Revealed Comparative Advantage (RCA) and Constant Market Share Model (CMS) of Indonesian Palm Oil in ASEAN Market

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Abstract

The purpose of this research was: 1) to study the situation of Indonesian palm oil industry 2) to analyze the comparative advantage of each Indonesian palm oil products in ASEAN market using the Revealed Comparative Advantage (RCA) method and 3) to analyze the market share condition of Indonesian palm oil products in the ASEAN market using Constant Market Share Model (CMS). The data used is secondary data of both Indonesian and world all goods export and the exports of Indonesian and world palm oil products (commodity 151110: palm oil and its fractions, crude, not chemically modified; commodity 151190: palm oil and its fractions, refined but not chemically modified; commodity 151321: palm kernel oil or Babassu oil and their fractions, crude, not chemically modified; and commodity 151329: palm kernel oil or Babassu oil and their fractions, refined but not chemically modified) either to world or ASEAN market during 2004-2008. The analysis used Revealed Comparative Advantage (RCA) and Constant Market Share Model (CMS). RCA was analyzed using Ballasa Index to reveal the comparative advantage by observed trade patterns and in line with the theory, one needs pre-trade relative price which are not observable. CMS used in this study introduced by Richardson in 1971. CMS contains four principle components that differs the export growth between the constant-share norm and the actual export performance are the world trade effect, commodity composition effect, market distribution effect and residual general competitiveness effects.

The results revealed that the RCA of Indonesian palm oil for every commodity was more than 1 (RCA>1) indicated that Indonesia had comparative advantage in the ASEAN market for all types of all palm oil products. The analysis of CMS found that Indonesian palm oil got negative market distribution effect in commodity 151110 and 151190, while other components gave the positive effects to all types of commodity. The

positive effect of competitiveness situation of palm oil industry in ASEAN market indicates that Indonesia had ability to respond to changing market and adapt its supply situation to ASEAN condition as it has a large amount of palm oil production.

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Chapter 1
Introduction

1.1 Research Justification

Indonesia is the market leader and top producer of oil palm in the world. The market share of Indonesian palm oil in global market was 46% and followed by Malaysia as 41% in the second position in 2006. Oil palm fruit can be produced to be many kinds of derivative products, instead of Crude Palm Oil (CPO) and Palm Kernel Oil (PKO) as the main products before further processing. Industrial department of Indonesia in 2007 also stated that CPO in domestic industry can be processed as 17 derivative products for food such as: frying oil, margarine, shortening and non-food (oleochemicals and biodiesel). Oleochemical industry produces fatty acids, fatty alcohol and glycerin (Triyanto, 2007).

Anyway, CPO is still the main oil palm-based product exported by Indonesia. Based on USDA report in 2007, it indicated that during 2006, the five top producers of palm oil were Indonesia (44%), Malaysia (43%), others (7%), Thailand (2%), Nigeria (2%) and Columbia (2%). CPO derivative products of Indonesia is in the second place after Malaysia, but Indonesia has to admit that China is improving greatly in oleochemical such as biodiesel, fatty acid, glycerin and alcohol (Cheah, S.C, 2007). Due to the bright prospect of oleochemical products instead of CPO and PKO, the Indonesian government seems to be more concerned in producing oleochemicals.

The global financial crisis hit all countries in the world and also ruined the business in any kind of sectors in 2008. Many companies and countries tried to cut off the production cost and saved more fund for other purposes. It might cause the decreasing of demand in palm oil, while the supply of it was abundant as the optimistic demand forecast in the beginning of 2008. The price of crude palm oil (CPO) on Nov, 19th 2008 in the world market was US$ 445 (based on price) per tonne CIF Amsterdam. It decreased extremely compared to the price in early of 2008 that reached above US$ 1,200 per tonne.

Actually, palm oil can be optimistically expected that in the future it will remain to be the 'golden' product to make many things used in human beings. The demand for palm oil is growing rapidly and most of this product ends up in hundreds

of food products and also used in cosmetics industry as well as biodiesel. So far, there is no report in declining, even eliminating the usage of palm oil products in the countries. Especially when the price of CPO in world market in the early to middle of 2009 was increasing for about US$ 690 per tonne CIF Amsterdam in June the 22nd, 2009 which indicated the recovery of palm oil industry after global finance crisis.

Despite the palm oil industry is improving, the world financial crisis had changed the condition of almost overall industries in many sectors, so this is still very important to every country to review their trade balance and re-examine their comparative advantage in export commodities to take any necessary action on the trade. Indonesia also needs to re-evaluate its exported products, which one of the main products exported is palm oil. Oil palm becomes the important product which is protected and maintained by the government. While many other oil palm producers must also take the same action to develop and improve their productivity and gain the larger market share to enhance their export value. The main idea is that all oil palm producers, due to the bright prospect of oil palm, should pay attention to its capability to compete in the world market.

Therefore, this research is to analyze the oil palm products especially CPO and PKO that currently considered as the important derivative product of oil palm. The products analyzed here are based on the HS-Code 6 digits, those are two main traded products from CPO; Palm Oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190) and two other kinds of products made of PKO; palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321), and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329). The comparative advantage of the four products will be analyzed by using Revealed Comparative Advantage (RCA). RCA will provide the information of advantage to export such product comparing to other competitive countries (Poramachom, 2002). This research will apply the RCA method to Indonesian palm oil in the ASEAN market. However, RCA doesn't show sources of advantage. Thus Constant Market Share Model (CMS) will be used to show the advantage components: world growth, commodity composition, market distribution and competitiveness.

The importance of the research is to describe the situation of the Indonesian palm oil industry, analyze the revealed comparative advantage of Indonesian palm oil and the constant market share of the products during 2004-2008 in ASEAN market.

The theories in this research are considered able to be generalized or used for other commodities.

1.2 Research Objective

This research attempts to describe and understand the current comparative advantage and market share situation of Indonesian oil palm-based products in ASEAN market. The specific objectives are:

1) To study the situation of Indonesian palm oil industry.
2) To analyze the comparative advantage of each Indonesian palm oil products in ASEAN market using the Revealed Comparative Advantage (RCA) method.
3) To analyze the market share condition of Indonesian palm oil products in the ASEAN market using Constant Market Share Model (CMS).

1.3 Scope of the Research

The scope of this research is statistical studies because it is designed for breadth rather than depth and attempting to capture a population's characteristics by making inferences from a sample's characteristics (Cooper and Schindler, 2003:150). This research focuses on international trade and marketing as well, because it specifically discusses about Revealed Comparative Advantage (RCA), as one of the subject in international trade field and Constant Market Share Model (CMS) which is obviously in the link with any marketing cases. The scope will contain of two major parts that are product and data analysis.

1.3.1 Product

The data/object used in this research is the data of oil palm-based products especially of four tradable and common traded products such as:

1) Palm oil and its fractions, crude, not chemically modified (151110).
2) Palm oil and its fractions, refined, but not chemically modified (151190).
3) Palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321).
4) Palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329).

This research does not analyze other derivative products because these mentioned products are the most important products to be exported and imported since they are in-process products which most countries more likely to import in this form to be easier in next manufacturing process related to their own needs. These products are traded for years so the data is somewhat more complete than any other products of oil palm.

The data series used in this research are the examined oil-palm based products from 2004 to 2008, due to the data availability, updated analysis, and the dynamic situations during those years.

1.3.2 Data Analysis

Another limitation of this research is about the objects of research. As mentioned before that this research is to describe the Indonesian palm oil using Revealed Comparative Advantage (RCA) and Constant Market Share Model (CMS). The research will analyze Indonesian oil palm market in ASEAN (Association of South East Asian Nation) countries, because Indonesia lies on the southeastern Asian region and is also the important member of ASEAN. The research will focus in narrower area which is closer to producer country although Indonesia also has main destination export countries for oil palm in Europe, America and other regions. The countries data measured and used in this research are all of the ASEAN members, namely Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

1.4 Research Benefit

The benefits resulted from this research are:

1) The common readers who don't have basic knowledge in agribusiness management will be able to understand the discussion throughout the research report.

2) The other researchers may get some insight to do further research in other ways using the data described here.

3) The Indonesian government is benefited in getting the scientific information about the Indonesian oil palm based products in the case of its comparative advantage and also the market share in ASEAN market during 2004-2008.

4) The research can be used to understand the condition of the oil and palm oil industry.

5) The research provides information about the condition of the oil palm and palm oil industry in ASEAN.

6) The other countries' government will benefit by understanding the pattern of the oil palm and palm oil industry in ASEAN.

Chapter 2
Literature Review

This chapter explains about 1) Indonesian oil palm and palm oil industry, 2) Revealed Comparative Advantage (RCA), 3) Constant Market Share Model (CMS), 4) related research in Revealed Comparative Advantage (RCA) and 5) related research on Constant Market Share Model (CMS).

2.1 Indonesian Oil Palm and Palm Oil Industry

Indonesia is the largest oil palm producer in the world after 2006, as it can exceed Malaysia in production volume. The Oil World reported that in 2006, the contribution of oil palm supply in the world was 44% from Indonesia and 43% from Malaysia. Indonesia produced 15.9 million tonnes in 2006, and it put Indonesia to be the largest exporter of oil palm and the products.

A significant change in the palm oil industry had taken place during the past season, as Indonesia surpassed Malaysia in production of palm oil and is now the world leader. This designation will continue and Indonesia's production rate will outpace Malaysia for the foreseeable future (USDA, 2007). In the 1990s, oil palm and palm oil industry were developing rapidly. In that period, oil palm cultivation increased about 11% each year and the production was also increasing 9.4% per year. The demands from domestic and export were increasing for about 10% and 13% per year. In the beginning of 2001-2004 the oil palm plantation area and the production of oil palm was increasing 3.97% and 7.25% per year, and the export increased 13.05% per year (Direktorat Jenderal Bina Produksi Perkebunan, 2005). Up to 2020, it is predicted that the oil palm and palm oil industry in Indonesia will continuously increased. CPO will increase up to 5-6% until that year.

2.1.1 Indonesian Oil Palm Industry

Within period 1967-1978 the production area of oil palm in Indonesia was only concentrated in large plantation field. But since 1979 there was included smallholder plantation with the starting area 3,125 ha and the production of smallholder plantation was 760 tonnes. Since then the contribution of smallholder in national oil palm production has been increasing. Here are the data to describe the

production area and the production value for each type of field exploitation (ownership).

Table 2.1 shows that the plantation area was increasing 2.6% from 2006 in 2007 and 11.66% in 2008. Even though in the middle of 2008 the misery of palm oil industry hit the producers in the world due to the global financial crisis, issues of oil palm plantation-caused damage to environment and also unclear issues of oil palm plantation closing by Indonesian government to avoid larger loss to farmer but since the oil palm-based products are still needed, it can assure of the prospect of palm oil industry in the future.

Table 2.1 Total Oil Palm Plantation Area in Indonesia, 2003-2009

Year	Smallholders		State-owned		Private-owned		National (Total)
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha) (100%)
2003	1,854,394	35.1	662,803	12.54	2,766,360	52.35	5,283,557
2004	2,220,338	42.01	605,865	11.46	2,458,520	46.52	5,284,723
2005	2,356,895	43.22	592,854	10.87	2,567,068	47.07	5,453,817
2006	2,549,572	36.66	687,428	10.42	3,357,914	50.92	6,594,914
2007	2,752,172	40.67	606,248	8.96	3,408,416	50.37	6,766,836
2008	2,881,898	39.14	602,963	8.19	3,878,986	52.68	7,363,847
2009	3,013,973	40.14	608,580	8.11	3,885,470	51.75	7,508,023

Source: Ditjenbun Deptan, 2010 (adapted)

Table 2.2 shows the contribution of each type of field exploitation and ownership. In 2006, smallholder contributed to 33.33%, state-owned plantation 13.33% and private-owned plantation 54.89%. There was, of course, an increasing percentage of contribution in total production value if compared to 1979, when the smallholder plantation first included in valuation, with the contribution of smallholder was 0.12%, state-owned 68.42% and private-owned contributed to 31.46% (Ditjenbun Deptan, 2006). In 2009, smallholders contributed 38.88% of total national palm production, state-owned 10.52% and the private-owned 50.59%. While the increasing

plantation areas in 2009 compared to 2006, for smallholders was 18.21, private-owned was estimated 15.71% and state-owned was decreasing 11.47%. The problem here was in smallholders, because it was estimated to increase in plantation area, but the total production per ha was the least of all which was only 2.41 tonnes/ha in 2009 while state-owned and private-owned were 3.22 tonnes/ha and 2.43 tonnes/ha. It was understood because of technology and management of private companies was clearly better than smallholders and state-owned. It could be the result of the investment of other countries such as Malaysia in to the palm oil industry in Indonesia by buying or taking over some medium companies because Malaysia had more advance technology and management than Indonesia.

Table 2.2 Total Oil Palm Production in Indonesia, 2003-2009

| Year | Production (Tonnes) | | | | | | Total Production |
| | Smallholders | | State-owned | | Private-owned | | |
	Production	Tonnes /Ha	Production	Tonnes /Ha	Production	Tonnes /Ha	
2003	3,517,324	1.89	1,750,651	2.64	5,172,859	1.87	10,440,843
2004	3,847,157	1.73	1,617,706	2.67	5,365,526	2.18	10,830,389
2005	4,500,769	1.9	1,449,254	2.44	5,911,592	2.3	11,861,615
2006	5,783,088	2.27	2,313,729	3.37	9,524,031	2.84	17,350,848
2007	6,358,389	2.31	2,117,035	3.49	9,189,301	2.70	17,664,725
2008	6,923,042	2.40	1,938,134	3.21	8,678,612	2.24	17,539,788
2009	7,247,979	2.41	1,961,813	3.22	9,431,089	2.43	18,640,881

Source: Ditjenbun Deptan, 2010 (adapted)

The main utilization of fresh fruit bunches (FFB) is indicated in Figure 2.1. FFB will be processed to produce Crude Palm Oil (CPO) and Palm Kernel (PK). CPO itself is the raw materials to produce margarine, cooking oil, mayonnaise and cosmetics. PK will be used to produce Palm Kernel Oil (PKO) and Palm Kernel Meal (PKM) which will be produced as for feed and livestock. Both CPO and PKO are the raw material to produce oleochemical products and biodiesel. In the future, FFB will

be the main product produced by oil palm plantation (in-farm level). Both CPO and PKO are currently exported to other countries. They are also considered major products produced by palm oil factories. Food and non-food (oleochemical) industry can be developed from oil palm through fractionation, refining and hydrogenation on oil palm (Pahan, 2008).

Below is the oil palm and palm oil production tree which also shows the multiplier effect because oil palm resulted in harvesting can be processed further.
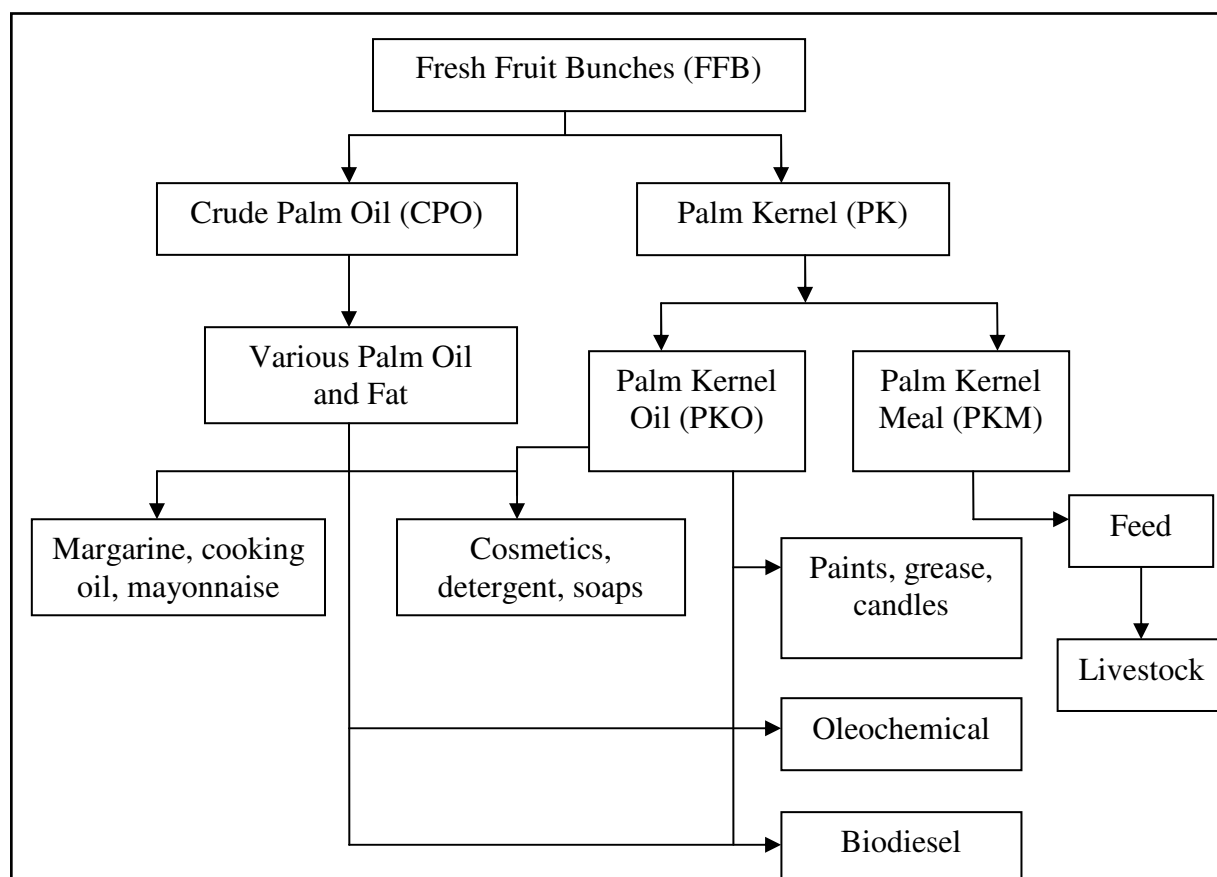
Figure 2.1 Oil Palm and Palm Oil Production Tree

Source: Pahan, 2008 (adapted)

2.1.2 Indonesian Palm Oil Industry

Palm oil is not used only for the biodiesel raw material, but in the past, it was initially used to produce many kinds of food products, which one of them is frying oil. In Indonesia, the most important usage of palm oil for food is frying oil because it is needed in cook-processing of food. The frying oil price in Indonesia is fluctuating as it depends on the price of oil world. The needs of palm oil for food in 2010 in Indonesia will be 10.5 million tonnes (Wahyudi, 2007) and for non-food usage it

reaches 2.3 million tonnes included 2.13 million kilo liter for biodiesel. In 2006, the palm oil production reached 15.9 million tonnes.

Towards the palm oil industry, Indonesian Government has stated the priority products, which is called *picking the winners strategy.* In 2030, the government has planned to prepare 10 products which high export potential, including palm oil. The Indonesian Minister of Trade issued 2008 priority included CPO. It will be the encouragement to the palm oil industry in Indonesia, in the middle of the global financial crisis. The production tree of palm oil as shown in Figure 2.1 is about the most important products from oil palm are Crude Palm Oil (CPO) and Palm Kernel Oil (PKO) which further will be produced as various products which are made in downstream industry area (Pahan, 2008). Downstream industry has 2 kinds of products, in-process goods and finished goods.

1) In process goods

Based on Pahan (2008), it can be divided into two kinds of oleo, oleo food and oleochemical. Oleo-food is the usage of palm oil to become food products such as cooking oil and fat oil (margarine and shortening). Oleochemical is the use of palm oil for non-food products. The products manufactured as oleochemical are fatty acid, fatty alcohol, fatty amine, biodiesel (methyl/ester), glycerol and metallic salt.

2) Finished goods

There are so many kinds of finished goods; food industry (cake, bread, biscuit, chocolate, candies, ice cream, filled milk, coffee mate, instant noodle), cosmetics industry (soap, lotion cream and shampoo), pharmaceutical industry (vitamin A and E), metal companies (paint, lubricant oil, floatation agent, body of car, crayon and candles).

Palm oil can be used for many other products (Figure 2.1). Generally, the usage of palm oil in Indonesia 30% for cooking oil and food industry, 60% for being exported and 10% will be used in oleochemical industry (Hadisoebroto, 2006). Based on data from Industrial Department in 2007, the usage of CPO by domestic firm to use as raw material for other CPO derivative products, are being used for 17 kinds of products; food industry (cooking oil, margarine, shortening, CBS, Vegetable Ghee) and non-food industry as oleochemical (fatty acids, fatty alcohol, glycerin) and biodiesel. But the type and volume of products will be changed based on market demand.

The marketing of biofuel in domestic and foreign market, as one of the competitive oil palm-based products is totally arranged by government which finally influences all the development of biodiesel marketing in Indonesia. There is a huge potential domestic market for biodiesel. Annually, the consumption of solar industry 6 million tonnes which means that the need of biodiesel (compared to the 20% usage of solar industry) is about 1.2 million tonnes for domestic usage. This is the reason why the CPO is still exported mainly by Indonesia, because it will be further processed in the importing countries. The target market of Indonesian oil palm products are India, Netherlands, Malaysia, China, USA, Italy, Singapore, Egypt, Pakistan , Bangladesh, and Saudi Arabia and it can grow broader when the awareness of biofuel usage increases in all countries in the world. It is because the main and the famous raw material of biofuel is palm oil. Although in the future even recently, it can be replaced by Jathropa, rapeseed or soybean which some of European and American countries are trying to develop (Indonesian Palm Oil Board, 2007).

There were at least two kinds of palm oil-based products which are tradable and manufactured seriously in Indonesia during 2006, namely: other palm oil products include for food and non-food products (biodiesel) was 48% of total export and CPO was 37%. The value of acid oil and industrial fatty alcohol are not significant to the total export which is each only 1% in value of total export as shown in Figure 2.2.
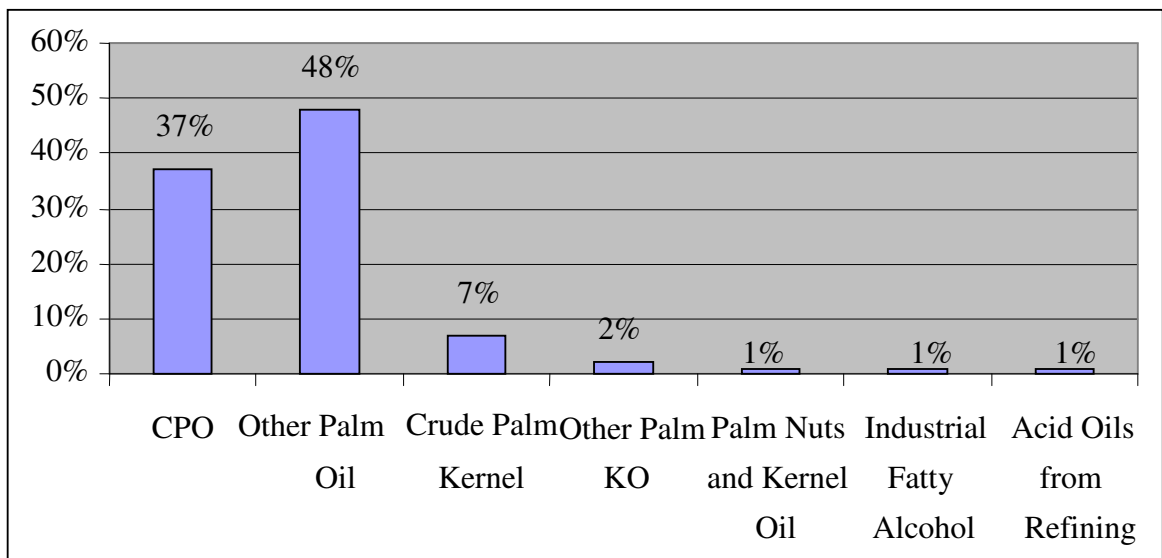
Figure 2.2 Total Export of Indonesian Palm Oil in 2006

Source: Indonesian Palm Oil Board, 2007 (adapted)

The total export of CPO in 2006 was 5.2 million tonnes. Figure 2.3 shows the biggest importers of Indonesian CPO are India (38%) followed by Netherlands (17%) of total export). Other European countries such as Germany and United States are included in others segments (20%). The total exports other palm oil products in 2006 was 6.9 million tonnes. The main destination countries are China, India, Netherlands and Pakistan. Other countries include in 41% of total export in this kind of products are included Germany and other European Countries, United States and other Asian countries (Indonesian Palm Oil Board, 2007).
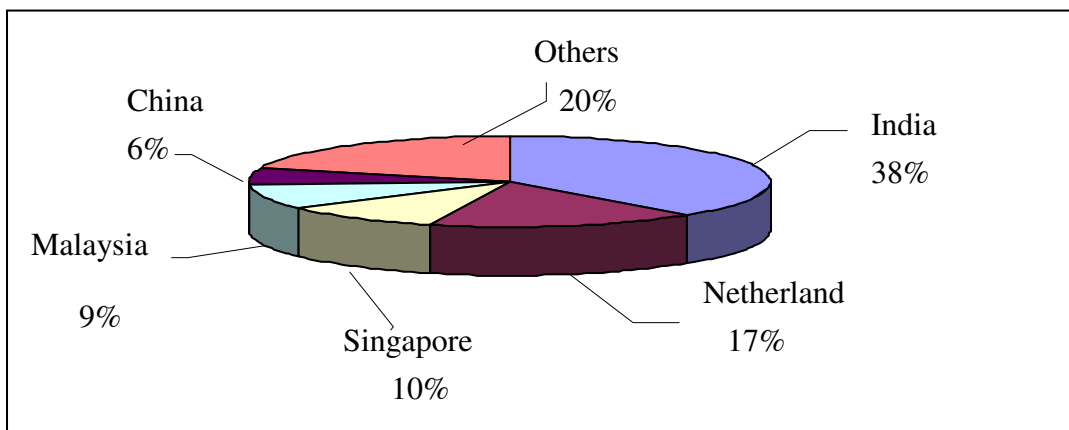
Figure 2.3 Total Export of CPO to Major Destination Countries in 2006
Source: Indonesian Palm Oil Board, 2007 (adapted)

The total exports other palm oil products in 2006 was 6.9 million tonnes. The main destination countries are China, India, Netherlands and Pakistan. Other countries include in 41% of total export in this kind of products are included Germany and other European Countries, United States and other Asian countries (Figure 2.4). Indonesia seems to maintain existed market target and even to increase the value of export to these countries rather than focusing in finding new markets. However, Indonesia is trying to export more to other countries in the world.
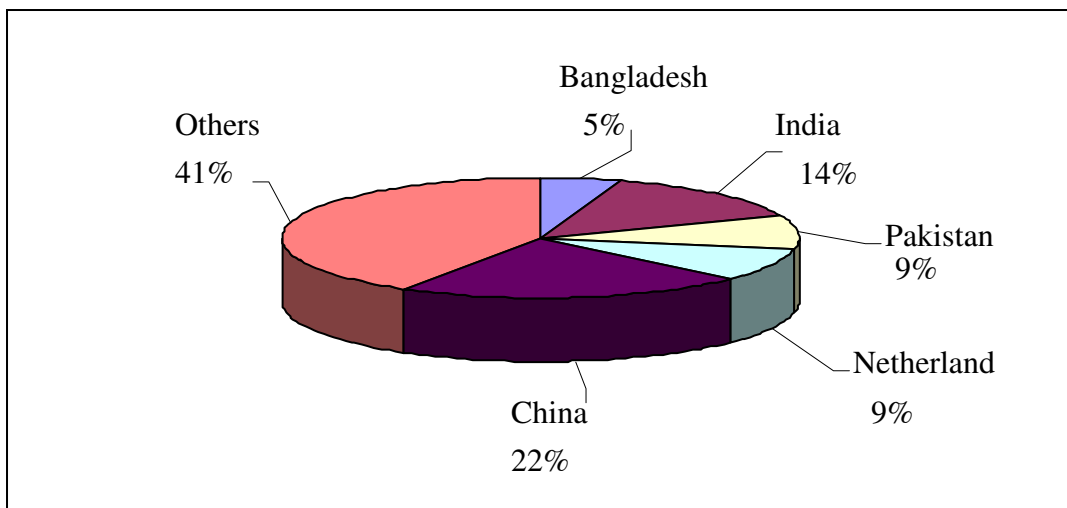
Figure 2.4 Total Exports of Other Palm Oil Products to Major
Destination Countries in 2006

Source: Indonesian Palm Oil Board, 2007 (adapted)

Indonesia has the raw material potential for palm oil to be produced in large amount and also has the lowest production cost compared to other palm oil producers in the world. Therefore, Indonesia has competitive advantage in the world market. Malaysia will be the competitor in Asia for especially oleochemical palm oil-based products. It is because Malaysia concerns seriously in developing downstream industry of palm oil, and exports the products to other countries, included Indonesia. While Indonesia focuses more on the CPO which is imported by Malaysia too. In 2008, the total export of palm oil in Indonesia was 19.7 Million tonnes and Malaysia's was 17.4 Million tonnes. Other countries, Thailand, Columbia and Nigeria had a small amount of market share in the world palm oil. This made Malaysia the main competitor of Indonesian palm oil (USDA, 2008).

This research analyzes four important oil palm-based products which currently competitive, tradable, prospective and most demanded in the world. The four products are: palm oil and its fractions, crude, not chemically modified; palm oil and its fractions refined but not chemically modified; palm kernel oil or Babassu oil and their fractions, crude, not chemically modified, and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified. The HS Code 6 digits used to identify the commodities are: 151110, 151190, 151321 and 151329.

2.1.3 Crude Palm Oil (CPO) and Palm Kernel Oil (PKO)

In this research we consider that CPO and PKO are different as both of them have strict differences either from the processing or chemical content. CPO is processed from the fruit meat (mesocarp) with boiling and pressing process, while PKO comes from the kernel (Pardamean, 2008). These two oils have very different fatty acid compositions. Palm oil is 50% saturated fat and 50% unsaturated fat. More specifically palm oil contains approximately 44% palmitic acid, 5% stearic acid, 39% oleic acid (monounsaturates), and 10% linoleic acid (polyunsaturates). Myristic acid and lauric acid are negligible. Conversely, the fatty acid composition of palm kernel oil resembles coconut oil, or what one generally thinks of when the term 'saturated fat' is used. Approximately 82% of palm kernel oil is saturated fat with the main contributors being 48% lauric acid, 16% myristic acid, and 8% palmitic acid. Approximately 18% of palm kernel oil is unsaturated fat with 15% oleic acid (monounsaturates) and 3% linoleic acid (polyunsaturates).

The differences of CPO and PKO are shown in the classifications of commodity code (SITC 4 digit) where Palm oil is 4242 and Palm Kernel Oil is 4244. Then further in this research, CPO and PKO data will be identified separately. This research uses the Harmonized System Code 6 digits to identify the strict definition of the products, which one is included in CPO and PKO. The detailed list of codes, are:

- 151110: palm oil and its fractions, crude, not chemically modified.
- 151190: palm oil and its fractions refined but not chemically modified.
- 151321: palm kernel oil or Babassu oil and their fractions, crude, not chemically modified.
- 151329: palm kernel oil or Babassu oil and their fractions, refined but not chemically modified.

Babassu oil or cusi oil is a clear light yellow vegetable oil extracted from the seeds of the babassu palm (*Attalea speciosa*), which grows in the Amazon region of South America. It is a non-drying oil used in food, cleaners and skin products. It is put in the same code with the palm oil because of its similarity in content and characteristics of the products in this code.

HS code internationally standardized system of names and numbers for classifying traded products developed and maintained by the World Customs Organization (WCO) (formerly the Customs Co-operation Council), an independent intergovernmental organization with over 170 member countries based in Brussels,

Belgium. The HS is a six-digit can refer to a system of names or terms, or the rules used for forming the names, as used by an individual or community (nomenclature). Countries that have adopted the Harmonized System are not permitted to alter in any way the descriptions associated to a heading or a subheading nor can the numerical codes at the four or six digit level be altered.

This research uses the HS Code 6 digits because of the data availability in each data sources and the usage of it in many countries included in this research. Thus, it will be easier and more precise to measure the data needed by indicating the definition of each products in the same perspective and definition among the countries used as objects in this research.

2.2 Revealed Comparative Advantage (RCA)

The term of comparative advantage is one of terms in international trade subjects. It is important for managers of firms in countries engaged in international trade to understand the driving forces behind the international flow of goods and services (Beamish et al., 2003).

Comparative advantage first was introduced by David Ricardo which postulated that even if one nation is less efficient than the other nation in the production of both commodities, there is still a basis for mutually beneficial trade (Salvatore, 2005). Utkulu (2004) also stated that there mainly exist two prominent theories of trade based on comparative advantage: the Ricardian theory and the Heckscher-Ohlin (H-O) theory. The Ricardian assumes that comparative advantage arises from differences in technology across countries while the H-O theory suggests that technologies are the same across countries. Then, H-O theory assumes that comparative advantage to cost differences resulting from differences in factor prices across countries.

David Ricardo (Ricardian) began by noting that Smith's idea of absolute advantage determined the pattern of trade and production internal to a country when factors were perfectly mobile (Appleyard et al.,2008). The movement of labor and capital to the area where productivity and returns are the greatest will continue until factor returns is equalized. But internationally, however, it is different. Ricardian described that even though a country has absolute advantage in some products (let's say two products for the simple way) and both countries have no basis to trade, it is still different. Because Ricardian saw the different from the relative factors such as

labor cost or labor hours to produce the products. The Ricardian suggested about the autarky (pre trade) price ratios (i.e the price ratio when a country has no international trade). Ricardo did not examine the precise determination of the international price ratio or terms of trade (Appleyard et al., 2008). But the point is that, after trade, there will be a common price of wine in terms of cloth in the two countries. A comparative advantage exists whenever the relative labor requirements differ between the two commodities.

The effects of factor endowment on international trade were analyzed early in the 20th century by Eli Heckscher and Bertil Ohlin with the assumptions of the H-O theory are mentioned below (Appleyard et al., 2008):

- There are two countries, two homogeneous goods and two homogeneous factors of production whose initial levels are fixed and assumed to be relatively different for each country.

- Technology is identical in both countries; that is, production function are the same in both countries.

- Production is characterized by constant returns to scale for both commodities in both countries.

- The two commodities have different relative factor intensities, and the respective commodity factor intensities are the same for all factor price ratios.

- Taste and preferences are the same in both countries. Further, for any given set of product prices, the two products are consumed in the same relative quantities at all levels of income; that is, there are homothetic tastes and preferences.

- Perfect competition exists in both countries

- Factors are perfectly mobile within each country and not mobile between countries

- There are no transportation costs

- There are no policies restricting the movement of goods between countries or interfering with the market determination of prices and output.

According to H-O theory, a country's comparative advantage is determined by its relative factor scarcity. However it's known that measuring comparative advantage and testing the H-O theory have some difficulties (Utkulu, 2004) since relative price under autarky are not observable. Given this fact, Ballasa (1995) then proposed that it may not be necessary to include all constituents effecting country's comparative

advantage and he suggested that comparative advantage is 'revealed' by observed trade patterns and in line with the theory, one needs pre-trade relative price which are not observable. Thus, inferring comparative advantage from observed data is named 'revealed' comparative advantage or RCA (Utkulu, 2004).

The concept of revealed comparative advantage (RCA) is grounded in conventional trade theory (Ferto and Hubbard, 2002). Ballasa index is used to measure a country's exports of a commodity (or industry) relative to its total exports and to the corresponding exports of a set of countries (Utkulu and Seymen, 2004). The original RCA index, formulated by Ballasa (1965), will be used in this research, formulated as:

$$\textbf{RCA} = (\textbf{X}_{ij} / \textbf{X}_{it}) / (\textbf{X}_{nj} / \textbf{X}_{nt})$$

Where:

X_{ij} = Country i's export of commodity j.

X_{it} = Country i's export of all goods.

X_{nj} = World export of commodity j.

X_{nt} = World export of all goods.

When the result is more than 1 (RCA>1) it means that a country has a revealed comparative advantage, and when it is less than 1 (RCA<1), it indicates that a country doesn't have a revealed comparative advantage.

2.3 Constant Market Share Model

Constant Market Share model (CMS), introduced by Richardson in 1971 (Poramacom, 2002). The formula of CMS used in this research is as below:

$$\textbf{V}_{(t)}\textbf{-V}_{(t-1)} = \textbf{r}_{world} \cdot \textbf{V}_{(t-1)} + (\textbf{r}_i \cdot \textbf{r}_{world})\,\textbf{V}_{(t-1)\,i} + (\textbf{r}_{ij}\textbf{-r}_i)\textbf{V}_{(t-1)ij} + (\textbf{V}_{(t)ij} - \textbf{V}_{(t-1)ij})$$

Where:

V   = Value of X's exports in the world market.

V_i = Value of X's exports of commodity i.

V_j = Value of X's exports to country j.

V_{ij} = Value of X's exports of commodity i to country j.

t   = Current year.

(t-1)   = Base year.

r_{world} = Percentage increase in total world exports from previous year to current year.

r_i = Percentage increase in world exports of commodity i from previous year to current year.

r_{ij} = Percentage increase in world exports of commodity i to country j

CMS is based on the assumption that without changes abroad and maintained competitiveness at home, a country's share in the world market should remain unchanged overtime. William James and Oleksandr Movshuk (2000) wrote that traditional market share analysis measures a country's export performance relative to the total imports of partner countries while constant market share analysis allows one to evaluate why a country's exports may grow faster than world exports. This may occur if the commodities a country exports experience relatively rapid growth in world trade (the commodity composition effect). It may also happen that a country exports to partners with relatively high import growth (the partner country composition effect). Finally, an exporting country may increase its market share in the imports of specific commodities in the importing countries (the market share or competitiveness effect).

Kellman (2002) stated that the constant market share is adopted from the sub-discipline of marketing and is used to explain changes in a country's share of trade in world markets. This model identifies the causes of the extent by which the country's exports growth differs from the world. Four principle components that differs the export growth between the constant-share norm and the actual export performance are: the world trade effect (, commodity composition effect, market distribution effect and competitiveness effects. Suprihatini (2005) cited from Leamer dan Stern (1970) that to know the competitive advantage or export competitiveness of a country, Constant Market Share (CMS) is used. In CMS the failure in export of a country which has lower export growth export than world export growth are caused by three problems: (1) export tend to be concentrated on the low demand growth commodities (2) export is concentrated to the stagnant destination, and (3) the failure to compete with competitors. The basic assumption of CMS analysis is that a country export market share will not change over time. For the result, the different between actual export growth and the growth might happen if a country maintain its market share, is

the effect of competitiveness. The negative competitiveness shows that a country fails to protect its market share and will be in reversal if the value is positive. In CMS the main source of competitiveness is mostly from price competitiveness.

CMS is often interpreted as indicating the dynamic ability of a country to respond to changing environments and adapt its supply situation to world conditions. The results of CMS measurement can be either positive or negative. A positive sign of the residual implies the improved position of exports in terms of competitiveness, whereas, the negative sign reflects the deterioration in the country's export due to fall in competitiveness. In this research we also try to use all four components to analyze the market share change on Indonesian oil palm-based products in ASEAN market over time.

2.4 Related research in Revealed Comparative Advantages (RCA)

Ferto and Hubbard (2002) wrote about "Revealed Comparative Advantage and Competitiveness in Hungarian Agri-food Sectors". The objective of this study is to investigate the competitiveness of Hungarian agriculture in relation to that of the EU four indices of revealed comparative advantage, for the period 1992 to 1998. The four indices here were Ballasa Index (B) and Relative Export Advantage (RXA) that embodied only export data, Relative Trade Advantage (RTA) and Revealed Competitiveness (RC) accounted for imports as well.

The result of this research is all four indices indicate that Hungary has revealed comparative advantage for eleven of the 22 aggregate product groups: live animals; meat; cereals; vegetables and fruit; sugar; beverages; oilseeds; cork and wood; and animal and vegetable materials, oils and fats. A second indicator of stability in Hungary RCA is the correlation between the index in time period t and the index in subsequent time periods. Using 1992 as the base year, the correlation coefficient for our four indices for Hungary over 1993-1998 are all reasonably high. However, examining changes in the distributin of Ballasa Index, which is in this research called 'B', as Hungary RCA has weakened somewhat. The mean values of Ballasa index from 1992 to 1998 were 4.0, 3.6, 3.0, 3.1, 3.4, 2.4, and 2.0. It implies that measurement of government intervention shows that support for agriculture in Hungary is biased towards livestock products, but levels of support are lower than in the EU, the comparator of the analysis in this research. It has also been noted that government intervention and competitiveness tend to be inversely related. It means

that those groups revealing a comparative advantage could become more competitive if markets were to become less distorted.

Nongnooch Poramacom (2002) described the RCA and CMS Model in her paper about 'Revealed Comparative Advantage (RCA) and Constant Market Share Model (CMS) on Thai Natural Rubber". The paper started from production, marketing and export backgrounds of natural rubber (NR). The objective of the research is to compare RCA indices between Thai NR and Indonesian NR. It covered the export values of NR for the period 1991 to 1998. It used CMS to indicate the market share of Thai NR.

The result of the analysis shows that according to RCA index, Indonesian NR had a comparative advantage or specialization of trade in US market. Thailand showed no comparative advantage in the US market with RCA at 0.42 in 1991 and 0.96 in 1998. Using CMS, Thailand was delighted in an actual export growth of NR in the world comparing the year 1995-1996 to 1991-1993. By contrast, comparison of the period 1997-1998 to the period 1995-1996, the actual export growth was lower due to the negative effects on standard growth effect, market effect and competitive effect.

Utku Utkulu and Dilek Seymen (2004) wrote their paper about "Revealed Comparative Advantage and Competitiveness: Evidence for Turkey *vis-à-vis* the EU/15". This study was to analyze the competitiveness and the pattern of trade specialization from Turkey to the EU on sectoral levels. It based mainly on different measures of RCA measures (using Balassa Index). This research also aimed to explain about the effects of customs union process between Turkey and the EU on trade patters, comparative advantages and competitiveness.

The result showed that Turkey has revealed comparative advantage for seven of the 63 products groups: clothing and clothing accessories; vegetables and fruit; sugar, sugar preparations, honey; tobacco; oil seeds and oleaginous fruits; ribber manufactures; textile yarn, fabrics and related products. It also noted that there were the effects of the subsequent economic crises in 1994, 1999, and 2001 on the RCA of Turkey. It also revealed that the commodity groups having the highest RCA values are the 'clothing and clothing accessories" and "vegetables and fruit".

Amita Batra and Zeba Khan (2005) in their working paper titled "Revealed Comparative Advantage: An Analysis for India and China" whose objective was specifically to examine the structure of comparative advantage of India and China in

the global market. The period was examined within 2002-2003. The analysis of comparative advantage used Balassa Index of revealed comparative advantage for the two and six digit level of HS classification.

The results showed that in 2002, India got the advantage in the agriculture and allied products category, while China got the manufactures and also miscellaneous manufactures advantages in global market. In 2003, China attained comparative advantage in nuclear reactors, boilers, machinery, etc. In the same year, India attained the comparative advantage only for explosives, pyrotechnics, matches, pyrophorics, etc.

Chairul Muslim (2006) with his research on "Analisis Daya Saing Produk Ekspor Agroindustri Komoditas Berbasis Kelapa di Indonesia" or "Competitiveness Analysis of Exported Agro-industry Product of Coconut-based Commodity in Indonesia". The objective of the research was to understand the competitiveness of Indonesian coconut-based products with measuring the comparative advantage of products in world market, this research using the coconut industrial tree and uses the RCA, AR (Acceleration Ratio) and TSI (Trade Specialization Index).

The result of the research on Revealed Comparative Advantage (RCA) analysis showed different value in every export destination with the RCA>1, and AR>1 indicated that Indonesia had the competitiveness in this commodity. When TSI was positive, it meant that Indonesia had the specialization in the products especially for CCO and Desco.

2.5 Related Research on Constant Market Share Model (CMS)

William James and Oleksandr Movshuk (2000) in "International Economic Integration and Competitiveness Industries in Japan, Korea, Taiwan and United States" described Constant market share analysis of imports in apparent consumption in manufacturing industries of four major economies—Korea, Japan, Taiwan and the United States, is conducted over the most recent available data. The analysis provides an alternative to existing conventional studies of market share in imports. It provides a quantitative measure of the extent to which international economic integration has occurred in manufacturing in these four economies. This study, in addition, disaggregates import penetration in manufacturing, including in sectors with relatively high technological requirements. Statistical tests of the significance of changes in import penetration in manufacturing industries are conducted. Real growth of exports

and apparent consumption in the two largest OECD markets is decomposed into (1) the commodity composition effect and (2) the market share or competitiveness effect. Finally, a statistical test of the significance of changes in trade policy for changes in import penetration in Japan and the United States is conducted.

One of the results of the study is that although international economic integration has advanced in three of the four cases studied (using import penetration as the measure), because of "globalization" has been taking place but at less rapid and invasive rate than many. Another result is about significant changes, both positive and negative, have taken place at the sectoral level in manufacturing in these markets. The shift of the NIEs from traditional manufacturing exports to those involving substantial technological capabilities along with a high degree of human skill is consistent with changing comparative advantage. Korea and Taiwan appear to have experienced changes similar to those that occurred earlier in Japan. Korea and Taiwan experienced the declining "comprehensive export competitiveness" and reached their greater specialization in machinery. A decomposition analysis based on real growth of exports and apparent consumption in the US and Japan revealed that it is the United States that has the highest market share effect. The significant loss of market share by the Korea and Taiwan in the US market contrasted with the continued advance in their shares of the Japanese market. Trade policy changes, along with numerous other factors (i.e., changes in real exchange rates, competitive conditions facing domestic producers, etc.) are possible explanations for the divergent performances.

Nongnooch Poramacom (2002) also described about CMS analysis in "Revealed Comparative Advantage (RCA) and Constant Market Share Model (CMS) on Thai Natural Rubber". Using the CMS formula introduced by Richardson in 1971, the paper was based on the assumption that without changes abroad and maintained competitiveness at home, a country's share in the world market will remain in steady state or unchanged overtime. Four components used in this research are world trade, commodity composition, market distribution and a residue.

The result of the study showed that comparing the period of 1997-1998 to 1995-1996, Thailand experienced negative actual export growth in rubber which mainly came from standard growth effect, market effect and competitive effect. Furthermore, it implied that eventhough Thailand is a major natural rubber exporter of the world, Thailand was still facing that high competitive market.

Wawan Juswanto and Puji Mulyanti (2003) in "Indonesia's Manufactured Exports: A Constant Market Analysis" had written about manufactured exports which were believed to be one of the engines of Indonesian economic growth. It was true that Indonesia`s manufactured exports grew rapidly and its share in GDP increased year by year. Even though manufactured exports grew fast but it grew inconstantly, fluctuating year by year. To minimize the problems, government should understand the causes of the problems. One of the objectives was to identify these causes to help set government on the right track. This research was conducted by using Constant Market Share Model (CMS) analysis.

In the end, it was found that product composition seemed to be a main problem of Indonesia's manufactured exports because Indonesia's manufactured exports concentrated in products with relatively low world demand. This was shown by the fact that in the period for three sub-periods: 1990-1993, 1993-1996 and 1996-1999, products under SITC 6 and 8 (SITC 5-8 is for manufactured export) which constituted more than fifty percent of Indonesia`s manufactured exports have lower world export growth than that of other products. The study also found that Indonesia's manufactured exports tend to concentrate in some specific markets such as Japan, NIEs (Singapore, Rep. of Korea, Taiwan, and Hong Kong), US, ASEAN and China. Those markets absorb more than sixty percent of total manufactured exports of Indonesia. Those markets make a strong impact on the performance of Indonesia`s manufactured export.

Rohayati Suprihatini (2005) gave another study about an application of CMS model in agriculture in her paper "Daya Saing Ekspor Teh Indonesia di Pasar Teh Dunia" or "The Competitiveness of Indonesian Tea Export in World Tea Market". The purpose of this study was to analyze competitive position of Indonesian tea in the world market using Constant Market Share (CMS) approach.

The result shows that export growth of Indonesian tea was lower than world tea export growth due to (1) product composition problem; (2) distribution aspect problem; and (3) low competitiveness of Indonesian tea. To increase the growth of Indonesian tea export, exporters should increase tea export in form of down-stream products as well as bulk green tea. Competitive position of Indonesian tea was lower than those other tea producing countries, except Bangladesh. Based on the growth import market, it was seen that some kind of tea would have different market

destination. The government should focus on the growing market to export tea products.

Joao Amador and Sonia Cabral (2008) wrote "The Portuguese Export Performace in Perspective: A Constant Market Share Analysis". This article analysed the evolution of Portuguese market shares in world exports over the 1968-2006 period, in comparison with other Southern European countries and Ireland and taking into account the impact of product and geographical composition on the aggregate results. It used the constant market share methodology as proposed by Nyssens and Poullet.

The results of this research indicated that the dominant contributions to the evolution of total Portuguese market shares in most periods were the effective changes of export share in each individual market, *i.e.*, the market share effect. In terms of the geographical destinations, the major positive contributions in the 1977-96 period came from the European Union market. Over the 1968-2006 period, the relative product composition of Portuguese exports had a negative impact resulted mainly from the high relative share in Portuguese exports of products whose markets grew below average, in particular some low-technology products like textiles, clothing and footwear. In addition, the non-specialization of Portuguese exports in most fast-growing sectors, like some high-technology products, also gave a negative contribution in most periods. The main negative contribution to the geographical effect in the 2002-2006 periods arose from the under-specialization of Portuguese exports in the Chinese market, one of the most dynamic in the world in recent years.

Chapter 3

Research Methodology

This chapter describes the details of data used and the method of analysis.

3.1 Data

This research mainly uses the secondary data. To accomplish the measurement of RCA and CMS, the main data have been collected and processed as follows:

3.3.1 Types of data

1) Indonesian data

- Indonesian palm oil export (151110, 151190, 151321, and 151329) to the world market during 2004-2008 in tonnes and US$.

- Indonesian palm oil export (151110, 151190, 151321, and 151329) to ASEAN market during 2004-2008 in US$.

- Indonesian all goods export to the world market during 2004-2008 in US$.

- Indonesian all goods export to ASEAN market during 2004-2008 in US$.

2) World data

- Total world's export of all goods during 2004-2008 in US$.

- Total world's export of palm oil (151110, 151190, 151321, and 151329) during 2004-2008 in US$.

- World palm oil export (151110, 151190, 151321, and 151329) to ASEAN during 2004-2008 in US$.

3.1.2 Source of Data

The secondary data used in this research is an interpretation of primary data which done by other parties or is available in other research instead of the annual reports both from industrial or governmental organizations.

The world data is taken from the following websites:

- United Nation, such as Comtrade (www.comtrade.un.org).
- United States Department of Agriculture (www.usda.gov).
- Malaysian Palm Oil Council (www.mpoc.org.my).

- Malaysian Palm Oil Board (www.mpob.gov.my).
- World Trade Organization (www.wto.org).
- Association of South East Asian Nations (www.aseansec.org).

The data taken from the websites was processed and adjusted to the requirements of doing this research. Data for other ASEAN countries is needed for analysis of RCA and CMS model. The other ASEAN countries' data is available in the websites of either Comtrade, WTO, USDA, MPOC, MPOB or official websites of agriculture department in each of ASEAN countries.

Fulfilling the Indonesian data, this research also uses the websites from where the world data is taken. Besides, Indonesian data also uses the official websites of the government. The other data sources for Indonesia are:

- Ministry of Agriculture Republic of Indonesia (www.deptan.go.id).
- Directorate General of Estate Crops (http://ditjenbun.deptan.go.id).
- Ministry of Trade Republic of Indonesia (www.depdag.go.id).
- Ministry of Industry Republic of Indonesia (www.depperin.go.id).

The research also needs a lot of references to analyze the result of the calculation later on from many media issued by ASEAN countries to get the complete description of each condition regarding the quantitative result.

3.1.3 The Problem of Data Collection

All the data are then re-processed from the sources due to data availability and fitness to the required format and calculation in this research. Some data cannot be taken because of the unavailability that might cause the underestimate measurement. Another problem in data collecting is some data for the same kind of it, has a different value. But it can be solved by referring to United Nation database in Comtrade as the most complete source of data, so this research mostly uses Comtrade United Nation as the reference for all data, except for Malaysian data that is used to analyze, which is provided mostly by Malaysian Palm Oil Board (MPOB) in www.mpob.my.

The data availability is a common problem in international trade analysis, since some countries in the world do not provide the updated statistical data regularly. But, again, this research will refer to Comtrade United Nation database, when this problem occurs especially when the country measured does not provide the updated and complete data. The assumption is done by using the trend series analysis or others in the case of there is no data exactly available.

3.2 Method of Analysis

This research uses quantitative analysis. The secondary data are then processed to analyze the Revealed Comparative Advantage (RCA) and Constant Market Share (CMS). The RCA and CMS are explained below:

3.2.1 Revealed Comparative Advantage

The formula used is as follows:

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

Where:

X_{ij} = Indonesian export of oil palm-based products to ASEAN market. This variable uses the value of: palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm oil or Babassu oil and their fractions, crude, not chemically modified (151321), and palm oil or Babassu oil and their fractions, refined but not chemically modified (151329).

X_{it} = Indonesian export of all goods to ASEAN market.

X_{nj} = World export of oil palm-based products to ASEAN market. This research uses palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321), and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329).

X_{nt} = World export of all goods to ASEAN market.

Then, if the result after computing shows that RCA < 1, it can be concluded that Indonesia does not have a revealed comparative advantage on computed (specific) product that either product 151110, 151190, 151321 or 151329 is measured separately. In adverse, when RCA of specific product is more than 1 (RCA >1) it means that Indonesia has the revealed comparative advantage on the product.

3.2.2 Constant Market Share Model

Based on Richardson (1971) as cited in Poramacom (2002), there is assumption that without changes abroad and maintained competitiveness at home, a country's share in the world market should remain unchanged overtime. Four components to make a deviation are: world trade, commodity composition, market distribution and a residue. The constant market share identity is described as follows:

$$V_{(t)} - V_{(t-1)} = r_{world} \cdot V_{(t-1)} + (r_i \cdot r_{world}) \, V_{(t-1) \, i} + (r_{ij} - r_i) V_{(t-1)ij} + (V_{(t)ij} - V_{(t-1)ij})$$

Where:

V = Value of Indonesian all goods exports in the world market.

V_i = Value of Indonesian export of palm oil commodities either palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321); and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329) to the world market.

V_j = Value of Indonesian all goods exports to ASEAN market.

V_{ij} = Value of Indonesian export of palm oil commodities either palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321); and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329) to ASEAN market.

t = Current year (2008).

(t-1) = Base year (2004).

r_{world} = Percentage increase in total world exports from previous year (2004) to current year (2008).

r_i = Percentage increase in world exports of palm oil commodities either palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321); and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329) from 2004 to 2008.

r_{ij} = Percentage increase in world exports of palm oil commodities either palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321); and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329) to ASEAN market.

The four principle component in Constant market share Model (CMS) that are used to analyze the CMS of Indonesian's oil palm are: world trade effect, commodity composition effect, market distribution effect and residual general competitiveness effects.

1. To indicate the world trade effect

$$\boxed{\mathbf{r_{world}} . \mathbf{V}_{(t-1)}}$$

Where, '$\mathbf{V}_{(t-1)}$' is the export of Indonesian of all goods to world at the base year (in this research is 2004), 'r' is the percentage increase of total world all goods exports between two points of time (2004 and 2008). In this research we use four items, palm oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190); palm oil or Babassu oil and their fractions, crude, not chemically modified (151321); palm oil or Babassu oil and their fractions, refined but not chemically modified (151329). The world trade effect indicates the growth in exports that would have been needed for reference reporting Indonesia to have maintained a constant share in its ASEAN markets of palm oil.

2. To indicate the commodity composition effect

$$\boxed{(\mathbf{r_i}.\mathbf{r_{world}}) \, \mathbf{V}_{(t-1)} \, \mathbf{i}}$$

In the second stage, the export growth of the reference country is decomposed into the commodity composition effect, which is described above. Where, r_i is the percentage increase of world export of the commodity group i (palm oil in each type of commodity), between two time periods (2004 and 2008). If an increase of exports by a country is more than the world average in the similar commodity classes, the sign of commodity composition would be positive and vice versa. A positive sign

indicates that the export country had concentrated on export commodities whose markets were growing relatively fast.

    3. To indicate market distribution effect

$$(r_{ij}-r_i)V_{(t-1)ij}$$

In the third stage, the export growth of the country is then disaggregated into the market distribution effect. Where, r_{ij} is the percentage increase of the world export of the commodity group (palm oil) in the ASEAN market between two points of time (2004 and 2008). A positive sign indicates the ability of the reference country to increase its exports of similar commodity classes in the relatively growing markets. A negative sign suggests that the exports are concentrated in relatively stagnant markets.

    4   To indicate the competitiveness of each products

$$(V_{(t)ij} - V_{(t-1)ij})$$

Where, $V_{(t)ij}$ and $V_{(t-1)ij}$ are Indonesia palm oil exports in each commodity for the terminal and base year respectively. A positive sign of the residual implies the improved position of exports in terms of competitiveness, whereas, the negative sign reflects the deterioration in the Indonesian's export due to fall in competitiveness.

Chapter 4
Results and Discussions

This chapter explains the research results. The results are divided into three parts namely 1) Situation of palm oil industry, 2) Reveled Comparative Advantage (RCA) and 3) Constant Market Share Model (CMS) analysis.

4.1 Situation of Palm Oil Industry

This section describes the information of the palm oil industry in Indonesia, ASEAN market, and international which is needed to support the overall description of the research.

4.1.1 The Indonesian Situation of Palm Oil Industry in 2004-2008

Palm oil, both CPO and PKO, is used to produce many kinds of products. In Indonesia, the allocation of palm oil production was: 30% for cooking oil and food industry, 60% for export and the rest 10% was used in oleochemical industry (Hadisoebroto, 2006).

One of the key success factors of palm oil agribusiness in Indonesia is field supplies. Indonesian government also planned to open new palm plantation areas consists of 5 million ha as the new expansion, 2 million ha is revitalization, 9 million ha is rehabilitation and 8 million ha is for agrarian reform program. So, the total of the prepared land is 24.4 million ha in 2010 (Setara Jambi, 2008). It will give broader opportunity for planters either small holder, state-owned or private-owned plantation field. But the implementation is not good in practice because it is not easy for the investor to get a license to cultivate a land more than 10,000 ha due to the regulation applied.

Although the government also developed *Jathropa* for producing more biodiesel during 2006-2007, due to the food security issue and environmental issue related the oil palm cultivation, but the production of palm oil in Indonesia had kept rising. It indicated that palm oil and other oil palm-based products in Indonesia are the main agricultural products of Indonesia to be traded either in domestic or international market. But the most important product of oil palm in Indonesia is CPO and its derivative products. Here are the tables of Industry performance and CPO usage Projection for both non-food and food in Indonesia in 2005 (Table 4.1 and 4.2).

Table 4.1 Industry Performance and CPO Usage Projection for Non-Food in 2005

No	List	Fatty Acid	Fatty Alcohol	Glycerin
1	Capacity (tonnes)	659,280	160,800	84,956
2	Production (tonnes)	525,312	113,490	41,000
3	Utilization (%)	80	71	48
4	Domestic demand (tonnes)	272,015	84,550	11,098
5	Export (tonnes)	250,272	77,762	29,120
6	Export (thousand US$)	85,302	99,520	22,076
7	Import (tonnes)	3,025	10,533	702
8	Import (thousand US$)	4,335	13,466	745
9	Demand for CPO (tonne)	131,328	4,540	4,100

Source: Wahyudi, 2007

Table 4.2 Industry Performance and CPO Usage Projection for Food in 2005

No	List	Cooking Oil (MGS)	Margarine & Shortening
1	Capacity (tonnes)	9,778,000	526
2	Production (tonnes)	5,254,000	496,565
3	Utilization capacity (%)	53.73	94.40
4	Production value (trillion IDR)	21,938	2.05
5	Export (thousand tonnes)	3.1	264

Source: Wahyudi, 2007

In the policy guidelines of Keputusan Menteri Pertanian No.339/ Kpts/PD.300/5/21/07 issued by the Indonesian Minister of Agriculture on 31 June 2007, it stated 46 palm oil factories varied from the small, medium and large scale. If it is assumed that the larger the firm, the more CPO contribution will produce, so it indicates that the small scale of palm oil factories will contribute 0-500 tonnes/month, medium palm firm contributes 500-1000 tonnes/month and the large palm will produce more than 1,000 tonnes/month. Based on the data in this official issued letter, there are 24 large palm oil factories, 7 medium palm oil factories, and 15 factories considered small ones because their contribution was only 50-450 tonnes in May 2007.

Based on Regulation by President Republic of Indonesia issued in May 7th, 2008 (Peraturan Presiden No.28/2008) about National Industry policy, the Indonesian Government encourages the development of industry clusters. One of the clusters is

agro-industry in which palm oil industry included. There are seven policies toward palm oil industry in the medium time range, namely; improving the action on oil palm plantation revitalization (both intensification and extensive), using the side products of palm oil-based to develop the downstream industry, increasing domestic supply of CPO to be used in downstream industry, improving the human resources quality, encouraging research and technology integrated palm-based oleochemical products and developing industry to use the palm oil industry's waste.

In the long range the government will focus in downstream industry of palm improving the quality and quantity of supporting infrastructure in the oleochemical industry, developing integrated area of palm oil industry, and improving the information and technology usage in palm oil industry. It indicates the Indonesian government realizes that palm oil industry has the bright future and how this industry provides higher income to the nation. Indonesian government also understands the importance of palm-based products development such as oleochemicals and biodiesel instead of CPO which requires more concentration on the downstream industry

Since August 2008, amid the global financial crises, the CPO price decreased. Pakistan, India and China canceled the purchasing contracts. EU minimized the usage of biodiesel from 15% to 10% after the decreasing of conventional energy price and the competition in renewable industry with soybean, rapeseed and sunflower seeds which in this quarter has the same time of harvesting. Then Indonesian government issued contingency policy to apply 0 % tax on CPO export due to the abundant stocks to be exported.

4.1.2 ASEAN Situation of Palm Oil Industry in 2004-2008

The palm oil industry is an important sector in Indonesian economy as it is one of the country's major export earners as well as food source for its population. The production of Indonesian palm oil had increased extremely from 450,000 tonnes in 1976 to about 12.11 million tonnes in 2004 that had brought Indonesia as the second world largest producer of palm oil after Malaysia. In 2004, Indonesia contributed 34.04% of palm oil world production while Malaysia 55.26%. In 2005, the average annual growth rate of palm oil production in Indonesia was 21.67% and Malaysia 7.71% because of suggested a rapid expansion of hectarage and production palm oil in Indonesia (Ernawati, et al., 2006).

Figure 4.1 is about the Indonesian export of palm oil during 2004-2008 to the ASEAN market. Indonesian palm oil export to ASEAN market increased for every commodity. Commodity with the HS Code 151110 increased every year and was the highest increase among the traded commodities in ASEAN market.
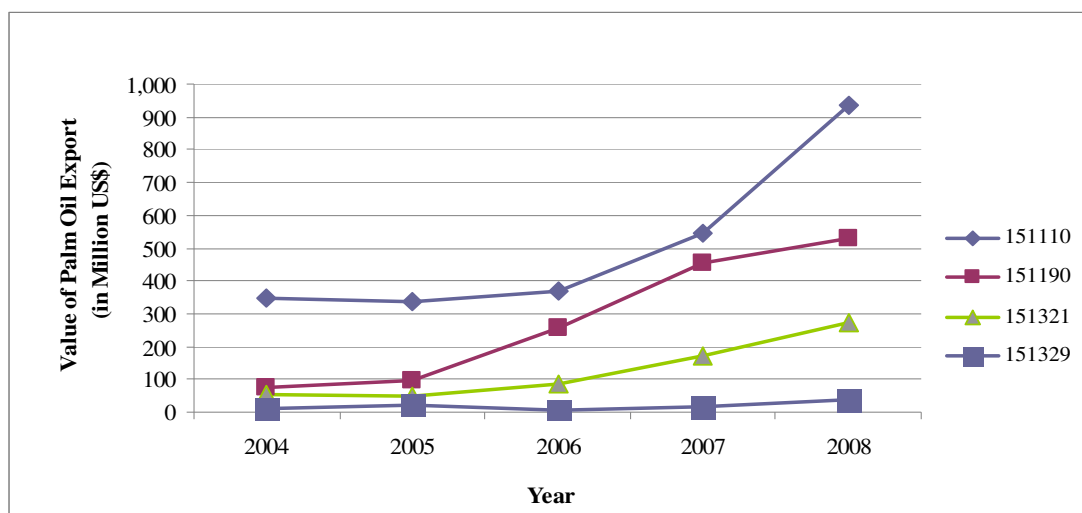
Figure 4.1 Indonesian Palm Oil Export to ASEAN Market

Source: Appendix 12

Figure 4.2 is about the value of Indonesian goods export to ASEAN market. It constantly increased every year as supported by the increasing of palm oil export value. Indonesia increased its export more commodities to the ASEAN market even though in 2008, the world economy was hit by the financial crisis.

Thailand had higher consumption on palm biodiesel as 11.9% in 2004 compared to 2003 because it was used 71.5% in transport sector, agriculture 20.4%, manufacture 4.6% and other sectors 1.5%. It also increased the export value of Indonesia and Malaysia to Thailand (Ministry of Energy, 2004).

In January 2008, Thailand imported 60,000 tonnes of palm oil either from Malaysia or Indonesia to ease a domestic shortage of the commodity (Siddiq, 2008). The imported palm oil was then used both for cooking oil and biodiesel fuel. Thailand, as a significant palm-oil producer, tried to keep a stockpile of 150,000 tonnes of palm oil to secure domestic supplies and keep prices down, but the stockpile had fallen to 98,000 tonnes. The country used about 70,000 tonnes of palm oil a month for cooking oil and 30,000 tonnes for biodiesel.

In the first half of 2004, there was a 6% decline in the production of major oils and fats compared to 2003. The decline was mainly in palm oil, soybean and sunflower seeds. The decrease of soybean was caused by the bad weather in Brazil, Argentina and other countries, while palm oil price declined as the result of the seasonality of fresh fruit bunches production both of Malaysia and Indonesia (Abdullah, 2004).

During 2004-2005 Vietnam imported more soybean because of rising animal population (swine and poultry sectors). While in 2006, Vietnam projected to import palm oil because of consumer preference and competitive prices combined preferential tariffs afforded key suppliers via ASEAN where Vietnam has been a member since July 1995 (USDA, 2004).

Malaysia exports of oleochemical products totaled 1.77 million tonnes valued around 5.0 billion RM in 2004, up sharply from 1.57 million tonnes valued at 3.85 billion RM in the previous year (2003). It made most of Malaysian palm oil was manufactured as oleochemical and then exported as the same product. That's why in the following year after 2004, Malaysia exported less CPO and PKO and more on oleochemicals (Malaysia Palm Oil Board, 2004).

In 2005, Asia became the primary market for Indonesian crude palm oil (CPO) export which was 70% of its total exports. The second largest market was European countries (EU) because Indonesia exported 25% of its total export to this area.

AFTA has brought some major changes to the Indonesian palm oil industry which has been subjected to various degrees of intervention and protection because Indonesia as a member of ASEAN 4 has pledged to reduce the tariff under the CEPT 5 program. In 2008, the import tax for palm oil under the ASEAN Free Trade Agreement (AFTA), were still subjected to 20% import tax, while most other commodities' tariffs were 0-5%.

The export demand function is influenced by the price of palm oil and the price of substitute of palm oil, such as soybean. From policy point of view, Indonesian palm oil industry needs the reorientation of palm oil trading policies and program in such a way that would ensure that the policies capture increasing competitiveness to increase market export share.

Oil palm is particularly in Sarawak, Eastern Malaysia. Malaysia wants to export biodiesel to European market. Malaysian palm oil may become a raw material

of European biodiesel. Expansion of palm oil production is possible in Malaysia. About 1.0% of Malaysian's palm oil was used for biodiesel in 2006 and 7.9% in 2007 (Ohga & Koisumi, 2007).
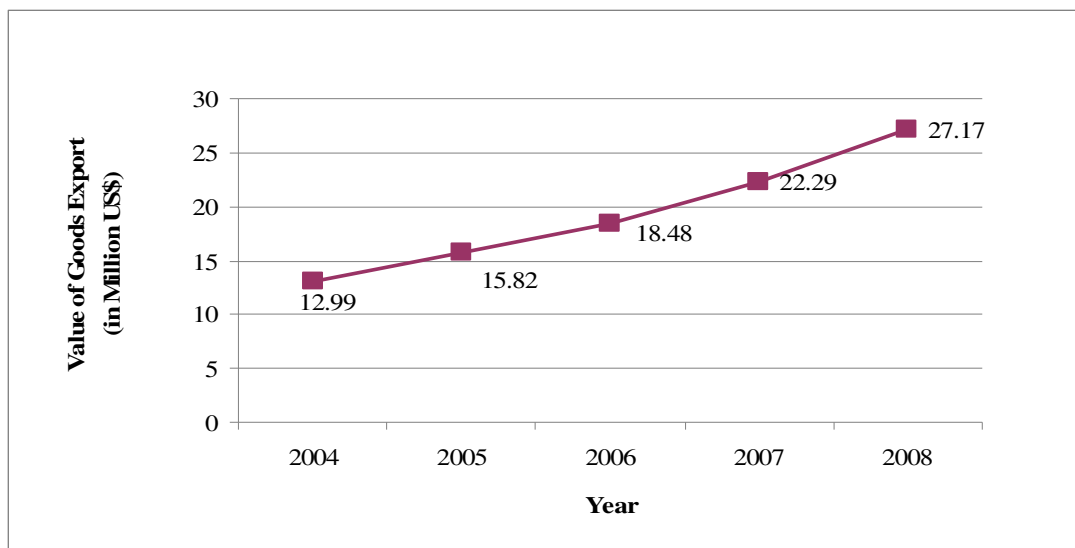
Figure 4.2 Value of Indonesian Goods Export to ASEAN Market

Source: Appendix 14.

Based on Table 4.3, oleochemicals production in South East Asia in 2007, were dominated by Malaysia and China. It showed that oleochemicals as the derivative products of palm oil had experienced increasing demand in ASEAN market. Malaysia and China were dominating the oleochemicals market due to the advance technology. Indonesia produced fewer oleochemicals than Malaysia, because of the technology and main exported palm oil products which were not oleochemical but CPO and PKO.

Table 4.3 Oleochemicals Production in South East Asia in 2007 (Tonnes)

Country	Biodiesel	Fatty Acid	Glycerin	Alcohol
Malaysia	4,145,000	2,160,000	264,280	471,000
Indonesia	1,478,000	800,751	99,140	414,249
Philippine	279,520	73,301	31,081	166,487
Thailand	350	104,500	650	100,000
Singapore	866,000			
Total SEA	**6,768,870**	**3,138,552**	**395,151**	**1,151,736**
India	12,000	790,000		160,000
China	3,070,000	2,333,520	240,000	777,000
Total	**9,850,870**	**6,262,072**	**635,151**	**2,088,736**

Source: Cheah, S.C, 2007

The total world export of all goods to ASEAN market during 2004 to 2008 (Figure 4.3) indicated the increasing value over time. It could be the effect of the conducive situation of global economy before financial crisis in the middle of 2008.

In Figure 4.3, the data for 2008 might be underestimated since the data of world export to ASEAN market is not available completely. The measurement data in 2008 is then done by multiplying the total world value with the average allocation to ASEAN market in the year 2004 to 2007. In 2004 to 2007, the export allocations to ASEAN market were 5.4%, 5.5%, 5.5%, and 5.4% respectively. So, in 2008, the allocation was estimated to be 5.5% as the average result of percentages during 2004-2007. Hence, while the value of total world's all goods export in 2008 was US$ 15,717 billion then the total value of world's all goods export to ASEAN market will be estimated to be 5.5% (x) US$ 15,717 billion or US$ 864.44 billion.
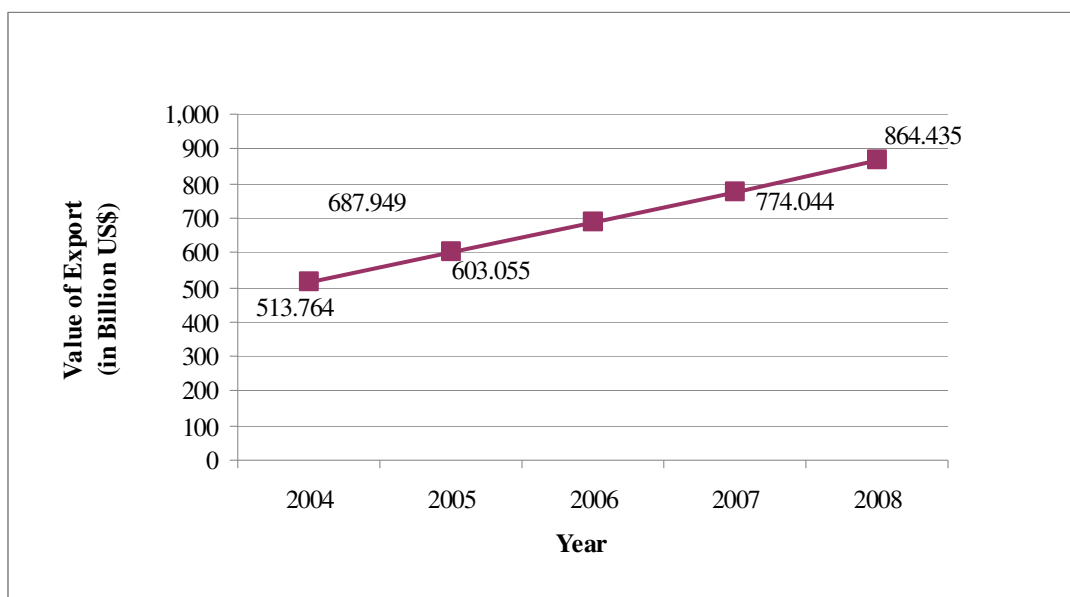
Figure 4.3 Total World Export of all Goods to ASEAN Market
Source: Appendix 15

World palm oil export to ASEAN market in this research is measured from the total main world palm oil exporters' export value (Figure 4.4). The main exporters in the world are: Indonesia, Malaysia, Thailand, Papua New Guinea, Columbia and others (USDA, 2009). In 2008, Nigeria was considered as the main exporter in the world with 2% of world market share. Referring to COMTRADE database, Nigeria had no export activities on palm oil with ASEAN market. The total world export of

palm oil to ASEAN market, then mainly came from Indonesia, Malaysia, Thailand, Papua New Guinea and Colombia. In the calculation, Papua New Guinea and Colombia are included as 'others'. The total of all exporters' export value is shown in Appendix 13.
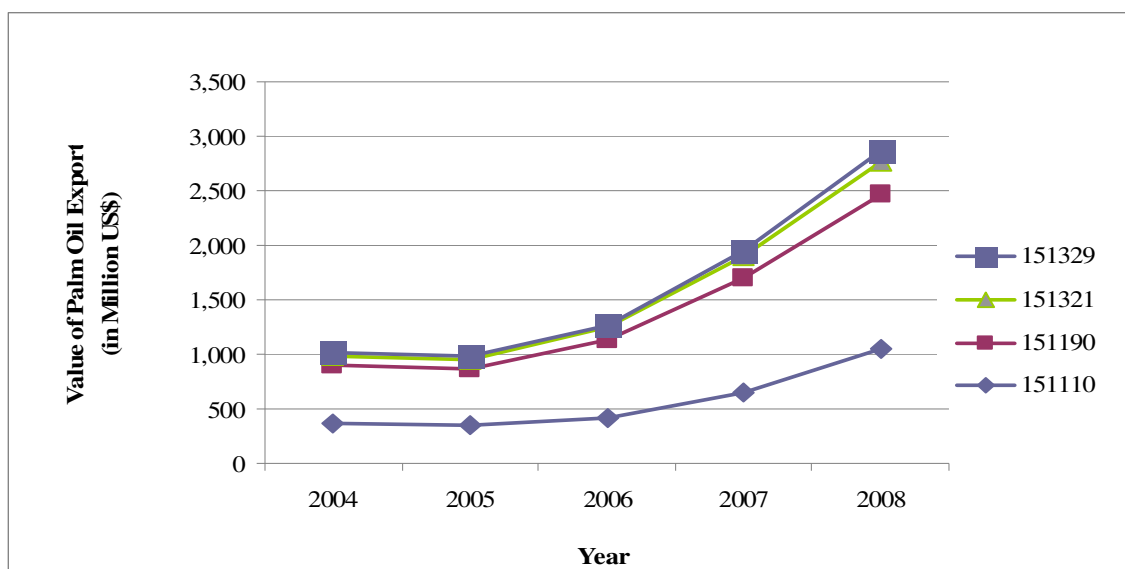
Figure 4.4 Value of World Palm Oil Export to ASEAN Market

Source: Appendix 13

4.1.3. International Situation of Palm Oil Industry in 2004-2008

In international market either for food and non-food (biofuel) usage, palm oil was projected to be the top usage among countries compared to the other oils such as soybean oil, rapeseed oil, tallow and others. Tallow is a rendered form of beef or mutton fat, or animal fat that conforms to certain technical criteria, including its melting point. Here are the projection of world consumption of oils and fats for food and biofuel with the comparison of soybean oil, rapeseed oil, palm oil and tallow.

From the Table 4.4 the usage of palm oil for food will be higher each year exceeds the usage of soybean oil which was the largest in use in the world. It means that the business in palm oil will be prospectus. In addition, there are many eligible countries have started planting oil palm to supply their own needs.

Table 4.4 Consumption of Palm Oil for Food (in Million Tonnes)

Oil	2001-2005	2006-2010 F	2011-2015F	2016-2020 F
Soybean Oil	26.50	29.40	31.50	34.10
Rapeseed Oil	12.12	13.93	17.20	20.10
Palm Oil	20.37	29.78	39.37	47.48
Tallow	2.90	3.00	3.20	3.40
Total	**61.89**	**76.11**	**91.27**	**105.08**

Source: ISTA Mielke, Oil World, 2008

Furthermore, the most common raw material for biodiesel is soybean oil that is used mainly in USA and South America, rapeseed and sunflower oils in Europe and palm oil in Asia (Table 4.5).

Table 4.5 Consumption of Palm Oil for Biofuel (in Million Tonnes)

Oil	2001-2005	2006-2010 F	2011-2015 F	2016-2020 F
Soybean Oil	0.30	4.20	7.00	9.00
Rapeseed Oil	1.75	5.30	7.80	9.35
Palm Oil	0.19	1.71	3.70	5.50
Tallow	0.53	0.75	0.90	1.00
Other	0.12	0.29	0.44	0.55
Recycle (from vegetable oils and animal fats)	0.15	0.35	0.58	0.85
Total	**3.04**	**12.60**	**20.42**	**26.25**

Source: ISTA Mielke, Oil World, 2008

Figure 4.5 shows the market shares of world palm oil producers in 2008. Indonesia was the biggest producer whose market share was the largest, followed by Malaysia, other countries (such as Papua New Guinea, Jordania and so on), Thailand, Columbia, and Nigeria.

The target market of Indonesian palm oil products in 2008 were India, Netherlands, Malaysia, China, USA, Italy, Singapore, Egypt, Pakistan, Bangladesh, and Saudi Arabia. It can grow broader when the awareness of biofuel usage increases in all countries in the world. Although in the future even recently, it can be replaced by Jathropa, rapeseed or soybean which some of European and American countries are trying to develop.
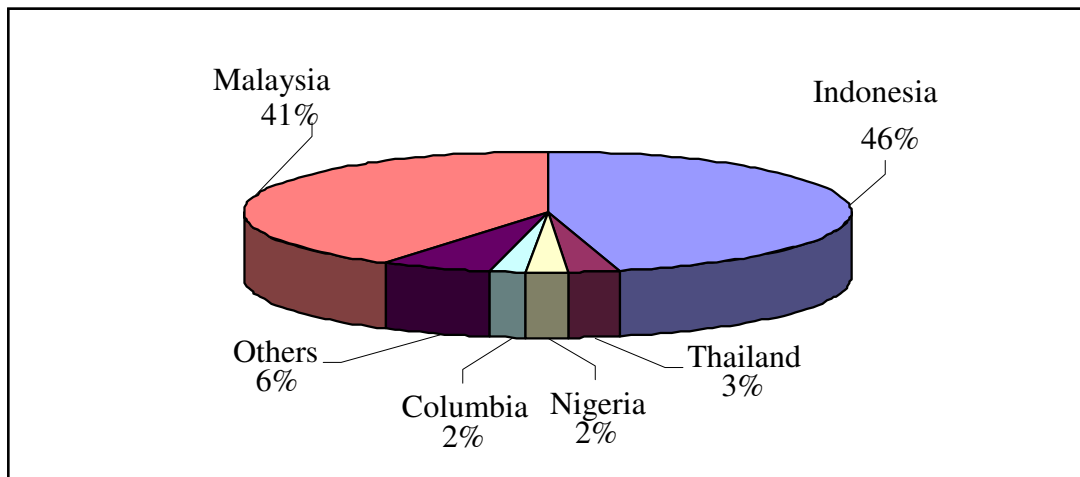
Figure 4.5 Market Shares of Top Five Palm Oil Producers in 2008

Source: USDA, 2008 (adapted)

Indonesia has high potential for palm oil production in large amount and also has lower production cost compared to other palm oil producers in the world. Therefore, Indonesia has competitive advantage in the world market. In European market for example, if comparing to biodiesel produced in Germany which is using rapeseed mixed with soybean oil and CPO (Levigne, 2007). Indonesia produces biodiesel in lower cost than Germany (Table 4.6).

Factories in Germany use 70% rapeseed, 20% soybean oil and 10% CPO, and in Indonesia use 100% CPO. This condition results in the decrease in export to European countries although European countries are one of the main destinations of Indonesian's palm oil export. Rapeseed is the competitor commodity for oil palm in Europe (Levigne, 2007).

In Asia, Malaysia will be the competitor for especially oleochemical palm oil-based products because Malaysia concerns seriously in developing downstream industry of palm oil, and exports the products to other countries, included Indonesia. While Indonesia still focuses more on the CPO which is imported by Malaysia too.

Table 4.6 Competitive Advantage of Biodiesel Industry

between Indonesia and Germany

Item	Germany's Biodiesel Factory (US$)	Indonesia's Biodiesel Factory (US$)
Raw material / tonne*	850	550
Manufacturing cost / tonne	110	85
Shipping cost / tonne	-	80
Cost of franco Jerman	960	715
Import tax (6.5%)	-	47
Sales price / tonne**	950	950
Profit	-10	188

Source: Levigne, 2007

4.2 Revealed Comparative Advantage (RCA) Analysis

The result of RCA of Indonesian palm oil products is shown in Appendix 1-5.

4.2.1 The RCA Analysis for Commodity 151110

During 2004 to 2008, for the commodity 151110 (palm oil and its fractions, crude, not chemically modified), Indonesia had the high RCA (RCA>1). It means that Indonesian palm oil of commodity 151110 has the comparative advantage in ASEAN market because Indonesia concentrated on export of CPO rather than the other derivative products. Another reason is about the price. The lower labor cost in Indonesia has made Indonesia exports palm oil in lower price. The policy of Indonesian government to apply the 0% of export tax to the commodity was also bringing the palm oil of Indonesia to get the lower export price than any other palm oil exporters in the world.

The trend of decreasing RCA for Indonesia as shown in Figure 4.6 was due to the policy of government that changes the main export palm oil -based products from crude palm oils to the derivative products whose value are higher, such as oleochemicals and others, the development of competitors' palm oil industries and also the consumer preference. Indonesia experienced decreasing RCA in 2008 due to the global financial crisis in the mid-year which hit the overall countries in the world in all kinds of industries which caused the decrease in all exports and imports of importer countries on this palm oil product. Indonesian farmers had suffered from the crisis as the CPO price was more than a half lower than the first quarter in the same year (2008).
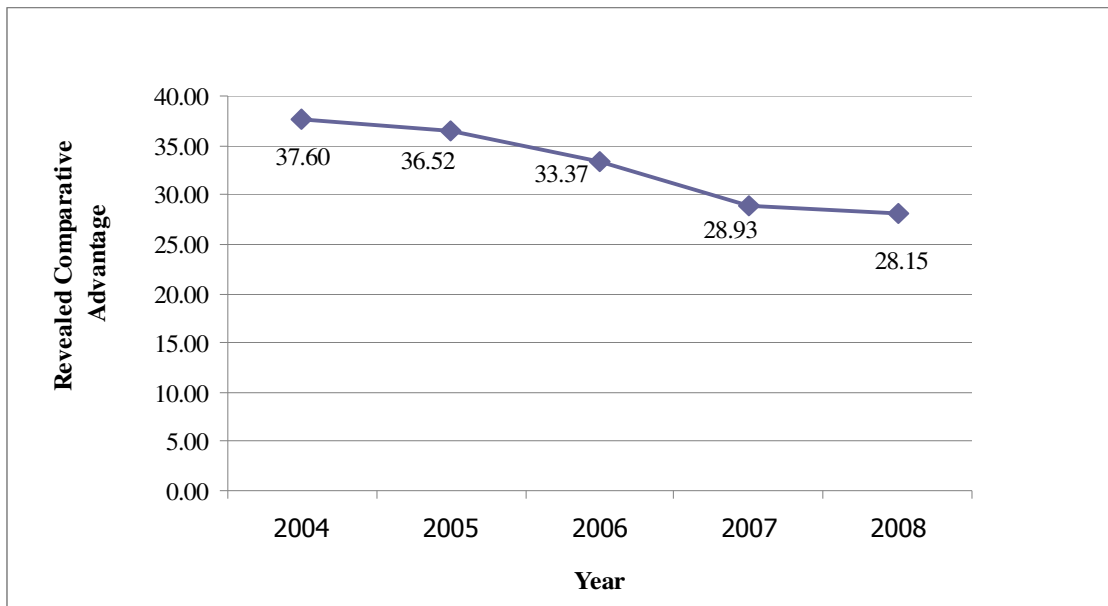
Figure 4.6 RCA for Palm Oil and Its Fractions, Crude, not Chemically Modified (151110)

4.2.2 The RCA Analysis for Commodity 151190

In 2004 and 2005 commodity 151190 (palm oil and its fractions, refined but not chemically modified) of Indonesia experienced the lower RCA if it was compared to the commodity 151110. This condition might be the effect of the starting point of Indonesia in cultivating oil palm. But in 2006-2007, Indonesia could increase its RCA in this commodity (Figure 4.7). It might due to the expansion in areas is done many years before and also the support of Indonesian government to facilitate the palm oil industry in Indonesia in many ways. Another reason is that Indonesia's refining technology was not better than its competitor for this product, such as Malaysia. However, Indonesia still had the RCA during those periods because its RCA value was more than 1 (RCA > 1). After those years, Indonesia learned to refine and improve the technology in producing palm oil and then Indonesia exceeded its competitors in this commodity's market. The decreasing value in 2008, as other commodities, was due to the global financial crisis.
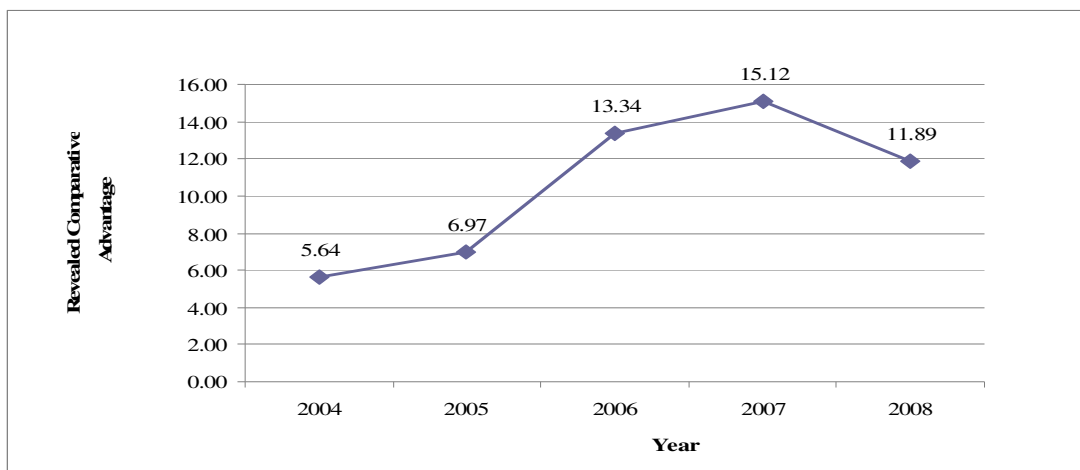
Figure 4.7 RCA for Palm Oil and Its Fractions, Refined but not Chemically Modified (151190)

4.2.3 The RCA Analysis for Commodity 151321

The commodity 151321 (palm oil or babassu oil and their fraction, crude, not chemically modified) is also mainly exported by Indonesia. The crude product of PKO had the high RCA value (RCA>1). It means Indonesia had the comparative advantage for this commodity during 2004-2008 and had been increasing during this period (Figure 4.8).

The decrease in 2008 was due to the global financial crisis and the changes of consumer preference to the refined oil products. The export activities of the competitors, such as Malaysia and Thailand to ASEAN market, had given the impact to Indonesian palm oil export.
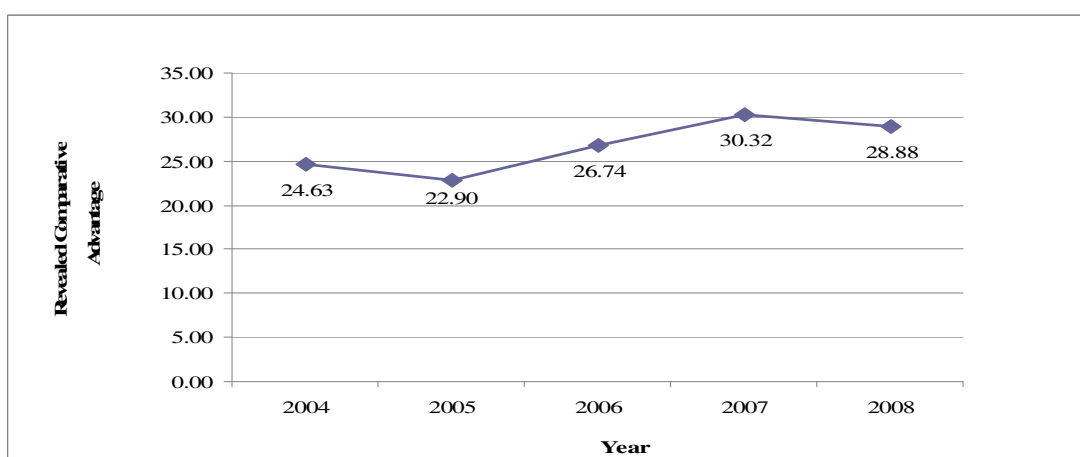
Figure 4.8 RCA for Palm Oil or Babassu Oil and Their Fraction, Crude, not Chemically Modified (151321)

4.2.4 The RCA Analysis for Commodity 151329

The commodity 151329 (palm oil or Babassu oil and their fraction, refined but not chemically modified) is also exported by Indonesia. Indonesia had the high RCA value in almost all palm oil commodities analyzed. In 2004, Indonesia started to expand the hectarage and production of palm oil in that year (Ernawati, et al.,2006). The increasing of RCA for the commodity 151329 in 2006 to 2008 might be occurred as the effects of the consumer preference, who demanded palm oil in other form to produce biodiesel and other oleochemical materials. So, the market of the commodity declined (Figure 4.9).

The world palm oil export of this commodity to ASEAN market was also increasing due to the demand (Figure 4.4), then Indonesia had the ability to export more of this commodity because of abundant production stocks.
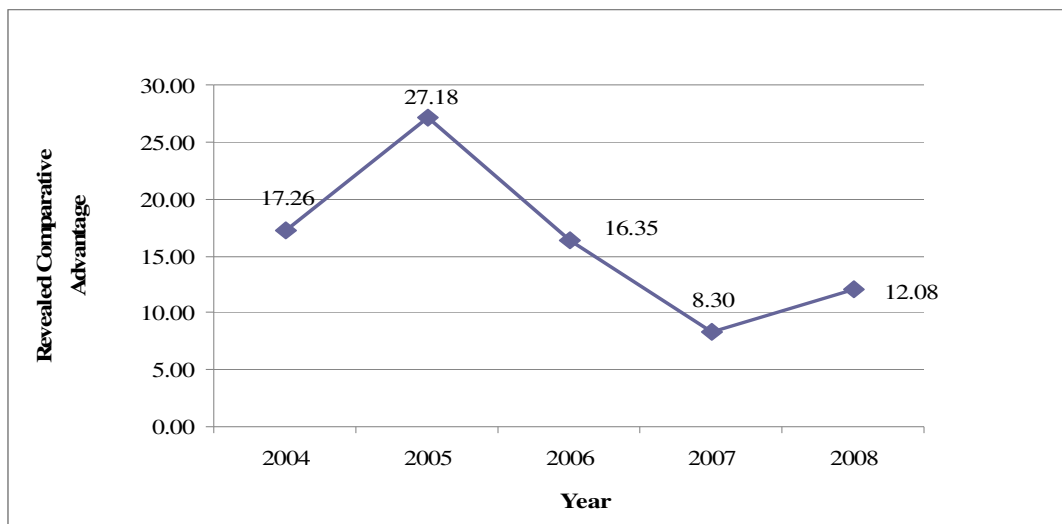
Figure 4.9 RCA for Palm Oil or Babassu Oil and their Fraction, Refined, but not Chemically Modified (151329)

4.3 Constant Market Share Model (CMS) Analysis

Four principle components that differs the export growth between the constant-share norm and the actual export performance are: the world trade effect, commodity composition effect, market distribution effect and residual general competitiveness effects (Poramacom, 2002). There are four principle components to explain changes in a country's share of trade in world markets. This model identifies the causes of the extent by which the country's exports growth differs from the world (Kellman, 2002).

This research examines the Constant Market Share of Indonesian palm oil commodity within the period of 2004-2008. The result of the commodities examined is shown below.

The market distribution effect was negative for commodity 151110 and 151190 of Indonesian palm oil during 2004-2008. It indicates that the world export of each of commodity type to ASEAN market increased by less than total world export of this commodity and Indonesia had concentrated its export in the market that were relatively stagnant. The result was positive for commodity 151321 and 151329 because Indonesia had concentrated its export in the market that was growing relatively fast.

The competitiveness effect was positive for all commodities indicated the Indonesia was able to gain international market shares despite potentially adverse world demand movements. Therefore, it indicated the dynamic ability of Indonesia to respond to changing environments and adapt its supply situation to world condition.

Finally, the actual export growths of all commodities are positive. The CMS itself is explicitly based on commodity composition effect and market effects since both components are external issues.

Table 4.7 Constant Market Share Model (CMS) Analysis of Indonesian Palm Oil, 2004-2008

| Commodity | Period | CMS Decomposition (In thousands US$) | | | | Actual Export Growth (in thousands US$) |
		Standard World Growth Effect	Commodity Composition Effect	Market Distribution Effect	Competitive-ness Effect	
151110		45,998,270.75	3,554,494.88	-431,652.83	584,028.93	49,705,141.73
151190	2004 - 2008	45,998,270.75	2,049,369.66	-1,083.31	453,419.70	48,499,976.80
151321		45,998,270.75	436,588.53	36,624.60	219,927.48	46,691,411.36
151329		45,998,270.75	74,656.12	16,509.69	24,625.69	46,114,062.24

Source: Appendix 6-9

For further deeper analysis of each commodity's analysis, it is explained separately below.

4.3.1 The CMS Model Analysis for Commodity 151110

Commodity 151110 of Indonesia (See Table 4.7) got the standard growth effect (world trade effect) component in positive sign as 45,998,270.75 (thousand US$) during 2004-2008 which means the increase in world exports gave the positive impact on the increase of Indonesia palm oil commodity 151110 exports.

The component commodity growth effect (commodity composition effect) for this commodity (151110) shows the positive sign during 2004-2008 as 3,554,494.88 (thousand US$). It indicates that Indonesia concentrated on exported commodity while markets were growing relatively fast.

In market growth component (market distribution effect), Indonesia had negative sign as -431,652.83 (thousand US$) during 2004-2008. It indicates that Indonesian's exports were concentrated in relatively stagnant market.

The competitive market effect (competitiveness effects) was positive during 2004-2008. It implies the improved position of exports in terms of competitiveness and there is ability of Indonesia to respond to changing environments and adapt its supply situation to world condition.

The increasing world all goods export from 2004 to 2008 had given the impact to the Indonesian all goods export as shown in Figure 4.10 and Figure 4.11.
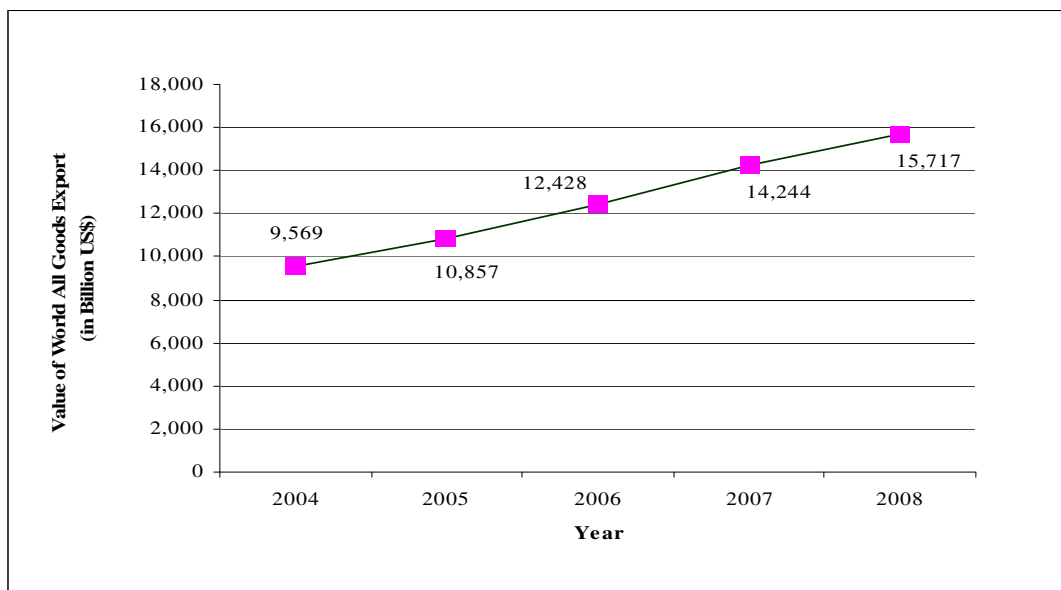
Figure 4.10 Growth of World all Goods Export

In Figure 4.11 Indonesia experienced growth in its all goods export from 2004 to 2008. It is driven by the increasing world all goods export during the same years. This condition had brought the value of Indonesian export of commodity 151110 increase as well.
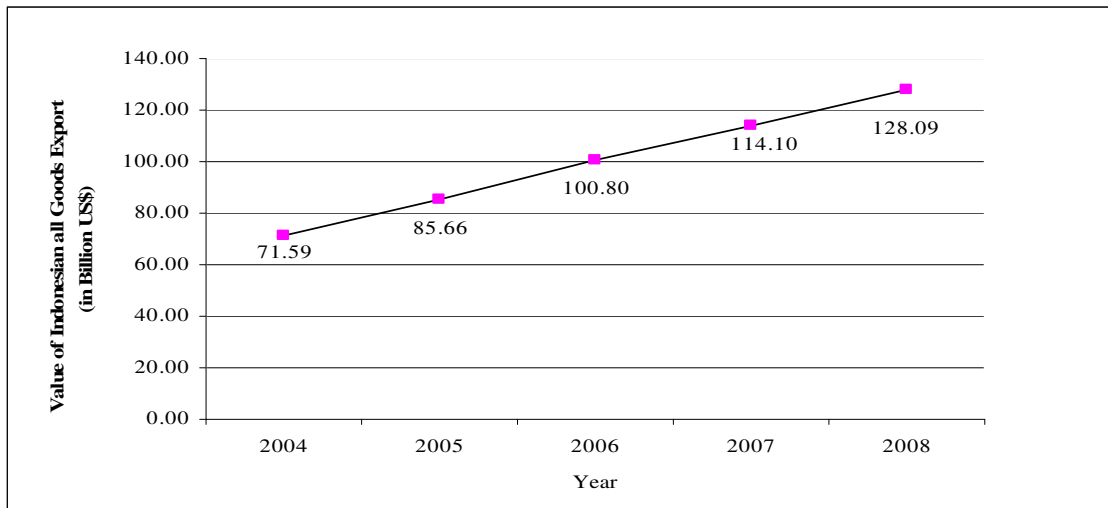
Figure 4.11 Growth of Indonesian all Goods Export

The increasing of world all goods export is also contributed by the increasing in world palm oil export (Figure 4.12).

Figure 4.12 Export of World and Indonesian for Palm Oil and Its Fractions, Crude, not Chemically Modified (151110)

In 2004, Indonesia had just expanded production area and also the usage of palm oil was not various. In other words, only a few of inventions on palm oil usage had been done in period. In 2005-2006, Indonesia started to export more of palm oil to ASEAN market. Since 2006, Indonesia left Malaysia, as the main competitor of palm oil in the world far behind as the effect of expansion supported by Indonesian Government to open 10 million hectares for oil palm plantation. This continued until 2008 when Indonesia remained exporting CPO as the main commodity of its palm oil industry although the global financial crisis had made all kinds of business suffered in the period.

Commodity 151110 as shown in Figure 4.1 had rapid growth for Indonesian export to ASEAN market. In 2004-2005 the world export of palm oil to ASEAN market seemed to be very low (Figure 4.4) as the result of the booming and the common of crude oil (conventional oil).

The commodity composition had made Indonesian palm oil in this type of commodity to get constant market share in ASEAN market because Indonesia concentrated in producing and exporting this commodity throughout the examined period.

The market distribution effect for this commodity is negative, indicates that the percentage increase of the world export of commodity 151110 to ASEAN market was lower than world all goods export to ASEAN market. It means that ASEAN market was stagnant in commodity 151110, although the export either from Indonesia or world increased. It might due to the global financial crisis that hit all countries in the world in the middle of 2008, when a number of businesses collapsed, and some ASEAN countries maintained its domestic product by canceling imports. The world export of this commodity to ASEAN countries was not much increasing while Indonesian export focused more in exporting this commodity to the same market (See appendix 6). It is the reason why the ASEAN market distribution of Indonesian palm oil was stagnant.

The competitiveness effect of Indonesian palm oil export is positive due to the high production and many supports from Indonesian government to ease the exporting process.

The actual export growth of the commodity 151110 of Indonesia was relatively increasing (See Appendix 6). It was caused by the support of government on the palm oil industry, especially for the CPO. The main product of palm was CPO,

and is still the main commodity which Indonesian Government concerns and involves. By applying the export tax based on price referenced, it makes the CPO price exported from Indonesia a bit higher than before. Based on the Regulation of Ministry of Finance (PMK No. 9/PMK011/2008 (04 February 2008) as the revision of PMK No. 94/2007, 3rd September 2007).

The Export tax for CPO will be counted based on price referenced (http://www.gapkiconference.org) as follows:

1) Price referenced < US$ 550,-/Tonnes, Export Tax: 0%
2) US$ 550,- ≤Price < US$ 650,-/ Tonnes, Export Tax: 2.5%
3) US$ 650,- ≤Price < US$ 750,-/ Tonnes, Export Tax: 5.0%
4) US$ 750,- ≤Price < US$ 850,-/ Tonnes, Export Tax: 7.5%
5) US$ 850,- ≤Price < US$ 1,100,-/ Tonnes, Export Tax: 10%
6) US$ 1,100,- ≤Price < US$ 1,200,-/ Tonnes, Export Tax: 15%
7) US$ 1,200,- ≤Price < US$ 1,300,-/ Tonnes, Export Tax: 20%
8) Price referenced ≥US$ 1,300,-/ Tonnes, Export Tax: 25%

Price referenced is stated by Trade Minister will be based on CPO price CIF Rotterdam. The export tax for other palm oil based products such as oleochemical both food or non-food is stated 6.5% in 2007.

To ease and support the export, Indonesian government has issued contingency policy to apply 0% tax on CPO export. It is because stocks of raw material in producing CPO and other derivative products should be sold to avoid damage of the commodity in farm level due to the nature of the agricultural products.

Towards the palm oil industry, Indonesian Government has stated the priority products, which is called *picking the winners strategy*. In 2030, the government has prepared 10 products which high export potential, including palm oil. The Indonesian Minister of Trade issued 2008 priority included CPO. It will be the encouragement to the palm oil industry in Indonesia, in the middle of the global financial crisis in the world.

4.3.2 The CMS Model Analysis for Commodity 151190

Commodity 151190 of Indonesia (as shown in Table 4.7) got the standard growth effect (world trade effect) component in positive sign as 45,998,270.75 (thousand US$) during 2004-2008 which means the increase in world exports gave the positive impact on the increase of Indonesia palm oil commodity 151190 exports.

The increasing world all goods export and Indonesia growth in its all goods export from 2004 to 2008 (Figure 4.10 and Figure 4.11) had brought the value of Indonesian export of commodity 151190 increase as well. The increasing of world all goods export was also contributed by the increasing in world palm oil export (Figure 4.13).

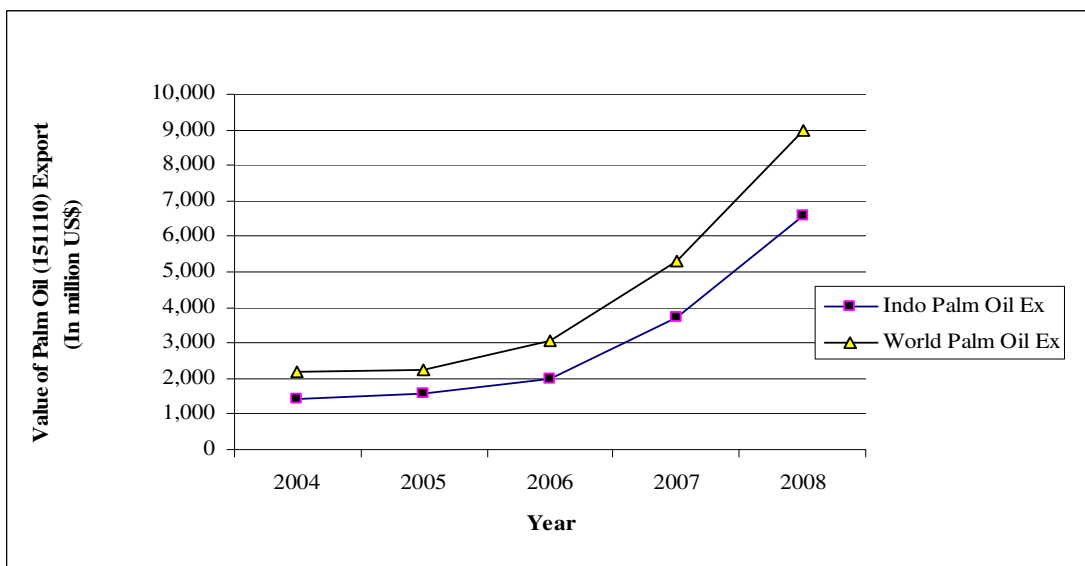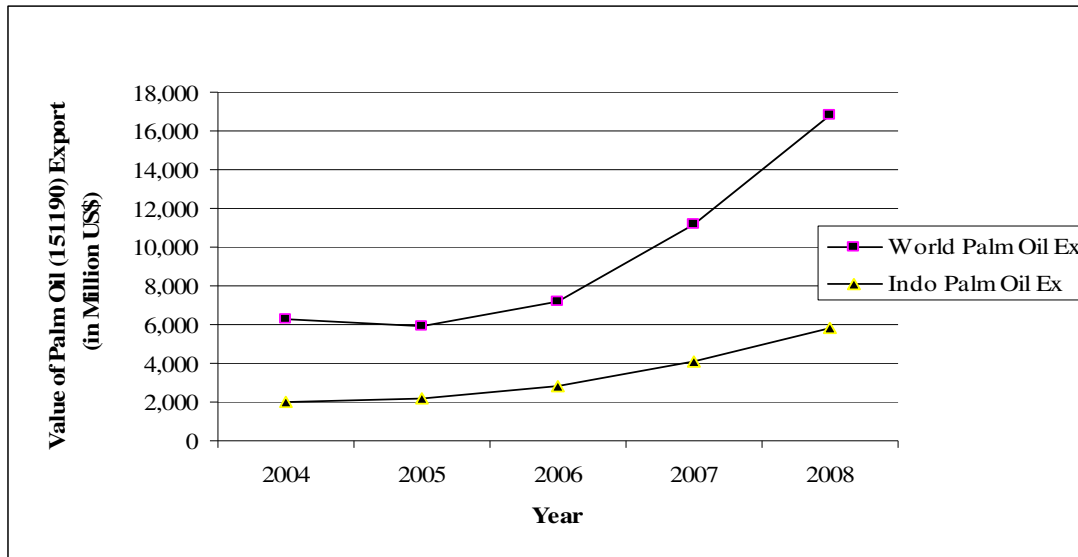**Figure 4.13 Export of World and Indonesian for Palm Oil and Its Fractions, Refined but not Chemically Modified (151190)**

The component commodity growth effect (commodity composition effect) for this commodity (151190) shows the positive sign in period 2004-2008 as 2,049,364.66 (thousand US$). It indicates that Indonesia concentrated on exported commodity while markets were growing relatively fast. Commodity 151190 as shown in Figure 4.4 had rapid growth for Indonesian export to ASEAN market. The increase of this commodity during 2004-2008 was mainly driven by the fame of palm oil as the biodiesel fuel, the innovation of oil palm based products and also the increases of demand within that period. The better refining technology of Indonesia had also driven its refined products of CPO.

In market growth component (market distribution effect), Indonesia has negative sign as -1,083.31 (thousand US$) for this type of commodity during 2004-2008. It indicates that Indonesian's exports were concentrated in relatively stagnant market. The percentage increase of the world export of commodity 151190 to ASEAN was lower than world all goods export to ASEAN. It means that ASEAN

market was stagnant to commodity 151190. The stagnant market could be caused by the financial crisis in the mid of 2008, the preferences of market and other innovation and invention of oil seeds that eliminated and replaced the usage of CPO or the refined CPO. Another reason of the stagnancy of ASEAN market for Indonesian palm oil (151190) that Indonesian export palm oil in this commodity (151190) was lower than the world increase of the same commodity export to ASEAN. While the ASEAN market of this commodity increased, Indonesian still exported commodity 151110 more than 151190.

The competitive market effect (competitiveness effects) was positive in period 2004-2008. It implies the improved position of exports in terms of competitiveness and there was ability of Indonesia to respond to changing environments and adapt its supply situation to world condition. The competitiveness effect to Indonesian palm oil export is positive due to the high production and many supports from Indonesian government to ease the exporting and production process of its commodity.

The actual export growth of the commodity 151190 of Indonesia was relatively increasing (See Appendix 7), because other component in CMS such as commodity growth effect and competitiveness effect are positive which shows that Indonesia concentrated on export while markets were going relatively fast in this period.

4.3.3 The CMS Model Analysis for Commodity 151321

Commodity 151321 of Indonesia (as shown in Table 4.7) got the standard growth effect (world trade effect) component in positive sign as 45,998,270.75 (thousand US$) during 2004-2008, which means the increase in world exports gave the positive impact on the increase of Indonesia palm oil commodity 151321 exports.

The increasing world all goods export and Indonesia growth in its all goods export from 2004 to 2008 (Figure 4.10 and Figure 4.11) has made the value of Indonesian export of commodity 151321 increase as well (Figure 4.14).
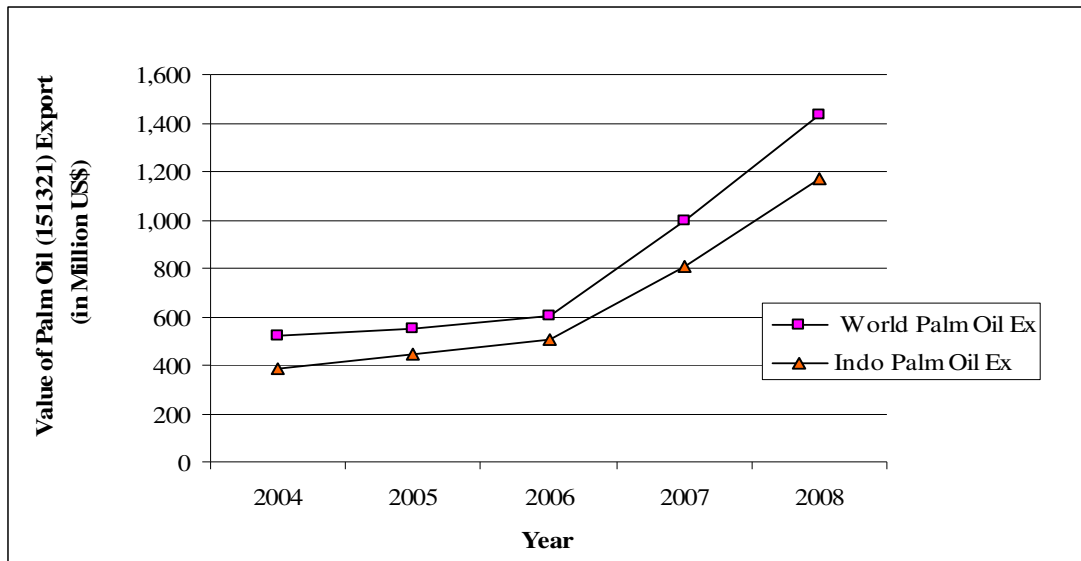
Figure 4.14 Export of World and Indonesian for Palm Oil or Babassu Oil and Their fraction, Crude, not Chemically Modified (151321)

The component commodity growth effect (commodity composition effect) for this commodity (151321) shows the positive sign during 2004-2008 as 436,588.53 (thousand US$). It indicates that Indonesia concentrated on exported commodity while markets were growing relatively fast. Commodity 151321 as shown in Figure 4.1 had rapid growth for Indonesian export to ASEAN market.

In market growth component (market distribution effect), Indonesia has positive sign as 36,624.60 (thousand US$) for this type of commodity in period 2004-2008. It indicates the ability of Indonesia to increase its exports of similar commodity classes in the relatively growing market. It is shown by the increasing in world export of commodity 151321 which was followed by the increasing of Indonesian export of this commodity in ASEAN market (Figure 4.1 and Figure 4.4). It means that Indonesia concentrated in export of commodity to the growing market (See Appendix 8).

The competitive market effect (competitiveness effects) was positive in period 2004-2008. It implies the improved position of exports in terms of competitiveness and there is ability of Indonesia to respond to changing environments and adapt its supply situation to world condition. The competitiveness effect to Indonesian palm oil export is positive due to the high production and many supports from Indonesian government to ease the exporting process of its commodity.

The actual export growth of the commodity 151321 of Indonesia is relatively increasing (See Appendix 8). Actual export growth of Indonesia is relatively increasing, because of other component in CMS such as commodity growth effect and competitiveness effect are positive which shows that Indonesia concentrated on export while markets were going relatively fast in this period.

4.3.4 The CMS Model Analysis for Commodity 151329

Commodity 151329 of Indonesia (as shown in Table 4.7) got the standard growth effect (world trade effect) component in positive sign as 45,998,270.75 (thousand US$) during 2004-2008 which indicated the increase in world exports gave the positive impact on the increase of Indonesia palm oil commodity 151329 exports.

The increasing world all goods export and Indonesia growth in its all goods export from 2004 to 2008 (Figure 4.10 and Figure 4.11) has made the value of Indonesian export of commodity 151329 increase as well (Figure 4.15). Although it fluctuated during 2005-2007 but the trend line is increasing.
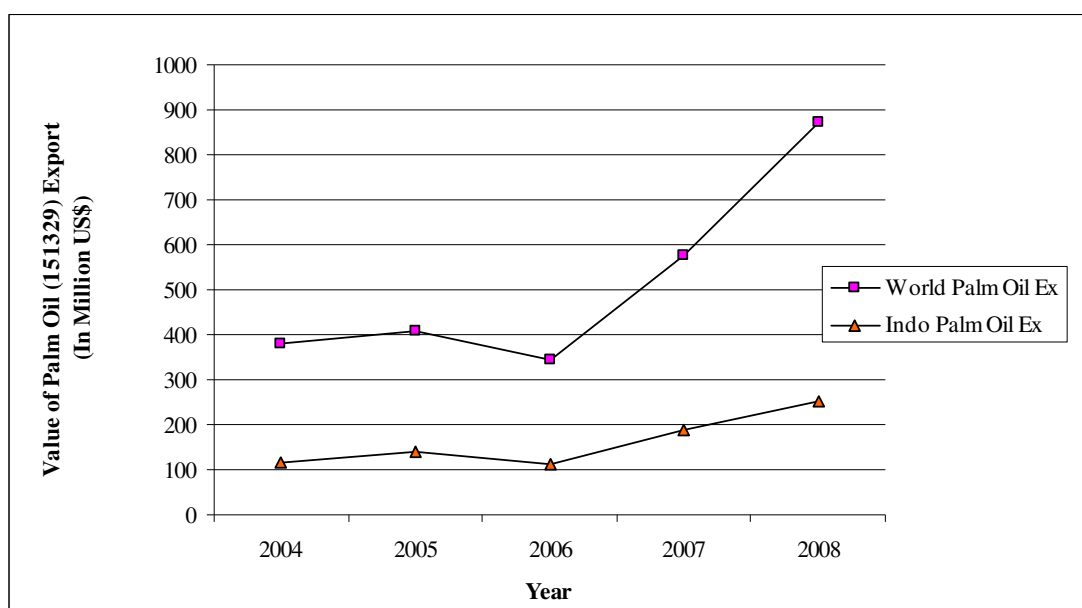
Figure 4.15 Export of World and Indonesian for Palm Oil or Babassu oil and Their Fraction, Refined but not Chemically Modified (151329)

The component commodity growth effect (commodity composition effect) for this commodity (151329) shows the positive sign during 2004-2008 as 74,656.12 (thousand US$). It indicates that Indonesia concentrated on exported commodity

while markets were growing relatively fast. Commodity 151329 as shown in Figure 4.1 has rapid growth for Indonesian export to ASEAN market.

In market growth component (market distribution effect), Indonesia had positive sign as 16,509.69 (thousand US$) for this type of commodity during 2004-2008. It indicates the ability of Indonesia to increase its exports of similar commodity classes in the relatively growing market. It is shown when world export of commodity 151329 was increasing (Figure 4.4), the Indonesian export of this commodity in ASEAN market was also increasing. It means that Indonesia concentrated in export of commodity to the growing market (See Appendix 9).

The competitive market effect (competitiveness effects) was positive as 24,625.69 (thousand US$) during 2004-2008. It implies the improved position of exports in terms of competitiveness and there is ability of Indonesia to respond to changing environments and adapt its supply situation to world condition. The competitiveness effect to Indonesian palm oil export was positive due to the high production and many supports from Indonesian government to ease the exporting process of its commodity.

The actual export growth of the commodity 151329 of Indonesia was increasing. Actual export growth of Indonesia was relatively increasing, because of other component in CMS such as commodity growth effect and competitiveness effect are positive which shows that Indonesia concentrated on export while markets were going relatively fast in this period.

From the separate explanation of CMS analysis above, it implies that Indonesia seemed to focus in commodity 151110 as the main oil-palm based product produced by Indonesian. Besides of refining technology and the policy of government, this commodity is easily to be manufactured and exported. ASEAN market still preferred to import this commodity although there was only a little amount of its demand increasing compared to the refined product (151190). It had made the market distribution of this important commodity (151110) to get higher negative impact to its constant market share in ASEAN market than commodity 151190. This result shows that Indonesian palm oil commodity 151110 exported more to the stagnant market because in the same period examined, ASEAN imported more on 151190 rather than 151110 which was exported more by Indonesia.

The commodity composition gave positive effect to Indonesian palm oil for all commodities because of the demand of ASEAN market towards the commodity was

growing as well. It was driven by the larger plantation field that cultivated during 2004-2008 and the policy of government to encourage the oil palm farmers to produce more. Thus, Indonesia was able to react to the demand of the market because it has abundant supply of palm oil commodities.

Competitiveness situation of palm oil industry in ASEAN market gave the positive effect to all Indonesian palm oil commodities although for commodity 151110 and 151190 the market distribution gives the negative impact, but in this market, Indonesia was considered as the market leader. Even though there is Malaysia as the main competitor of Indonesian palm oil industry in international market, this CMS analysis shows that Indonesia did not have any problem in competitiveness situation. It means that Indonesia had ability to respond to changing market and adapt its supply situation to ASEAN condition as it has a large amount of palm oil production.

Finally, the main contributions of Indonesian palm oil constant market share in all commodities (Table 4.7) came from the world trade effect, commodity composition effect, and competitiveness effect which result in positive actual growth. Although, there was the main problem in the negative contribution of market distribution components of commodity 151110 and 151190, but due to the positive contribution from other three components of the constant market share, the actual growth of these two commodities were positive as well.

Chapter 5

Conclusions and Recommendations

This chapter consists of the conclusions about the research, recommendation referring to the result and suggestion for further research.

5.1 Conclusions

This research was to study: 1) the situation of Indonesian palm oil industry 2) to analyze the comparative advantage of each Indonesian palm oil products in ASEAN market and 3) to analyze the market share condition of Indonesian palm oil products in the ASEAN market. It used secondary data of both Indonesian and world all goods export and the exports of Indonesian and world palm oil products (commodity 151110: palm oil and its fractions, crude, not chemically modified; commodity 151190: palm oil and its fractions, refined but not chemically modified; commodity 151321: palm kernel oil or Babassu oil and their fractions, crude, not chemically modified; and commodity 151329: palm kernel oil or Babassu oil and their fractions, refined but not chemically modified) either to world or ASEAN market during 2004-2008. The analysis used the Revealed Comparative Advantage (RCA) method and Constant Market Share Model (CMS). RCA was used to reveal the comparative advantage by observing the trade patterns and CMS was to differ the export growth between the constant-share norm and the actual export performance by using its four components namely the world trade effect, commodity composition effect, market distribution effect and residual general competitiveness effects.

5.1.1   Situation of Palm Oil Industry

Indonesia as the largest exporter of palm oil in the world is given by the wide land areas to cultivate the oil palm plantation and Indonesia has the lower labor cost among palm oil producers in the world. Indonesia has Malaysia as the main competitor in this commodity. While Indonesia concerns in crude palm oil export, Malaysia will concern more on the exported derivative products of palm oil, such as oleochemicals.

ASEAN market during 2004-2008 has shown the increasing demand of palm oil from Indonesia. Being able to be processed into various kinds of goods is the cause of the rapid increase of the demand. The other oil plants were previously used

commonly in some of ASEAN market, but finally they changed to use and process oil palm-based products especially palm oil, either CPO and its derivatives, or PKO and its derivatives.

Amid the global financial crisis in the middle of 2008, countries in the world experienced the worst situation in business, including Indonesian palm oil industry. Importer countries should evaluate their expenditure on palm oil needs, and then it affected the palm oil industry. But, the palm oil industry seems to continue its existence, since the usage of palm oil based-products are more common among the human.

5.1.2. Revealed Comparative Advantage (RCA)

This study analyzes oil palm products especially CPO and PKO that currently considered as the important derivative product of palm oil. The products analyzed here are based on the HS-Code 6 digits, those are two main traded products from CPO; Palm Oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190) and two other kinds of products made of PKO; palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321), and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329). The comparative advantage of the four products was analyzed by Revealed Comparative Advantage (RCA). However, RCA didn't show sources of advantage so Constant Market Share Model (CMS) was used to show the advantage components: world export growth, commodity composition effect, market distribution effect and competitiveness residue effect.

For commodity 151110, Indonesia had the high RCA value because of the concentration of product exported by Indonesia was CPO. In exporting commodity 151190, Indonesia experienced the low RCA value in 2004 and 2005. This condition might be the effect of the starting point of Indonesia in cultivating oil palm. The following period, Indonesia was able to reach higher RCA value (2006, 2007 and 2008) because of the expansion in areas done many years before and also the support of Indonesian government to facilitate the oil palm oil industry in Indonesia in many ways.

The commodity 151321 was also mainly exported by Indonesia and for its derivatives after processing and refining, which is commodity 151329, Indonesia has the higher RCA. The increasing of RCA for this commodity in 2006 to 2008 might be occurred as the effects of the consumer preference, who demands palm oil in other

form to produce fuel for biodiesel and other oleochemical materials. So, the market of the commodity tends to increase.

5.1.3 Constant Market Share Model (CMS)

Constant Market Share Model (CMS) analysis shows that world export growth and competitiveness affected positively to all commodity types of palm oil exported during 2004-2008.

The commodity composition gave positive effect to Indonesian palm oil for all commodities because of the demand of ASEAN market towards the commodity was growing as well. It was driven by the larger plantation field that cultivated during 2004-2008 and the policy of government to encourage the oil palm farmers to produce more. Thus, Indonesia was able to react to the demand of the market because it has abundant supply of palm oil commodities.

Indonesian's palm oil export especially for commodity 151110 and 151190 got the negative effect of the market distribution while the other commodity 151321 and 151329 were positively affected. The stagnant market in ASEAN market towards the most important commodity exported by Indonesia such as 151110 was the cause of this negative effect. Commodity 151190 was exported less in the growing market seemed to be the driver of negative effect by market distribution of Indonesian palm oil in ASEAN market.

Competitiveness situation of palm oil industry in ASEAN market gave the positive effect to all Indonesian palm oil commodities. This condition indicates that Indonesia had ability to respond to changing market and adapt its supply situation to ASEAN condition as it has a large amount of palm oil production.

5.2 Recommendations

The commodities analyzed in this research are Palm Oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190) and two other kinds of products made of PKO; palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321), and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329).

Based on the result of the study, here are the recommendations to be insights in improving and maintaining the palm oil industry in Indonesia.

1. Indonesian government should maintain the position of comparative advantage in palm oil industry especially for the CPO and PKO commodities, especially in ASEAN market.

2. Indonesian government should recognize the condition of palm oil market, especially in ASEAN market, so that Indonesia will concentrate to export the commodity while the market of that commodity is growing relatively fast.

3. Due to the negative effect of market distribution in ASEAN market, it is necessary to Indonesian government to search another promising market especially for commodity 151110 and 151190.

4. Indonesian government and all the parties in the oil palm business should enhance the innovation and produce the new products derivative from oil palm as the reaction of rapid changing of global oil palm market.

5.3 Suggestions for Further Research

This research has limitations in commodities analyzed and the methods those being used to analyze the commodities. Commodities analyzed in this study The commodities analyzed in this study are Palm Oil and its fractions, crude, not chemically modified (151110); palm oil and its fractions, refined but not chemically modified (151190) and two other kinds of products made of PKO; palm kernel oil or Babassu oil and their fractions, crude, not chemically modified (151321), and palm kernel oil or Babassu oil and their fractions, refined but not chemically modified (151329). The methods used to analyze are Revealed Comparative Advantage (RCA) and Constant Market Share Model (CMS).

The suggestions for the further research and studies are:

1) The more commodities of oil palm based-products to be analyzed to make the more complete explanation on the oil palm industry.

2) As RCA and CMS model are limited in area of discussion, the further studies may include another method, such as Acceleration Ratio (AR) to analyze the competitiveness of the commodity and Trade Specialization Index (TSI) to analyze the export specialization of country.

3) The more objects of study, not only Indonesia, but also more countries involved and the scope of area of study will be broader than ASEAN market. It is possible to analyze the European market or even the world market.

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APPENDIX

Appendix 1.   Revealed Comparative Advantage (RCA) Value of Indonesian Palm Oil Products in 2004-2008

Commodity	HS Code 6 Digit	Year	RCA of Indonesia
Palm oil and its fractions, crude, not chemically modified	151110	2004	37.60
		2005	36.52
		2006	33.37
		2007	28.93
		2008	28.15
Palm oil and its fractions, refined but not chemically modified	151190	2004	5.64
		2005	6.97
		2006	13.34
		2007	15.12
		2008	11.89
Palm oil or Babassu oil and their fraction, crude, not chemically modified	151321	2004	24.63
		2005	22.90
		2006	26.74
		2007	30.32
		2008	28.88
Palm oil or Babassu oil and their fraction,refined but not chemically modified	151329	2004	17.26
		2005	27.18
		2006	16.35
		2007	8.30
		2008	12.08

Appendix 2. Revealed Comparative Advantage (RCA) Calculation for Palm Oil and Its Fractions, Crude, not Chemically Modified (151110)

Value in thousand US$

Year	Indonesian Palm Oil Export to ASEAN Market	Indonesian Goods Export to ASEAN Market	World Palm Oil Export to ASEAN Market	World Goods Export to ASEAN Market	Indonesian RCA
2004	349,736.11	12,994,300	367,785.99	513,764,000	37.60
2005	336,344.27	15,823,700	350,948.45	603,055,000	36.52
2006	371,522.26	18,483,000	414,391.74	687,949,000	33.37
2007	545,370.60	22,292,200	654,541.57	774,044,000	28.93
2008	933,765.04	27,170,819.70	1,055,218.35	864,435,000	28.15

Appendix 3. Revealed Comparative Advantage (RCA) Calculation for palm oil and Its fractions, Refined but not Chemically Modified (151190)

Value in thousand US$

Year	Indonesian Palm Oil Export to ASEAN Market	Indonesian Goods Export to ASEAN Market	World Palm Oil Export to ASEAN Market	World Goods Export to ASEAN Market	Indonesian RCA
2004	76,093.91	12,994,300	533,763.32	513,764,000	5.64
2005	94,609.44	15,823,700	517,041.10	603,055,000	6.97
2006	256,849.22	18,483,000	716,429.83	687,949,000	13.34
2007	454,343.62	22,292,200	1,043,403.35	774,044,000	15.12
2008	529,513.61	27,170,819.70	1,416,766.43	864,435,000	11.89

Appendix 4. Revealed Comparative Advantage (RCA) Calculation for Palm Oil or Babassu Oil and Their Fraction, Crude, not Chemically Modified (151321)

Value in thousands US$

Year	Indonesian Palm oil Export to ASEAN Market	Indonesian Goods export to ASEAN Market	World Palm Oil Export to ASEAN Market	World Goods Export to ASEAN Market	Indonesian RCA
2004	54,759.57	12,994,300	87,910.82	513,764,000	24.63
2005	47,820.70	15,823,700	79,587.26	603,055,000	22.90
2006	84,152.23	18,483,000	117,129.03	687,949,000	26.74
2007	173,178.74	22,292,200	198,300.21	774,044,000	30.32
2008	274,687.05	27,170,819.70	302,622.72	864,435,000	28.88

Appendix 5. Revealed Comparative Advantage (RCA) Calculation for Palm Oil or Babassu oil and Their Fraction, Refined but not Chemically Modified (151329)

Value in thousands US$

Year	Indonesian Palm Oil Export to ASEAN Market	Indonesian Goods Export to ASEAN Market	World Palm Oil Export to ASEAN Market	World Goods Export to ASEAN Market	Indonesian RCA
2004	10,420.67	12,994,300	23,873.49	513,764,000	17.26
2005	22,645.39	15,823,700	31,748.67	603,055,000	27.18
2006	7,705.84	18,483,000	17,539.76	687,949,000	16.35
2007	14,053.58	22,292,200	58,762.98	774,044,000	8.30
2008	35,046.36	27,170,819.70	92,309.94	864,435,000	12.08

Appendix 6. Constant Market Share Model (CMS) Analysis of Palm Oil and Its Fractions, Crude, not Chemically Modified (151110)

Value in thousands US$

Year	Indonesian all Goods Export to World	Indonesian Palm Oil Export Commodity 151110 (Vi)	Indonesian all Goods Export to ASEAN Market (Vj)	Indonesian Palm Oil Export to ASEAN Market (Vij)
2004	71,593,600	1,444,422	12,994,231	349,736
2005	85,660,000	1,593,295	15,823,720	336,344
2006	100,798,600	1,993,667	18,483,088	371,522
2007	114,100,900	3,738,652	22,292,115	545,371
2008	128,090,900	6,561,330	27,170,820	933,765

Year	Total World all Goods Export	Total World Palm Oil Export Commodity 151110	Total World Palm Oil Export To ASEAN Countries
2004	9,569,000,000	2,182,208	367,786
2005	10,857,000,000	2,238,829	350,948
2006	12,428,000,000	3,060,799	414,392
2007	14,244,000,000	5,319,131	654,542
2008	15,717,000,000	8,954,330	1,055,218

r world   0.642491378
ri   3.103334
rij   1.869110

$V(t)-V(t-1) = r\,world.\,V(t-1) + (ri-rworld)V(t-1)i + (rij-ri)\,V(t-1)ij + [V(t)ij - V(t-1)ij]$

r world. V(t-1)	45,998,270.75	Standard World Growth Effect
$\sum i\,[(ri-rworld)$	3,554,494.88	Commodity Composition
$\sum i \sum j [rij-ri]\,V(t-1)ij$	-431,652.83	Market Distribution
$\sum i \sum j [V(t)ij - V(t-1)ij]$	584,028.93	Competitiveness Effects
CMS V(t)-V(t-1)	49,705,141.73	

Appendix 7. Constant Market Share Model (CMS) Analysis of Palm Oil and Its Fractions, Refined but not Chemically Modified (151190)

Value in thousands US$

Year	Indonesian all Goods Export to World	Indonesian Palm Oil Export Commodity 151190 (Vi)	Indonesian all Goods Export to ASEAN Market (Vj)	Indonesian Palm Oil Export to ASEAN Market (Vij)
2004	71,593,600	1,997,354	12,994,231	76,094
2005	85,660,000	2,162,988	15,823,720	94,609
2006	100,798,600	2,823,975	18,483,088	256,849
2007	114,100,900	4,129,988	22,292,115	454,344
2008	128,090,900	5,814,239	27,170,820	529,514

Year	Total World all Goods Export	Total World Palm Oil Export Commodity 151190	Total World Palm Oil Export To ASEAN Countries
2004	9,569,000,000	6,308,293	533,763
2005	10,857,000,000	5,936,346	517,041
2006	12,428,000,000	7,146,192	716,430
2007	14,244,000,000	11,202,976	1,043,403
2008	15,717,000,000	16,833,892	1,416,766

r world 0.642491378
ri 1.668534
rij 1.654297

$V(t)-V(t-1)= r\ world. V(t-1) + \Sigma i\ [(ri-rworld)\ V(t-1) + \Sigma i \Sigma j[rij-ri]\ V(t-1)ij + \Sigma i \Sigma j[V(0)ij - V(t-1)ij]$

r world. V(t-1)   45,998,270.75   Standard World Growth Effect

$\Sigma i\ [(ri-rworld)$ 2,049,369.66   Commodity Composition

$\Sigma i \Sigma j[rij-ri]\ V(t-1)ij$ -1,083.31   Market Distribution

$\Sigma i \Sigma j[V(t)ij - V(t-1)ij]$ 453,419.70   Competitiveness Effects

CMS   V(t)-V(t-1)   48,499,976.80

Appendix 8. Constant Market Share Model (CMS) Analysis of Palm Oil or Babassu Oil and Their Fraction, Crude, not Chemically Modified (151321)

Value in thousands US$

Year	Indonesian all Goods Export to World	Indonesian Palm Oil Export Commodity 151321 (Vi)	Indonesian all Goods Export to ASEAN Market (Vj)	Indonesian Palm Oil Export to ASEAN Market (V'ij)
2004	71,593,600	385.997	12,994.231	54,760
2005	85,660,000	448.955	15,823.720	47,821
2006	100,798,600	506.002	18,483.088	84,152
2007	114,100,900	807.873	22,292.115	173,179
2008	128,090,900	1,172.163	27,170.820	274,687

Year	Total World all Goods Export	Total World Palm Oil Export Commodity 151321	Total World Palm Oil Export To ASEAN Countries
2004	9,569,000,000	517,172	87,911
2005	10,857,000,000	550,704	79,587
2006	12,428,000,000	606,586	117,129
2007	14,244,000,000	998,692	198,300
2008	15,717,000,000	1,434,407	302,623

r world 0.642491378
ri 1.773558
rij 2.442383

$V(t)-V(t-1) = r\ world. V(t-1) + \sum i\ [(ri-rworld) + \sum i \sum j[rij-ri]\ V(t-1)ij + \sum i \sum j[V(t)ij - V(t-1)ij]$

r world. V(t-1)	45,998,270.75	Standard World Growth Effect
$\sum i\ [(ri-rworld)$	436,588.53	Commodity Composition
$\sum i \sum j[rij-ri]\ V(t-1)ij$	36,624.60	Market Distribution
$\sum i \sum j[V(t)ij - V(t-1)ij]$	219,927.48	Competitiveness Effects
CMS V(t)-V(t-1)	46,691,411.36	

Appendix 9. Constant Market Share Model (CMS) Analysis of Palm Oil or Babassu Oil and Their Fraction, Refined but not Chemically Modified (151329)

Value in thousands US$

Year	Indonesian all Goods Export to World	Indonesian Palm Oil Export Commodity 151329 (Vi)	Indonesian all Goods Export to ASEAN Market (Vj)	Indonesian Palm Oil Export to ASEAN Market (Vij)
2004	71,593,600	116,684	12,994,231	10,421
2005	85,660,000	138,791	15,823,720	22,645
2006	100,798,600	110,474	18,483,088	7,706
2007	114,100,900	189,932	22,292,115	14,054
2008	128,090,900	251,795	27,170,820	35,046

Year	Total World all Goods Export	Total World Palm Oil Export Commodity 151329	Total World Palm Oil Export To ASEAN Countries
2004	9,569,000,000	381,303	23,873
2005	10,857,000,000	408,292	31,749
2006	12,428,000,000	344,721	17,540
2007	14,244,000,000	575,268	58,763
2008	15,717,000,000	870,252	92,310

r world 0.642491378
ri 1.282309
rij 2.866629

$V(t)-V(t-1)= r\ world. V(t-1) + \Sigma i\ [(ri-rworld) + \Sigma i\Sigma j[rij-ri]\ V(t-1)ij + \Sigma i\Sigma j[V(t)ij - V(t-1)ij]$

r world. V(t-1)	45,998,270.75	Standard World Growth Effect
$\Sigma i\Sigma j[rij-ri]\ V(t-1)ij$	74,656.12	Commodity Composition
$\Sigma i\Sigma j[rij-ri]\ V(t-1)ij$	16,509.69	Market Distribution
$\Sigma i\Sigma j[V(t)ij - V(t-1)ij]$	24,625.69	Competitiveness Effects
CMS	46,114,062.24	

Appendix 10. Palm Oil World Supply 2004-2008 (In thousands Tonnes)

Countries/year	Production				
	2004	2005	2006	2007	2008
Indonesia	13,560	15,560	16,600	18,300	19,700
Malaysia	15,194	15,485	15,290	17,567	17,700
Thailand	820	784	1,170	1,050	1,400
Nigeria	790	800	810	820	820
Colombia	647	690	770	830	800
Other	2,518	2,661	2,708	2,738	2,768
Total	33,529	35,980	37,348	41,305	43,188

Source: Foreign Agriculture Service, US Department of Agriculture, 2008 (adapted)

Appendix 11. World Palm Oil Export 2004-2008 (In thousands US$)

Year	HS Code (6 Digits)			
	151110	**151190**	**151321**	**151329**
2004	2,182,208.40	6,308,293.02	517,172.27	381,303.24
2005	2,238,828.70	5,936,345.92	550,703.75	408,292.48
2006	3,060,798.90	7,146,191.61	606,585.79	344,721.25
2007	5,319,130.96	11,202,975.63	998,691.86	575,267.76
2008	8,954,330.04	16,833,891.52	1,434,407.08	870,251.64
Total	21,755,297.00	47,427,697.70	4,107,560.75	2,579,836.37

Source: Comtrade, United Nations Database (adapted)

Appendix 12. Indonesian Export of Palm Oil to ASEAN Countries

Commodity HS Code 6 Digits	Year 2004 Value (000 US$)	Volume (Tonnes)	2005 Value (000 US$)	Volume (Tonnes)	2006 Value (000 US$)	Volume (Tonnes)	2007 Value (000 US$)	Volume (Tonnes)	2008 Value (000 US$)	Volume (Tonnes)
151110	349,736.11	894,442.30	336,344.27	959,531.57	371,522.26	1,011,292.12	545,370.60	838,991.37	933,765.04	669,066.11
151190	76,093.91	176,804.24	94,609.44	255,213.31	256,849.22	618,699.09	454,343.62	666,983.54	529,513.61	558,391.70
151321	54,759.57	100,548.14	47,820.70	89,364.66	84,152.23	171,311.57	173,178.74	225,964.75	274,687.05	256,160.58
151329	10,420.67	17,991.97	22,645.39	34,322.81	7,705.84	18,380.67	14,053.58	14,822.03	35,046.36	29,168.55
Total	491,010.26	1,189,786.65	501,419.80	1,338,432.35	720,229.55	1,819,683.45	1,186,946.54	1,746,761.69	1,773,012.06	1,512,786.94

Source: Comtrade, United Nations Database (adapted)

Appendix 13. World Export of Palm Oil to ASEAN Countries

HS Code 6 Digits	Year 2004 Value (000 US$)	2004 Volume (Tonnes)	2005 Value (000 US$)	2005 Volume (Tonnes)	2006 Value (000 US$)	2006 Volume (Tonnes)	2007 Value (000 US$)	2007 Volume (Tonnes)	2008 Value (000 US$)	2008 Volume (Tonnes)
151110	367,785.99	931,521.71	350,948.45	997,481.22	414,391.74	1,118,789.68	654,541.57	1,002,470.85	1,055,218.35	804,634.19
151190	533,763.32	1,074,736.14	517,041.10	1,241,997.63	716,429.83	1,677,707.13	1,043,403.35	1,484,458.08	1,416,766.43	3,536,523.07
151321	87,910.82	167,525.55	79,587.26	147,345.52	117,129.03	238,508.65	198,300.21	256,689.68	302,622.72	279,861.52
151329	23,873.49	40,501.75	31,748.67	49,549.25	17,539.76	39,036.98	58,762.98	81,508.68	92,309.94	1,090,206.94
Total	**1,013,333.62**	**2,214,285.15**	**979,325.48**	**2,436,373.62**	**1,265,490.36**	**3,074,042.44**	**1,955,008.11**	**2,825,127.29**	**2,866,917.44**	**5,711,225.72**

Source: Comtrade, United Nations Database (adapted)

Appendix 14. Indonesian Goods Export to ASEAN Countries

Countries	2004	2005	2006	2007	2008
Brunei Darussalam	31,761.80	39,332.00	37,557.90	43,367.40	59,671.00
Cambodia	71,824.70	93,936.00	103,648.20	121,853.20	174,027.30
Laos	1,570.10	1,752.80	4,344.90	3,711.00	3,992.50
Malaysia	3,016,048.00	3,431,299.70	4,110,757.50	5,096,063.50	6,432,551.90
Myanmar	60,281.60	77,990.00	137,708.10	262,387.30	250,765.20
Philippines	1,237,593.80	1,419,120.40	1,405,668.80	1,853,683.10	2,053,611.30
Singapore	5,997,898.30	7,835,385.10	8,929,849.20	10,501,617.30	12,862,045.20
Thailand	1,976,263.30	2,246,458.70	2,701,548.70	3,054,276.00	3,661,251.90
Vietnam	600,989.50	678,444.90	1,052,004.30	1,355,156.10	1,672,903.40
Total	**12,994,231.10**	**15,823,719.60**	**18,483,087.60**	**22,292,114.90**	**27,170,819.70**

Source: International Trade Statistics, WTO Publication, 2008 (adapted)

Appendix 15. World Goods Export to ASEAN Countries

Country	Year (000 US$)				
	2004	2005	2006	2007	2008
Brunei Darussalam	1,422,000.00	1,491,000.00	1,676,000.00	2,101,000.00	
Cambodia	3,193,000.00	3,927,000.00	4,749,000.00	5,500,000.00	
Indonesia	54,877,000.00	75,533,000.00	80,346,000.00	92,381,000.00	
Laos	713,000.00	882,000.00	1,060,000.00	1,065,000.00	
Malaysia	105,283,000.00	114,625,000.00	131,152,000.00	146,982,000.00	
Myanmar	2,196,000.00	1,927,000.00	2,564,000.00	3,250,000.00	
Philippines	46,102,000.00	49,487,000.00	54,078,000.00	57,985,000.00	
Singapore	173,599,000.00	200,047,000.00	238,710,000.00	263,155,000.00	
Thailand	94,410,000.00	118,158,000.00	128,723,000.00	140,795,000.00	
Vietnam	31,969,000.00	36,978,000.00	44,891,000.00	60,830,000.00	
Total	**513,764,000,000.00**	**603,055,000,000.00**	**687,949,000,000.00**	**774,044,000,000.00**	**864,435,000,000.00**
Total World	**9,569,000,000,000.00**	**10,857,000,000,000.00**	**12,428,000,000,000.00**	**14,244,000,000,000.00**	**15,717,000,000,000.00**

Source: International Trade Statistics, WTO Publication, 2008 (adapted)

Notes:

1. The data might be underestimated since 2008 data is not available in detail.

2. The measurement data in 2008 is done by multiplying the total world value with the average allocation from 2004-2007.

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