UNIVERSITAS INDONESIA

ANALYSIS OF DETERMINANT FACTORS OF INDONESIAN EXPORTS OF CRUDE PALM OIL, ITS DERIVATIVE PRODUCTS, AND CRUDE PALM KERNEL OIL TO CHINA

THESIS

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FACULTY OF ECONOMICS
MASTER OF PLANNING AND PUBLIC POLICY
JAKARTA
DECEMBER 2009

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**A Thesis submitted in partial fulfillment of the requirements for the degree of Master of Economics in Planning and Public Policy
Universitas Indonesia**

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I would like to thank to Allah SWT because finally I could complete this research which is entitled of "Analysis Determinant Factors of Indonesian Exports of Crude Palm Oil, Its Derivative Products, and Crude Palm Kernel Oil to China".

This research is partial fulfillment of the requirements for the degree of Master of Economics in International Trade Policy, Master of Planning and Public Policy, Faculty of Economics, University of Indonesia. I do realize that, without any assistance and supervision from all side, it is difficult for me to completing this research. Thus, with the completion of this research, I would like to express my sincere gratitude to following people who made this research possible:

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Last but not least, I believe that this research is still imperfect. Therefor, suggestions are welcome to enhance this research. Furthermore, I expect that this thesis will be useful for the development of Indonesian export and the economy of Indonesia.

Jakarta, December 2009

ABSTRACT

Name   : Niken Wulandari
Study Program   : Master of Planning and Public Policy
Title   : Analysis of Determinant Factors of Indonesian Exports
                             of Crude Palm Oil, Its Derivative Products, and Crude
                             Palm Kernel Oil to China.

Palm oil commodity is the one product that is important to the Indonesia's economy. The aim of this research are to analyze export performance of Indonesian exports of crude palm oil (CPO), its derivative products and crude palm kernel oil (CPKO) to China and to find out the effects of such as: real exchange rate, prices of commodities in the world market, Indonesian export duty of commodities, and dummy CEPT5 toward Indonesian export volume of those commodities to China.

We examine this research using panel data regression. The data periods for this research were quoted from 2002 to 2008 quarterly. As a result of this research we obtain the biggest exporter of crude palm oil and crude palm kernel oil in the world is Indonesia while Malaysia possesses more comparative advantage than Indonesian in regards of the export of other palm oil products. However, in China's market, Indonesian market share of CPO and its derivative products is lower than Malaysia. Nevertheless, in China, Indonesia has export volume of CPKO larger than Malaysia. Consequently Indonesia will benefit to do specialization CPKO export to the world especially to China.

In addition, the result of econometric regression shows that real exchange rate variable significantly influence to Indonesian exports of those commodities. Also, tariff export variable give significant influence on those Indonesian exports of those commodities. Meanwhile the relation between price variable and export demand is significant but the expected sign for this variable is not appropriate with the hypotheses. We expect the price sign is negative but the result of estimation we obtain positive price sign. We state that in the world market price of CPO is used for business speculation. Finally, dummy-CEPT5 is affectively influence to Indonesian exports of those commodities.

Keywords:
Crude Palm Oil (CPO), Other Palm Oils (Its derivative products of CPO), Crude Palm Kernel Oil, export, Indonesia's economy

ABSTRAK

Name	: Niken Wulandari
Study Program	: Master Perencanaan dan Kebijakan Publik
Title	:Analisis Faktor-Faktor yang Mempengaruhi Ekspor Indonesia untuk Crude Palm Oil, Produk-Produk Turunan dari Crude Palm Oil, dan Crude Palm Kernel Oil ke China.

Kelapa sawit merupakan salah satu produk yang penting bagi perekonomian Indonesia. Penelitian ini bertujuan untuk menganalisa performan ekspor Indonesia untuk CPO, Produk-Produk Turunan dari CPO, dan Crude Palm Kernel Oil ke China dan untuk mencari pengaruh dari variable-variable independen seperti: real exchange rate, harga komoditi ekspor di pasar dunia, penetapan tarif export yang diberlakukan untuk komoditi ekspor, dan kebijakan penetapan tarif impor yang diterapkan oleh negara tujuan ekspor sebagai variabel dummy.

Kami menguji penelitian ini dengan menggunakan regresi data panel. Interval waktu yang kami gunakan yaitu mulai tahun 2002 sampai 2008 dengan data quarter. Sebagai hasilnya kami mendapatkan hasil bahwa eksportir CPO dan CPKO terbesar di dunia adalah Indonesia. Sedangkan di pasar China, Indonesia menempati urutan ke dua setelah Malaysia sebagai eksportir CPO dan produk-produk turunannya. Namun demikian ekspor Indonesia untuk CPKO ke China bahkan ke pasar dunia menempati nomor satu. Untuk itu Indonesia akan untung jika melakukan spesialisasi ekspor CPKO ke China maupun ke pasar internasional.

Sebagai hasil pengujian data panel dengan ekonometri didapatkan bahwa variable real exchange rate mempengaruhi ekspor Indonesia secara signifikan. Variable tarif juga memberikan pengaruh signifikan terhadap jumlah ekspor Indonesia ke China. Sedangkan harga komoditi di pasar dunia juga memberikan pengaruh yang signifikan terhadap jumlah ekspor Indonesia ke China. Tetapi berhubungan positif, hal ini disebabkan karena komoditi ini digunakan untuk spekulasi bisnis. Sehingga fluktuasi harganya mengikuti pergerakan harga minyak mentah di pasar dunia. Variabel CEPT5 juga berpengaruh secara signifikan terhadap ekspor Indonesia ke China.
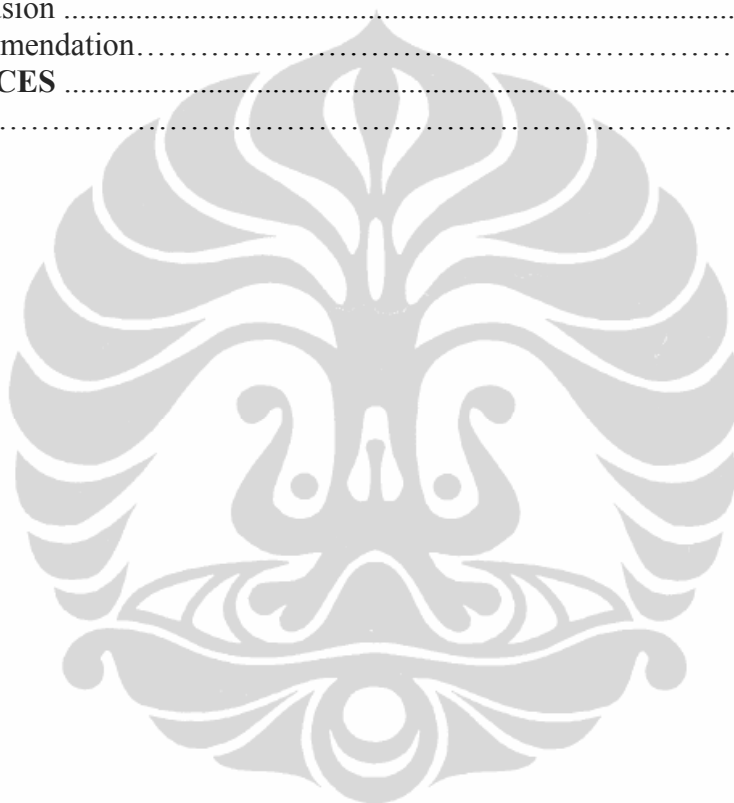
Kata Kunci:

Crude Palm Oil (CPO), Other Palm Oils (produk-produk turunan CPO), Crude Palm Kernel Oil, ekspor, perekonomian Indonesia.

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CHAPTER I
INTRODUCTION

1. 1   Background

Palm oil commodity is the one product that is important to the Indonesia's economy. It is not only important for the foreign exchange resources but also for the resources of food for Indonesian societies. On the other hand, palm oil also has a significant role as it create employment in the plantation sector. In addition, the palm oil industry also serves as a leading sector of Indonesia's economy that will continue to be one driving force of the country's economy.

The role of oil palm industry has increased since the 1980s together with the growth of palm oil production which is very high above 10 % per year, outpacing the growth in other plantation sectors which is only less than 5%. In 2008, a total area of palm oil reached 7.1 million hectares and total production of palm oil was 19.2 million ton. Besides, the amount of exports of CPO, its derivative products, CPKO and other of palm kernel oil reached 15.65 million tons with the value more than U.S. $ 13.8 billion.[1] In addition, they contributed 12.79% of U.S. $ 107.89 billion in 2008 to non-oil and gas export.[2] Therefore, palm oil industry became important in economic growth.

CPO, its derivative products and CPKO play an important role in the national economy for several reasons. First, cooking oil has a function as a buffer food security. CPO needed for cooking oil in the year 2008 reached 4.5 million tons.[3] Second, as one of the macro indicators, cooking oil has a significant role in the suppression of inflation rate. The contribution of cooking oil on inflation is approximately 1%, almost the same as that of sugar, but still below that of the rice of

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[1] Source : Board Statistic Center and it is processed by Ministry of Trade, 2009
[2] Ibid
[3] Achmad Mangga Barani in "Memaknai Sebuah Anugerah Sumbangsih Kelapa Sawit Indonesia bagi Dunia", Ideals Agro Akbar, Jakarta, page: 3

which 4% (Mangga Barani, 2009). Thirdly, CPO, its derivative products, and CPKO play an important role in creating employment opportunities. In 2008, the number of employees working in the cooking oil industry was estimated at 4.47 million people; 2.16 million in plantations and 2.31 million in downstream industries. The total number of work opportunities created was quite significant as the work opportunities created by various other sectors stagnant. It is even predicted that work opportunities will undergo depression in the coming two or three years ahead doe to the global financial crisis. Fourthly, because Indonesian exports of CPO, its derivative products and CPKO have very high both quantity and quality, so to sufficient domestic consumption the Indonesian government imposes export tariff for this commodities. On the other hand the imposition of the tax will impact on various aspects of the industry, such as on investment, production, trade, and farm income and welfare distribution (Wayan, 2004). Therefore we are interested to deeply analyze of determinant factors of Indonesian exports of CPO and its derivative products, and CPKO to China.

In addition, there are several reasons why do we choose to analyze China's market. In term of international trade, in 2008 the growth of palm oil industry in the coming years is quite promising with world's palm oil production reaching 43.11 million tones and Indonesia contributing 44.53%.[4] Nevertheless, the Indonesia's 43.31% palm oil export was lower than Malaysia's 45.65% (total amount world's export reached 33.74 million ton). Besides the contribution of palm oil was 26.70% in the 17 oils and fats consumption which amount reached 159.82 million tons compared to soybean oil which contributed nearly 23.80%. Moreover, according to Figure 1.1, China make up the largest consumption among other countries of 17 oils and fats by 18.41%, followed by USA 10.50%, India 9.50%, Brazil 3.84%, Indonesia 3.34%, Malaysia 2.59%, and Argentina 1.04%. In 2008, nearly 13% from 26.70% of total world consumption of palm oil is consumed by China with India trailing at the second place by 12%, and at the third by Indonesia that only consumed by 13%.

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[4] Based on Oil World, 2009

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Analysis of determinant..., Niken Wulandari. FE UI, 2009.

WORLD PRODUCTIONS, IMPORTS, EXPORTS, AND CONSUMPTIONS OF 17 OILS AND FATS IN 2008
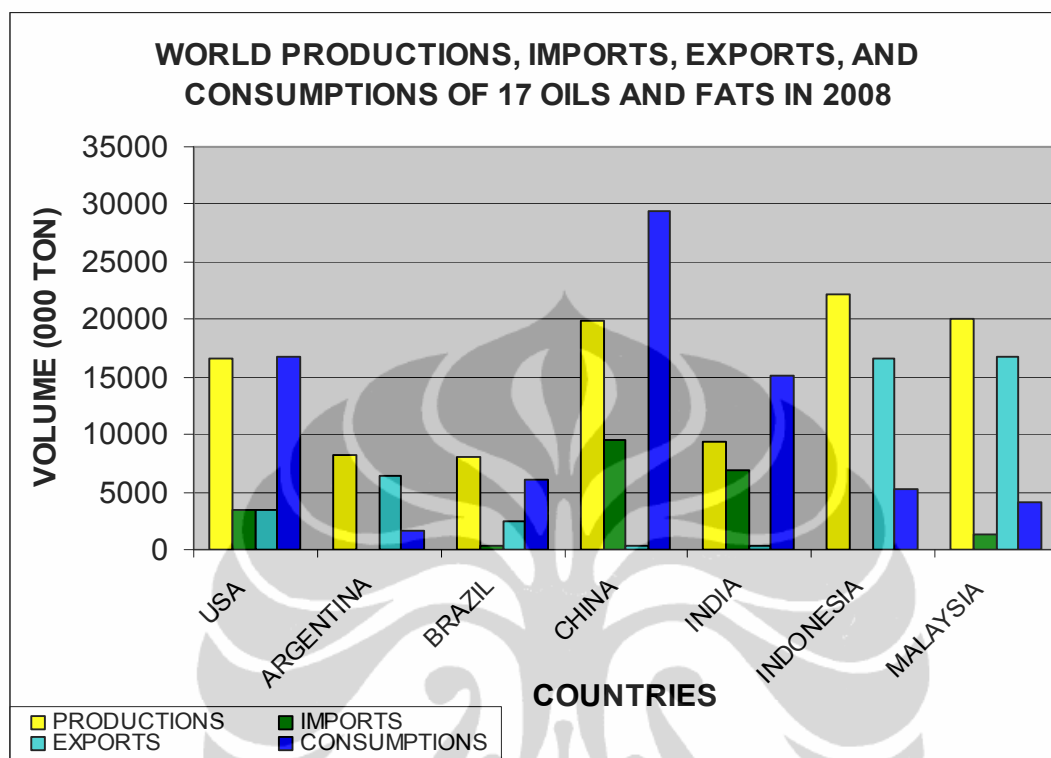
Source: oil world, 2009

Figure 1.1. **World Production, Consumption, Export and import of Oil and Fats in 2008**

Based on data source by SITC, in 2008 Indonesia's CPO export destination are India, followed by China, Netherlands, Pakistan and Malaysia. But the biggest country in the world that has import value of Other of palm oil product (its derivative products) from Indonesia is China. For this commodity in 2008, Indonesia's world export volume was US$ 19.94 billion. Whereas Indonesia's exports this commodities to China was U.S. $ 4.31 billion with market share 21.60 %, then India reach US$ 4.31 billion and market share 5.37%. Third position for this export was Pakistan U.S. $ 1.07 billion with market share 5.34%. The completely its information is shown by

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Table 1.1. In addition, import duty rates of CPO to China is 9% and palm stearin is 8% while for others product is 9% less than rates that import duty imposed by India.[5]

Table 1.1.

Indonesian Other Palm Oils Export to the World (000 US$)

NO	COUNTRIES	YEARS					SHARE (%) 2008	TREND (%) 04 TO 08
		2004	2005	2006	2007	2008		
	World	7.354.191	6.997.458	8.509.070	13.350.233	19.943.319	100,00	30,23
1	China	1.414.446	1.286.378	1.768.373	3.027.407	4.307.125	21,60	36,11
2	India	652.244	358.322	272.283	417.855	1.071.625	5,37	12,15
3	Pakistan	547.916	590.045	564.824	974.019	1.064.785	5,34	20,08
4	Germany	181.121	174.712	282.304	516.832	602.920	3,02	41,76
5	Bangladesh	221.077	286.083	328.985	375.463	581.575	2,92	24,69
6	Iran, Islamic Rep.	108.899	167.676	158.856	334.282	580.431	2,91	49,73
7	Jordan	426.955	81.165	145.351	30.582	567.479	2,85	-3,99
8	Russian Federation	123.876	178.729	243.929	533.817	528.302	2,65	49,11
9	Egypt, Arab Rep.	173.046	247.500	277.964	331.908	514.857	2,58	28,07
10	Japan	213.715	174.422	207.767	338.066	488.968	2,45	26,08
	Others	3.290.896	3.452.424	4.258.434	6.470.002	9.635.253	48,31	32,00

Source: WITS 2009

1.2 Problem Formulation

Based on the matters mentioned above, the problems tried to analyze how is export performance of Indonesian CPO, its derivative products and CPKO to China and what factors affect the amount of Indonesia's export volume of CPO, its derivative products and CPKO to China in the period 2002-2008. Where these factors are only the author constraint with the use variables such as: real exchange rate, prices of commodities in the world market, Indonesian export duty of commodities, and dummy variable as China's import duty based on CEPT5 for commodities.

Commodities used in this research are the CPO and its derivative products and CPKO in accordance with Regulatory of the Ministry of Trade. In the Regulatory it is stated that there are 14 kinds of CPO and its derivative products but the author just

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[5] Reported by Oil World No. 12 Vol. 51 months March 2008 that the Government of India have decreased tariff rate of CPO to 20% (the tariff before is 45%) and RBD Olein and Refine Rape Oil 27.5% have decreased from 54.08% based on the Notification No Indian government No. 37/2008-Customs at 20 March 2008.

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choose several product that constraints of Harmonize System (HS) 6 digit there are: HS. 151110 is CPO, HS. 151190 is Other palm oil that consist of Refined Bleached Deodorized Palm Oil-RBD Palm Oil-, RBD Palm Olein and RBD Palm Stearin—that is all then we mention as its derivative products or Other palm oil, and HS. 151321 is CPKO. Questions in the research:

1. How are Indonesian export performance of CPO, its derivative products, and CPKO to China?
2. Does the variable of prices in the world market affect Indonesian exports of CPO, its derivative products, and CPKO to China?
3. Does the exchange rates variable affect the Indonesian exports to China?
4. Does Indonesia's export duty variable affect the Indonesian exports to China?
5. Does Dummy CEPT5 affect the Indonesian exports to China?
6. What kinds of policy can be recommended in the export of CPO and its derivative products to China?

1.3 Research Objectives

The objectives to reach in this research are:

1. To analyze export performance of Indonesian exports of CPO, its derivative products and CPKO to China.
2. To analyze export model approached by demand side from Indonesia to China and to find out the effects of such as: real exchange rate, prices of commodities in the world market, Indonesian export duty of commodities, and dummy CEPT5 toward Indonesian export volume of those commodities to China.

1.4 Scope of Research

The thesis focuses in the analysis of determinant factors of Indonesian exports of CPO, its derivative products and CPKO to China. The period of observation from the first quarter of 2002 until the fourth quarter of 2008, so the number of observation is 28 samples.

1.5   Methodology

In order to achieve the objective of the study, the author will use model modification from Ernawati Munadi Model that uses estimation of an error correction model approach (ECM). She states that export demand of Indonesian palm oil to India has influenced significantly by world price of palm oil (WPO_t), world price of soybean oil ($PSTO_t$), export price of Indonesian palm oil (PX), exchange rate (ER) and those variables have given the expected coefficient.

But in this research, the model will be estimated using panel data regression. There are other names for panel data, such as pool data (pooling of time series and cross-sectional observations), combination of time series and cross-sectional observations), and longitudinal data (a study over time of a variable or group of subjects), (Gujarati, 2003). In other word, panel data or pooled data is a data combination between time series and cross section data. Time series data have temporal observation, while cross section data have observation in certain point of time.

The data used in this study based on the secondary data. The Bilateral Trade between Indonesia and China were quoted from the Data of Center Ministry of Trade processed by Badan Pusat Statistik (BPS) or Central Statistic Agency. Data for real exchange rates were quoted from International Financial Statistics (IFS). The Tariff Export Duty imposed by Indonesia were quoted from The Ministry of Finance of the Republic of Indonesia. The Commodity Prices in the world market were quoted Ministry of Finance. And the data of dummy CEPT5 were quoted from the website of Ministry of Trade. The data periods for this research are from 2002 to 2008 quarterly. The data will be processed by using statistical and econometric software called EViews (Econometric Views) version 4.1.

1.6   Content of Report

This research will arrange in the report as follow:

Chapter I, Introduction

Content of introduction include such us: background of research, identification of problem formulation, research objection, scope of research, and methodology.

Chapter II, Literature Study

This chapter will describe about literature study include theoretical and previews study that used to analysis problem formulation.

Chapter III, Commodity Profile

This chapter will describe commodity profile of CPO, derivative products, and CPKO that consist of performance of: production, consumption, export, price, government policy, development of palm oil industry.

Chapter IV, Methodology

This chapter will describe about the model that used in this research, estimation of the model, and definition of variable that used in this research.

Chapter V, Analysis

This chapter will give descriptive analysis of the data of export performance of CPO, its derivative product, and CPKO and analysis the result of model estimation that used in this research.

Chapter VI, Conclusion and Recommendation

After we make analyses, in this chapter as a closing chapter will be extended conclusion that find out in this research. In addition we also give recommendation to follow up this research.

CHAPTER II
LITERATURE STUDY

2.1   International Trade Theory

According to Krugman and Obstfeld (2003) there are two reasons why the countries doing international trade. First, countries traded because they have different resources and producing capability from another. The different of resources caused trading between two countries, and each country take gain from trade. Second, some countries have the objective to achieve economics of scale. If each country produces only a certain number of goods, they can produce a larger scale and therefore more efficient than if they had to produce all kinds of goods.

Based on absolute advantage theory, when the nation is more efficient than another in the production of one commodity but it is less efficient than the other nations in producing a second commodity. Then both nations gain by each specializing in the production of commodity of its absolute advantage and exchanging part of its output with other nations for the commodity of its absolute disadvantage. This theory is created by Adam Smith. On the other words, trade can be beneficial for both countries if each country specialization in production of the good with lower opportunity cost.

Absolute advantage theory assert that a nation benefit from manufacturing more output than others since it is in the possession of a particular resource or commodity. This particular resource can also be a certain method or knowledge that increases the production efficiency, and thus reduces the relative need to resources.

In addition, David Ricardo developed the concept of absolute advantage theory with introduced his Principles of Political Economy and Taxation, in which he presented the law of comparative advantage and it is known as Ricardian model. The Ricardian model uses the concept of opportunity cost and comparative advantage. A country faces opportunity cost when it employs resources to produce goods and services. A country has a comparative advantage in producing a good if the

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opportunity cost of producing that good is lower in the country than it is in other countries. In addition, a country with a comparative advantage in producing a good uses its resources most efficiently when it produces that good compared to producing other goods. Then, trade between two countries can benefit both countries if each country exports the goods in which it has comparative advantage. Based on this model international trade happens due to international differences in the productivity of labor.

Ricardian model assumes labor is the only factor of production and countries differ only in the productivity of labor in different industries. Consequently, a country will export that commodity in which it has comparative (as apposed to absolute) labor productivity advantage. Even if one nation is less efficient than (has an absolute disadvantage with respect to) the other nation in the production of both commodities, this is still a basis for mutually beneficial trade.

According to the law of comparative advantage, even if one nation is less efficient than (has an absolute disadvantage with respect to) the other nation in the production of both commodities, there is still a basis for mutually beneficial trade. The first nation should specialize in the production of and export the commodity in which its absolute disadvantage is smaller (this is the commodity of its comparative advantage) and import the commodity of its comparative disadvantage).

In the real world, while trade is partly explained by differences in labor productivity, it also reflects differences in countries' resources. The Hecksher-Ohlin theory reveals that a country will export that commodity which uses intensively its abundant factor and import that commodity which uses intensively its scare factor. The Heckscher-Ohlin model, in which two goods are produced using two factors of production, emphasizes the role of resources in trade. A rise in the relative price of the labor-intensive good it will shift the distribution of income in favor of labor. Consequently, the real wage of labor will rise in terms of both goods, while the real income of landowners will fall in the term of both goods. The basic concept of Heckscher-Ohlin theory as follow, first, international trade is extent trade among regions where its difference is distance. This theory is refusing classical theory

subject to distance factor. Second, international trade is doing not only for benefit motive but also in term of proportion basic and production factor intensity that used for producing a product. Heckscher-Ohlin explained the difference price which happened for same product among the countries caused by difference proportion and production factor intensity to produce the product. Production factors in this term are including land, labor, and capital as well.

2.2 Demand Trade Theory

Exports are activities that sell goods produced domestically and sold widely abroad (Mankiw, 2006).[6] According to Blanchard (2006), the factors that affect the export (the determinant of exports) is the real exchange rate and income or output of trading partners (foreign output). An increase in foreign income (equivalently, foreign output), leads to increase foreign exports and an increase in the real exchange rate, leads to a decrease in exports.

In international trade theory stated that the factors that affect exports can be seen from the demand side and supply side (Krugman and Obstfeld, 2003). From the demand side, exports are influenced by export prices, exchange rate, world income and foreign trade policies of importing and exporting countries devaluation. While the supply side, exports are influenced by export prices, domestic prices, exchange rate, production capacity, the interest of capital, labor wages, input prices, and the policy of exporting countries.

Krugman and Obstfeld (2003) explains that the trade will occur if there are differences in price at the time before the trade. Before there is no trading, the domestic wheat prices is higher than in foreign. After two countries do trading, foreigners will send grain to the domestic side. Furthermore, wheat exports will increase in foreign prices and lower domestic prices until the price difference does not happen again.

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[6] Net exports (net exports) by Mankiw (2006) is the value of goods and services exported to a country less the value of goods and services imported from other countries. Net exports also called the trade balance (trade balance).

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Formation mechanism of the demand curve when the price of an item increases, domestic consumers ask for less. Meanwhile domestic producers offer more, so the demand for imports falls. Import demand curve for decreasing shaped (downward-sloping). While bidding for the export curve shaped ascending (upward-sloping). Formation mechanism of the supply curve of exports of foreign goods, if the price of a good increase, it caused the foreign producers offer more foreign consumers while asking for less, so the supply of available exports increased.

In addition, the balance of the world occurs when the demand for domestic exports equal to the supply for foreign export. At the world price, while the two curves intersect, the world supply equals world demand. This balance occurs when the world price of import demand with domestic supply of foreign exports.

2.2.1 Export Tax

Export taxes are predominantly used by developing countries with the objective either to generate government revenues or to protect particular groups for political reasons. The effect of an export tax by a small country under a competitive market structure causes the price in the exporting country to fall below the world price (McCalla and Josling (1985). Under this policy, producers in the exporting country will lose because they receive lower prices and exports decline. Consumers in the exporting country gain through lower prices and the government generates revenue. The effect of an export tax is different in the case of a large exporting country (i.e., when a country faces a downward sloping residual demand curve). Having market power on the world market, the export tax causes a reduction in domestic production; thus, exports decline and the world price increases. In this case, consumers, producers and the government in the exporting country can gain from this policy (McCalla and Josling, 1985).

Marks, Larson, and Pomeroy (1998) analyzed the effect of an export tax for palm oil on the distribution of income in Indonesia using a static model. They found that an export tax reduced the price of palm oil products, ceteris paribus, thus, benefiting consumers.

In addition, they found that the tax lowered profits earned by palm oil producers, and that processors lost slightly as well. The government gained revenue from the export tax, but lost more revenue in the government's role as owners of palm estates. Thus, the net result was that the government lost with an export tax on palm oil. Our research extends their work by using a dynamic, time series model that assesses the short and long term consequences of the Indonesian palm oil export tax on competitiveness.

Wayan (2004) explained that since the policy implementation in August 1994, this export tax policy has had significant impact on the industry. Within the time horizon 1994-1999 when the effective tax rate was around 13.33%, the mature area of oil palm plantation had been reduced by 2.56% per annum or around 37 000 ha per annum. This indicates that this policy had a substantial negative effect on investment in the industry. As a result of this negative investment effect, CPO production had also been depressed by the policy. It is estimated that the policy had caused a loss of around 0.81% of the total production or around 36 000 ton CPO per annum.
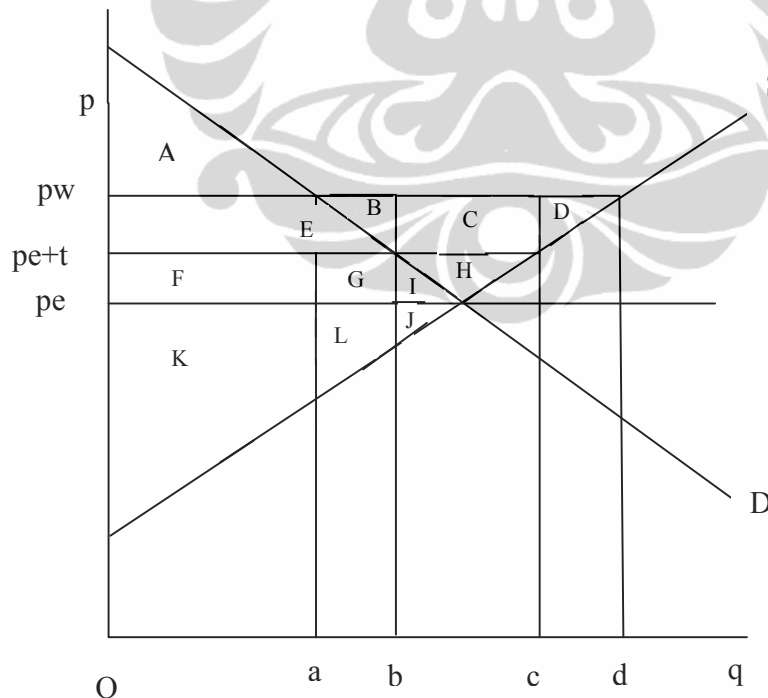
Figure. 2.2.1 Welfare Gains and Losses From Export Tax

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Let us use partial equilibrium consumer and producer surplus idea to analyze economic gains and losses for domestic economy from the imposition of an export tax.

Table 2.2.1

The effect of imposition export tariff

Description	Before Tax	After Tax	Changes
Consumer Surplus	A	A,E	E
Producer Surplus	E,B,C,D,F,G,H,I,J,K,L	F,G,H,I,J,K,L	-(E,B,C,D)
Government Revenue	-	C	C
Total Surplus	A,B,C,D,E,F,G,H,I,J,K,L	A,C,E,F,G,I,J,K,L	-(B,D)

Consider Figure. 2.2.1 with assumption Indonesia is small country. The effect export tax that imposed by small country can not higher world price of the good it exports. At the free trade price pw (world price), this nation is an exporter of q, exporting a volume of ad units. Domestic production is Od and domestic consumption is Oa. The export tax in this simple case lowers the pw (world price) to pe+t (domestic price plus export tariff), increasing domestic consumption by ab but decreasing production by cd. As a result, the price of the export good decrease from pw to pe+t and quantity of exports demanded fall from a-d to b-c. So, in partial equilibrium context, areas B and D are net costs to society of protecting consumers from higher international prices (dead weight loss) and of being able to generate government revenue from an export tax.

2.2.2 Exchange Rate

Exchange rate defined as value of foreign currency to domestic currency (Blanchard, 2000). The exchange rates could divide into depreciation and appreciation. Depreciated is decreasing of value of domestic currency to foreign currency, and the appreciation is increasing of value of domestic currency to foreign currency. If other condition in state position (ceteris paribus) and then depreciation of

a domestic currency will makes its good cheaper for foreigner. Reserve condition for appreciation of a domestic currency will makes its goods more expensive for foreigner.

The definitions of exchange rate can be separated between real and nominal exchange rate. Nominal exchange rate is relative value of currency among two countries. For example, if exchange rate of Rupiah to US$ is RP 9,200 per US$ than we can convert our money for US$ 1 with 9,200 in money changer. Real exchange rate is relative value of goods among two countries. Likewise the real exchange rate shows a value of goods in a country with other country. Real exchange rate also called as term of trade.

According to Calvo and Mishkin (2003) in countries with strong institutional frameworks which based on central bank independence low inflation can be achieved without any specific commitment to an explicit exchange rate target. In addition, Dornbusch (2001) explained that the resulting lower long-term interest rates stimulate investment, consumption and growth.

2.2.3. Elasticity

According to Pindyck (2005) elasticity measure the sensitivity of one variable to another. In the other words, elasticity show percentage change in one variable resulting from a one percent increase another. There are two kinds of elasticity, namely demand elasticity and supply elasticity. Elasticity of demand describes the degree of sensitivity of quantity demanded to others variables changes. While price elasticity of supply are defined the percentage change in the quantity supplied resulting from a one percent increase in price. The function of the elasticity that is used to describe a response or change in quantity demanded or offered if the price or other factors change.

Elasticity of demand can be divided into three, namely the price elasticity of demand, cross-price elasticity and income elasticity. Price elasticity of demand measure how much percent the demand of a good will change if price change in a 1 percent. Meanwhile, cross elasticity of demand measure how much percent the

demand of a good (x) will change if price of another good (Y) changes in a 1 percent. In addition, income elasticity of demand measures how much percent the demand of a good will change if income changes in a 1 percent.

2.3 Empirical Studies

2.3.1 Gold Stein and Khan

One of the early studies often used as a reference model for further research is the model developed by Goldstein and Khan (1978). The main purpose of this study was to determine the demand and supply response of exports to price changes. This study uses simultaneous method to avoid bias due to two-way relationship between the quantity of exports and export prices.

General model of export demand (in the log-linear equations), which will further be expressed as Goldstein and Khan's model, are:

$$\log X_d(t) = \alpha_0 + \alpha_1 \log [PX / PXW](t) + \alpha_2 \log YW(t) + \varepsilon(t) \ldots\ldots\ldots\ldots(1)$$

where:

$X_d(t)$	= quantity of demand for exports
$PX(t)$	= export price of commodities
$PXW(t)$	= export price of commodities in trading partner countries
$YW(t)$	= real income in trading partner countries
$\varepsilon(t)$	= error

Morris Goldstein and Mohsin.S.Khan did a research on exports for the eight industrialized countries, namely Belgium, France, Germany, Italy, Japan, Netherlands, England and America during the years 1955-1970. Goldstein and Khan make two models. First, they make a model of equilibrium with the assumption that there is no lag in the system so that the adjustment of prices of exports and the balance point occurs in each period. Second, is the model that takes into account the lagged disequilibrium and adjustment of exports and the price of the balance point

does not occur in every period. As a result, excess demand and excess supply may occur which is in turn influenced the quantity of exports and prices.

One method used is a two stage least square (TSLS). In the equilibrium model, the regression results of the study showed that the price variables have a significant impact on export demand. In general, the results shown that the price elasticity has obtained more than 1. It means that decreasing of price would influence the increasing of export demand.

Income variables are also significantly and positively affecting the demand for exports. Export demand significantly influenced on the export price with a positive coefficient. As for industrial capacity is significantly negative effect. This means that the larger domestic capacity is the more affordable goods. Domestic prices also have a significant effect on foreign supply positively.

The disequilibrium model shows that the variables price affect significantly export demand with a negative coefficient. Meanwhile, real income variables positively affect export demand. This means that the higher a country's real income will be even greater demand for its exports. Likewise for export lag, means that if the previous export demand increase, the current export demand will increase too.

For the supply function, the domestic price has a positive impact and significant. Production capacity has a significant influence on export prices. From the findings of the two models, statistically could not determine the best model, as goodness of fit and R^2 have almost the same value.

The estimate for price elasticity of export demand in Goldstein and Khan research (1978) in accordance with expectations, that is negative and significant at the 5 percent level for all countries, except Japan. For 6 countries, namely Belgium, France, Italy, Netherlands, England and the United States, the price elasticity of export demand is greater than one. This shows that there is a substantial response in the event of exports relative price changes. The estimation of income elasticity of demand for exports showed results consistent with expectations, that is positive and significant at the 1 percent level.

2.3.2 Ballasa

Ballasa et. al. (1989) conducted a study of the two countries, namely Greece and Korea to find out the determinants of export supply and demand in these countries. The model used in this study is the extension of the model Goldstein and Khan (1978) by adding variable export incentives on export supply model. Estimation method is TSLS (Two-Stage Least Square) by using the data period from 1960 to 1978 for Greece and the period from 1965 to 1979 for Korea.

Research Ballasa et. al. (1989) concluded that the price elasticity of export demand is generally greater than 1 and even more in the Greek manufacturing for 3.43. This shows that export demand is responsive to changes in relative prices. Income elasticity in the two countries is relatively high compared with previous research done in other countries. It is beyond expectations, considering that Korea and Greece more exported simple product compared to the other industrialized countries where the growth in world demand for these products is low enough.

Ballasa et al. (1989) suggests the existence of an outside price factor that can affect the result of the income elasticity estimates, this is the "product quality improvement" related to productivity. This is expected to prevail in the case of Korea where there is a product quality change due to rapidly increasing of productivity so that Korea's exports to "high income elasticity products.

2.3.3 Moran

Cristian Moran examines 15 manufacturing exports of developing countries. The model used is as follows:

$$LogX_t^{\ s} = a_0 + a_1 \log(PX/PT)_t + a_2 \log(PH/PT)_t + a_3 \log Y_t * + v_{1t} \dots\dots\dots(3)$$

$$LogX_t^{\ d} = b_0 + b_1 \log(PX/PX^w)_t + b_2 \log Y^w_t * + v_{2t} \dots\dots\dots\dots\dots\dots\dots(4)$$

Expected,

$$a_1 > 0, a_2 < 0, a_3 > 0, b_1 < 0, b_2 > 0$$

Where, X_d =   export demand of manufacturing industry

           X_s =   export supply of manufacturing industry

           PX =   export price index of manufacturing industry

           PT =   domestic price index of tradable goods

           PH =   price of non-tradable goods

           Y*   =   index of domestic production capacity

           PX^w =   world export price index of manufacturing

           Y^w =   world demand index on export goods

Regression results show that the supply function variables did not significantly affect prices, although all the studied parameters in accordance with the expected assumption. This is not significant lack may be due to imperfect data. While the demand functions, all variables have a significant influence and impact in accordance with the expected results. Thus, it can be said that relative prices are significantly affecting the export demand.

2.3.4   Khumar and Dhawan

Dhawan Khumar research aims to determine the impact of exchange rate fluctuations on trade in the state of Pakistan - its main trading partner countries, namely England, West Germany, Japan and the United States, Khumar and Dhawan (1991) conducted an empirical study using data period from 1974 to 1985.

Model specification used by Khumar and Dhawan are:

$$X_i(t) = \alpha_{i0} + \alpha_{i1}Y_i(t) + \alpha_{i2}[PX_i(t) + PD_i(t)\} + \alpha_{i3}R_i(t) + \mu_i(t) \dots\dots\dots\dots\dots\dots\dots(5)$$

$X_i(t)$ =   real export value of commodity j required by the state (the market) i

$Y_i(t)$ =   real income of trade partner countries i

$PX_i(t)$ =   export price

$PD_i(t)$ =   price index of trading in trading partner countries i for time t

$Ri(t)$ =   nominal exchange rate of each country trading partner i against the U.S. dollar.

$\mu_i(t)$ =   error term

In this study, the estimates done separately for each trading partner country to determine the impact of exchange rate fluctuations and other export determinants of demand for exports to each trading partner country without the rest of the world effect. The conclusion of Khumar and Dhawan research (1991) among others are:

1. Model specification using the log-linear gives better results than the linear model. In contrast to the results obtained by Bahmani-Oskooee (1986), using lag in relative prices and exchange rates are not affected significantly.

2. There are significant results that the bilateral exchange rate fluctuations affect the volume of Pakistan's exports to the trading partner countries, except in the case of Pakistan's exports to the UK.

3. Fluctuations in the nominal exchange rate significantly more influential than the real exchange rate variations.

2.3.5 Afia Malik

Research conducted by Malik (2004) aims to see the prospects (opportunities) of the textile and clothing exports of Pakistan in the international market after the agreement of the WTO textile and clothing (World Trade Organization Agreement on Textiles and Clothing). Malik in his research uses a model in which simultaneous export model is divided into two, namely export demand and export supply. The two models used are as follows:

$$LogX_t^{D} = a_0 + a_1 \log PX_t + a_2 \log REER_t + a_3 \log WY_t + \mu_t \dots\dots\dots\dots\dots\dots\dots\dots(6)$$

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$$LogX_t{}^S = \beta_0 + \beta_1 \log PX_t + \beta_2 \log PD_t + \beta_3 \log NER_t + \beta_4 T + v_t \quad\dots\dots\dots\dots\dots\dots(7)$$

Where :

$X_t{}^D$: number of export demand for textiles

PX_t : price of textile exports

$REER_t$: real effective exchange rate

WY_t : income of the world

$X_t{}^D$: the number of textile export supply

PD_t : price of the domestic textile

NER_t : nominal exchange rate

T : the trend of time (time trend)

The results of these studies on the demand for exports is the export price and the real effective exchange rate has a direction of the negative effect but not significant to total export textile of Pakistan and the world income does not affect the number of Pakistan's textile exports.

Whereas if viewed from the export supply model,as the result of this study obtained that the export prices do not affect the number of Pakistan's textile exports, domestic prices negatively affect and significantly to the amount of its exports. And the nominal exchange rate does not affect the number of Pakistan's textile exports.

2.3.6   Ernawati Munadi

Munadi (2007) has done research on "Export Tax Reduction and Its Impact on Indonesian Export of Palm Oil to India (An Error Correction Model Approach)". She explained that the export demand of Indonesia's palm oil exports to India as follow:

$$QX_t = f\left[WPO_{t,}, PSTO_t, EX_t, IP_t\right]\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(8)$$

where:

QX_t :   export volume of Indonesia's palm oil (thousand ton)

WPO_i : world price of palm oil (US$/ton)

$PSTO_t$: world price of soybean oil (US$/ton)

EX_t : exchange rate (Rp/US$)

IP_t : India's production index

Then this equation can be changed in the equation of error correction model as follow:

$$\Delta QX_t = a_0 + a_1 \Delta WPO_t + a_2 \Delta PSTO_t + a_3 \Delta EX + a_4 \Delta IP + a_5 \varepsilon_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots(9)$$

According to (Munadi, 2007) the export demand of Indonesian palm oil to India is significantly influenced by several factors such as: world price of palm oil, world price of oil soybean, exchange rate, production index of India's goods and export demand of Indonesia's oil palm to India latest year. She implied Error Correction Model in running her model and those variables have given the right coefficient sign for instance the world price of oil palm has given negative coefficient sign and the world price of oil soybean has given positive coefficient sign. This indicates that if the world price of oil palm increases, Indonesia's palm oil exports to India will decrease and if the world price of oil soybean rises, Indonesia's palm oil exports will increase.

In addition, the result of regression toward export demand function that uses ECM indicated the export volume of Indonesian palm oil to India has no relation in the long time. Whereas in the short time, export volume of Indonesian palm oil to India can be influenced by ratio between world soybean price and world palm oil price with elasticity 2.74, elasticity of production index 2.69, and coefficient adjustment that is reflected by demand for export to India last years 0.89. In addition, decreasing export tax will be followed by increasing export volume of palm oil. Decreasing export tax 10% will increase domestic price of palm oil 14.83%.

2.3.7. Mohammad F. Hasan et. al

Hasan, et. al (2001) has researched the analysis of the dynamic effects of an export tax export performance of the Indonesian palm oil industry using econometric time series method. This study focused on the effects of competitiveness of Indonesian palm oil export shares as influenced by relative export price and palm oil export tax. Using a vector autoregressive model (VAR), this relationship can be presented as follows:

$$Z_{1t} = a10\sum_{i=1}^{m} a1iZ1t - i + \sum_{j=1i}^{m} b1jZ2t - j + \sum_{k=1}^{m} c1kZ3t - k + \varepsilon1t, \ldots\ldots (10)$$

$$Z_{2t} = a20\sum_{i=1}^{m} a2iZ1t - i + \sum_{j=1i}^{m} b2jZ2t - j + \sum_{k=1}^{m} c2kZ3t - k + \varepsilon2t, \ldots\ldots\ldots\ldots\ldots(11)$$

$$Z_{3t} = a30\sum_{i=1}^{m} a3iZ1t - i + \sum_{j=1i}^{m} b3jZ2t - j + \sum_{k=1}^{m} c3kZ3t - k + \varepsilon3t, \ldots\ldots\ldots\ldots\ldots(12)$$

where: Z_{1t} , Z_{2t} , and Z_{3t} are net export shares, the export tax, and relative export price of Indonesian palm oil, respectively; a, b, and c are parameters to be estimated; and the ε is the error.

These results indicated that:

1. If the export tax on Indonesian palm oil increases by 1%, there is no instantaneous change in the net export shares of Indonesian palm oil. However, in the second period net export will decrease by 0.8% and in the third period will decrease by 1.1 %.

2. If the relative export prices for Indonesian palm oil increase by 1%, there is no changes in the net export shares in the first period. However, in the second period net export shares of Indonesian palm oil increase by 0.75% and in the third period will increase by 1.04%.

Therefore, this research showed that the imposition of an export tax has been long lasting and gives negative effects on competitiveness of Indonesian palm oil industry. The effect of export tax imposition was not immediate. But it appears in the

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second month and reaches a peak in the fourth month after the export tax of Indonesian palm oil is imposed.

Based on empirical previous researches we conclude that the demand of export goods is affected by export price, competitor's export price, world price, substitute goods price, exchange rate, income of trading partner, export tax and consumption.

Table 2.6.1

Summary of Empirical Research

No.	Study	Researcher(s)	Results
1.	To examine the effect of price on export demand and supply with simultaneous two stage least square (TSLS) method.	Gold Stein and Khan	The elasticity of price significantly influence export demand and gives negative coefficient sign for export demand of Belgium France, Germany, Italy, UK, Netherlands and US except for Japan.
2.	To examine the effect of price on export demand and supply. The model used in this study is the extension of the model Goldstein and Khan (1978) by adding variable export incentives on export supply model.	Bela Ballasa	Export demand is responsive to changes in relative prices. Income elasticity in the two countries is relatively high compared with previous research done in other countries. It is beyond expectations, considering that Korea and Greece more exported simple product compared to the other industrialized countries where the growth in world demand for these products is low enough.
3.	To analyze the effect of relative price and income on manufactured export and to capture lags in the adjustment to equilibrium. Using pooled cross-section	Cristian Moran	Relative price elastic to influence export demand also income elastic to influence export demand but does not capture the full effect of external economic activity on manufactured export revenue.

No.	Study	Researcher(s)	Results
	time-series method.		
4.	To determine the impact of exchange rate fluctuations on trade in the state of Pakistan. Using Ordinary Least Square method.	Khumar and Dhawan	Bilateral exchange rate fluctuations affect the volume of Pakistan's exports to the trading partner countries, except in the case of Pakistan's exports to the UK.
5.	To see the prospects (opportunities) of the textile and clothing exports of Pakistan in the international market with simultaneous export model (TSLS).	Afia Malik	1. The export price and the real effective exchange rate has a direction of the negative effect but not significant to total export textile of Pakistan. 2. The world income does not affect the number of Pakistan's textile exports.
6.	To examine the impact of reduction in export duty and Its impact on Indonesian Export of Palm Oil to India. Using Error Correction Model approach.	Ernawati Munadi	1. Export volume of Indonesian palm oil to India has significantly influenced by world price of palm oil (WPOt), world price of soybean oil (PSTOt), export price of Indonesian palm oil (PX) and exchange rate (EXt) and those variable have given the expected coefficient. 2. decreasing export tax will be followed by increasing export volume of palm oil.
7.	To analysis of the dynamic effects of an export tax export performance of the Indonesian palm oil industry using econometric time series method.	Mohammad F. Hasan et. al	The imposition of an export tax has been long lasting and gives negative effects on competitiveness of Indonesian palm oil industry. The effect of export tax imposition was not immediate. But it appears in the second month and reaches a peak in the fourth month after the export tax of Indonesian palm oil is imposed.

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CHAPTER III
COMMODITY PROFILE OF PALM OIL

3.1   Background

Palm oil plantations in Indonesia have existed since the Dutch Colonial times. The first plantations were planted in the island of Sumatra where volcanic soil and the tropical climate were best suited for the crop. Today Sumatra owns the biggest plantations area of 4.9 million ha, followed by Kalimantan/Borneo with 1.8 million ha, Sulawesi/Celebes with 218 thousand ha and Papua with 61 thousand ha. However, currently the strongest growths in percent per year are shown by Kalimantan (11.26 %) and Sulawesi (15.98%) in 2008.

Palm oil plantations started as development by large plantations. In 1915 the total plantations area was 2,715 ha, increasing to 100 thousand ha in 1939. During the Japanese invasion in 1941 most of palm plantations were uncared for. After the independence, the government decided to follow the step laid out by the other commodities by involving smallholders in developing palm oil plantations. This opened opportunity for the poor to increase their welfare by transmigrating people from Java to other islands in Indonesia. In addition at the same time this was increasing domestically needed vegetables oil/frying oil.

In 1970 the total palm oil plantations were 133 thousand ha increasing gradually in 1980 to 294 thousand ha, where 6 thousand ha, belonged to smallholders. Government plantations at that time were 200 thousand ha and private-owned plantations were 84 thousand ha.

Following the success and the benefit attributed by the palm oil plantation developments, the government offered stimulus packages to further accelerate the growth of the plantations. The growth increased significantly in the period of 1997 to 2000, and continued until now in 2004 there are of Malaysian palm oil plantation only attributed to 3,790 thousand ha while the Indonesian already managed to each 5,285 thousand ha. In 2008 it was 7.1 million ha.

Smallholders plantations increase in number has attributed to their significant role every year. The area planted by smallholders increased 2 million ha, 225% from 1998 to 2008. In 2008 Indonesian smallholders produces 6.7 million ton, this constitutes to 36% of the Indonesia predicated total production of 2008 which is estimated about 18.4 million ton.

However considering the total area compared with the production, the Indonesian smallholders average productivity are relatively small, compared to the government plantation and private sector productivity, as shown in the following Table 3.1.1.

The low productivity are mostly contributed by the non-supreme/illegitimate seeds use the smallholders and the young age of their palms where in 2008 about 24.75% of all palm oils in Indonesia are immature pal oil trees.

To increase the smallholders productivities and open new opportunities for smallholders, the government has introduced the Agriculture Revitalization Program where subsidies are offered in form of reduced bank loan rates for smallholders as well as its guarantor – the large plantation.

Admittedly there is slow progress on implementing this program which is mainly because of land acquisition problem and also the case of smallholders willingness to extend and replant their plantation, faced with dwindling price situation.

The palm oils in Indonesia are classified into 3 age years which are: immature trees (age less than 4 years), mature trees (age between 4 to 25 years) and damage trees which do not produce fruits any more.

3.2 The Composite of Palm Oil Tree and Its Production

According to Table 3.2.1, it is shown in the year of 2008 immature trees is 1,925,856 ha (27.07%), mature trees cover the area of 5,107,396 (71.78%) and 81,587 ha (1.19%). From the list of the composition it can be seen that every year there are additional new opening areas of 300 ha to 500 ha per year.

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Smallholders plantations showed a very strong growth from 1980 to 2008 where per year growth was recorded at 24.70%, this was much higher than the government estates growth (3.98%) and larger private plantations (15.56%). This showed that many smallholders are interested to plant palm oil because this commodity is very promising. Moreover it was estimated that the total area of palm oil plantation in 2008 reached 7.144 million ha.

Table 3.2.1
Palm Oil Tree Composition and Production (2000-2008)

Years	Immature Trees (Ha)	Mature Trees (Ha)	Damage Trees (Ha)	Total (Ha)	Production (Ton)
2000	1.564.575	2.518.107	75.395	4.158.077	7.000.508
2001	1.662.047	2.956.113	85.271	4.703.431	8.396.472
2002	1.669.375	3.307.415	90.267	5.067.057	9.622.344
2003	1.700.088	3.428.580	74.890	5.203.558	10.440.834
2004	1.618.743	3.882.306	65.586	5.566.635	12.194.492
2005	1.492.400	4.394.898	63.051	5.950.349	14.620.830
2006	1.497.220	4.923.389	68.767	6.489.376	16.861.482
2007	1.627.236	5.138.909	88.769	6.854.914	17.935.872
2008*)	1.925.856	5.107.396	81.587	7.114.839	18.380.409

Source: Ministry of Agriculture, 2008
*estimation
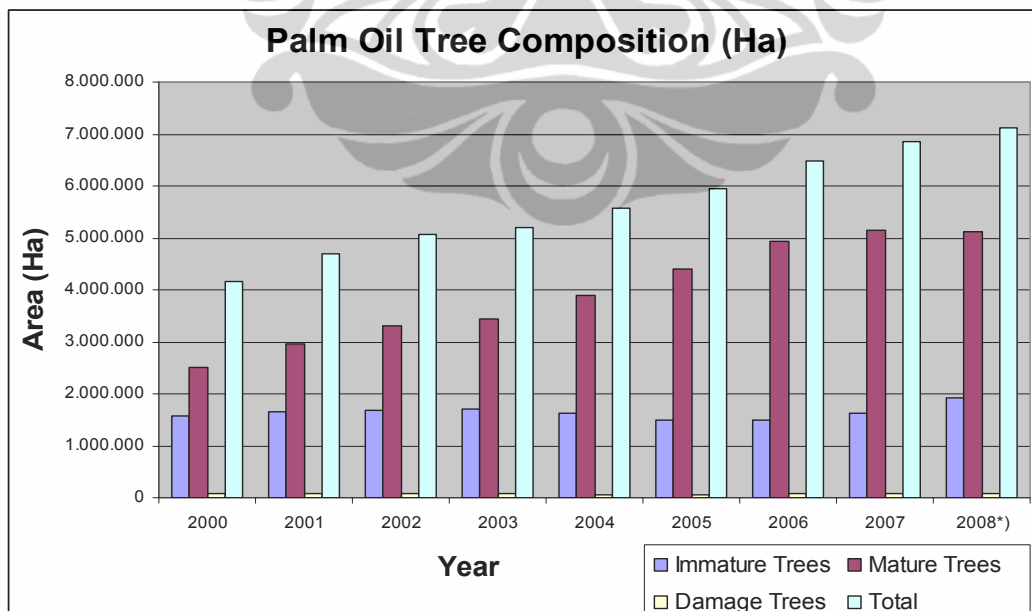
Source: Ministry of Agriculture, 2008

Figure. 3.2.1. Palm Oil Tree Composition in 2000 to 2008 (Ha)

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The overall Indonesia production has steadily been increasing since 1991 round 12% per year. In 2008 the estimated production reached 18,380,409 ton (Oil World estimation in 2008 was 19.20 million ton), meanwhile the domestic of CPO in 2008 is estimated to reach 5 million. The number is expected to increase in 2009 when the mandatory implementation of biofuel is implemented.

3.3. Consumption of CPO, Its Derivative Products and CPKO

Vegetables oil and fat have significantly growth in period of 1993-2008   by 2.7%. Before in 1990, world vegetables oil market was dominated vegetable oil from climate plant that produced by sub tropic countries, such as soybean oil, rapeseed oil, sunflower oil, olive oil, and peanut oil. But since 1993 have moved consumption rate of vegetables oil world. CPO in 1993 have market share by 15.3% increased become 33.2% in 2008 or it average growth as 8.1%. The growth of CPO is bigger than others vegetables oil. It means that palm oil have contributed to consumption of vegetables oil world, followed by soybean oil by 29.7%, and rapeseed oil by 15.5%.[7] The completed information is shown by the Table 3.3.1.

The biggest percentage of world consumption of 17 oils and fats is palm oil 26.70%, followed by soybean oil 24%, rapeseed oil 12%, sunflower oil as 6%, and completed information can be seen in the Figure 3.3.1. In addition, according to oil world, in 2008, the biggest country that has the biggest consumption is China by 20%, then followed by India by 18%, Indonesia by 16%, Malaysia 9%, Pakistan 6%, Thailand 3%, USA, 3%, Bangladesh 3% and others countries by 22%.

There is any increasing of market share of palm oil consumption in the world market compared others vegetables oil because palm oil has a cheap cost production and a high productivity. Palm oil has higher productivity than others vegetables oil until fourfold to ten time. Also palm oil have lower production cost than other vegetables oil. Palm oil can produce CPO average above 4 ton/ha/year. Meanwhile

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[7] Ahmad ManggaBarani in Sumbangsih Kelapa Sawit Indonesia bagi Dunia, Jakarta. 2009.

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others vegetables oil such as: rapeseed, sunflower, soybean, just produce oil less of 1 ton/ha/year. [8]

Table 3.3.1
World Market Share of Vegetables Oil Consumption

DESCRIPTION	Palm Oil*	Soybean Oil	Rape Oil	Sunflower Oil	Coconut Oil	Others	World
1993 (000 Ton)	13.200	17.760	9.645	7.730	2.930	34.857	86.122
Share (%)	15,3	20,6	11,2	9,0	3,4	40,5	100,0
2000 (000 Ton)	21.771	25.135	14.471	9.404	2.962	39.689	113.432
Share (%)	19,2	22,2	12,8	8,3	2,6	34,9	100,0
2007 (000 Ton)	37.900	37.090	19.090	11.160	3.160	13.830	122.230
Share (%)	31,0	30,3	15,6	9,1	2,6	11,4	100,0
2008 (000 Ton)	42.380	37.880	19.740	10.320	3.130	14.260	127.710
Share (%)	33,2	29,7	15,5	8,1	2,5	11,2	100,0
Growth (%)	8,1	5,2	4,9	1,9	0,4	-5,8	2,7

Source: Oil World and it is processed by Ministry of Agriculture.
*: includes: CPO and its derivative products.
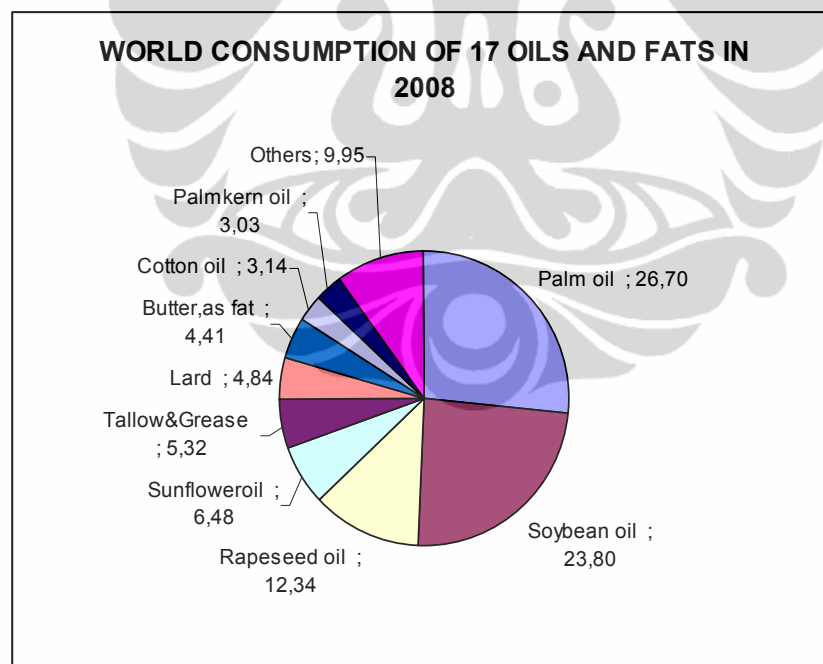
Source: Oil World 2009

Figure 3.3.1. World Consumption of 17 Oils and Fats in 2008 (000 Ton)

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[8] Achmad Mangga Barani in "Memaknai Sebuah Anugerah Sumbangsih Kelapa Sawit Indonesia bagi Dunia", Ideals Agro Akbar, Jakarta, page: 34.

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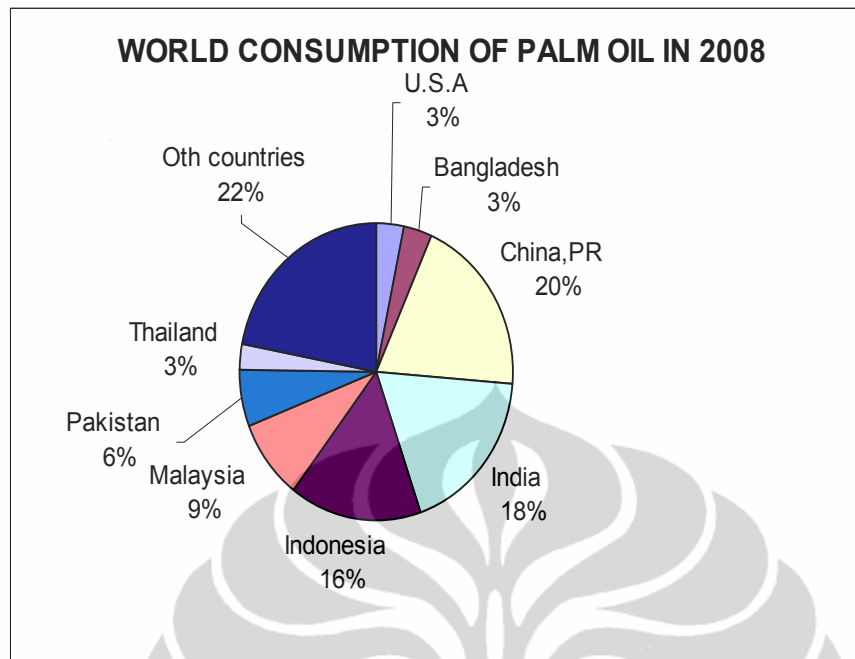
Source: Oil World 2009

Figure 3.3.2. World Consumption of Palm Oil in 2008

3.4   Exporters of CPO, Its Derivative Products, and CPKO in the World

Development of world crude palm oil (CPO) exports from 2004 to 2008 shows a significant number. Indonesia is the first player of CPO exporter in the world. In 2007 the export value of Indonesian CPO reached U.S. $ 4.047 billion, up by 37.86% to U.S. $ 5.580 billion. Meanwhile, Malaysia ranks second with exports worth U.S. $ 2.992 billion increased by 43.25% from the year 2007 with exports worth U.S. $ 2.089 billion. Indonesia slower growth 5.39% compare to Malaysia. While CPO number three players in the world market is occupied by the Papua New Guinea, with export growth in 2007 to the year 2008 by 25.51%. In 2008, Indonesian CPO market share in world was half of total world exports. The completed information is shown by Table 3.4.1. in the Appendix V.

There are three major players of its derivative products of CPO or Other palm oils in the world markets, namely Malaysia, Indonesia, and The Netherlands. In 2008, Malaysia has a market share of it product was 59.10% in other world markets meanwhile Indonesia only reached 26.10%. In other word, for this product, Indonesia

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Analysis of determinant..., Niken Wulandari. FE UI, 2009.

has half of market share in the world market. Completed information is described by Table. 3.4.2 in the Appendix V.

In addition, Indonesia have superior position in the world market for crude palm kernel oil with share of 73.33%, followed by Malaysia for 9.75%, Thailand by 6:48% and 2.72% for Papua New Genie. Furthermore, data completely is shown by Table 3.4.3 in Appendix V.

3.5 Exports Performance of Indonesian CPO, Its Derivative Products and CPKO to China

According to Table 3.5.1. in the Appendix VI, in 2008, fourth countries that have the biggest market share of CPO Exporter to China such us: Malaysia with 47.22% share, followed by 45.19% for Indonesia, Thailand by 6.45%, and 1.13% for PNG. While the trend of imported CPO by China from the world for five years was 236.64%. Trend of China's imported crude palm oil from Malaysia for five years was 204.51%. While the trend for CPO that imported by China from Indonesia for five years by 275.11%. There is a difference trend CPO that imported by China from Malaysia and Indonesia by 70.59%. It means that Indonesia has opportunity to increase the supply of CPO export to China's since consumption of CPO has already increased.

According to Table 3.5.2. in Appendix VI, we can say that there are only two countries as suppliers that supply other of palm oil products to China, namely Malaysia and Indonesia. China's import growth of other of palm oil products from 2007 to 2008 of the world reached 39.21%. China's import growth of it products from Indonesia in 2007 to 2008 was 64.66% higher than the rate of growth that was imported from Malaysia reached 30.83%.

From Table 3.5.3. in Appendix VI, we can say that China's import growth into the world for crude palm kernel oil product from the year 2007 amounted to U.S.$ 268.64 million increase by 38.05% to U.S.$ 370.86 million in 2008. China's import growth from Indonesia has a share of 75.12% with growth rate in 2007 to 2008 was

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42.12%. Meanwhile Malaysia ranked second after Indonesia with a share of 24.82% with the growth rate in 2007 to 2008 was 7.12%.

3.6   Price of CPO in the World Market

Price of CPO in the world market has positively growth as long as five years, since 2005 until medium of 2008. But begin quarter III-2008 the price of CPO have ready fall reach US$ 923.47/MTon after have obtain a peak price in quarter II-2008 by 1,174.71/Mton. Finally, CPO reaches the lowest price at the level US$ 506.21/Mton in quarter IV-2008.

According to Figure 3.6.1. and Figure 3.6.2 we can obtain price fluctuation between CPO and crude oil. Based on those figure we can say that price fluctuation of CPO follow price fluctuation of crude oil. On the other world, CPO have same pattern on price fluctuation of crude oil.
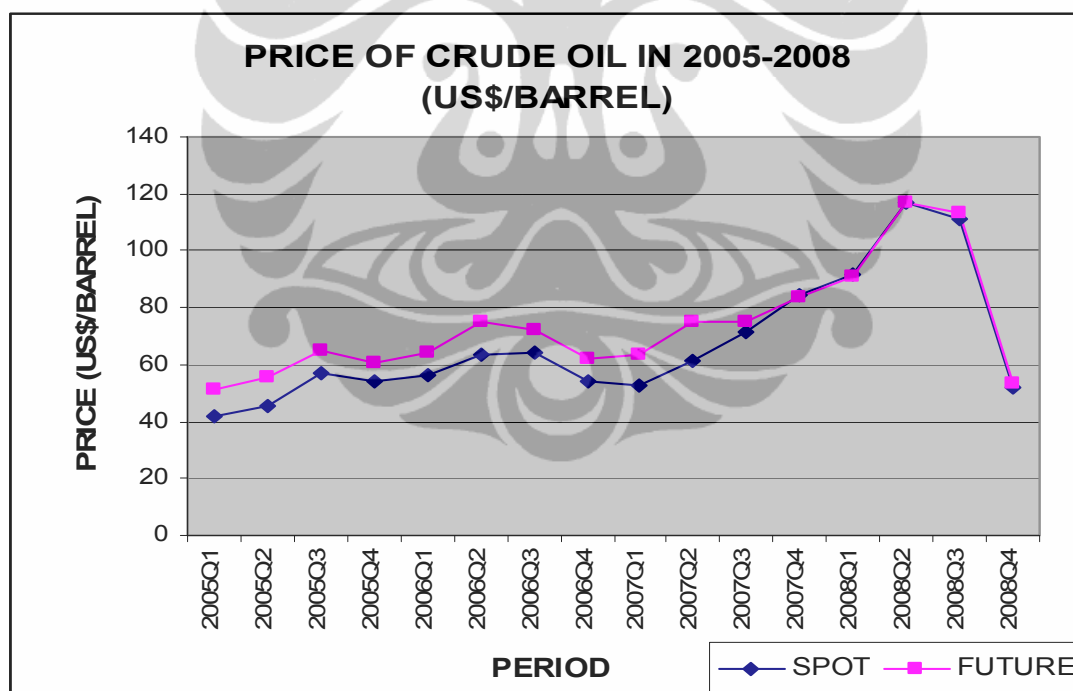
Source: Reuters

Figure 3.6.1. Price of Crude Oil in 2005-2008 (US$/Barrel)

PRICE OF CPO IN 2005-2008
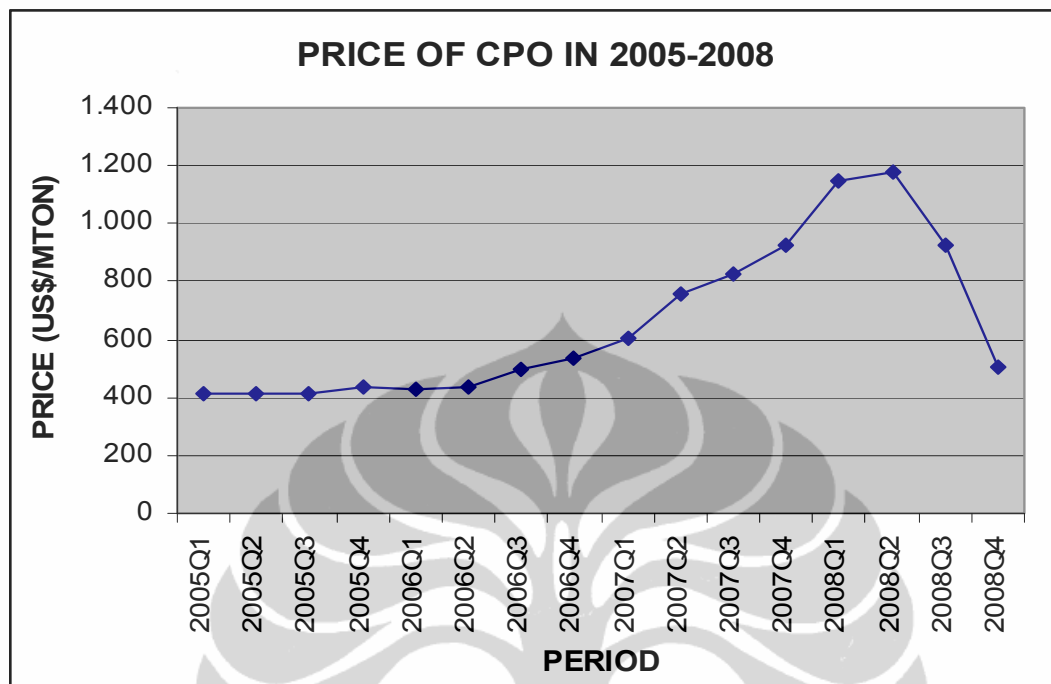
Source: Reuters,2009

Figure 3.6.2. Price of CPO in 2005-2008 (US$/MTon)

In the world market crude oil is the kind of goods which speculation value. Because the CPO price has fluctuation as well as crude oil so we state that CPO is trading goods that it has speculation value in the stock market like a crude oil. It can be shown by the fluctuation of those goods, the price of CPO reach at the highest levels in June 2008 while the highest price of crude oil reached at level US$ 126.27/Barrel in July 2008 for spot price and US$ 131.11/Barrel in the same period for future price. It means that the businessmen in the market have been speculating in trading CPO, its derivative products and CPKO. Speculation in this market is happen because the businessmen expect to get more products if in the future the products will be expansive. That is way the pattern of CPO price fluctuation follow the fluctuation of crude oil price.[9]

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[9] It is supported by the Ministry of Trade research for the determinant factor of CPO price in the world market. This document is not publicized.

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3.7   Government Policy to Support Development Industry of CPO

The Indonesian government adopted the system of free trade which provided the opportunity open for all people, and occurs when the settings, this is done only for a particular purpose, such as the application of export levies and for the purposes listed in the Government Regulation No. 35, 2005, among others, protect the supply of CPO in the domestic country.

As the largest producer country in the world, Indonesia has been able to meet their own needs so that it can be referred to as a "self sufficient" in consumption of palm oil and fat which is mostly cooking oil needed. According to Government Regulation of the Republic of Indonesia No. 35, 2005 about Export Levies in Specific Good Export that have been revised by Government Regulation of the Republic of Indonesia No. 55, 2008 about imposition export tax (Bea Keluar) to export goods, the objectives of the establishment levies export are:

1.   To ensure the sufficiently of needs in domestic country;

2.   To protect the sustainability of natural resources;

3.   To anticipate the influence of price increasing which is quite drastic of export specific goods in the international market; or

4.   To maintain stability a certain goods in domestic country.

To determinate the tariff rates of specific goods, especially CPO, Its derivative products, and CPKO the last Tax Regulation was published by Ministry of Finance No.233/PMK.011/2008 about Imposition of export goods that have been export levied and tariff of export tax. Meanwhile the benchmark of export price (HPE) every month is determined by the Ministry of Trade Regulation.

In addition, especially for the export of fresh fruit bunches (tandan buah segar/TBS), exporter must ask permission from the Ministry of Trade. Its procedure is arranged in the decree No. 01/M-DAG/PER/1/2007 which was changed on the attachment Decree of the Minister of Industry and Trade No. 558/MPP/Kep/12/1998 about the General Term of the Export.

3.8 Development of Palm Oil Industry

In 2008, production of Indonesian crude palm oil (CPO) and its derivative products are estimated to reach 18.38 million tons. Meanwhile the capacity of refineries reaches 20 million tons, over much of raw material productions capacity of production that used only reached 50 percent. Palm oil industry can be classified become two big industries, namely refinery industry and shortening industry. Refinery industry includes such as: RBD Palm Oil, RBD Palm Olein, and RBD Palm Stearin.

Other sides, shortening industry most of raw material resources is produced from crude palm kernel oil. Its derivative product such as: breads, cookies, biscuits, cake and pastry. It also used butter cream. In addition, frying shortenings are used in the commercial deep-fat frying of products such as doughnut, meat, fish, nuts, potato chips or French-fried potatoes, and other snack items. The most important shortening characteristic are: flavor stability, melting point, and solid fat content. The solid fat content of the shortening affects the palatability of the food, depending on the type of food to be eaten and the amount of fat normally absorbed by the food.

	Palm Oil	Palm Kernel Oil & Palm Kernel Meal
Food Applications *(80% share of palm oil consumption)*	• Cooking Oil • Vanaspati • Margarine • Shortening • Frying Fats • Ice Cream • Cocoa Butter Extender • Chocolate coatings	• Specialty Fats • Cocoa Butter • Margarine • Non Dairy Creamer • Confectionery Fats
Non-Food Applications	• Tocotrienol Extract • Soap and Detergent • Textile Oil • Lubricant	• Animal Feed • Soap • Biodiesel
Oleo Chemicals	• Alcohol • Candle Wax • Food • Lubricants • Food • Paint • Pharmaceuti • Paint	• Shampoo • Detergents • Cosmetics

Source: Association of Palm Oil of Indonesia, 2009

Figure 3.8.1. Numerous Application of Palm Oil

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Analysis of determinant..., Niken Wulandari. FE UI, 2009.

CHAPTER IV
RESEARCH METHODOLOGY

4.1   Model Specification

Based on Krugman and Obstfeld (2003), export that examined from demand side are influenced by export prices, exchange rate, world income and foreign trade policies of importing and exporting countries. In addition, refers to empirical previous researches that we explained in empirical research before, the demand of export goods is affected by export price, competitor's export price, world price, substitute goods price, exchange rate, income of trading partner, export tax and consumption.

Goldstein and Khan (1978) used export price as independent variable to determine on export demand. This result shown that price significantly affected to export demand and give a negative coefficient. Meanwhile, real income variables positively affected export demand. Khumar and Dhawan (1991) used nominal exchange rate, bilateral exchange rate, export price, and income trading partner to determine export demand model in which bilateral exchange rate has influenced significantly to their research model. In addition, Ballasa used relative price and income of trading partner to determine export demand. This research shown that export demand responsive to changes in relative prices. Income elasticity in the two countries is relatively high compared with previous research done in other countries. Meanwhile, Moran used export price index of manufactured industry and world price index of manufactured industry as independent variable of his research. Export price index is divided by world price index which given the great result or in other word, it has affected significantly to the equation of export demand. Moreover Malik (2004) used independent variable such as: price of commodity, real effective exchange rates, and world income to determine export demand for Pakistan's textile and clothing to partner countries. In addition Hasan et.al (2001) used export tax independent variable to examine export demand of Indonesian palm oil industry. While Munadi (2007) used world price of commodity and world price of commodity substitution, real

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exchange rates as independent variable to examine export demand of Indonesian palm oils export to India.

Regarding to the previous explanation, refers to demand side model that Munadi used to examine the impact of export tax reduction on Indonesian export of palm oil to India, we will modify her model to analysis the determinant factors of Indonesian export of crude palm oil, its derivative products and crude palm kernel oil to China. We examine this export model approached by demand side that use several independent variables such as: real exchange rate, price of commodities in world market, export tax of those commodities that imposed by Indonesia and import duty on those commodities that imposed by China. So, for this study, author uses equation on determinant factors of Indonesian exports of CPO, its derivative products, CPKO to China as follows:

$$logXit = \beta_0 + \beta_1 logREXt + \beta_2 log PCit + \beta_3 logTEit + \beta_4 DCEPT5t + \varepsilon t$$

Where i denote commodities, t denotes time, and the variables are defined as:

logXit = Volume of Indonesian Commodities Export (i) to China in (t) period (Ton)

logREXt = Real Exchange Rate in (t) period (Rupiah/Yuan)

LogPCit = Commodities Prices (i) in the world market (US$/Ton)

Log TEit = Indonesia Export Duty of Commodities (i) in (t) period (%)

DCEPT5t = Dummy of China's import duty based on CEPT5 in t period Value 0 when it has high import tariff or it was before imposition CEPT5. Value 1 when it has low import tariff or it was after imposition CEPT5 in third quarter of 2005.

εt = error term

In this equation, we also made a summary on the expected sign of independent variable and the explanation. As follow the table of the expected sign and the explanation:

Table 4.1
Summary of The Expected Sign

No.	Variable	Expected Sign	Explanation	Empirical Research(s)
1	Real Exchange Rate (RERt)	Positive (+)	This variable is obtained from rupiah currency in term of trading partner's currencies. If this variable gets depreciation, it will lead to increase Indonesia's palm oil exports.	Khumar and Dhawan
2	Commodities Prices in the world market (PCit)	Negative (-)	If this variable increases, it will lead to decrease the dependent variable of this research that is volume of Indonesian commodities export to China .	Ernawati
3	Indonesia's Export Duty of Commodities (TEit)	Negative (-)	If the tariff exports of commodities decrease, it will lead to raise the dependent variable of this research that is volume of Indonesian exports of commodities to China .	Hasan et. al
4	Dummy CEPT5	Positive (+)	If the tariff imports of commodities decrease, it will lead to raise the dependent variable of this research that is volume of Indonesian commodities export to China .	Ernawati

4.2   Data and Source

The data used in this study based on the secondary data. The Bilateral Trade between Indonesia and China were quoted from the Data of Center Ministry of Trade processed from Badan Pusat Statistik (BPS) or Central Statistic Agency. Data for real exchange rate were quoted from International Financial Statistics (IFS). The Tariff Export Duty imposed by Indonesia were quoted from The Ministry of Finance of Republic Indonesia. The Commodity Prices in the world market were quoted from

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Reuters. Indonesian export taxes of commodities were quoted from Ministry of Finance. And data of China's import duty as dummy CEPT5 were quote from the website of Ministry of Trade. The data periods for this thesis are from 2002 to 2008 quarterly.

4.3   The Estimation Method of Data Panel Regression

The model will be estimated using panel data regression. There are other names for panel data, such as pool data (pooling of time series and cross-sectional observations), combination of time series and cross-sectional observations), and longitudinal data (a study over time of a variable or group of subjects), (Gujarati, 2003). In other word, panel data or pooled data is a data combination between time series and cross section data. Time series data have temporal observation, while cross section data have observation in certain point of time.

According to Baltagi (2001), there are some advantages of using data panel that are:

1. Panel data could control the heterogeneity of each individual;
2. Panel data gives better information of time series or cross section data, gives more variations, declines collinear among variables, gives higher the degree of freedom and gives more efficiency;
3. Panel data is better in seeing the dynamic changes of each variable;
4. Panel data is better to identify and to measure the impact of time series or undetected cross section data;
5. Panel data is probably to improve and examine the more complex of behavioral model;
6. Panel data often catches the point of micros.

Panel data has three kinds of estimation approach, namely *pooled least square (PLS)*, *fixed effect method (FEM)*, *random effect method (REM)*. Pooled least square compiles all of time series and cross section data simply and then estimates the model through applied ordinary least square (OLS) method. Fixed effect model faces

omitted variables which the omitted variables is probably caused by the changes in *time series intercept* or *cross section intercept* and adds *dummy variables* to permit the change of those interceptions. The Random effect model reforms the efficiency process of least square through a measure of the error of time series and cross section.

CHAPTER V
RESULT AND ANALYSIS

5.1   Exports Performance of CPO, Its Derivative Products and CPKO

According to Figure 5.1.1. Indonesian Exports of CPO, Its Derivative Products, and CPKO to China from 2002 to 2008 fluctuated. The export volume of CPO and CPKO was relatively the same. But the export volume of other palm oil commodities to that country was higher than that of other commodities. In addition, the export volume of CPO and that of other palm oil products has negative correlation: as the CPO export volume decreased, the other palm oil products went up. Because others palm oil products are produced from CPO.

In first quarter of 2002, Indonesia had a high export volume of CPO and CPKO. Then in the second quarter of 2002, there were any decreased exports. Furthermore, it has risen again in the third quarter and the fourth quarter of 2002. These fluctuations had respectively the same pattern started from 2002 until 2004. Except for CPKO, in first quarter of 2005 there was no export volume of CPO. Then, starting from second quarter to fourth quarter, CPO export rose steadily. However the fluctuation of CPKO in second quarter of 2005 increased before it fell in the third quarter. And it fluctuated until second quarter of 2006 before it steadily rose and reached the peak level of 93,241 tons in fourth quarter. Nevertheless, the export volume of CPKO fell sharply by 62.44% in the third quarter of 2008 at 35,024 tons. On the other hand, in year 2006, the CPO export volume saw steady increase until it peaked at 126,149 ton in third quarter of 2006 before decreasing to nearly 54.60% in fourth quarter of the year at the 57,282 tons level. Furthermore, the CPO had a decreasing fluctuation and hit the bottom at 30.903 tons in third quarter of 2008.

The fluctuation of the other palm oils (its derivative products) has negative correlation with CPO. The export volume of the other palm oils in first quarter of 2002 was less than that of CPO in the second quarter. The pattern of export volume of other palm oils fluctuation had low export volume in the first quarter than its

fluctuation a risen until last quarter. And it remained the same until the year 2004. But in 2005 and 2006, the fluctuation of export volume had differenced pattern. In the beginning quarter, it was low export volume then it rose in the second quarter and it fall gradually until period of 2006. Then there was any significantly rose in the first quarter of 2008 by 46.41 % from 296,213 tons in first quarter of 2007 to 444,092 tons in third quarter of 2008.

Generally, in 2006 each commodity reached its peak of export volume. If we do amount of export volume of other palm oil products, the total amount of it products reached 1.447 million ton in 2006. So in 2007 there was any decreased export volume of it products. Moreover for CPO and CPKO, because in 2006 had high accumulation of export volume so in 2007 there was any decrease the total amount of its commodities. After China reduced its stock in market then the country started to buy more of the commodities as the consumption increased during the 2008 Olympic Games. Beijing Olympiad Games which took place in August 2008, automatically stimulus Chinese to consume CPO, its derivative products and CPKO larger than normal.

In addition, in second quarter of 2008, the export volume of all commodities decreased and it was due to the crisis that swept over the United States. But CPO, its derivative products and CPKO were not quite shaken since they are a primary commodity, Therefore, to increase its decreased supply, at the end of 2008, China beefed up the stock and hence increased the export volume of CPO, its derivative products, and CPKO significantly. The CPO export volume increased by 73.39% from 30,903 tons in third quarter of 2008 to 116,141 tons in the fourth quarter of 2008. Then export volume of other palm oils products rose by 70.19% from 132,395 tons in the third quarter of 2008 to 444,092 tons in fourth quarter of 2008. And CPKO rose by 34.97% from 35,024 tons in third quarter of 2008 to 53,859 tons in fourth quarter of 2008. Consequently, Indonesia benefited much during the crisis that hit Asia.

EXPORTS OF CPO, OTHER PALM OILS AND CPKO
IN 2002-2008
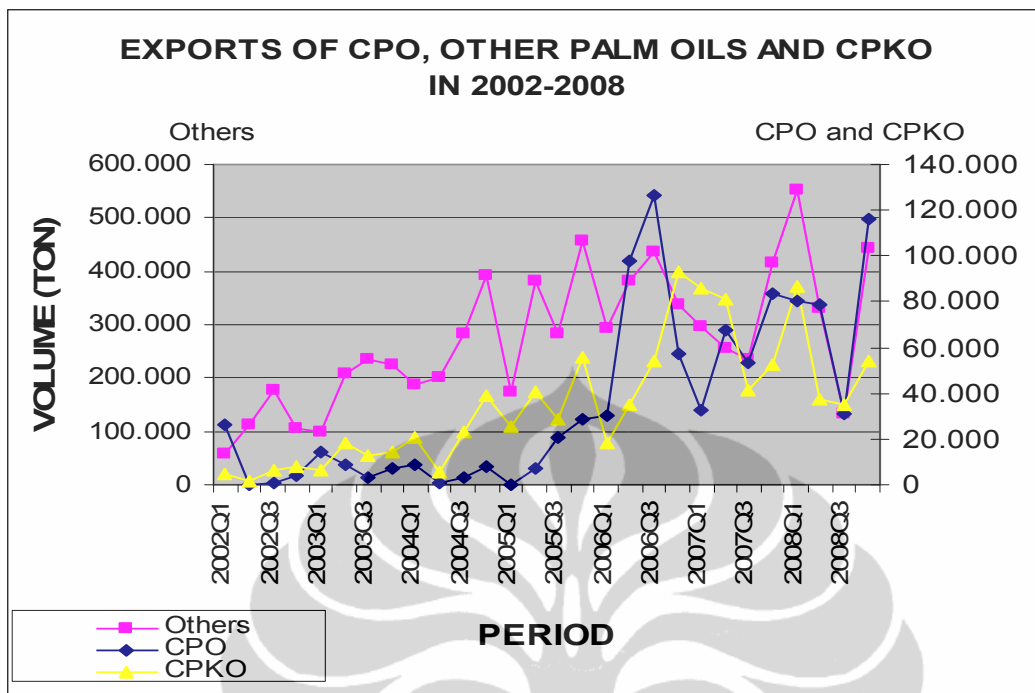
Source: BPS, 2009

Figure 5.1.1. Indonesian Exports of CPO and Its Derivative Products and CPKO to China

According to Figure 5.1.2. in the China's market of CPO, there are only three exporting countries that playing the export of CPO to China. In 2008, the biggest exporter was Malaysia with 47.22% of market share, followed by Indonesia with market share 45.19% and Thailand whit 6.45% and Papua New Guinea with 1.13%. But from 2004 to 2008, Indonesia's CPO export trend was 275%, higher than Malaysia's 204.51%. It means that there is any increasing of demand for export to China from Indonesia significantly.

In addition for export value of other palm oils or its derivative products of CPO, Malaysia still have runner up position with market share in 2008 was 69.85% while Indonesia's market share was 30.02%. There is only two countries that playing export of it product to China. Then trend export value of this product as long as five years started from 2004 to 2008 for Indonesia was 26.08%, lower than Malaysia was 29.54%.

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EXPORTER COUNTRIES OF CPO TO CHINA
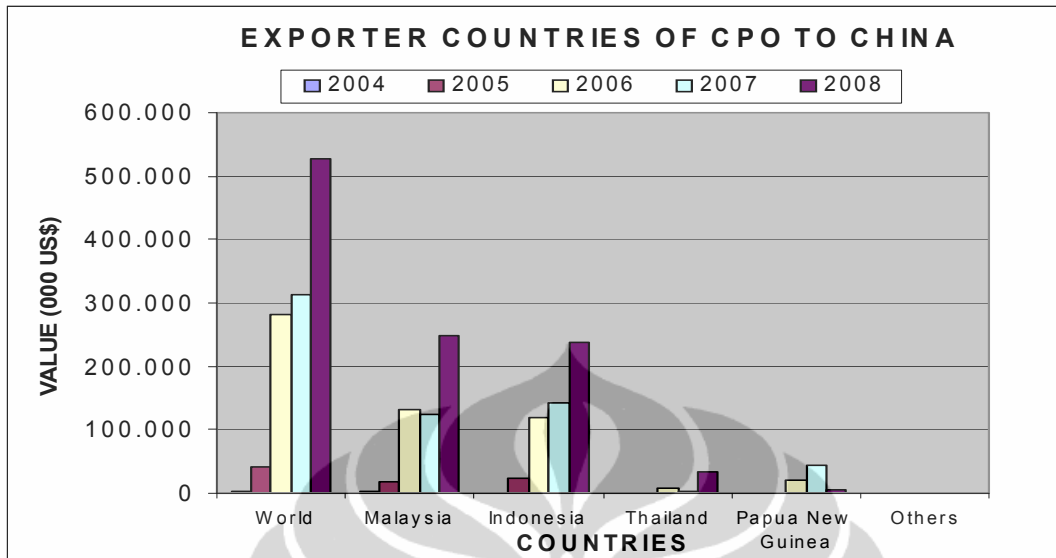
Source: WITS, 2009

Figure 5.1.2. Exporter Countries of CPO to China

However, Indonesia had the biggest CPKO market share of in 2008 was 75.12% while Malaysia still held at 24.82%. Nevertheless as long as five years started from 2004 to 2008 export trend of this commodity for Indonesia was 49.78 % lower than Malaysia 86.19%. Therefore, in the China market Indonesia more superior than Malaysia in export volume of CPKO.

EXPORTER COUNTRIES OF OTHERS OF PALM OIL PRODUCTS TO CHINA
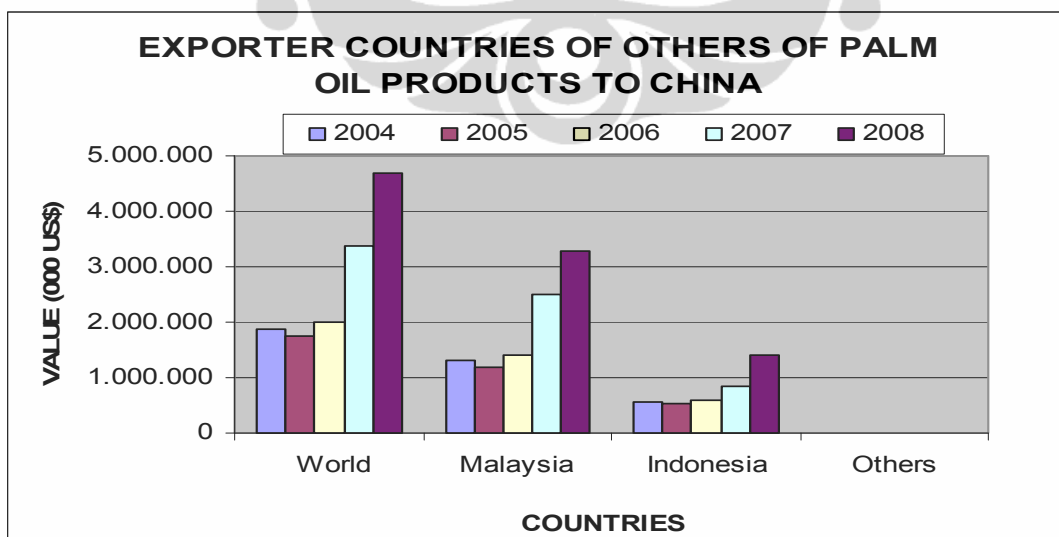
Source: WITS, 2009

Figure 5.1.3. Exporter Countries of Other Palm Oils to China
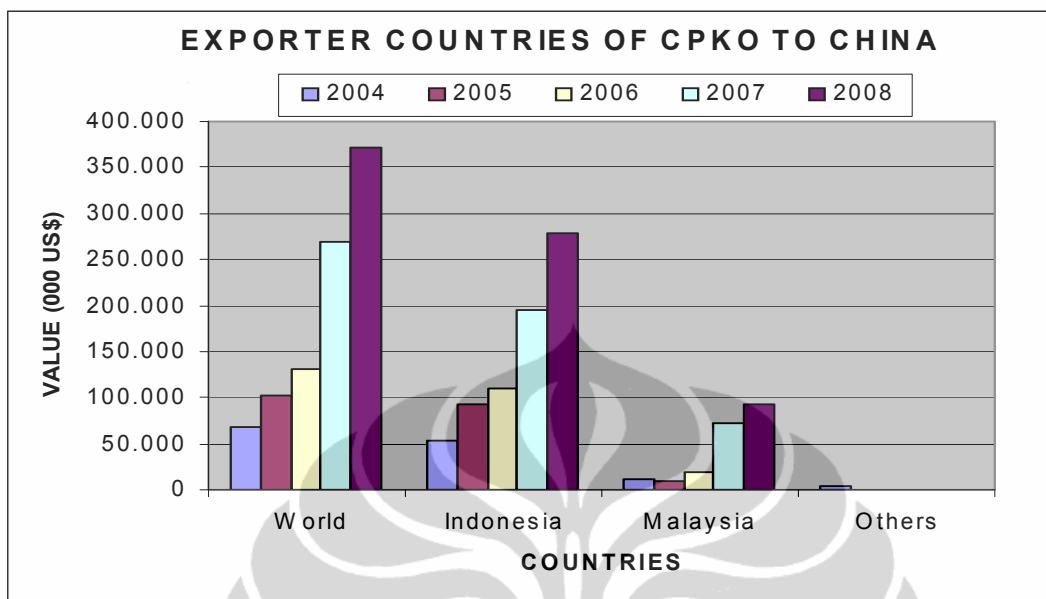
Source: WITS, 2009

Figure 5.1.4. Exporter Countries of CPKO to China

There are many reasons why Indonesia's export value of CPO and its derivative products was lower than Malaysia's export value of it commodities. First, it is productivity. At the present Indonesia's productivity of palm oil averagely reached 3.5 ton/ha/year, lower than its potential productivity of 8-9 ton/ha/year while Malaysia's productivity was more than 4 ton/ha/year. Second, Malaysia's industry of CPO and its derivative products was more developed as it was deeply supported by the Malaysia's government. For example, Malaysia imposes compensation principle by allocating tariff revenues of its products exports on development industries by 49%, promotion by 13%, law advocation by 12%, and social safety linkages 26%. As the resulting Malaysia was larger export of derivative products of palm oil than Indonesia. Thirdly, Malaysia has a good bargaining position in the international market, especially to China. The effect is that Malaysia receives preferential import tariff in China, India, and Pakistan. It should also be noted that Malaysia was required to open import access for its partner countries for tradeoffs (Manggabarani, 2009).

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5.2.   World Prices of CPO, Its Derivative Products and CPKO

The fluctuation in prices of CPO, its derivative products and CPKO in the Rotterdam stock are not much different, that they moved in the same direction. In the first quarter of 2002 until third quarter in 2003 all of commodities averagely had the same fluctuation. However, started from last quarter of 2003 to the last quarter of 2008, price fluctuation of CPKO was higher than those of others commodities. This is because the quality of CPKO was better than CPO and its derivative products. In addition the value added that produced by the CPO is also different from CPKO. The oil quality of CPKO is higher than CPO. Furthermore, CPKO had a higher international price.

Price fluctuation of CPO, its derivative products, and CPKO were less reflective than the actual market price. The price listed on the Stock of Rotterdam is the only reference to the purchase price of CPO. Meanwhile, the real selling price is the price that agreed by the seller and the buyer in the market. But this price is not systematically recorded.

For this reason, it clear why pricing variable is not sufficient to answer the question for the world price for CPO, its derivative products and CPKO if it has significant impact on the export demand. According to the theory of demand for export when the commodity price rises on the world market, demand for exports will decline. But this is not the case with commodities of CPO, its derivative products and CPKO. Based on the price variable, the price charts do not have real impact on export demand. The printed prices are not the real price that actually took place which were determined by transactions between sellers and buyers.

In addition, the businessmen in the market have been speculating in trading CPO, its derivative products and CPKO. Speculation exists because the businessmen expect to possess more of the comodities to anticipate higher prices in the future. That is way the pattern of CPO price fluctuation follows the fluctuation of crude oil price.[10] As the evidence, at the peak point, the price of CPO reached at the highest

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[10] It is supported by the Ministry of Trade research for the determinant factor of CPO price in the world market. This document is not publicized.

levels in June 2008 and the crude oil reached its highest at US$ 126.27/barrel for spot price and US$ 131.11/barrel for future price. However, the export volume of CPO, its derivative products and CPKO were not responsive toward increased international prices.
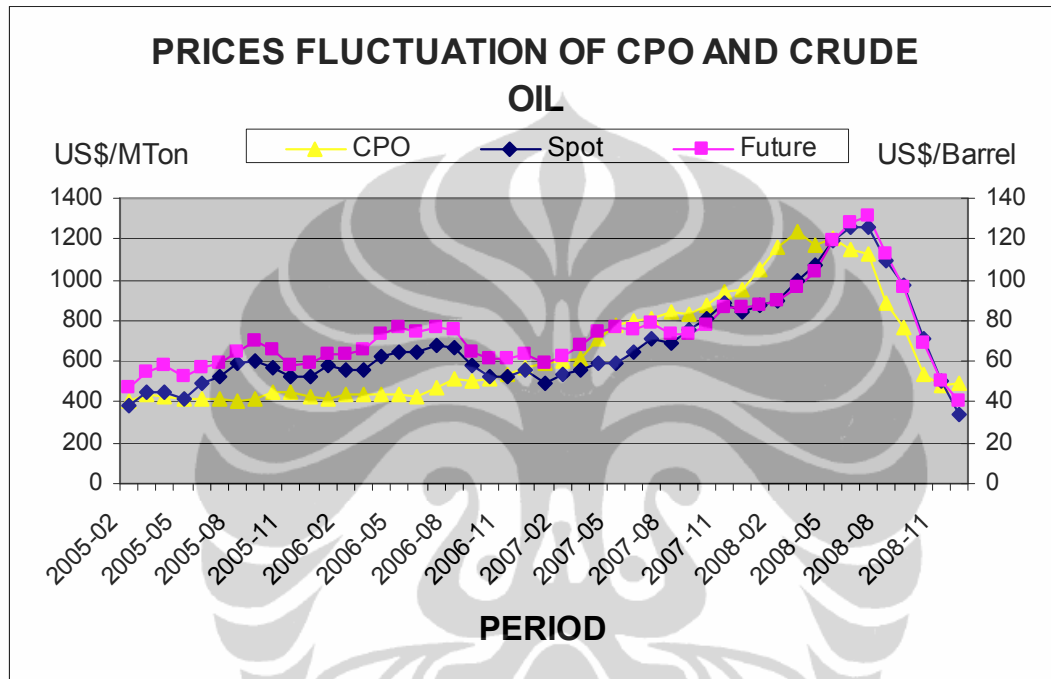
Source: Reuters, 2009.

Figure 5.2.1. Prices Fluctuation of CPO and Crude Oil

In addition, the 2008's global crisis resulted in Indonesia's decreased balance of payments. It was quite positive in the first quarter of 2008 but became significantly in the second quarter of 2008, especially in the last quarter. Pressure in the balance of payments performance was driven by a worsening current account triggered by declining export performance following the weakening global demand and the slump in commodity prices in the world.[11] Therefore, in the third-quarter of 2008 the prices of CPO, its derivative products and CPKO fell from the highest to the lowest levels within the last two years. The relation between CPO price and export

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[11] Outlook Indonesian Economy 2009-2014, January edition 2009, page: 61.

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volume of the commodity in 2008 was recorded with significant correlation. There was a steep decrease of the volume by 155.47% from 78.949 tons in second quarter of 2008 to 30.903 tons in third quarter and CPO price decreased by 27.21% from US$ 1,174/Mtons in second quarter to 923.47 in third quarter of that same year. Furthermore, in the last quarter of 2008, there was a significantly increased export volume while the price of CPO relatively decreased. The export volume of CPO rose sharply by 275.82% from 30,903 tons in third quarter of 2008 to 116,141 tons in the last year of 2008 while the price just decreased by 82.43% from US$ 923.47/MTons to US$ 506.21/MTon in the last quarter of 2008.

The price of its derivative products of CPO or other palm oils in 2002 until third quarter of 2005 had gradually increased. In addition, beginning in the last quarter of 2005 the price of other palm oils steadily rose until it reached US$ 1,209.09/MTons following an increased amount of other palm oils export volume to 552,706 Tons. Furthermore, its derivatives products prices were recorded reached a peak at the level 1,254.34 in the second quarter of 2008 but in the same period the export volume decreased to 331,395 tons. In the last quarter of 2008, those commodities increased the export volume by 70.19% to 444,092 tons while the price fell by 72.54% from US$ 964.28/MTon in third quarter of 2008 to US$ 558.87 in the last quarter of 2008.
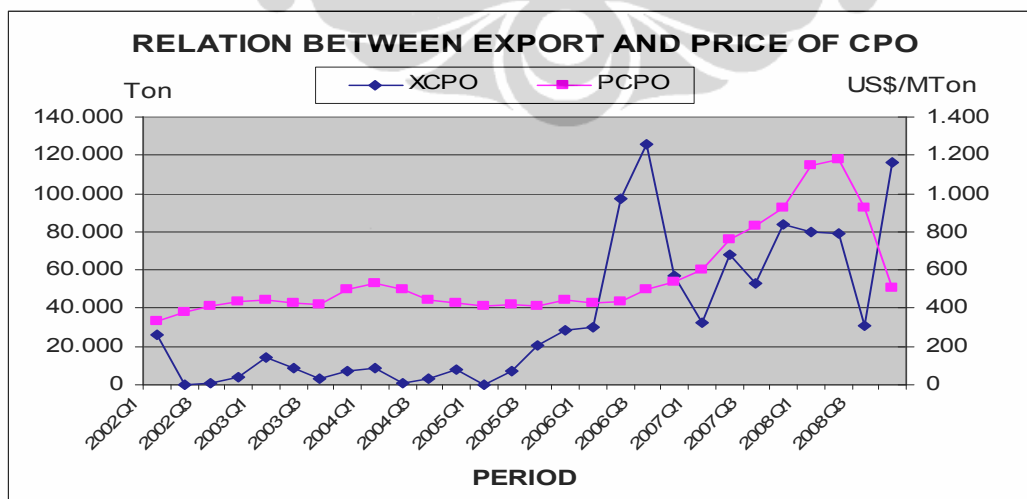
Source: Reuters, 2009.

Figure 5.2.2. Relations between Export and Price of CPO

The relation between price of CPKO and its export volume had the same fluctuation. The price fluctuation of CPKO in first quarter of 2002 increased until second quarter of 2005 following the gradual increased of its export volume before it remained constant until last quarter of 2006. Furthermore, the price rose steadily before it reached the peak US$ 1,419.67 in the second quarter of 2008 though the volume remain the same. But the price of CPKO dropped again by 82.98% from US$ 1,114.33/MTons in the third quarter of 2008 to US$ 609/MTon in the last quarter of 2008 and the export volume still managed to increase by 34.97% from 35,024 ton to 53,86 ton in the same period.
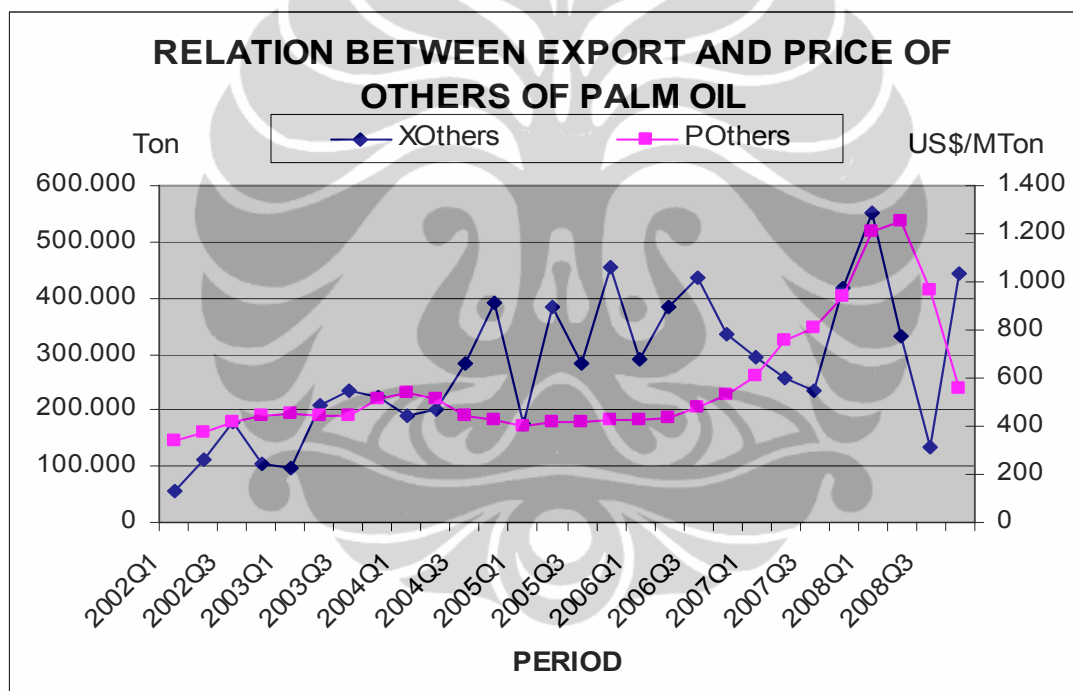
Source: Reuters, 2009.

Figure 5.2.3. Relations between Export and Price of Other Palm Oils

Finally we say that the prices of CPO, its derivative products, and CPKO in the international market did not too significantly influence the amount Indonesian export to China. On the other hand, relation between exports value and prices showed that prices in the international market influenced less the demand for exports of CPO, its derivative products and CPKO. In this condition it can be said that the price did

not play a role in the volume growth. Demand for Indonesian exports of CPO, its derivative products, CPKO to China market were more influenced by the amount of the stock of the China market.
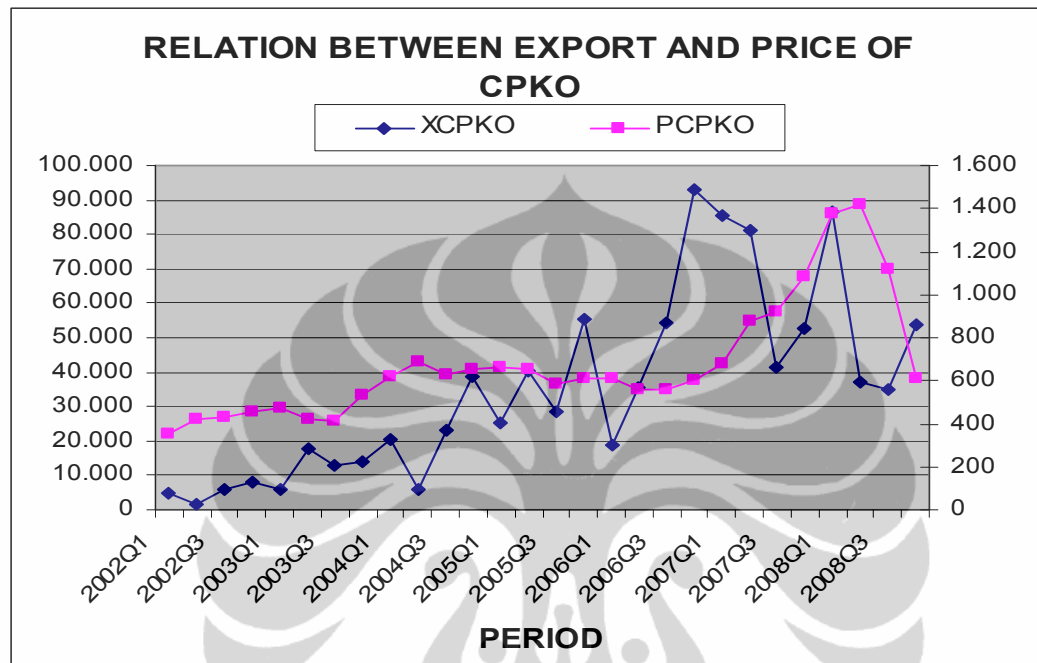
Source: Reuters, 2009.

Figure 5.2.4. Relations between Export and Price of CPKO

5.3 Real Exchange Rate

Before 2005, the Yuan was undervalued against Dollar. The undervalued Yuan against Dollar made it exposed to currency appreciation. In addition, the appreciation supported by the exchange rate regime is fixed-paged and controlled by government, namely Revaluation. System fixed peg exchange rate policy, meaning there are threshold up and down that make Yuan exchange rates more stable against Dollar's exchange rate. Moreover, Yuan undervalued condition would have an impact on the China's trade. Price of China's exports goods become more expensive and price of China's imported goods become cheaper overseas.

Furthermore, the U.S. government urged the government of China to make revaluation of Yuan against the Dollar. Mankiw (2006) said that if the condition of

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country is the high real exchange rate, foreign goods are relatively cheaper and domestic goods are more expensive. Conversely, if the real exchange rate is low, it is because China's currency is undervalued or its real value is appreciated. In July 2005 the government of China finally made the revaluation against the Dollar by applying the threshold of the upper and lower threshold limits.

From the Figure 5.3.1 it can be explained that the first quarter of 2002 value of exchange rate between Indonesia's Rupiah and China's Yuan reached 1,832.66 and gradually decreased in the first quarter of 2004 at level 1,517.13. It rose again almost to the early position at 1811.06 in the second quarter of 2005. After that the exchange rate of Rupiah againts the Yuan began fluctuate. Further, starting from first equarter of 2006, continuously Indonesian exchange rate rose and reached the higest level 2.664.79 in the last quarter of 2008. It means that Rupiah was overvaluad against the Yuan. So there is needed more Rupiah to obtain one Yuan. The consequence is that implication is that the price of China's imported goods become cheaper overseas and it led to increased import of CPO, its derivative products and CPKO from Indonesia.
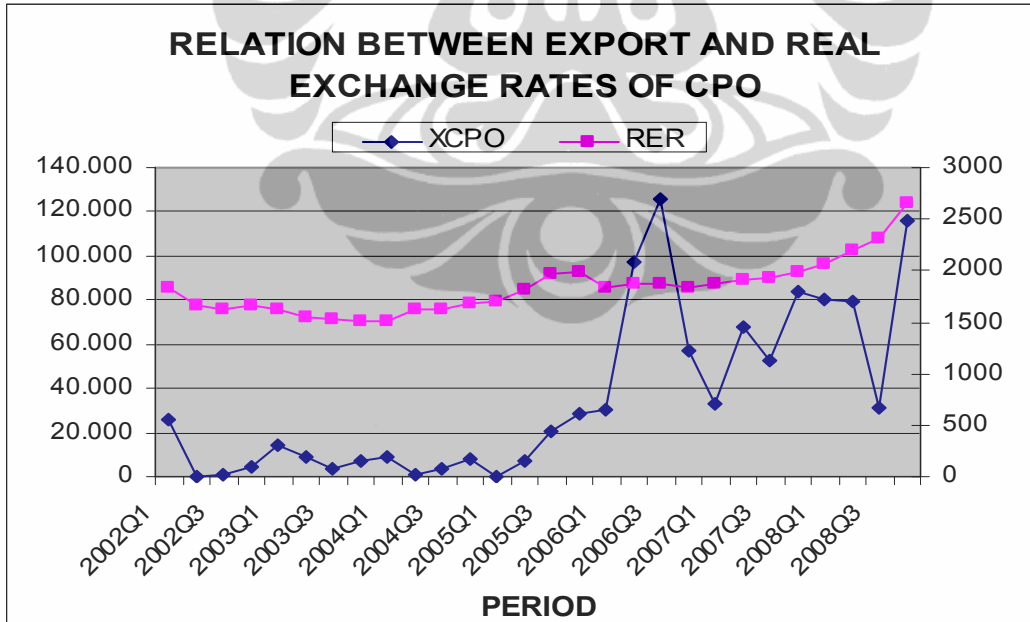
Source: International Fund Statistic and BPS, 2009.

Figure 5.3.1. Relation Between Export and Real Exchange Rates of CPO in 2002 to 2008

According to Figure 5.3.2. we can describe that after China did revaluation its Yuan, real exchange rates fluctuation gradually decreased from 1,979.53 in last quarter of 2005 to 1,931.39 in third quarter of 2007. But fluctuation of real exchange rates did not quite influence the export value of CPO, its derivative product and CPKO. In addition, because of global financial crisis in the last of 2007, the Rupiah more depressed than before. Consequently, in the last year of 2008 real exchange rates of the Rupiah against Yuan was 2,664.79 and it would stimulate an increased demand for Indonesian exports of those commodity to China. As seen in this period, the export volume of other palm oils increased by 70.19% from 132,395 tons in third quarter of 2008 to 444,092 ton in the last quarter of 2008.
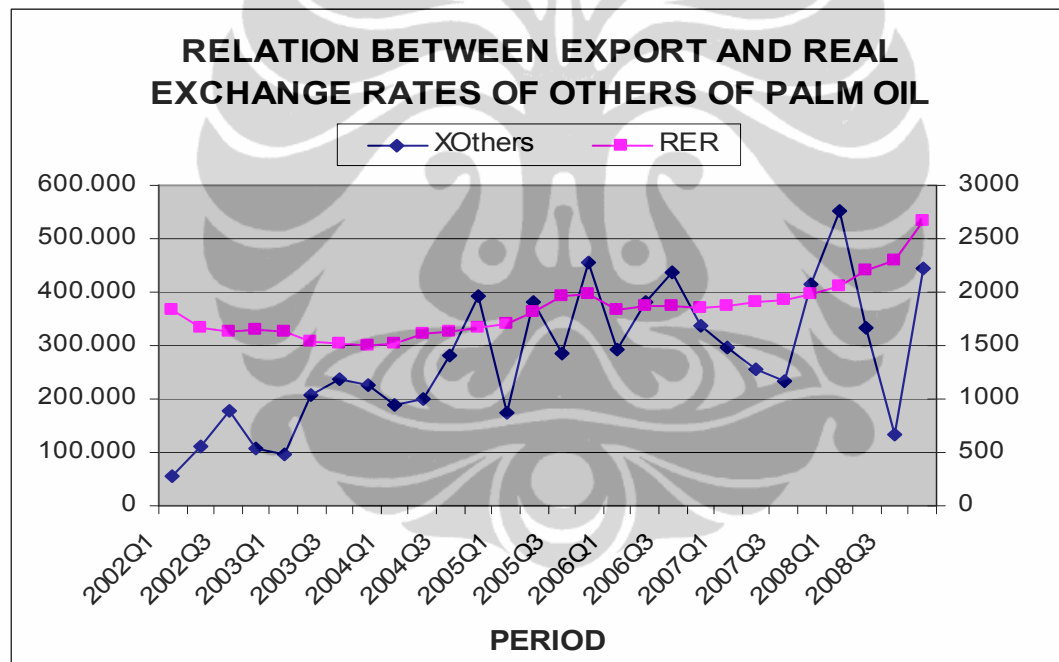
Source: International Fund Statistic and BPS, 2009.

Figure 5.3.2 Relation Between Export and Real Exchange Rates of Other Palm Oils in 2002 to 2008

According to Figure 5.3.3. we can say that there is a relation between real exchange rates and export volume of CPKO. When the Rupiah more depressed against the Yuan, it resulted in increasing export volume of the commodity. For example when real exchange rates reached at 1,865.63 in the second quarter of 2006,

the export volume reached 35,316 tons. In addition, in last quarter of 2008, the value of real exchange rates reached 2,664.79 as a result of the amount of export volume reached 53,859 tons at the same period.
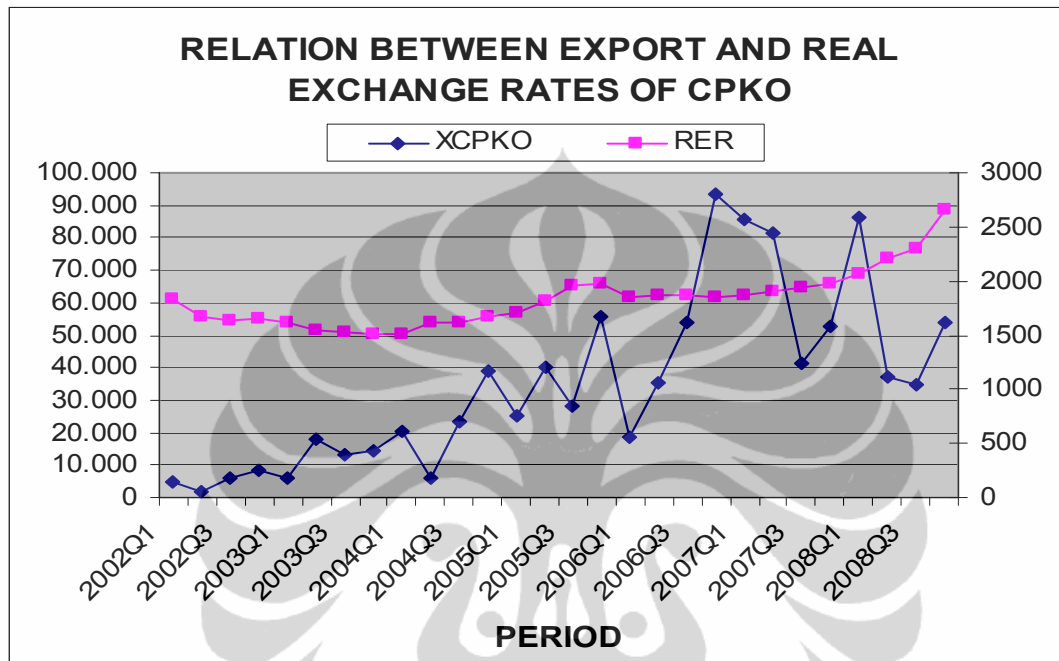
Source: International Fund Statistic and BPS, 2009.

Figure 5.3.3. Relation between Export and Real Exchange Rates of CPKO in 2002 to 2008

Generally, if we measure the annual total export value, we are seeing increased export volume of CPKO commodities every year. It means make senses according theory that the relationship between real exchange rates and export volume is inversely proportional to the value of exports. If the real exchange rate of the Rupiah depreciated against the Yuan automatically, it will raise value of China's import goods. Moreover, from China's point of views Indonesia's export goods will be cheaper. Consequently demand for CPO, its derivative products and CPKO by Chi will increase.

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5.4   Export Tariff

Exports tariff for CPO, its derivative products and CPKO was determined by the CPO price in Rotterdam market one month in advance. So the fluctuation of CPO export tariff moves in the direction of price movement of CPO in international markets. In the second-quarter of 2008, the prices of CPO, its derivative products and CPKO in Rotterdam reached the highest level, with the export tariffs were set by the Minister of Finance with recommendation from several institutions such as the Ministry of Trade, the Ministry of Industry, the Ministry of Agriculture, also reached the highest levels: 15.0% , 13.9% and 13.7% respectively. However, variable export tariff are not too responsive to influences export demand. Although the government had set a high tariff on CPO, its derivative products, and CPKO, demand for exports of CPO, its derivative products and CPKO did not decline. Demand for exports of CPO, its derivative products and CPKO in the China's market was more affected by the amount of those stocks in the market.

For example the fluctuation between export tariff of CPO and the amount of export value of CPO. According to Figure 5.4.1. we can say that in from first quarter of 2002 to third quarter of 2005 the government imposed the constant 3% export tariff and the fluctuation of CPO export volume relatively same. The fluctuation of the export volume was high in first quarter. Then in the second quarter decreased before it rose until the last quarter of the period. Further, when the government decreased the export tariff to a constant 1.5% from the last quarter of 2005 to first quarter of 2007, the CPO export volume increased higher than before. Nevertheless, the government imposed the highest export tariff of 15% for CPO in the second quarter of 2008 but the fluctuation of export volume did not quite influence. The total export volume in this period was 78,949 tons. Because of global financial crisis in the middle of 2008, the government lowered the tariff below 4.2%. The main purpose why the government did was to encourage export of this commodity. So in the last quarter of 2008 export tariff of CPO was set to 4.2%. And this resulted in its increased export volume by 275.82 % from 30,903 tons in third period of 2008 to 116,141 ton the last period.

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There are many reasons why government imposed export tariff on CPO, its derivative products, and CPKO. First, it intends to control the domestic supply and price of CPO, its derivative products and CPKO. The government has imposed CPO export tax since 1994 as the CPO industry plays an important role in Indonesian economy. The imposition of the tax is expected to have a substantial impact on various aspects of the industry, such as on investment, production, trade, and farm income and welfare distribution (Wayan, 2004). Second, it intends to ensure the availability of raw material for producing cooking oil in the domestic market. The export tax can be used as an instrument to indicate the flow of CPO in the world market. In many ways, the governments can interfere more to lower and stabilize the price of the domestic market than the price of the world market.
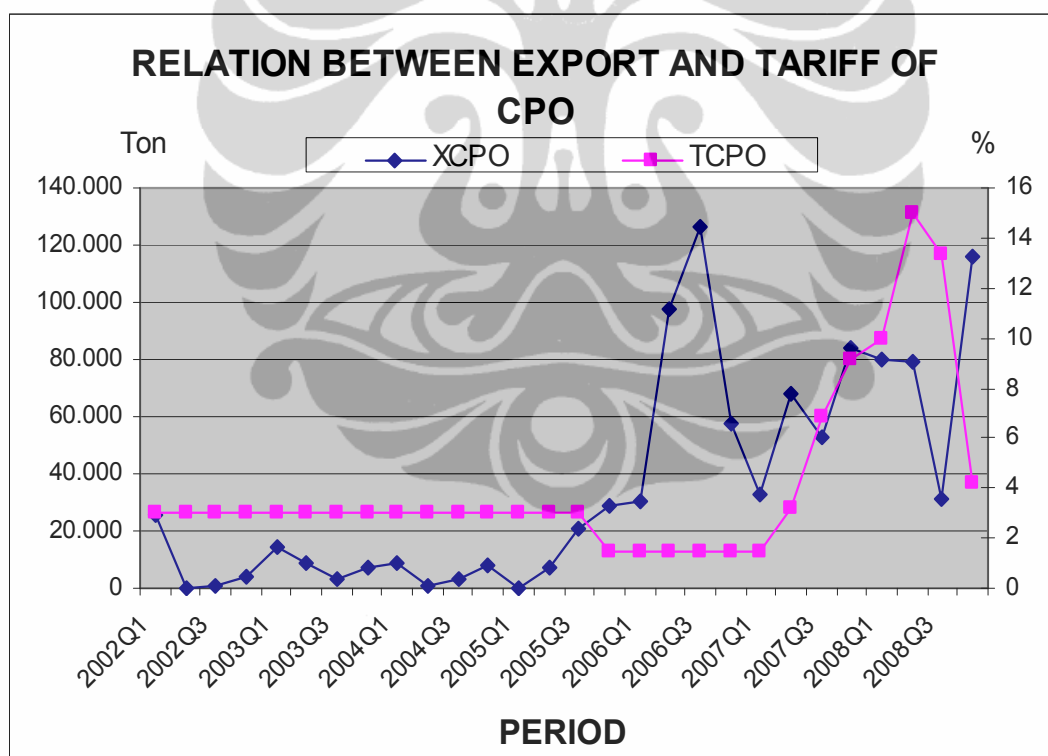
Source: Ministry of Finance and BPS, 2009.

Figure 5.4.1. Relations between Exports and Export Tariff of CPO

The fluctuation of export tariff imposed on other palm oils is not really different from CPO. When the CPO export tariff was 3%, the other palm oils export tariff was 0.7%. In addition, decreased CPO tariff to 1.5% was followed by a decrease on the other oils to 0.3% in the same period. The relation between export tariff and export volume of other palm oils was not quite significant in influencing each others. As evidenced in the period of second quarter in 2007, when the government imposed 2.4% export tariff, the export volume reached 256,315 tons. Furthermore, in second quarter of 2008 when export tariff reached its highest of 13.9%, the export volume was not quite influenced; in this period the export volume reached 331,558 tons. In addition, because of global financial crisis that attacked Indonesian economy, to push up trade sectors, the government reduced export tariff to 3.6% in the last quarter of 2008. Consequently it increased the export volume to 444,092 tons. The lowered tariff for other palm oils by 71.49% from third quarter of 2008 to the last quarter of 2008 followed by increasing export volume of other palm oil by 235.43% in this same period.
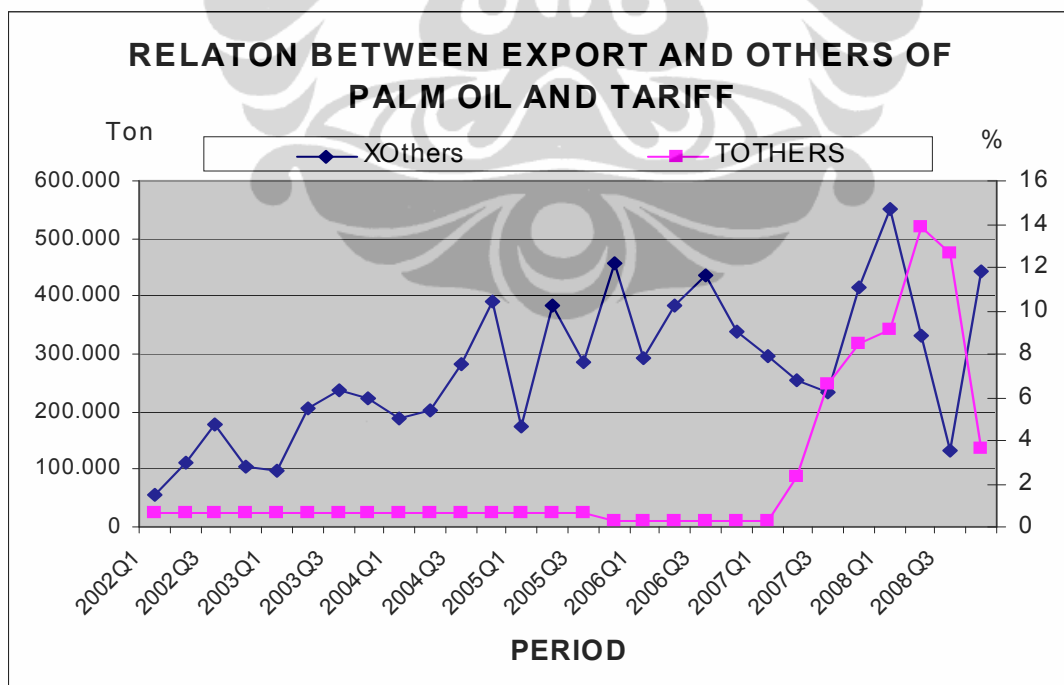
Source: Ministry of Finance and BPS, 2009.

Figure 5.4.2. Relations between Exports and Tariff of Other Palm Oils

The Indonesian government imposed export tariff of CPKO in the beginning of second period in 2007. Before that period, the export tariff had been zero since 2002. But export volume fluctuation not quite for the imposed export tariff. From 2002 to the middle of 2007, the fluctuation of CPKO export volume followed the that of CPO export volume. However when the export tariff of CPKO reached the peak position 13.7% in the second quarter of 2008, its export volume decreased by 54.41% from 81,347 tons in the second quarter of 2007 to 37,089 tons in second quarter of 2008. Furthermore, to increase its export volume, the government reduced export tariff by 74.39% from 13.7% in the second period of 2008 to 3.5% in the last period of 2008 and it saw its increased export volume by 45.22% from 37,089 tons to 53,859 tons in the same period.
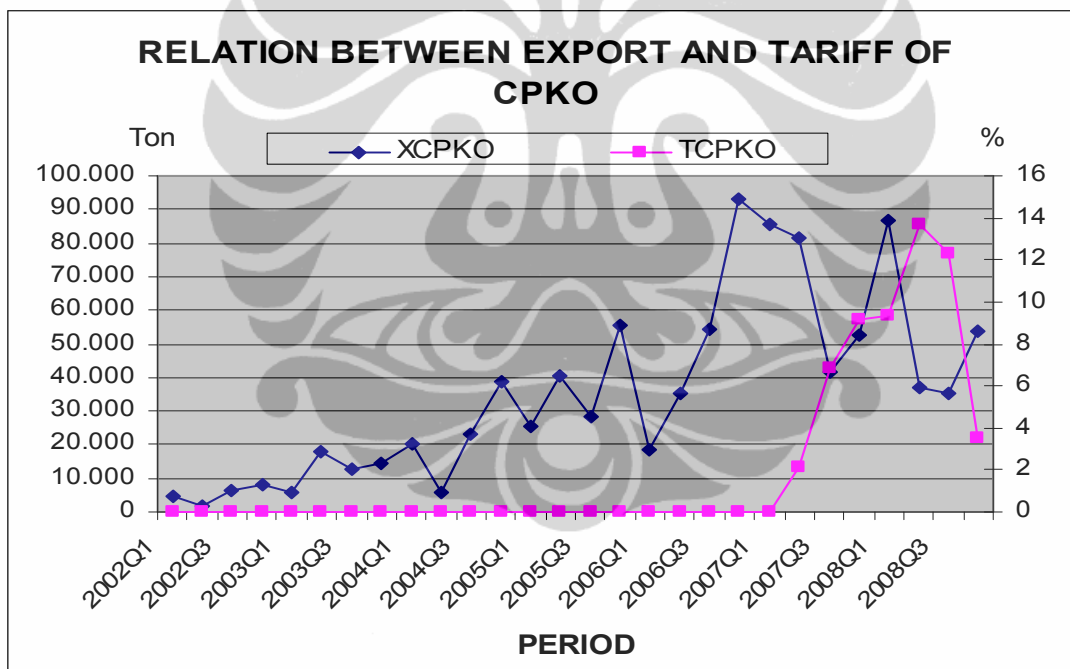
Source: Ministry of Finance and BPS, 2009.

Figure 5.4.3. Relations between Exports and Export Tariff of CPKO

The export tax variable has no significant effects on Indonesian exports growth of CPO, its derivative products and CPKO to the China. According to Wayan (2004), his study finds that an increase of a 1% export tax rate causes a 0.19%

decrease in mature area/investment and 0.81% drop in production. More over, this policy also leads to a 0.41% cent drop in export. At the farm level, an increase of 1% export tax rate leads to a decrease of 1.53% of farm income. In addition, this also causes a 1.22% decrease in added value in industry and 0.09% decrease in employment. Therefore, the government should think about imposition export tariff of Indonesia's exports of CPO, its derivative product, and CPKO in the foreign market in order to increase competitiveness of Indonesia's those commodities in the world market and encourage downstream CPO in domestic market.

5.5 CEPT5 as Dummy Variable

According to Munadi, et.al (2006) said that with the advent of AFTA (ASEAN Free Trade Area), Indonesia as a member ASEAN has pledged to reduce the tariff under the Common Effective Preferential Tariff (CEPT5) program. This trade liberalization move is expected to bring some major changes onto the Indonesian palm oil industry which has been subjected to various degrees of intervention and protection. According to result of her study, the trade liberalization due to the increase of domestic price and reduce world price. Reduction on import tariff on the exported quantity to India, China, Europe, and the rest of the world increased by: 0.25, 2.67, 0.49 and 2.96 percent respectively.

In our analysis, CEPT5 we used as dummy variables shows the condition before the ratification of the agreement of the ASEAN-China Free Trade Area (AC-FTA) (China import tariff is high) with value 0 and after the countries have ratification of AC-FTA (China import tariff is low) with value 1. China imposed import tariff of CPO, its derivative products, and CPKO in the years 2003-2004 for 41.60%, 30.40%, and 10%. In the year of 2005 decreased to 14.45%, 13.16% and 9.50%. Based on CFPT5, tariff import duty of CPO and its derivative products and CPKO in China from 2006 to the present is 9% for CPO, 8% for its derivative products and 9% crude palm kernel oil. With the decline in China's import tariff, it will increase the volume and value of the exports of those commodities to China. It means that China can be the potential market of Indonesian CPO, its derivative products, and CPKO.

5.6   Result of Estimation Model

5.6.1   Significance Test on Indonesian Exports of Crude Palm Oil, Its Derivative Products, and Crude Palm Kernel Oil

The coefficient estimation result of variable regression will be faced upon the whole estimation of commodities of CPO, and its derivatives export products such us: Crude Palm Oil HS 151110, Its derivative product or Other Palm Oils HS 151190, and Crude Palm Kernel Oil HS 151321. As I stated before, this estimation will be operated by E-Views 4.1 program in which each of data could be estimated by using *fixed effect model (FEM)*.

Table 5.6.1
Significance Test on Indonesian Exports of Crude Palm Oil, Its Derivative Products, and Crude Palm Kernel Oil

Variable	Coefficient	Probability	Appropriate with the Expected Sign		Probability
			Yes	No	
Log(RERT)	1.801902	0.0125	Yes	-	5%
Log(PCIT)	1.399167	0.0038	-	No	1%
Log(TEIT)	-0.521463	0.0008	Yes	-	1%
(DCEPTT)	0.451786	0.0691	Yes	-	10%
Adjusted R-squared : 0.980823					

5.6.2 Interpretation and Analysis of the Model

The interpretation of the estimation result for that model can be explained as follow:

a. The correlation between dependent and independent variables is shown by the value of adjusted R-squared as 0.980823. It means that all explanatory variables can be explained by the model in the level of 98 percent in condition ceteris paribus. So, it is relatively strong correlation between dependent and independent variables.

b. Variable of exchange rate gives significant influence to Indonesian export for those commodities. Every increasing 1 percent of exchange rate will increase Indonesian exports 1.80%. In this case of the real exchange rate; the coefficient is positive; it means that a depreciation of the Rupiah against Yuan will increase the Indonesian exports of CPO, its derivative products, and CPKO to China. In the other words, an appreciation of Yuan currency toward Rupiah currency will increase the China's import of those commodities. And probability mistake to take decision in this model is 1.2 percent ceteris paribus. Elasticity coefficient of this variable is more than one and namely elastic. It means that if this variable increases in a 1 percent, it will give more changes to Indonesian exports of CPO, its derivative products, and CPKO to China will rise.

c. Variable of world price of CPO, its derivative products, and CPKO affects significantly in the level 99% on Indonesian exports of those commodities to China and gives positive coefficient sign. If the world price of CPO, its derivative products and CPKO increase 1 percent it means that Indonesian exports of CPO, its derivative products, and CPKO to China will increase 1.39%. Probability error to take this decision is 0.38 percent ceteris paribus. The number of elasticity more than 1 % it means that the change of world price of those commodities against Indonesian exports of CPO, its derivative products, and CPKO to China is elastic. But the sign of correlation between world price and Indonesian exports of CPO, its derivative products, and CPKO to China is not appropriate with the hypothesis.

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We expect that its relation sign is negative. But the result of its correlation sign is positive. It is caused by the commodities prices in the world market exploited by business speculation.

d. Tariff export variable gives significant influence to Indonesia's trade. It is shown in error probability to take decision as 0.08 % and it has expected negative sign ceteris paribus. If the Indonesian tariff for those commodities decreases, the total export of Indonesia for those commodities will increase. Based on the result of model, if tariff decreases 1%, it will cause increased export for those commodities about 0.52%. Based on elasticity; Indonesian tariff has value less than unity; it means that tariff is in the inelastic export demand. So that change of tariff will slowly affect to Indonesian export, in other words, tariff is not the major factor which is able to push Indonesian exports of CPO, its derivative products and CPKO to China.

e. Finally, dummyCEPT5 gives significant influence to Indonesia's trade. It is shown in error probability to take decision as 0.69 % and it has expected positive sign (+) ceteris paribus. If the China's import tariff for those commodities decreases, the Indonesian export volume of those commodities to China will increase.

Based on the estimation, we use pooled least squares and fixed effect. But fixed effect is the most preferred because it has the best estimation result. The independent variables have relation to the theory and also have significant relation with dependent variable. Moreover based on the opinion from some econometricians, when the number of time is more than the number of object, it is preferred to use fixed effect model.

CHAPTER VI
CONCLUSION AND RECOMMENDATION

6.1   Conclusion

The biggest exporter of crude palm oil and crude palm kernel oil in the world is Indonesia while Malaysia possesses more comparative advantage than Indonesian in regards of the export of other palm oil products. However, in China's market, Indonesian market share of CPO and its derivative products is lower than Malaysia. It caused at the present, Indonesia's productivity of palm oil averagely reached 3.5 ton/ha/year lower than Malaysia's productivity was more than 4 ton/ha/year. Also Malaysia's industry of CPO and its derivative products was more developed as it was deeply supported by the Malaysia's government. Nevertheless, Indonesia has export volume of CPKO larger than Malaysia to China even to the world. Consequently, Indonesia will benefit to do specialization CPKO export to the world especially to China.

The result of econometric regression shows that real exchange rate variable significantly influence to Indonesian export for CPO, its derivative products and CPKO. Also, tariff export variable give significant influence on Indonesian exports of those commodities. But based on elasticity, its variable is not elastic to affect Indonesian those exports. Meanwhile the relation between price variable and export demand is significant. But the expected sign for this variable is not appropriate with the hypothesis. We expect the price sign is negative but the result of estimation we obtain positive price sign. It means that if price of commodities in world market increase, so will the export demand for those commodities increase. And the movement of CPO, its derivative products and CPKO follow the fluctuation of crude palm oil in the world market. We state that in the world market price of CPO is used for business speculation. Finally, as a dummy-CEPT5, China import duty is affectively influence to Indonesian exports for those commodities. The decreased China's import tariff will increase Indonesian exports volume of those commodities.

6.2   Recommendation

We recommend to Indonesian government should concern with the development of palm oil industry both in downstream industry and upstream industry of palm oil. Because at present the Indonesia's productivity is lower than Malaysia's productivity. Moreover the development its industry gives result multiplier effect in the country's economy growth.

We suggest that the government revenue from palm oil tax should be used for such as: development of sustainable palm oil plantation, research and development of palm oil, promotion and advocacy toward negative campaigning in foreign countries, and also development of infrastructure of the palm oil industry.

In addition, we suggest for further study to analyze deeply the effect of bilateral agreement between Indonesian government and China government on decreasing effective preferential tariff for Indonesian exports of its products' to China.
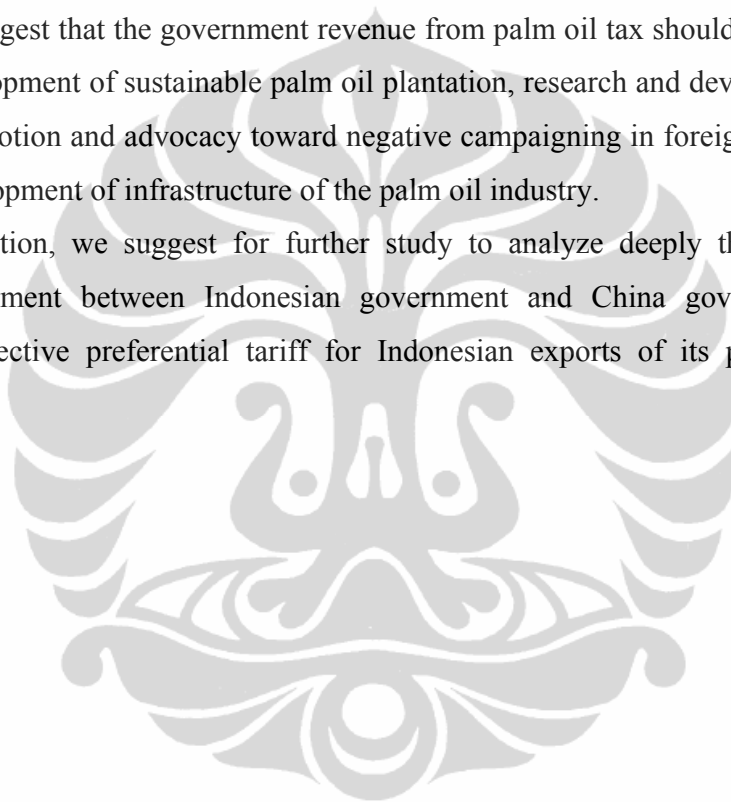
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Analysis of determinant..., Niken Wulandari. FE UI, 2009.

APPENDIX I

Result of Estimation Model

a. Fixed Effect Method

Dependent Variable: LOG(XIT?)
Method: GLS (Cross Section Weights)
Date: 11/09/09   Time: 12:09
Sample: 2002:1 2008:4
Included observations: 28
Number of cross-sections used: 3
Total panel (unbalanced) observations: 61
One-step weighting matrix
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(RERT?)	1.801902	0.697415	2.583687	0.0125
LOG(PCIT?)	1.399167	0.462090	3.027912	0.0038
LOG(TEIT?)	-0.521463	0.146130	-3.568486	0.0008
(DT?)	0.451786	0.243560	1.854927	0.0691
Fixed Effects				
_HS151110--C	-12.14017			
_HS151190--C	-10.10955			
_HS151321--C	-12.08729			

Weighted Statistics			
R-squared	0.982741	Mean dependent var	13.41384
Adjusted R-squared	0.980823	S.D. dependent var	5.537553
S.E. of regression	0.766840	Sum squared resid	31.75433
Log likelihood	-58.89544	F-statistic	512.4667
Durbin-Watson stat	1.073721	Prob(F-statistic)	0.000000

Unweighted Statistics			
R-squared	0.769287	Mean dependent var	11.11157
Adjusted R-squared	0.743652	S.D. dependent var	1.638817
S.E. of regression	0.829746	Sum squared resid	37.17785
Durbin-Watson stat	1.010228		

APPENDIX II

b. Pooled Least Squares

Dependent Variable: LOG(XIT?)
Method: Pooled Least Squares
Date: 10/08/09   Time: 16:24
Sample: 2002:1 2008:4
Included observations: 28
Number of cross-sections used: 3
Total panel (unbalanced) observations: 61
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-54.52082	12.28557	-4.437793	0.0000
LOG(RERT?)	5.898274	1.430329	4.123717	0.0001
LOG(PCIT?-1)	3.581662	0.648823	5.520249	0.0000
LOG(TEIT?)	-1.611526	0.198264	-8.128165	0.0000
(DT?)	-0.600368	0.387723	-1.548446	0.1271
R-squared	0.616386	Mean dependent var		11.11157
Adjusted R-squared	0.588985	S.D. dependent var		1.638817
S.E. of regression	1.050652	Sum squared resid		61.81673
Log likelihood	-86.96091	F-statistic		22.49506
Durbin-Watson stat	0.775932	Prob(F-statistic)		0.000000

APPENDIX III

Data Running

COMODITIES	Ys	Xit	RERt	PCit	TEit	Dt
_HS151110	2002Q1	25.952,40	1832,66	330,31	3,0	0
	2002Q2	0,00	1667,43	377,35	3,0	0
	2002Q3	450,00	1632,30	415,07	3,0	0
	2002Q4	4.100,00	1655,04	434,97	3,0	0
	2003Q1	14.485,00	1624,05	446,05	3,0	0
	2003Q2	9.010,00	1538,35	426,55	3,0	0
	2003Q3	3.451,00	1526,88	420,83	3,0	0
	2003Q4	7.100,00	1506,31	500,16	3,0	0
	2004Q1	8.500,00	1517,13	528,13	3,0	0
	2004Q2	500,00	1618,46	501,49	3,0	0
	2004Q3	3.500,30	1624,00	440,94	3,0	0
	2004Q4	7.617,44	1675,20	429,92	3,0	0
	2005Q1	0,00	1707,53	413,89	3,0	0
	2005Q2	7.125,43	1811,06	416,04	3,0	0
	2005Q3	20.951,81	1963,43	411,99	3,0	0
	2005Q4	28.545,51	1979,53	439,53	1,5	1
	2006Q1	30.048,85	1842,39	430,02	1,5	1
	2006Q2	97.641,25	1865,63	433,45	1,5	1
	2006Q3	126.148,81	1874,79	494,58	1,5	1
	2006Q4	57.282,47	1843,70	538,91	1,5	1
	2007Q1	32.634,16	1867,83	604,75	1,5	1
	2007Q2	67.784,28	1903,55	760,59	3,2	1
	2007Q3	52.903,65	1931,39	829,55	6,8	1
	2007Q4	83.883,77	1984,29	924,04	9,2	1
	2008Q1	80.212,66	2058,02	1.146,85	10,0	1
	2008Q2	78.948,81	2202,44	1.174,71	15,0	1
	2008Q3	30.903,10	2302,80	923,47	13,3	1
	2008Q4	116.140,79	2664,79	506,21	4,2	1
_HS151190	2002Q1	57.048,61	1832,66	340,61	0,7	0
	2002Q2	111.806,36	1667,43	372,31	0,7	0
	2002Q3	177.438,76	1632,30	414,46	0,7	0
	2002Q4	106.013,35	1655,04	442,08	0,7	0
	2003Q1	98.089,49	1624,05	456,38	0,7	0
	2003Q2	207.507,93	1538,35	441,82	0,7	0
	2003Q3	236.570,27	1526,88	443,26	0,7	0
	2003Q4	224.208,71	1506,31	515,42	0,7	0
	2004Q1	189.067,07	1517,13	536,80	0,7	0
	2004Q2	201.153,07	1618,46	514,46	0,7	0
	2004Q3	281.844,35	1624,00	446,81	0,7	0
	2004Q4	391.569,09	1675,20	430,35	0,7	0
	2005Q1	174.876,35	1707,53	400,60	0,7	0
	2005Q2	382.659,12	1811,06	420,68	0,7	0

COMODITIES	Ys	Xit	RERt	PCit	TEit	Dt
	2005Q3	284.645,19	1963,43	417,43	0,7	0
	2005Q4	455.816,20	1979,53	421,76	0,3	1
	2006Q1	292.506,99	1842,39	424,76	0,3	1
	2006Q2	382.701,87	1865,63	438,11	0,3	1
	2006Q3	435.355,62	1874,79	476,91	0,3	1
	2006Q4	336.874,64	1843,70	532,51	0,3	1
	2007Q1	296.213,29	1867,83	606,63	0,3	1
	2007Q2	256.315,17	1903,55	760,62	2,4	1
	2007Q3	235.102,26	1931,39	809,64	6,6	1
	2007Q4	416.261,91	1984,29	937,17	8,5	1
	2008Q1	552.706,31	2058,02	1.209,09	9,1	1
	2008Q2	331.558,35	2202,44	1.254,34	13,9	1
	2008Q3	132.395,36	2302,80	964,28	12,7	1
	2008Q4	444.091,91	2664,79	558,87	3,6	1
_HS151321	2002Q1	4.900,00	1832,66	352,00	0,0	0
	2002Q2	1.620,00	1667,43	423,67	0,0	0
	2002Q3	6.100,00	1632,30	430,00	0,0	0
	2002Q4	8.250,00	1655,04	457,67	0,0	0
	2003Q1	6.000,00	1624,05	469,33	0,0	0
	2003Q2	17.938,00	1538,35	420,33	0,0	0
	2003Q3	12.923,08	1526,88	410,33	0,0	0
	2003Q4	14.225,00	1506,31	535,00	0,0	0
	2004Q1	20.479,81	1517,13	619,00	0,0	0
	2004Q2	5.712,00	1618,46	691,33	0,0	0
	2004Q3	23.308,34	1624,00	629,00	0,0	0
	2004Q4	38.940,92	1675,20	653,00	0,0	0
	2005Q1	25.249,45	1707,53	662,33	0,0	0
	2005Q2	40.199,71	1811,06	655,67	0,0	0
	2005Q3	28.246,65	1963,43	582,33	0,0	0
	2005Q4	55.549,00	1979,53	607,67	0,0	1
	2006Q1	18.627,91	1842,39	606,67	0,0	1
	2006Q2	35.316,02	1865,63	557,00	0,0	1
	2006Q3	54.079,26	1874,79	559,00	0,0	1
	2006Q4	93.241,17	1843,70	601,67	0,0	1
	2007Q1	85.671,71	1867,83	677,67	0,0	1
	2007Q2	81.346,86	1903,55	875,67	2,2	1
	2007Q3	41.589,89	1931,39	917,00	6,8	1
	2007Q4	52.477,51	1984,29	1.083,67	9,2	1
	2008Q1	86.444,32	2058,02	1.375,00	9,3	1
	2008Q2	37.088,95	2202,44	1.419,67	13,7	1
	2008Q3	35.024,59	2302,80	1.114,33	12,3	1
	2008Q4	53.858,86	2664,79	609,00	3,5	1

APPENDIX IV

Table 3.1.1. National Production of Palm Oil

Year	Yields (Kg/Ha)			
	Smallholders	Government Plantations	Private Plantations	Average Production (Kg/Ha)
2006	2,968.05	3,692.87	3,713.63	3,424.77
2007	2,991.13	3,696.45	3,819.94	3,472.57
2008*	2,523.00	4,165.00	3,846.00	3,511.00

Source: Indonesian Palm Oil Statistics 2008
*estimation

Table 3.1.2. Effort to Increase Productivity

No	Description	Area (000 ha)		
		Smallholders	Government Plantations	Private Plantations
1	Expansion	1.682	221	1.030
2	Replanting	670	39	841
3	Total	2.352	260	1.871
4	Realization 2008 (ha)	466	18	309

Source: Indonesian Palm Oil Statistics 2008
*estimation

Table 3.2.2. Palm Oil Production (2000-2008)

Years	Small Holder Plantations	Government Plantations	Private Plantations	Total (Ton)
2000	1.905.663	1.460.954	2.403.184	5.769.801
2001	2.798.032	1.519.289	4.079.151	8.396.472
2002	3.426.739	1.507.734	4.587.871	9.522.344
2003	3.517.324	1.750.651	5.172.859	10.440.834
2004	3.847.157	1.988.430	6.358.905	12.194.492
2005	4.500.469	2.236.827	7.883.234	14.620.530
2006	5.608.171	2.376.872	8.876.439	16.861.482
2007	6.358.388	2.388.183	9.189.301	17.935.872
2008*)	6.683.020	2.400.223	9.297.166	18.380.409

Source: Indonesian Palm Oil Statistics 2008
*estimation

APPENDIX V

Table 3.4.1. Exporter of CPO to The World in 2004 to 2008 (000 US $)

NO	COUNTRIES	2004	2005	2006	2007	2008	SHARE (%)
	World	4.528.332,53	4.885.413,74	6.122.714,96	7.831.372,73	11.178.630,57	100,00
1	Indonesia	2.320.062,86	2.229.134,11	3.158.394,82	4.047.619,42	5.580.073,63	49,92
2	Malaysia	1.344.290,21	1.591.383,46	1.965.904,27	2.088.767,15	2.992.141,89	26,77
3	PNG	272.226,62	267.611,13	311.857,83	500.350,51	628.015,55	5,62
4	Colombia	158.558,29	171.382,56	149.428,88	322.662,14	481.715,42	4,31
5	Thailand	4.810,24	1.500,69	61.548,83	161.810,26	263.810,82	2,36
6	Singapore	44.893,72	129.312,31	72.359,15	115.235,20	192.852,78	1,73
7	Ecuador	22.732,55	61.041,52	39.904,26	113.227,39	178.538,87	1,60
8	Honduras	39.313,06	44.881,96	44.463,59	94.083,06	159.650,18	1,43
9	Guatemala	28.494,23	25.031,80	34.645,59	72.753,40	159.479,60	1,43
10	Costa Rica	41.474,93	54.200,49	52.121,83	77.773,81	117.279,63	1,05
	Others	251.475,82	309.933,71	232.085,93	237.090,37	425.072,22	3,80

Source: WITS, 2009

Table 3.4.2. Exporter of Others of Palm Oil Products to the World (000 US$)

NO	COUNTRIES	2004	2005	2006	2007	2008	SHARE (%)
	World	7.755.790,10	7.062.464,40	7.726.346,49	11.650.540,89	17.144.480,70	100,00
1	Malaysia	4.418.097,77	3.949.563,15	4.177.634,27	6.648.792,54	10.133.232,23	59,10
2	Indonesia	2.313.699,28	1.983.386,62	2.279.980,73	2.963.133,59	4.474.699,61	26,10
3	Netherlands	290.550,57	335.881,33	545.732,10	854.930,65	1.070.052,21	6,24
	Others	733.442,48	793.633,30	722.999,39	1.183.684,12	1.466.496,65	8,55

Source: WITS, 2009

Table 3.4.3. Exporter of Crude Palm Kernel Oil to the World (000 US$)

NO	COUNTRIES	2004	2005	2006	2007	2008	SHARE (%)
	World	1.038.077,60	1.035.220,20	1.077.414,48	1.606.177,60	2.323.753,59	100,00
1	Indonesia	769.739,08	740.370,77	819.182,63	1.113.420,10	1.704.043,92	73,33
2	Malaysia	100.681,21	112.236,48	113.351,75	179.771,88	226.663,42	9,75
3	Thailand	29.203,59	22.187,90	28.073,92	98.132,93	150.523,06	6,48
4	PNG	34.936,95	41.275,28	35.542,80	57.945,24	63.240,71	2,72
	Others	103.516,76	119.149,77	81.263,38	156.907,46	179.282,49	7,72

Source: WITS, 2009

APPENDIX VI

Table 3.5.1. China's CPO Import Origin from the World (000 US$)

NO	COUNTRIES	2004	2005	2006	2007	2008	SHARE (%)
	World	3.359,38	41.161,91	280.763,41	313.033,17	526.674,18	100,00
1	Malaysia	2.434,64	18.818,23	132.573,56	123.615,41	248.720,35	47,22
2	Indonesia	809,73	22.198,14	118.644,45	141.705,14	238.000,28	45,19
3	Thailand			7.865,29	3.201,48	33.981,47	6,45
4	PNG			21.679,44	44.511,14	5.968,57	1,13
	Others	115,01	145,53	0,67	0,00	3,51	0,00

Source: WITS, 2009

Table 3.5.2. China's Other of Palm Oil Products Import Origin from the World (000 US$)

NO	COUNTRIES	2004	2005	2006	2007	2008	SHARE (%)
	World	1.864.587,88	1.741.006,72	1.993.322,74	3.370.107,49	4.691.397,50	100,00
1	Malaysia	1.299.694,62	1.196.459,96	1.396.923,52	2.504.643,51	3.276.763,12	69,85
2	Indonesia	555.888,96	540.908,36	593.517,26	855.253,61	1.408.293,43	30,02
	Others	9.004,30	3.638,40	2.881,96	10.210,37	6.340,95	0,14

Source: WITS, 2009

Table 3.5.3 China's of Crude Palm Kernel Oil Import Origin from the World (000 US$)

NO	COUNTRIES	2004	2005	2006	2007	2008	SHARE (%)
	World	68.296,90	101.637,77	130.725,35	268.639,66	370.858,05	100,00
1	Indonesia	53.858,11	92.294,46	110.469,24	196.014,72	278.585,16	75,12
2	Malaysia	11.483,78	9.287,21	19.895,64	72.399,83	92.036,74	24,82
	Others	2.955,01	56,10	360,47	225,11	236,15	0,06

Source: WITS, 2009

APPENDIX VII

Table 3.8.1 The Main Role Players of Exports of CPO and Others Consisting of RBD Palm Olein, Crude Olein, RBD Stearin, Crude Stearin, PFAD in 2007.

NO.	NAME OF FIRM	(%)
1	Wilmar	33,58
2	Musim Mas	17,26
3	Permata Hijau Sawit	11,43
4	Asian Agri	10,57
5	Sinar Mas	9,03
6	Berlian Eka Sakti Tangguh	2,97
7	PT. Perkebunan Nusantara	2,29
8	Duta Palma Nusantara	1,81
9	Pasific	1,62
10	Salim Ivomas Pratama	0,70
11	Hasil Karsa	0,02
12	Lain-lain	8,73

Source: Indonesian Palm Oil Board, 2008

Table. 3.8.2. Main Players of Export of CPO in 2007

NO.	NAME OF FIRM	(%)
1	Wilmar	23
2	Musimas	18
3	Sinar Mas	16
4	Asian Agri	9,4
5	Permata Hijau Sawit	8,1

Source: DMSI, 2008

Table. 3.8.3. The Main Export of RBD Olein in 2007

NO.	NAME OF FIRM	(%)
1	Wilmar	40,8
2	Permata Hijau Sawit	18,90
3	Musimas	17,80
4	Asian Agri	9,50
5	Sinar Mas	2,25

Source: DMSI 2008