country with a strong agricultural base with agricultural exports in the third position of their foreign exchange earnings (Pusdatin 2013). Furthermore, the importance of agricultural trade is shown

by the increasing of the total value of trade and its growing share in merchandise trade of Indonesia.

Based on export value, in 2011 Indonesia was the third biggest agricultural exporter in the world after the United States and Malaysia (FAOSTAT 2013), improving from number eleven in 2004. Although Indonesia is well-known as one of the biggest agricultural exported country in the world, its export is quite narrow in terms of variety of commodities and export destinations. The main agricultural commodity exported from Indonesia is palm oil with its value $17,261,248 in 2011, having increased from $3,441,776 in 2004. This commodity has primarily been exported to new growing markets, including ASEAN countries, India and China. On the other hand, exporting this commodity to traditional agricultural markets such as USA, EU, Japan has not expanded.

To improve its exports, Indonesia has made many efforts, including joining many free trade agreements. The ASEAN-China Free Trade Agreement (ACFTA) is one of the agreements Indonesia has signed. It has been expected that this agreement will increase Indonesian exports, especially the agricultural ones, to China. ACFTA has a special program to encourage agricultural trade among members, named the Early Harvest program (EHP) that started in 2004. Considering China is a prospectively big market with its huge population and a growing economy, it is envisaged that Indonesia will gain benefit by increasing its exports to China in spite of competition with other ASEAN countries that has similar exports.

The influence of the ACFTA can be shown by the movement of the trade between Indonesia and China. The total trade balance between Indonesia and China is a deficitin Indonesia. This deficit became bigger during 2000 to 2012 (UNComtrade 2013). In contrast, the trade balance for agricultural commodities has been positive for Indonesia since 2005; yet the positive balance for Indonesia has been getting wider until recently. This indicates that agricultural exports are an important sector in Indonesia and there is an opportunity to increase economic growth from this sector.

8.2.2 *Empirical Studies Reviews*

With respect to this endeavour to improve agricultural exports, it is foreseeable that this sector is projected to contribute more to the economy of Indonesia. The first objective of this study was to

measure the influence of Indonesian agricultural exports to China and the implementation of the ACFTA on Indonesian economic growth. This objective is examined in Chapter Four of this thesis. In addition, this chapter also focuses on the effect of the global financial crisis on Indonesian economic growth. The generalized gravity theory is employed to address this objective. Considering the causality relationship between economic growth and exports, this model employs the instrumental variables technique with two-stage least Squares (2SLS) estimation to address this problem. The exercise of the requirements for instrumental variables model found that there is no causality for the Indonesian economic growth-agricultural export model. Furthermore, the model is estimated by employing the OLS estimation. The model reliability is well as tested by employing the Friedman-Kydland criterion of data-model consistency (Kydland 2006).

The export-led growth theory postulates that exports can be an engine for economic growth; However, the findings show that Indonesian agricultural exports to China does not have any influence on the economic growth of Indonesia at 10 per cent significance level. Although agricultural exports to China have been increasing, their effect has not been strong enough to lift the economy of Indonesia. The agricultural exports has small portion in the overall Indonesian export compare to other sectors such as oil and mining and industries sectors. Even though the agricultural exports have been increasing, the pace of growth is not as higher as the other sectors. The agricultural exports' share has been declining in the GDP while the other sectors have been increasing. This finding is consistent with previous research that showagricultural exports have no impact on economic growth(Doppelhofer, Miller & Sala-i-Martin 2000; Esfahani 1991; Sala-i-Martin 1997) or negative impacts (Faridi 2012) of agricultural exports on economic growth.

In contrast, the implementation of the ACFTA has a positive and significant impact on Indonesian economic growth at 5 per cent. This is consistent with the theory that free trade areas are able to increase welfare of a country and voluminous literature supports this finding. The trade integration with China has beneficial impacts for Indonesia as the export market has been broadened. The implementation of trade facilities and tariff reduction gave Indonesian exports more bargaining power in China's market. This is demonstrated by increasing exports to China. ACFTA implementation is not only for the agricultural sector, but for broader sectors such as

services and investment, hence the contribution of the ACFTA on the economic growth of Indonesia may come from all of these sectors (Fukunaga & Ishido 2013; Xiao 2010).

The literature claims that crises, shocks and major policy reforms can be sources for fluctuations in economic growth (Johansen, L 1982). However, the empirical result shows the occurrence of the global financial crisis in 2007 had no significant impact on Indonesian economic growth at 10 per cent level. This finding is consistent with previous literature (Basri, M.C. 2010). It means that the Indonesian economy is robust from the global financial crisis that mainly worsened the economies in developed countries (Reinhart & Rogoff 2009).

Even though agricultural exports to China did not successfully improve the economic growth of Indonesia, greatest increase and the movement from a deficit to a surplus trade balance after the implementation of the ACFTA has made it worthwhile to examine whether the ACFTA has contributed to this phenomenon or not. This, therefore, is the second objective of this study.

Chapter Five presented an examination of the ACFTA programs, especially the EHP and SL and their relation to the related agricultural commodities exported from Indonesia to China. The Autoregressive Distributed Lag (ARDL) approach has been implemented on import demand models of EHP and SL. The findings show that co-integration exists for both models of EHP and SL, thus the short-run and long-run impacts can be measured.

Tariff reductions as a trade facility of the EHP program ran from 2004 to 2006. Agricultural commodities under this program were reduced to a zero percent tariff in 2006. However, based on the empirical findings of this study, the tariff reduction as a signature project of the EHP had no significant influence on the EHP agricultural products for both short-run and long-run. This contradicts the theory that tariff reduction will improve trade. However, it can be shown that agricultural commodities under the EHP program are not the key commodities from Indonesia. Indonesia is not a strong producer of these commodities and the volume of exports is relatively small. In contrary, China has a strong comparative advantageof these products, especially for agricultural commodities under HS code 01-08 thus the tariff reduction has no implication in increasing imports for these products.

Meanwhile, the MFN tariff rates are employed for the SL agricultural products. The implication of MFN tariff reduction has been measured in the export growth of the SL agricultural

commodities as the exports of these products to China are growing fast. The empirical findings show that the MFN tariff reduction has no significant effect on export growth for these products in the long-run but has a negative and significant impact in short-run. This finding is to be expected as the tariff reduction as trade facility under the ACFTA will be implemented in 2012 and 2016 for the Sensitive Track agricultural commodities.

Furthermore, the empirical results reveal that the implementation of the other regulation of the ACFTA in the long - run has positive and significant impacts of the EHP agricultural products but negative and significant impacts in short-run. This reflects the adjustment of the exporters in Indonesia to follow new regulations under the ACFTA program which will bring positive improvement in the long-term. The implementation of the ACFTA has no significant impacts on the SL agricultural products for both short-run and long-run.

This can be explained that the main agricultural commodities exported from Indonesia, such as palm oils and other vegetable oil products, are included in the list of China's 'national strategic products'. This list consists of high demand products which China has no comparative advantage in. China has a trade policy to employ strong protection for these products by implementing a high import tariff or placing these commodities in the Sensitive Track of the ACFTA, thus the tariff implemented for these commodities are very high which is unfavorable for Indonesian exports to China. As agreed by both Indonesia and China, the Sensitive Track will get an import tariff reduction starting in 2012 from the Sensitive List and 2016 for the Highly Sensitive List. Hence, it is expected that the impacts of the ACFTA will be greater once the tariff has been reduced for these commodities under the Sensitive Track.

The other reason for this is that most of the agricultural products listed in the EHP scheme are not main products of Indonesia, especially for the products under HS code 01 until 08. Furthermore, Indonesia tends to be importers of these products. Although Indonesia has many exports in HS 03 (fish products) to other traditional export destinations, such as the USA, the exports to China has been relatively small. Fortunately, due to further negotiation between Indonesia and China, eight other commodities have been incorporated into the EHP scheme. In this study, these eight commodities are grouped as three big commodities, based on HS codes. These three groups, commodities reveal different responses for the tariff reduction under the

EHP scheme. This outcome can be shown in the examination of competitiveness for every single commodity under this scheme.

Chapter Six was dedicated to the analysis of the impact of the ACFTA programs, the EHP and Sensitive Tracks on the competitiveness of selected agricultural commodities. This chapter explored more closely the competitiveness represented by the Trade Intensity Index (TII), the Dynamic Revealed Comparative Advantage (DRCA), and Market Share Index for selected agricultural products under the EHP and SL programs. The EHP scheme was represented by agricultural commodities under HS code 01-08 and products related to vegetable oils and fats (HS 1513, HS 151620, HS 151790); while the SL scheme will be represented by HS 200820 (processed pineapples), HS 151110 (crude palm oil) and HS 151190 (palm oil).

The results reveal that for the EHP products, there are only vegetable oils (HS 1513, HS 151620, HS 151790) that are competitive in China's market after the implementation of the ACFTA; while for the most of the other products covered by the EHP, the agricultural products under HS 01-08, have very low level of competitiveness in terms of TII, DRCA and market share index. The EHP has only done little to improve exports of the latter products.

Meanwhile, the Sensitive Track products have a very high level of competitiveness in China's market despite the fact there is no tariff reduction for them. Whereas their market share in China has already high, it might be expected to increase further with tariff reductions from 2012, if supply capacity is available in Indonesia.

While previous empirical studies use aggregate export data, a more detailed analysis ofexport commodities was presented in Chapter Seven. The objective of this chapter was to calculate for the first time chain-linked volume and price index measures for the thirty-five biggest agricultural commodities that cover more than 90 per cent of the whole agricultural exports from Indonesia. The benefit of these measures is free from the bias of price fluctuation so that the examination of the agricultural export condition can be more objective.

By implementing chain-linked volume and chain-linked price index methods (ABS 1998), the real value that is represented by the chain-linked volume and price index of the agricultural exports was obtained. The findings reveal that the price and volume of Indonesian agricultural exports have grown strongly since 2001. It also revealed that the price of the agricultural

products has been spiking since the end of 2006, outpacing the volume of exports. It indicates the production of the agricultural products has not been as high as demand; therefore, the price has been increasing rapidly. The high demand for agricultural products as sources for bio-fuels production has forced the prices rise. The diversion of grain from food to bio-fuels or the land conversion away from food when induced by distorting policies have meant food prices may rise. Attention has been put on this condition by governments and also world organizations in order to maintain food security globally.

The expanding agricultural exports are dominated by semi-processed products, mainly palm oils, which are primarily going to the new growing agricultural export markets such as ASEAN, China and India. The shares of exports to these countries have been magnified significantly compared to the traditional agricultural export market such as the USA, Japan and the European Union that tend to decline over time. This analysis reveals a narrow basis for Indonesia's agricultural exports, with limited exports to other markets in products other than palm oil products. This narrow base may be part of the reason for variable results in the modelling studies.

8.3 Policy Implication

While the issues are complex and the empirical results are mixed, agricultural exports facilitated by free trade agreements have the potential to contribute to Indonesia's growth. From the results of the study, it is found that Indonesia in recent decades had strong growth in volume and price and this opportunity should be focused on by the Indonesian Government to improve its contribution to economy of Indonesia.

However, this good growth has not entirely reflected the role of the free trade agreement. In comparison, between exports to India, China and ASEAN, the exports to India has the strongest growth and biggest quantity despite not having a free trade agreement between Indonesia and India in the period focused on. In the case of the ACFTA, there is no significant product that is important for Indonesia covered by the early programs of the ACFTA such as the EHP and the Normal track.

Since Indonesia's agricultural export base is very narrow, and attention needs to be given to building a more competitive base outside of palm oil, in part by initiatives on the supply side.

Indonesia needs to enhance the capacity of production for the agricultural products under the EHP scheme as China seems to get more benefits from this agreement because the actual production level in China is much higher than that in Indonesian.

Furthermore, the study shows that the other agricultural commodities have been fast growing with very strong growth such as the processed group products. However, they started from a very low amount. This should be paid attention to as it becomes a potential source of exports. There should be greater diversity of products for exports, considering its potential growth, even if the amount is low.

For the same reason ACFTA has had a limited impact on Indonesia's exports to Chinaso far, because Indonesia has low competitiveness in most of the product areas covered. But this will change as tariffs are reduced to commodities covered by the Sensitive List, many of which Indonesia has strong export potential.

To enhance the competitiveness of agricultural commodities, the government should ensure all agricultural commodities are sustainable, as ruled by the trade partners and international agreement, since the awareness of the environmental sustainability has been increasing in the recent years. As such, the European countries and USA have raised concern in recent years that palm oil plantations have destroyed Indonesian forests as well as created high greenhouse gas emissions, which have negatively affected Indonesian exports of crude palm oil.

The competition for exports from other ASEAN countries that produce similar products should also be considered, thus actions are needed to be taken by the Indonesian Government and farmers to respond to this condition and to compete. Proper support from the government for the farmers should also be provided in financial and technology sectors so that they can improve their competence in productivity and quality of the commodities.

Summarizing the study, it is suggested when negotiating for future free trade agreement, the Indonesian Government should consider the strong and superior products of Indonesia to be included in the agreement, since they will provide a more significant contributionto the economy. Also, a re-negotiation of the commodities included in the ACFTA might be considered as this agreement seems to be negative for Indonesia.

8.4 Limitation of the Research and Recommendations for Future Research

The elaborate study on the impact of the ACFTA programs focused on specific sectors and specific countries have been hard to find, hence this study contributes important evidence in the literature. Although the findings from this study provide substantial findings about agricultural exports from Indonesia to China under ACFTA, there are several limitations of this study that provide opportunities to extend this study for further investigation in the future.

First, the availability of the data has limited the scope of this thesis. Throughout this thesis, the examined periods were varied because of adjustments to the data availability of the variables used in this study. The shortage of the data period has also given limited options to explore the data for further analysis using different analysis technique to achieve reliable results.

The limitation of the data has also meant the type of data used in this study was varied. The use of data on the same platform creates coherent and synchronized results, thus avoiding biased results. The shortcoming of the data has also meant the study's scope was limited.

Second, this study has only focused on the agricultural exports from Indonesia to China. This, therefore, gives options to compare the impact of the ACFTA on other sectors and other member countries. Hence, the scope of the impacts of the ACFTA can be broadened to enhance a more holistic analysis in terms of trade, sectors and countries. The one way exports from Indonesia to China have also caused difficulties when comparing the impact of the ACFTA on exports from China to Indonesia. To analysis the reversible impacts of a free trade agreement, the scope can be extended to exports and imports between Indonesia and China. Furthermore, the incorporation of other ASEAN countries into the study can make the analysis more complete and find which countries gain most benefit from this trade agreement.

Next, only the agriculture sector was focused on in this study, which caused difficulty when comparing the impact of the agreement with other sectors, such as manufacture and service, hence involving other sectors can enrich the analysis of the study. Thus, it can compare the benefits and losses experienced by a country because of ACFTA. Furthermore, this study has only focused on two programs under the ACFTA, so the impact of the ACFTA on the commodities under the other programs remains unclear. To extend the study in order to get a more complete analysis, the impact of all the programs under the ACFTA should be completed.

This study is limited to examining the Early Harvest Program (EHP) and Sensitive and Highly Sensitive List (SL) program of the ACFTA. The ACFTA also has another program namely the Normal Track program that is not included in this study due to the difficulties in obtaining the data. There is also limitation on the long-run impact of the ACFTA as this program process is still ongoing while this study is conducted. The finding impacts of the ACFTA from this thesis are based on the process of the ACFTA program that has been done in the period of the study. Thus there is the possibility of examining the impact of the ACFTA once the program has been fully employed.

The scope of free trade agreements signed by a country should be considered. To capture the impacts of free trade agreements on a country, it is better to compare all the impacts of free trade agreements that a country is involved in. This, therefore, can compare the strength and weakness of every trade agreement.

Third, the limitation of the methodology used in this study has restricted the breadth of study. This thesis uses import demand equations for Chapter Four that impedes the opportunity to explore the supply side of the agricultural commodities. Thus, further research can examine the supply side to a more elaborate analysis.

Finally, it is difficult to obtain reliable research on agricultural trade under the ACFTA programs. This, therefore, has limited ability to confirm and compare the robustness of the results of this study with previous results in similar issues. The further research of this study will enrich the literature in this sector.

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Appendix

Data for Indonesian Agricultural Export-Economic Growth Model in Chapter 4

Period	GDP Indonesia	Export	Asian crisis	ACFTA	GFC	FDI	Exchange rate	Population China	GDP China
Feb-96	0.041	0.494	0	0	0	1.759	0.059	0.002	0.093
May-96	0.050	0.161	0	0	0	1.625	0.103	0.002	0.083
Aug-96	0.066	-0.245	0	0	0	1.600	0.071	0.002	0.080
Nov-96	0.084	0.055	0	0	0	1.310	0.066	0.002	0.086
Feb-97	0.059	-0.360	0	0	0	1.757	0.077	0.002	0.089
May-97	0.037	0.891	0	0	0	1.626	0.053	0.002	0.086
Aug-97	0.038	1.870	1	0	0	1.615	0.057	0.002	0.072
Nov-97	-0.003	1.503	1	0	0	1.323	0.091	0.003	0.074
Feb-98	-0.060	0.151	1	0	0	1.585	0.118	0.003	0.064
May-98	-0.157	0.081	1	0	0	1.458	0.102	0.003	0.057
Aug-98	-0.188	-1.477	1	0	0	1.609	0.090	0.003	0.069
Nov-98	-0.215	-0.296	1	0	0	1.311	0.000	0.003	0.072
Feb-99	-0.077	1.243	1	0	0	1.394	-0.057	0.004	0.078
May-99	0.004	0.574	1	0	0	1.281	-0.044	0.004	0.065
Aug-99	0.014	1.923	1	0	0	1.398	-0.057	0.004	0.066
Nov-99	0.039	0.570	1	0	0	1.111	-0.021	0.004	0.055
Feb-00	0.027	0.403	1	0	0	1.213	-0.019	0.005	0.078
May-00	0.031	0.194	1	0	0	1.102	-0.007	0.005	0.076
Aug-00	0.035	-0.128	1	0	0	1.372	0.013	0.006	0.077
Nov-00	0.047	-0.123	1	0	0	1.100	0.056	0.006	0.063
Feb-01	0.024	-0.365	1	0	0	1.308	0.057	0.007	0.074
May-01	0.043	0.255	1	0	0	1.204	0.064	0.007	0.067
Aug-01	0.020	-0.343	1	0	0	1.412	0.045	0.008	0.068
Nov-01	0.002	-0.355	1	0	0	1.129	0.022	0.008	0.078
Feb-02	0.021	0.017	1	0	0	1.391	0.034	0.009	0.078
May-02	0.028	-0.531	1	0	0	1.287	-0.024	0.009	0.078
Aug-02	0.041	0.115	1	0	0	1.377	-0.049	0.009	0.086
Nov-02	0.032	0.108	1	0	0	1.103	-0.050	0.010	0.078
Feb-03	0.035	-0.169	1	0	0	1.472	-0.090	0.010	0.096
May-03	0.036	0.715	1	0	0	1.387	-0.081	0.010	0.077
Aug-03	0.031	0.409	1	0	0	1.086	-0.054	0.010	0.096
Nov-03	0.032	0.546	1	0	0	0.820	-0.071	0.010	0.087

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Feb-04	0.027	0.781	1	1	0	1.499	-0.073	0.009	0.092
May-04	0.030	0.117	1	1	0	1.406	-0.014	0.009	0.101
Aug-04	0.031	0.016	1	1	0	1.337	-0.007	0.009	0.087
Nov-04	0.056	0.507	1	1	0	1.077	-0.030	0.008	0.082
Feb-05	0.045	0.023	1	1	0	1.781	-0.023	0.008	0.100
May-05	0.044	0.349	1	1	0	1.691	-0.048	0.007	0.096
Aug-05	0.044	0.307	1	1	0	1.863	-0.019	0.007	0.100
Nov-05	0.037	0.068	1	1	0	1.599	0.042	0.007	0.104
Feb-06	0.038	0.496	1	1	0	1.688	0.049	0.006	0.110
May-06	0.036	0.145	1	1	0	1.587	0.021	0.006	0.122
Aug-06	0.045	0.362	1	1	0	2.030	-0.007	0.006	0.109
Nov-06	0.047	0.064	1	1	0	1.764	-0.012	0.005	0.111
Feb-07	0.047	0.365	1	2	0	1.903	0.015	0.005	0.125
May-07	0.053	-0.070	1	2	0	1.793	0.033	0.005	0.133
Aug-07	0.053	-0.216	1	2	1	2.049	0.052	0.005	0.127
Nov-07	0.045	0.026	1	2	1	1.786	0.030	0.005	0.123
Feb-08	0.048	0.069	1	2	1	2.042	0.038	0.004	0.101
May-08	0.049	0.110	1	2	1	1.937	0.064	0.004	0.096
Aug-08	0.049	-0.379	1	2	1	1.915	0.074	0.004	0.088
Nov-08	0.040	-0.209	1	2	1	1.675	0.158	0.004	0.065
Feb-09	0.033	-0.178	1	2	1	1.394	0.150	0.003	0.058
May-09	0.029	0.203	1	2	1	1.274	0.088	0.003	0.073
Aug-09	0.030	0.711	1	2	1	1.794	0.021	0.003	0.086
Nov-09	0.043	0.187	1	2	1	1.538	-0.083	0.003	0.102
Feb-10	0.046	0.055	1	3	1	2.106	-0.082	0.002	0.108
May-10	0.050	-0.208	1	3	1	2.001	-0.020	0.002	0.093
Aug-10	0.045	-0.092	1	3	1	2.180	0.011	0.002	0.087
Nov-10	0.055	0.339	1	3	1	1.923	0.032	0.001	0.088
Feb-11	0.052	-0.086	1	3	1	2.306	0.021	0.001	0.087
May-11	0.052	0.249	1	3	1	2.204	-0.010	0.001	0.084
Aug-11	0.052	-0.035	1	3	1	2.085	0.018	0.001	0.081
Nov-11	0.052	-0.028	1	3	1	1.829	0.066	0.000	0.079
Feb-12	0.051	0.222	1	3	1	2.010	0.056	0.000	0.071
May-12	0.052	-0.144	1	3	1	1.912	0.088	0.000	0.067

All the data in quarterly growth rate, except for the dummy variables.

Real GDP China, Real GDP Indonesia, FDI, real exchange rate, M2 China, Government budget China and population of China are obtained from DataStream.

Agricultural exports value data from Indonesia to China is obtained from Datatrade.net calculated by author.