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Master's Thesis of Public Administration

**Impacts of CPO Export Tariff on the Industries in
Indonesia:
Focusing on Cooking Oil, Oleo-chemical and Bio-diesel Industries**

August 2013

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Seoul National University

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Submitting a master's thesis of Public Administration

April 2013

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Abstract

Impacts of CPO Export Tariff on the Industries in Indonesia: Focusing on Cooking Oil, Oleo-chemical and Bio-diesel Industries

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Crude Palm Oil (CPO) is an important commodity and the most popular oil among soybean, rapeseed, coconut and others. Indonesia has been the biggest CPO producer in the world since 2006. There are three major palm oil based industries in Indonesia such as cooking oil, oleo-chemical and bio-diesel. However, the development of palm oil based industries is not as fast as the CPO production itself. Most of the CPO produced in Indonesia has been exported to other countries. Indonesia has failed benefit from the abundance of CPO to be raw material in CPO processing industries. Therefore the government tried to encourage the palm oil based industries and limiting the CPO export.

In order to encourage the palm oil based industries and limit the CPO export for the domestic supply, the government has imposed a CPO export tariff policy. This study tried to analyze the impact of CPO export tariff to the CPO export and the development of palm oil based industries in

Indonesia. This study also tried to analyze the market and demographic factor that influenced palm oil based industries development in Indonesia

The research found that this policy has a negative correlation on the CPO export, but the impact is very weak. The development of CPO industries is more likely influenced by the market and demographic factor.

Keywords: Crude Palm Oil, Export Tariff, Indonesia

Student Number: 2011 – 24177

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1. Introduction

1.1. Background

Indonesia has abundant and diverse natural resources. Agriculture sector has important role, because it provides foods, employment and also contributes on the Gross Domestic Product (GDP). According to the Ministry of Trade (2011), CPO or Crude Palm Oil has the biggest contribution from agricultural sector for government income. In 2010, the CPO export has reached U.S \$ 15.2 billion which is 11.71 % from the total export of non-oil and gas resources in Indonesia. Since 2006, Indonesia is the biggest palm oil producers in the world surpassing its main competitor Malaysia producing more than 20.8 million tons. It will keep growing due to the expansion of palm oil plantation and land productivity improvement. The total production in 2010 has reached more than 23 million tons of CPO (CIC, 2012). However, more than 60 % of the output is still exported in raw form or CPO.

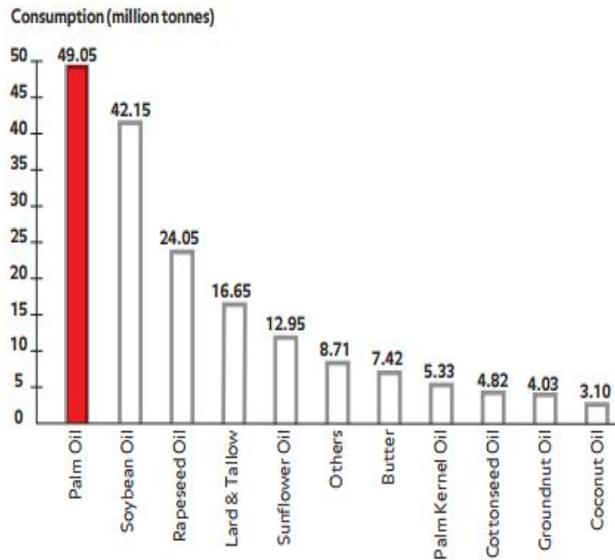
In 2011, Indonesia produces almost 25 million tons of CPO and only 9.5 million ton goes for the CPO domestic supply. Cooking oil industry absorb the most of the CPO domestic supply, almost 68 % is used for the cooking oil followed by Oleo-chemical for 14.38 % and Bio-diesel industry for 12.53 % (CIC, 2012).

During the year 1995 to 2010, the world demand for palm oil increased rapidly approximately more than 32 million tons. The largest importer of CPO in 2007 is China, India and Netherlands which contribute about half of the world CPO import (United States Department of Agriculture, 2008). The main destination of Indonesia's CPO export is Asia which comprises about 70 % of total export, followed by EU by 21 % and the rest of the world by 9 %. Most of Asian country needs the CPO for consumption purpose but EU needs it for developing the biofuel or bio-diesel.

As the world the demand increase, Indonesia has to maintain its palm oil for the domestic palm oil industry. Palm oil is the most popular oil among soybean, rapeseed, sunflower, coconut and others (see figure 1). In Indonesia, palm oil is important commodity because over 70 % of the palm oil is used for cooking oil industry.

The high demand for palm oil in the world market causing the CPO price in the international market increased sharply. This situation could influence the price volatility in the domestic market and interrupt the cooking oil industry in Indonesia. The tendency of CPO producer to export the CPO will affect the CPO domestic supply as a raw material of palm oil industries in Indonesia.

Figure 1. World Consumption of Oil and Fats in 2011



(Source: Oil World 2012)

Due to the massive export in CPO, the government imposed a CPO export tariff policy. The aims of this policy are to limit the CPO export and stabilize the domestic CPO price. This policy also try to encourage the CPO producer to invest or produce the derivative product of CPO such as cooking oil, oleo-chemical, margarine, soap and bio-diesel in Indonesia.

There are three CPO downstream industries that prospective in Indonesia, namely cooking oil industry, oleo-chemical industry and bio-diesel industry. First, cooking oil industry, is simply because cooking oil industry is the largest consumer of CPO in Indonesia and has grew significantly over the years. During the year 2000 to 2011, the production of cooking oil made from CPO grew 11.07 % in average (CIC, 2012). In 2005, the total production capacity of cooking oil industry is 9.94 million

tons and 76 % was dominated by nine groups of companies (Infordev, 2006). Second, Oleo-chemical industry, produces fatty acid, glycerin, and fatty alcohol that is essential for food essence, pharmacy and cosmetics. This industry has been growing fast since 2006 until 2011. The oleo-chemical production increased from 809,450 tons to 1,376,991 tons in 2011 (CIC, 2012). Third, Bio-diesel industry in Indonesia just started to develop since 2006. This industry is prospective, because it is an environmental friendly energy and an alternative renewable energy that is currently trending in the world especially in Europe.

Over the last decades, there are many studies related to government policy in the CPO industry, especially on the CPO export tariff. Susila (2004) analyzed the CPO export tariff impact on several aspects such as mature area, production, CPO price, cooking oil price, and export period 1994 to 1999. While Akyuwe and Sulistyanto (2010) argued that government policies have not fully supported the development of palm oil industry. The CPO export tariff has been changed frequently and burdened CPO producer. Most of export tariff was not allocated sufficiently. PT. Capricorn Indonesia Consultant, Inc. (2007), has studied that the prospect of palm oil industry in Indonesia was not only influenced by the increased demand of cooking oil industry, but also by the higher demand of other industries such as oleo-chemical and biodiesel.

This study will analyze the impact of CPO export tariff policy on the development of cooking oil, oleo-chemical and bio-diesel industry in Indonesia. How this policy can influence the ratio of CPO export to CPO production, due to the policy that was intended to decrease the ratio. Besides the CPO export tariff policy, the study will also analyze the impact of demographic and market factor on the development of cooking oil, oleo-chemical and bio-diesel industry in Indonesia.

1.2. Purpose of Research and Research Questions

This study will analyze the CPO export tariff policy, demographic and market factor that have been influence the Indonesia's cooking oil, oleo-chemical and bio-diesel industries. First it will analyze the CPO export tariff impact in reducing the CPO export or the ratio of CPO export to CPO production. Secondly, it finds whether this policy has any positive or negative impact on the Indonesia's cooking oil, oleo-chemical and bio-diesel industries.

This study also analyze the demographic and market factor such as population, GDP per capita and CPO international price that have been influence the Indonesia's cooking oil, oleo-chemical and bio-diesel industries development.

The research questions for this research are:

1. Does the CPO export tariff influence the CPO export or the ratio of CPO export to CPO production?
2. Does the CPO export tariff affect the cooking oil, oleo-chemical, and biodiesel industry?
3. Does the demographic and market factor affect the cooking oil, oleo-chemical, and biodiesel industry?

2. Literature Review

2.1. Government Policy

Government policy is a definite course of method of action selected by government from among alternatives and in the light of given conditions to guide and, usually to determine present and future decisions (<http://www.fao.org/>). Palm oil is essential to Indonesia's economy, because it contribute to the government revenue and the main commodities for producing cooking oil. Therefore cooking oil industry is very dependent on the availability of CPO. The demand and supply on CPO in the domestic and world markets influence the availability of raw material for palm oil industries such as palm cooking oil, oleo-chemical and bio-diesel in Indonesia. To maintain this situation, the government needs to make some intervention with several policies.

There are several policies related to the cooking oil, oleo-chemical and bio-diesel industries such as CPO export tariff, subsidy, elimination of VAT, tax holiday and etc. (See figure 2 below). In addition, the cooking oil industry is also protected by the import tariff in order to secure the cooking oil competition in domestic market (BKPM, 2008). Other policy related with the promotion of palm oil investment with tax incentive facility such as tax allowance (Government Regulation number.52/2011) and this industry is registered as an open for investment in Indonesia has

never listed in the Negative Investment List (President Decree No 31 of 1995 on NIL).

Figure 2. Indonesia's Palm Oil Industries Policy

No	Content	Policy	Description
1	Export tariff on palm oil	In order to meet the objective for secure domestic stock, to preserve natural resources, to anticipate drastic international price increases of certain commodities, and to stabilize domestic prices of certain commodities, the Government shall impose	Government Regulation No. 55/2008
2	Regulation for export tariff	Regulation on export tariff for CPO and derivative products according to CPO price reference	Decree of Ministry Finance No.223/PMK.011/2008, dated Dec.17,2008
3	Incentive scheme in the form of reduced income tax for certain industries	The scheme ranges from oleo chemical s industry (derivatives industry like fatty acid, fatty alcohol, glycerin), bio energy industry (bio-diesel, bio-ethanol anhydrate), to bio lube industry	Government Regulation No. 62/2008 concerning amendment to the Government Regulation No. 1 / 2007
4	Elimination of VAT	VAT Exemption of agricultural primary products of Palm Oil Fresh Fruit Bunches (FFB)	Government Regulation No. 7 / 2007
5	Smallholders revitalization	Subsidized interest rate for the development of bio fuel energy and plantation revitalization	Decree of Ministry of Finance No.11/PMK.06/2006

Source: Ministry of Trade, 2010

However in this study, I emphasized the CPO export tariff policy in Indonesia. According to the government regulation number 55 years 2008 about export tariff imposition on the export goods, the objectives of this policy are:

1. To guarantee the domestic demand fulfilled
2. To conserve the natural resources
3. To anticipate the increasing of particular commodity in the international market
4. To maintain the price stability of particular commodity in Indonesia

The other reason behind the CPO export tariff policy according to Ministry of Finance decree number 128/PMK.011/ 2011 is to guarantee that the cooking oil material is fulfill the domestic needs and to control the price stability of cooking oil in Indonesia. The government also encourages the palm oil downstream industry such as oleo-chemical and bio-diesel to develop. Attracting new investor and increasing the competitiveness of the palm oil industry are the other way to support this industry.

2.2. The History Of CPO Export Tariff In Indonesia

In this section, this study will explain briefly about the palm oil export tariff history in Indonesia. Export tariff for CPO and its derivative products starts on 1994 through decree of Minister of Finance. The rate for CPO export tariff is about 40% - 60%, this policy was taken due to the rising of CPO prices in the international market from U.S \$ 379 per metric ton to U.S \$ 536 per metric ton in 1994 (Rifin, 2010).

To provide an opportunity for domestic investment in this sector, since March 1997, the government froze the license for foreign investment in the palm oil plantations and the license for foreign investment in CPO is limited. When the financial crisis began in July 1997, the government lowered the export tariff for CPO and its derivatives from 10 – 12 % to 2 – 5 % in ad-valorem. This tariff system emphasizes the harmonized tariff structure export tariff by providing a greater burden on the export of raw materials (CPO) and a lighter load on the export of finished goods. On December 24th, 1997, the government banned the CPO export through Decree of domestic trade (SK Dirjen Perdagangan Dalam Negeri 420/DJPDN/XII/1997) to restrict the exports (Prahastuti, 2000). This situation lasts from January to March 1998; this policy was issued because the cooking oil price in Indonesia is still high.

Due to the MoU (Memorandum of Understanding) with IMF (International Monetary Fund), on April 1998 the CPO export ban has been eliminated. The rising price of CPO in the international market in mid-1998 and the depreciation of the Rupiah (Rp) against the U.S \$ is pushing the pace of palm oil exports. The result is a shortage of supply CPO in domestic. Therefore, in July 1998 the government raised the original CPO export tariff from 40 % to 60 %. In early 1999, the government lowered the original export tariff of CPO from 60 % to 40 %. On mid-1999, the government lowered the export tariff of CPO by 10 %, from 40 % to 30 % (Rifin, 2010).

According to Ministry of Industry and Trade, the goals on the reducing the CPO export tariff is to secure domestic cooking oil prices. Furthermore, the decline will be gradual after reviewing the market conditions, in domestic and international markets. The government effort to stabilizing domestic price and restrict exports is not effective. This can be seen from the price of the palm cooking oil in Indonesia remain high. However, when the export tariff was lowered to 10 %, the price of palm oil in the world market tends to decline. One of the cause of ineffectiveness of this export tariff policy because there are many illegal palm oil smuggled out to the world market (Rifin, 2010).

The government lowered the CPO export tariff in September 2000 and goes down to 3% in 2001. The CPO export tariff is lowered because

Indonesia is facing the intense competition from other CPO exporting countries especially Malaysia. The Malaysian government made a major breakthrough by allowing export of 500,000 ton of palm oil without being taxed and also gave a credit worth of U.S \$ to the buyer's country. In June 2007, the government raised its CPO export tariff from 1.5 % to 6.5 %, and continued to increase to 7.5 % in September, and reached 10 % in November 2007 (Rifin, 2010).

Figure 3. Indonesia's Export Tariff Regulation in 2007.

Group	Palm oil and its products	CPO International Price (cif Rotterdam US\$/ton)				
		< 550	550 - 649	650 - 749	750 - 849	>=850
I	FFB and Palm Kernel	40%	40%	40%	40%	40%
II	Crude Palm Oil (CPO) RBD Olein Crude Olein Crude Stearin Crude Palm Kernel Oil Crude Kernel Stearin Crude Kernel Olein	0%	3%	5%	8%	10%
III	RBD Palm Kernel Oil RBD Stearin RBD Palm Oil	0%	2%	4%	7%	9%

Source: Ministry of Trade, 2007

From the figure above, if the CPO international price reached U.S \$ 550 to 649 the export tariff for CPO will be 2.50 %. The CPO export tariff will increase following the incremental of the CPO international price.

The figure 4 below shown that the export tariff increased during 2007 to 2008 because the CPO international price rising rapidly from U.S \$ 416.8 per metric ton in 2006 up to U.S \$ 719.1 per metric ton in 2007. This situation is caused by the global financial crisis and the high demand on CPO in the world market

Figure 4. The Export Tariff Rates (Average per Year)

Year	Tariff (%)	CPO Price (US\$)
1994	60	437.3
1995	52	537.6
1996	60	467.2
1997	56	490.4
1998	44	600.8
1999	30	377.3
2000	5	261.1
2001	3.5	238.4
2002	3	356.7
2003	3	410.4
2004	3	434.7
2005	3	367.7
2006	3	416.8
2007	7	719.1
2008	10	862.9
2009	3	644.1
2010	12.5	859.9
2011	20	1076.5

Source: Indexmundi, Ministry of Trade, Ministry of Finance, 2012
calculated by the author

2.3. CPO Export Tariff Influence The CPO Export

Export tariff are taxes on goods or services that become payable when the goods leave the economic territory or when the services are delivered to

non-residents (OECD, 2013). According to Piermartini (2004), export tariff can take different forms. It can be an ad valorem tax, specified as a percentage tax of the value of product, or a specific tax, specified as a fixed amount to pay per unit of a product. It can be a progressive tax, in example characterized by a high tax rate when the price of the product is high and a lower tax rate when the value of the product is low. All types of export tariff have the effect of reducing the volume of exports and a form of export restriction.

According to Reed (2000), and McCalla and Josling (1985), the export tariff are usually used by developing countries in order to generate government revenues or to protect particular groups for political reasons. If a small country adopted this policy it can cause the price in the exporting country fall below the world price in a competitive market structure. The producers in the exporting country will lose because they receive lower prices and exports also decline. However the result will be different in the case of a large exporting country. Because they have market power and the export tariff causes a reduction in domestic production; thus export decline and the world price increases. In this case, consumers, producers and the government in the exporting country can gain from this policy (Reed 2000; McCalla and Josling 1985). However, in this study I assume that Indonesia is a small country because they do not have the power to control the world market although Indonesia is the biggest CPO producer.

There are several research had been analyzed the impact of palm oil export tariff to the CPO export. Susila in 2004 has analyzed the impact on palm oil export tariff using an econometric model of the industry. The result reveals that palm oil export tariff on period 1994 to 1999 has negative impact on several aspects such as investment, production, farm income and CPO export. He also found that a 1 % of increase of export price will cause a 0.253 % in export. While Munadi (2007), made a simulation with the error correction model about the effect reduction of tariff export period 1969 to 2006 and the result is the reduction of export tariff will increase the CPO export. Reduction CPO export tariff of 10 % will increase the CPO domestic price for 14.83 % and increase the CPO export to China from 25.36 thousand ton to 48.23 thousand ton or approximately 47.42 %.

From Prahastuti research on 2000, Indonesia's CPO exports are affected by the domestic price of CPO, the production of CPO and the exchange rate (Rupiah against the US\$). She also mentioned that the availability of CPO is depends on domestic production of CPO, CPO Exports and CPO imports. Although Indonesia is the country's largest CPO producer, Indonesia still imports to fulfill the domestic needs of CPO, though its value is relatively small compared to the export. An increase and a change in the structure of world palm oil consumption, directly or indirectly will affect the supply of palm oil in Indonesia.

Sitohang (2008) analyzed that palm oil export tariff has a negative impact, meaning that if the export tariff increase it will reduce Indonesia's CPO export volume. She also mentioned that Indonesia's CPO export is influenced by the import demand from China, India and EU. In 2008, around 53% is exported to those countries (OECD, 2011).

The figure below shows the relation of CPO export tariff on CPO export annually from 2000 to 2011. From 2000 to 2006 the CPO export tariff still relative low but the CPO export is growing. In 2007, the CPO export tariff is rising but the CPO export is not affected. It is relative more clear to see the effect of CPO export tariff to the CPO export on monthly basis according to this figure.

Figure 5. Indonesia's CPO Export (tons) and CPO Export Tariff (percentage)



Source: Food and Agricultural Policy Research Institute (FAPRI), Ministry of Finance 2012

According to Rifin (2010) in his study about the effect of changes to the export tariff and relative export prices on net export shares of Indonesian palm oil, he conclude that:

1. If the export tariff on Indonesian palm oil increases by 1 %, there is no instantaneous change in the net export shares of Indonesian palm oil. However, net export shares will decrease by 0.8 % in the second period, by 1.1 % in the third period, and so on.
2. If the relative export prices for Indonesian palm oil increase by 1%, there is no change in the net export shares in the first period. However, net export shares of Indonesia palm oil increase by 0.75 % in the second period, by 1.04% in the third period, and so on.

2.4. Domestic Consumption of CPO

Besides to control the CPO export, this policy also aims to maintain the availability of CPO for the domestic consumption of palm oil industry. With reducing the CPO export, the domestic supply of CPO is expected to fulfill the needs of raw material for palm oil industry. This condition hopefully can improve the production of cooking oil, oleo-chemical and bio-diesel industries in Indonesia. Unfortunately the domestic consumption of CPO is low because the CPO producer tends to export. They will get more profit from exporting the CPO. Therefore, the

utilization of production capacity for palm oil industry is not optimum. If this situation continues, the palm oil industry would be stagnant.

Compare to the production, the amount CPO for domestic consumption is still very low. Most of the CPO is exported to international market. There is a significant increase of CPO domestic consumption from 2,930,663 tons in 2005 up to 7,461,113 tons in 2006 (increase 154.59 %). According to Sinaga and Ardana (2004), changes in the structure of consumption for cooking oil from coconut oil (CCO) into palm cooking oil (using CPO) influence the CPO domestic consumption.

Figure 6. Production, Import, Export and Domestic Consumption of CPO, 2004 - 2011

Year	Production (Ton)	Import (Ton)	Export (Ton)	Domestic Consumption (Ton)	%
2004	13,097,660	7,884	9,565,974	3,539,570	
2005	14,336,147	13,902	11,419,386	2,930,663	-17.20
2006	20,821,018	15,055	13,374,959	7,461,113	154.59
2007	21,197,670	4,247	13,210,742	7,991,175	7.10
2008	21,047,746	10,994	15,647,657	5,411,083	-32.29
2009	23,189,152	21,187	18,532,470	4,677,869	-13.55
2010	23,712,013	48,082	17,864,141	5,895,953	26.04
2011	25,137,303	1,845	15,569,081	9,579,067	62.47
Average Growth					23.40

Source: PT CIC Consulting Group, 2012

The maximize usage of CPO domestic consumption will lead this to the development of palm oil based industry. This domestic consumption also affected by the national economic growth according to Head of Marketing at Indonesia CPO Entrepreneurs Association (Amri, 2012). Another reason of the increasing CPO domestic consumption is an opening of a new factory in palm oil industry. According to Stevanus Goei King, there will be a new oleo-chemical producer and other company that plan to add their production capacity, increasing the requirement of raw materials (Amri, 2012)

2.5. An Overview Of Cooking Oil, Oleo-Chemical, And Bio-Diesel Industry

Traditionally, the main raw material for cooking oil in Indonesia was coconut oil (copra). Because of the limitation of coconut oil production growth, this oil not sufficient for the cooking oil industry demand. CPO is used for the alternative raw material because they have higher productivity and lower price compare to coconut oil. From year 1996 to 2002, the share of CPO increased, almost reached 80 % from the total raw material for cooking oil (CIC, 2003).

In Indonesia, the domestic consumption of CPO is mostly for food and more precisely for cooking oil. This accounts for 87 % of total domestic consumption in 2005, while the domestic consumption for industry was only 11%. Indonesian people are accustomed to fried foods. There are

many varieties of fried foods in Indonesia, and nearly all these foods need cooking oil for their preparation (Gelder and Bloemen, 2004)

Oleo-chemical is a prospective industry that made from CPO and can produce fatty acid, glycerin, and fatty alcohol that is used for food essence, pharmacy and cosmetics. Unfortunately, due to the high investment costs coupled with the low awareness of environmental care for the common Indonesia, the oleo-chemical industry in Indonesia has expanded very slowly. The total production of all oleo-chemical industries only increased from 712,000 tons in 2001 to 950,000 tons in 2007 (Santosa, 2008).

According to the research that conducted by PT. CIC in 2011, there are 16 Oleo-chemical company in Indonesia with the total production capacity of 1.67 million tons per year. The details of the production are 1,004,800 tons for fatty acid, 490,000 tons for fatty alcohol and 177,750 tons for glycerin. From the market aspect, the total supply of oleo-chemical industry in 2006 is 869,350 tons, 93 % (809,450 tons) of the total supply is come from domestic production and the rest is from import. In the demand side, almost 85 % is for export and the rest for domestic consumption.

Oleo-chemical industry has more value-added, it shown that the price of 1 ton CPO is US \$ 370 per ton compare to 1 ton of Fatty Acid (Oleo-chemical) has reached US \$ 500 per ton (Ministry of Industry, 2010).

However, this industry need higher technology therefore the investment value in this industry is also big.

Biodiesel by definition is a compound of methyl ester derived from the esterification/trans-esterification process of various types of vegetable oils or animal fats (Wirawan and Tambunan, 2006). One of the vegetables oil that can be used for producing bio-diesel is CPO. The option of using bio-diesel is based on the availability of raw material. If rapeseed oil is the raw material for biodiesel in Germany and soybean oil for the United States, then CPO is the logical option for Indonesia, due to its large production volume and thus ready availability in the country (Goto and Chollacoop, 2010).

Bio-diesel industry in Indonesia began to rise since 2006, marked by the number of new investors who are and will build this alternative fuel. The increasing trend of investment in the bio-diesel industry is driven by the release of the president's instruction of Indonesia Number 1 of 2006, dated January 25, 2006 regarding the supply of and use of bio-fuel (bio-diesel) as alternative fuel. The bio-fuel production in Indonesia is started with the bio-diesel production that made from CPO on 2003, most of them still on the small scale of production or in laboratory use with limited usage (CIC, 2012).

Developing biofuel is a must for Indonesia due to various reasons including the abundance availability of raw material (CPO), an alternative renewable fuel to strengthen the country energy security and a solution to improve local air pollution in several Indonesia major cities. One alternative is converting plant oil to methyl ester or famously called biodiesel (Wirawan and Tambunan, 2006). According to Goto and Chollacoop (2010), the most significant hurdle for broader commercialization of biodiesel in Indonesia is its cost. Thus acceptance of biodiesel in Indonesia is more influenced by pricing factor. The advantages of biodiesel such as a renewable energy, lower exhaust gas emission and favorable effect on engine lifetime are often ignored

3. Research Design

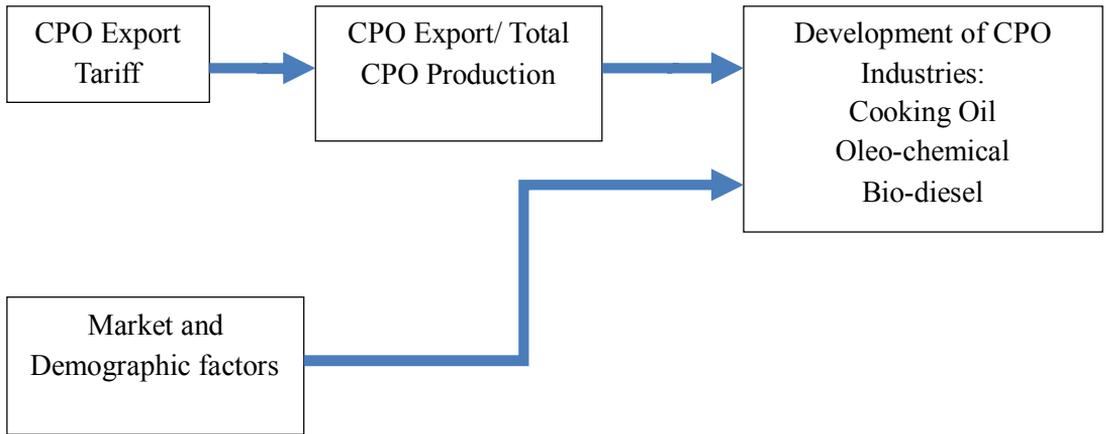
3.1. Research Framework

There are several factors that affect the cooking oil, oleo-chemical and bio-diesel development in Indonesia such as government policy, market and demographic factor.

In this study I will analyze the CPO export tariff as the government policy that related to the development of CPO industries in Indonesia. The CPO export tariff trying to reduce the amount of CPO export (Ratio of CPO export to CPO production), therefore to ensure the CPO domestic supply and it will help encourage the development of CPO industries (cooking oil, oleo-chemical and bio-diesel) in Indonesia.

The other factor that influence the development of CPO industries in Indonesia are market and demographic factors which consist the world consumption of CPO, the CPO international price, Indonesia's population and Indonesia's GDP per capita. I would like to analyze the correlation between CPO international price and CPO export. Then I also want to analyze the CPO international price, Indonesia's population and GDP per capita impacts on the development of cooking oil, oleo-chemical and bio-diesel industry in Indonesia.

Figure 7. Research Framework



3.2. Research Hypothesis:

1. CPO export tariff has negatively impact on the CPO export.
2. CPO export tariff has positively impact on cooking oil, oleo-chemical and bio-diesel industry.
3. Market and demographic factors influence the cooking oil, oleo-chemical and bio-diesel industry

3.3. Data Resources and Research Methods

In this study, I will collect secondary data period 2000 to 2011. Types of secondary data sourced from multiple agencies associated with the object of research such as the Ministry of Agriculture, Ministry of Trade,

Ministry of Industry, Ministry of Finance, Indonesian Central Statistics Bureau, Internet, and other related previous research in this study. The data will be in form of numbers, graphs and pictures. Other sources are from newspaper, articles, research literature related issues.

I will use descriptive analysis and correlation test in this study. Descriptive analysis is a method that deals with the collection and presentation of a group of data so as to provide useful information (Walpole, 1995). Descriptive analysis provide information on the data collection and get ideas for the purposes of further analysis, if necessary analysis includes the preparation of the size of the concentration, size distribution, labels, charts and graphs. However, if the results of this analysis can already be concluded that right there is no need to analyze a more complex manner. (Clark and Schkade, 1983).

Correlation is a common way of measuring the relationship between two variables. It can be calculated using Microsoft Excel or any spreadsheet or econometric software package. Correlation can be interpreted in a common sense way as a numerical measure of a relationship or association between variables. However, correlation does not necessarily imply causality between two variables (Koop, 2009).

4. Indonesia's Cooking Oil, Oleo-chemical and Bio-diesel Industry

4.1. An Overview

CPO is the main raw material for the cooking oil industry, which is why the cooking oil industry is dependent on it. The development of CPO production from year to year shows an increasing trend, so does the consumption of CPO in Indonesia also rising. Cooking oil industry is growing rapidly, the export of cooking oil also increasing along with the CPO export. However, the portion of cooking oil industry for export is still far behind the CPO export. Other industries such as cosmetics, oleo-chemical, and biodiesel also contributed on this CPO consumption. Cooking oil industry absorb the most of the CPO domestic supply, almost 68 % is used for the cooking oil the followed by Oleo-chemical for 14.38 % and Bio-diesel industry for 12.53 % (CIC, 2012).

At the beginning, the Indonesia's CPO consumption is only to fill the raw material of cooking oil that cannot provide by the coconut cooking oil. However, as time goes by there is a shifts where CPO becoming a major source of raw material to supply the cooking oil in Indonesia, while more coconut cooking oil for export (Putera, 2009).

Figure 8. Cooking oil, Oleo-chemical and Biodiesel Production and Utilization

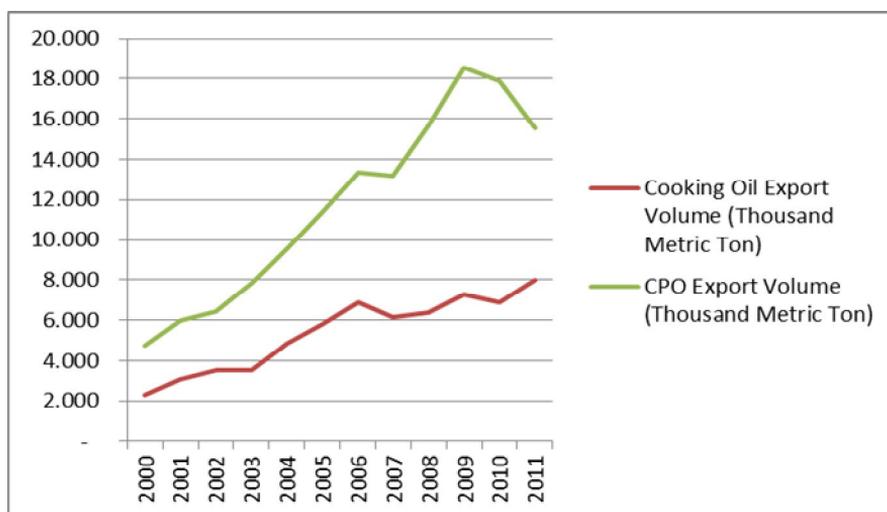
Year	CPO Domestic Consumption (Supply)	Cooking Oil Production	Utilization	Oleo-chemical Production	Utilization	Bio-Diesel Production	Utilization
	Ton	Ton	%	Ton	%	Ton	%
2004	3,539,570	2,364,433	66.80	557,129	15.74	500	0.01
2005	2,930,663	2,066,118	70.50	262,588	8.96	10,000	1.02
2006	7,461,113	5,182,468	69.46	809,450	10.85	100,000	1.34
2007	7,991,175	5,319,848	66.57	820,978	10.27	400,000	5.01
2008	5,411,083	2,905,175	53.69	936,974	17.32	403,000	7.45
2009	4,677,869	2,174,965	46.49	975,052	20.84	400,000	8.55
2010	5,895,953	3,020,113	67.43	1,155,103	19.59	500,000	8.48
2011	9,579,067	5,371,458	68.54	1,376,991	14.38	1,200,000	12.53

Source: CIC, 2012

Currently, cooking oil producer as the market player in CPO generally is private enterprise. The dominant private enterprises are PT Lonsum Tbk, PT Sinar Mas, Salim Group, PT Bakrie Plantation, PT Astra Agro Lestari Group, Asian Agri Group, Wilmar International Group, PT Karya Prajona Nelayan, PT. Musim Mas, and PT. Permata Hijau Sawit. Whereas from state enterprises are PTPN III and IV (BKPM, 2008). Private enterprise is also dominant in both export and domestic cooking oil market. There are 11 large scale producers of which three companies, namely Permata Hijau Sawit, Musim Mas, and Wilmar are merged into The Union of Indonesia Vegetable Oil industry (GIMNI). Meanwhile Sinar Mas, Salim, Best Agro

Group, Pentameter Nabati, Astra Agro, Bina Karya Prima, Asian Agri, and Darmex are merged into Association of Indonesia Vegetable Oil Industry (AIMNI). Only Panca Nabati and Darmex are the companies of cooking oil produces which are not CPO producers (BKPM, 2008).

Figure 9. CPO Export and Cooking Oil Export in 2000 – 2011



Source: Food and Agricultural Policy Research Institute (FAPRI), 2013

The status of cooking oil industry based on figure below, its utilization from 2006 to 2010 is declining by – 8.42%. There are several factors that affect this situation, such as caused by the cooking oil performance, shortage of CPO as a raw material, changing trends into other palm oil derivative product (oleo-chemical and biodiesel). However the cooking oil company still growing slowly with 5.27% and the opportunity for new investment on this sector is still wide open. This sector also contributes in creating a job opportunities, with the positive trends of 11.09 %.

Figure 10. Indonesia's Cooking Oil Industry Status

Year	2006	2007	2008	2009	2010	Trend (%)
Utilization (%)	84.5	71.7	81.6	77.6	52.1	-8.42
Company (unit)	43	50	57	53	54	5.27
Worker (people)	11041	15208	14854	17284	17254	11.09

Source: Ministry of Industry, 2013

In 2012, PT Astra Agro Lestari Tbk (AALI) received tax allowance because of the investment Rp. 1.7 Trillion on new cooking oil plant with an area of 1.3 Ha located in West Sulawesi, Indonesia¹. According to government regulation number 52 year 2011, if there is an investment worth more than Rp. 1 Trillion, then the company will receive a tax allowance.

According to the research that conducted by PT. CIC in 2011, there are 16 Oleo-chemical company in Indonesia with the total production capacity of 1.67 million tons per year. The details of the production are 1,004,800 tons for fatty acid, 490,000 tons for fatty alcohol and 177,750 tons for glycerin. From the market aspect, the total supply of oleo-chemical industry in 2006 is 869,350 tons, 93 % (809,450 tons) of the total supply is come from domestic production and the rest is from import. In the

¹ <http://www.imq21.com/news/print/86259/20120827/161631/AALI-Peroleh-Insentif-Tax-Allowance.html>

demand side, almost 85 % is for export and the rest for domestic consumption.

The difficulty in developing the oleo-chemical industry in Indonesia is this sector needs a huge cost and high technology. While in Indonesia, the majority of the industry is a labor intensive industry with low technology. However, the government is trying to attract investment in this sector by giving them a tax allowance or tax holiday.

Until 2011, the biggest bio-diesel producer in Indonesia is PT Wilmar Bioenergy with a production of 1.05 million ton per year using CPO as the main material, followed by PT Eterindo Wahanatama with a production of 240,000 ton per year using multiple feed, PT Musim Mas and PT Sumi Asih with each production of 100,000 ton per year (CIC, 2012).

According the research that conduct by PT CIC (2012), with the increasing price of crude oil that use for fuel in the international market, it stimulate the bio-diesel producer to increase their productivity. So the prospect of this industry is really good, since it is also environmental friendly.

Figure 11. Cooking Oil, Oleo-chemical and Bio-diesel Production Growth in 2000 - 2011

Year	Cooking Oil Production	Growth	Oleo-chemical Production	Growth	Bio-Diesel Production	Growth
	Million Ton	%	Ton	%	Ton	%
2000	3.53		524,602		0	
2001	3.89	10.20	531,699	1.35	0	
2002	4.2	7.97	528,885	-0.53	0	
2003	4.22	0.48	532,820	0.74	0	
2004	4.7	11.37	557,129	4.56	500	
2005	5.39	14.68	262,588	-52.87	10,000	1900
2006	7.461	38.42	809,450	208.26	100,000	900
2007	7.991	7.10	820,978	1.42	400,000	300
2008	5.441	-31.91	936,974	14.13	403,000	0.75
2009	4.677	-14.04	975,052	4.06	400,000	-0.74
2010	5.895	26.04	1,155,103	18.47	500,000	25
2011	9.579	62.49	1,376,991	19.21	1,200,000	140
Average Growth		11.07		19.89		466.43

Source : CIC, 2012 and Ministry of Industry, 2012

The figure above shows that the growth of palm cooking oil production is increasing. The average growth of this increasing trend is 11.07 % from 2000 to 2011. Oleo-chemical industry has growing of 19.89 % on average start from 2000 to 2011 and Bio-diesel industry also growing rapidly with the average growth of 466.43% from 2004 to 2011. In 2007 to 2008 period there is a global financial crisis that affect the palm oil industry. After recovered from the global financial crisis, the palm oil production growth is starting to increase.

There are several factors that influence the cooking oil, oleo-chemical and bio-diesel development in Indonesia. It can be divided as a two factors, which is government policy factor and market also demographic derived factor. As I mentioned before, there are several government policies related to the cooking oil, oleo-chemical and bio-diesel industry in Indonesia. However, this study only focused on the CPO export tariff policy.

4.2. Government Policy

In this part, this study will analyze my findings about the government policy impact on the Indonesia's the cooking oil, oleo-chemical and bio-diesel industry from the previous research and other data that I have collected. The reason behind the CPO export tariff policy according to Ministry of Finance decree number 128/PMK.011/ 2011 (PMK No.

128/PMK.011/2011) is to guarantee that the cooking oil material is fulfill the domestic needs and to control the price stability of cooking oil in Indonesia. The government wants to encourage the palm oil downstream industry to develop, so Indonesia can get higher value added from this industry. The government is also trying to improve the government revenue through this policy (Syafaat, 2005). The CPO prices are rising causing lots of CPO producer is choosing to export rather than sell domestically. In 2008, the CPO price reached above US \$ 800/ ton causing the supply of CPO that were supposed to meet the downstream industries demand in the export without any restrictions from the government (Herianto, 2008).

Other intention is to maintain the availability of CPO for domestic supply by reducing the CPO export. The CPO production is increasing year by year in line with the CPO export. By calculating the ratio of CPO export to CPO production, this policy is expected to decrease that ratio. To see the impact of CPO export tariff on this ratio, this study will conduct a correlation test between CPO export tariffs to the ratio of CPO export to CPO production.

Figure 12. Correlation between CPO Export Tariff with the Ratio of CPO Export to CPO Production

Time Period	Correlation
2000 - 2011	-0.1152
2000 - 2006	-0.5898
2007 - 2011	-0.5554

The result from the correlation between CPO export tariff and the ratio of CPO export to CPO production during 2000 to 2011 is -0.1152 , which means the CPO export tariff has a weak and negative impact on the ratio of CPO export to CPO production. During this period, the CPO export tariff is was not effective in controlling the ratio of CPO export to CPO production in Indonesia. The increasing of CPO production is followed by the CPO export. The correlation during this period is less correlated compared to the 2000 to 2006 period (-0.5895) and the 2007 to 2011 (-0.5554). These means during that period, the CPO export tariff has negative correlation but not strong correlation. During that period, the tariff and ratio were fluctuated and negatively correlated.

During 2000 to 2011 the correlation is more disperse between CPO export tariff and ratio of CPO export to CPO production. If we see the figure below (Figure 12) the export tariff is increasing from 2000 (3%) to 2011

(20%) while the ratio of CPO export to CPO production has not changed significantly since 2000 (0.58) to 2011 (0.62).

Figure 13. CPO Production, Export, Price, CPO Export to CPO Production Ratio and CPO Export Tariff

Year	CPO Production (1)	CPO Export (2)	Tariff (3)	CPO export to CPO production Ratio	CPO Price (4)
	Volume (Thousand Metric Tons)	Volume (Thousand Metric Tons)	Percentage (%)	(2)/(1)	(US \$ per gallon)
2000	8,300	4,773	5	0.58	261.1
2001	9,200	5,971	3.5	0.65	238.4
2002	10,300	6,417	3	0.62	356.7
2003	11,970	7,851	3	0.66	410.4
2004	13,097	9,565	3	0.73	434.7
2005	14,336	11,419	3	0.80	367.7
2006	20,821	13,374	3	0.64	416.8
2007	21,197	13,210	7	0.62	719.1
2008	21,047	15,647	10	0.74	862.9
2009	23,189	18,532	3	0.80	644.1
2010	23,712	17,864	12.5	0.75	859.9
2011	25,137	15,560	20	0.62	1076.5

Source: Food and Agricultural Policy Research Institute (FAPRI), CIC, Ministry of Finance 2012

According to the table above (Figure 13), the ratio between CPO exports to CPO production is not decreasing significantly. Even after the CPO

export tax imposed in 2007, this policy could not affect the ratio. The CPO export increasing in line with the CPO production, no matter how big the CPO production, the amount of CPO export followed it. The trend has not been changed, the CPO producer still prefer to export their CPO.

In order to see the relationship between CPO export tariff on the development of cooking oil, oleo-chemical and bio-diesel industry, I conduct a correlation test among them. The results during 2000 to 2011 were positive in general, this policy has a positive relation to the cooking oil, oleo-chemical and bio-diesel industry development. However, this correlation cannot prove that the CPO export tariff has a direct impact on these industries. It is hard to draw a conclusion from these results, because these correlation tests are not strong evidence.

Figure 14. Correlation between CPO Export Tariff and Cooking Oil Production

Time Period	Correlation
2000 - 2011	0.6831
2000 - 2006	-0.4902
2007 - 2011	0.7187

Correlation between CPO export tariff with cooking oil production resulting a positive correlation (0.6831) in 2000 to 2011. During the year

2000 to 2006 the result was -0.4902 , which mean it has a weak and negative correlation. Although the CPO export tariff declines from 5 % in 2000 to 3% in 2002 until 2006, the cooking oil production is still increasing. Therefore it creates a negative correlation between the CPO export tariff with the cooking oil production. After the CPO export tariff imposition in 2007, the result was positive (07187) and much stronger correlated compared to before 2007 period. It shows that somehow the CPO export tariff helps promote the cooking oil production compared to the 2000 to 2006 period, although this result is not a strong evidence to prove the impact of CPO export tariff on cooking oil production.

Figure 15. Correlation between CPO Export Tariff and Oleo-Chemical Production

Time Period	Correlation
2000 - 2011	0.8247
2000 - 2006	-0.0327
2007 - 2011	0.8539

Correlation test between CPO export tariff with oleo-chemical production resulting a strong positive correlation (0.8247) in 2000 to 2011. During the year 2000 to 2006 the result was -0.0327 , which mean it has a weak and negative correlation. Although the CPO export tariff declines from 5 % in 2000 to 3% in 2002 until 2006, the oleo-chemical production is

still increasing. Therefore it creates a negative correlation between the CPO export tariff with the cooking oleo-chemical production. After the CPO export tariff imposition in 2007, the result was positive. It shows that somehow the CPO export tariff helps promote the oleo-chemical production compared to the 2000 to 2006 period. Before the CPO export tariff was imposed in 2007, the oleo-chemical production growth was quite slow. Although this correlation test is not a strong evidence to prove the CPO export tariff benefit on the oleo-chemical industry.

Figure 16. Correlation between CPO Export Tariff and Bio-Diesel Production

Time Period	Correlation
2004 - 2011	0.9211
2004 - 2006	N/A
2007 - 2011	0.8753

Correlation between CPO export tariff with bio-diesel production resulting a strong positive correlation 0.9211 in 2004 to 2011. The bio-diesel industry started to produce since 2004, therefore the period before 2007 is 2004 to 2006. However, we cannot do the correlation at that period because the CPO export tariff during 2004 to 2006 is 3 % flat without any changes while the bio-diesel production is growing. So the result during 2004 to 2006 was not available.

After the CPO export tariff imposition in 2007, the result was positive. It shows that somehow the CPO export tariff helps promote the bio-diesel production. However from this correlation we are not able to convince that CPO export tariff has a direct impact on the development of bio-diesel industry in Indonesia

To support the findings from the correlation test above, this study will conduct some analysis from the previous research about the CPO export tariff in Indonesia. However, in those previous researches there are no findings about the CPO export tariff impact on the CPO industries especially on the cooking oil, oleo-chemical and bio-diesel industries. Most of the previous research analyzes the impact on general industries or in macro economy such as CPO producer (palm oil plantation owner), CPO foreign buyer (importer) and some potential investor in palm oil industry.

Previously, several studies mentioned that the CPO export tariff did not bring positive outcomes. This policy contains beneficial and detrimental consequences. According to Syafaat (2005), Arisman (2002), Putera (2009), Rifin (2010), Agustian and Hadi (2004), those who benefited from the implementation of CPO export tariff are a domestic CPO buyer (Palm oil downstream industry, especially cooking oil industry), Indonesia's government and the Indonesia's CPO export competitor. Palm oil downstream industry benefited from this policy because the price of CPO

in the domestic market will be lower, especially for the cooking oil industry which used the CPO as the main raw material for their industry. Indonesia's government gets the benefit with the increasing of the state revenue regarding CPO export tariff policy. From this revenue, government can use it for the development of palm oil industry such as for research and development, building infrastructure. However, the government did not fully disclosure about the usage of the revenue from this policy. Finally, the Indonesia's CPO export competitor will get the benefit from it. Application of this policy tends to lower the volume exports, so that foreign exporters benefited from a reduction in export of CPO by Indonesia. It is an opportunity to gain more market share from it. This policy also tends to reduce the competitiveness level of CPO industry in Industry.

Meanwhile, the injured party from the implementation of CPO export tariff is the domestic palm oil producer/farmer, foreign CPO buyer (Importer), state palm oil plantations, and the potential investor on the palm oil industry (Syafaat (2005), Arisman (2002) and Putera (2009)). Consumer may or may not gain from this policy since there is no guarantee that the processors will pass on the lower price of cooking oil. Considering that the concentration ratio (CR4) in this industry is large, which indicates as a potential oligopolistic market structure, it is not likely that the consumers fully benefited from the lower price of cooking oil (Rifin, 2010).

According to Herianto (2008) and Syafaat (2005), the negative impact from this policy is:

1. Reducing the palm oil plantation producer/farmer revenue
2. Trigger smuggling CPO
3. Beneficial to other exporting countries especially the Indonesia's competitor
4. Lose of CPO market share in the international market
5. Interfere the investment climate
6. Inhibits the government in poverty alleviation programs

CPO export tariff will depress prices in the domestic market, causing a disincentive for the palm oil plantation producer/farmer. Other case according to Syafaat (2005) and Putera (2009), CPO producer will push the price of palm oil fresh fruit bunches (FFB) produced by the palm oil growers. Furthermore, this policy will lead to the decreasing of CPO Export. The result from the slowdown of CPO export is the demand from overseas importers insufficient and harming the business activity at the port and also foreign exchange loss too in the government revenue side.

Imposition of CPO export tariff will increase Indonesia's CPO export price in the world market, while the Malaysia's CPO export price remains the same. It reflected in an increasing if Malaysia's CPO exports volume while Indonesian CPO exports volume decrease. The decrease of CPO

export is because Indonesia's CPO competitiveness decreasing compares to the other country especially the main rivalry is Malaysia (Syafaat ,2005 and Kusumawardhana, 2008). According to Sitohang (2008), limiting the CPO export with export tariff is not only a disincentive for the palm oil industry, but it can reduce the government revenue and hamper the international trade and investment in palm oil industry. Rifin (2010) mentioned that the export tariff policy also hinders the development of the cooking oil industry in Indonesia as a whole and does not encourage diversification in cooking oils. The major sources of cooking oil in Indonesia are coconut oil, which is made from CCO (Crude Coconut Oil), and RBD (refined, bleached, deodorized) olein, which is made from CPO. These two products are close substitutes so that policies imposed on one commodity will have tremendous effects on the other commodity. The imposition of an export tariff diverts CPO from the export market to the domestic market, lowering all cooking oil prices. This causes more competition with the domestic coconut oil industry, which otherwise would provide the supply more of the raw material for domestic cooking oil. (Rifin, 2010)

The government should reconsider the CPO export tariff policy comprehensively. As a public policy, it should pay attention the impact on the stakeholder especially for palm oil producers, including farmers and business services related to CPO trade. (Syafaat, 2005 and Putera, 2009). Indonesia's CPO export tariff policy should influence the CPO export

supply then it will affect the CPO domestic supply. Domestic supply CPO later will affect the CPO domestic price. It can be concluded that the CPO export tariff is not very efficient. This policy does not achieve their goal which is to lower the CPO domestic price (Kusumawardhana, 2008).

The impact of CPO export tariff on bio-diesel industry is still not effective, because there are several problems such as low domestic demand of bio-diesel, there are no standardization and poor distribution system². According to the president director of PT Eterindo Wahanatama Tbk, Immanuel Sutarto admitted, the production capacity of national bio-diesel industry continues to grow but the problem is the domestic demand is very low in absorbing the production.

The government is trying solves this problem through the Ministry of Energy and Mineral Resources Directorate, General of New and Renewable Energy and Energy Conservation (EBTKE), in conjunction with Indonesia's largest state-owned oil company, PERTAMINA are enforcing some mandatory Indonesian bio-diesel consumption. These initiatives are expected to further increase the consumption of bio-diesel in Indonesia by 196 million liters to 500 million liters in 2012 (Slette and Wiyono, 2012). In Indonesia, transportation has become the only sector

2

http://www.infosawit.com/index.php?option=com_content&view=article&id=119:terkendala-ketidajelasan-harga-&catid=70:photography

that drives the bio-diesel consumption. With this policy, the consumption of bio-diesel is expected to expand to non-transportation sectors.

The other difficulties in the bio-diesel industry on the domestic market is because the increasing price of the CPO that could lead to the high price on bio-diesel compared to common fuel (fossil fuel). This situation could discourage the bio-diesel producer in developing their industry in Indonesia. The bio-diesel producer also have to sell their product in lower price, it is discouraging for them.

However, “The positive impact of CPO export tariff in the next two years is the investment on the palm oil industry is projected to reach US\$ 3 Billion. Till the end of October 2012, investment in palm oil industry has reach US\$ 800 million” said the Director General of Agriculture, Ministry of Industry, Benny Wahyudi in Jakarta³. He also mentioned that the impact on palm oil export tariff will not be affected in short terms (1-2 years) but in the long run after the realization of new investment in palm oil industry⁴.

³ <http://www.investor.co.id/agribusiness/bea-keluar-tingkatkan-investasi-hilir-kelapa-sawit/46926>

⁴ <http://www.bisnis.com/articles/utilisasi-rafinasi-cpo-bisa-naik-6-percent>

4.3. Market and Demographic Factors

In this part, this study will analyze the market and demographic factors that influence the development of palm cooking oil, oleo-chemical and bio-diesel industry in Indonesia. I also analyze the correlation between the CPO international prices with the CPO export and the three main palm oil industries in this section.

In Indonesia, the consumption of cooking oil is rising rapidly in the past few years. According to the CIC (2012) and Hasbullah (2009), this situation happens because there is a change in the Indonesia's society consumption pattern from consuming the coconut cooking oil (CCO) into palm cooking oil. In 1999, the domestic edible oil demand (household and industrial) reach 3.2 million ton, but in 2005 it doubled to over 6 million ton and 5 million ton of which came from palm cooking oil. Consumer preference for palm oil also determine the number of CPO consumption, the reason is palm oil contain relatively low trans-fatty acids compared to other vegetable oils (Hasbullah, 2009). Change in the consumption trends has significant impact on the development of palm cooking oil industry in Indonesia. There is no such policy in Indonesia that could influence the society to consume the palm cooking oil rather than coconut cooking oil. Indonesian consumer made their own decision to consumer the palm cooking oil without any government intervention.

Along with the changing trend from coconut oil to palm cooking oil, the growing of domestic CPO consumption encourages the growth of cooking oil industry plant. Until 2011, there are 90 unit of cooking oil plant operated in Indonesia with the total production capacity of 15.4 million ton. More than 68 % of those companies are integrated from upstream to downstream. It means that the company owned a palm oil plantation, CPO industry and cooking oil plant (CIC, 2012).

According to Herianto (2008), the growth of food industry, oleochemicals and cooking oil that using CPO is increasing. The consumption growth rate of edible oil made from CPO is rising rapidly, both in the domestic and export markets. This situation is supported by an increasing in aggregate demand factors such as population growth, people purchasing power and the tendency of world consumes CPO. This trend is growing as products using palm oil more competitive than vegetable oil with other raw materials. Increasing price of CPO also caused by the rising price of soybean oil because of the falling of world soybean production this year. Based on the data from Oil World, the trend of the use of palm oil based commodities in the global market continues to increase from time to time, beats the vegetable oil based industrial commodities such as corn oil, coconut oil. The share of consumption of palm oil to the world vegetable oil consumption as much as 34.15 million ton in 1963-1967 estimated 4 % of the total world vegetable oil. This share increased to 14.9 % of world vegetable oil consumption by 92 million ton in 2003 to 2007. Whereas in

the year 2003 and 2006, the world consumption increased up to 18 % with the size of consumption 117 million tons. Since 2004 the use of palm oil have occupied the highest position in world vegetable oil markets, reaching about 30 million ton with an average growth of 8 % per years beating soybean oil about 25 million ton with an average growth of 3.8 % per years. Other commodities are widely used sunflower oil is about 11.5 million ton with an average growth of 2.2 % per year. Indonesia is a net-exporter of palm oil, but sometimes in urgent circumstances also imports palm oil. The main importer of Indonesia's palm oil is Western Europe, India, Pakistan, China and Japan. The products are exported refined oil early stage RBD palm oil, palm oil and some oleo-chemical products.

In general, Indonesia's palm oil export rise 12.9 % in the 1980 – 2005. In 2005 and 2006 the amount of cooking oil plants does not change as many as 74 plants spread throughout Indonesia. The production capacity in 2005 and 2006 is 15.43 million ton, due to the amount of cooking oil factory has not changed. Production of edible oil derived from coconut and palm oil. In 2005, the domestic demand for cooking oil rise by 3.29 ton due to increasing population and thus an increase in consumption to 3.54 ton (Herianto, 2008).

Ramadhan (2001), also mentioned that the CPO domestic consumption influenced by the domestic demand itself. So if the domestic demand of CPO is moving from cooking oil industry to the other palm oil derivative

product such as oleo-chemical and biodiesel. It will impact the cooking oil industry with the decreasing amount of cooking oil production, export and also company that produced cooking oil changes into other sector. The consumption of CPO for palm cooking oil industry influenced by CPO exports, the exchange rates, the domestic price of CPO and the supply of CPO in domestic (Prahastuti, 2000).

According to Rifin (2010), the market structure of the Indonesian palm oil industry has changed in the last 20 years. The concentration ratio of the four largest firms decreased significantly. A decline in the four-firm concentration ratio has been accompanied by an increase in the number of firms in the industry - from only 24 palm oil firms in 1975 to 194 firms in 1997. In terms of value added per worker and per plant, substantial changes have also occurred in the structure of the Indonesian palm oil industry. Real value added per worker increased significantly from US \$3,518 in 1975 to US \$5,359 in 1985. In 1997, the real value added per worker became US \$7,201, a more than two-fold increase from 1975. Meanwhile, real value added per plant also showed a significant increase from US \$430,116 in 1975 to US \$1,687,555 in 1997 (Indonesian Central Bureau of Statistics, various issues).

According to Tetty (2009) The Indonesia's oil consumption increases from 2000 to 2006 the national oil consumption increased by 23.07% or from 2,922,970 tons into 3,799,483 tons in 2006. This consumption is

positively related to the population growth and per capita consumptions of cooking oil in Indonesia (The Directorate General of Plantation, 2007). From Tetty (2009) research results that the increases in the price of palm oil as the main raw material of cooking oil will cause oil prices to rise and reversely the increase in palm cooking production will decrease palm cooking oil prices.

According to the executive director of the Indonesia Palm Oil Association (GAPKI) Fadhil Hasan, said the weakening of global demand is likely restrain CPO export from Indonesia⁵. The impact from the weak demand from other countries could be an advantage for Indonesian Palm Oil industry, they can use the CPO as a material to develop their industries (Cooking Oil, Oleo-chemical and Bio-diesel). The domestic producers of these industries are expected to gain from this momentum. However, the domestic demand is still low, especially in the bio-diesel sector. Palm oil cooking production is expected to be increase with the new investment came on this industry. In 2012, Sinar Mas Group will invest US\$ 500 million to build two CPO processing plants, while Wilmar International is allocating US\$ 900 million for five CPO processing plants. These new plants will increase the 2011 production capacity of the company's cooking oil processing by 36 % to 4,880 ton per day compare to 3,080 tons per day in 2010. With these plants, the company will be able to meet

⁵ <http://www.bisnis.com/articles/ekspor-cpo-penurunan-bea-keluar-tak-banyak-pe-ngaruh>

the high demand of cooking oil in Indonesia. Around 70 % of total production of palm cooking oil from the processing plants is allocated for the domestic market. Even though the palm oil industry has change the trend, cooking oil industry it is still developing because of the main commodities for Indonesian consumer.

From the figure below, the domestic consumption of CPO has fluctuation but still in positive trends with average growth 17.37 %. However, the domestic consumption of CPO is still far below the CPO export. It indicates, the domestic producer of palm cooking oil, oleo-chemical and bio-diesel still have not maximize their production capacity and from the palm oil producer itself, they still prefer exporting the CPO rather than supplying to the domestic market.

Figure 17. CPO Production, CPO Export, and Domestic Consumption
Growth

Year	CPO Production (1)	Growth	CPO Export (2)	Growth	Domestic Consumption (4)	Growth
	Volume (Thousand Metric Tons)	%	Volume (Thousand Metric Tons)	%	Volume (Thousand Metric Tons)	%
2000	8,300		4,773		3,527	
2001	9,200	10.84	5,971	25.10	3,229	-8.45
2002	10,300	11.96	6,417	7.47	3,883	20.25
2003	11,970	16.21	7,851	22.35	4,119	6.08
2004	13,097	9.42	9,565	21.83	3,539	-14.08
2005	14,336	9.46	11,419	19.38	2,930	-17.21
2006	20,821	45.24	13,374	17.12	7,461	154.64
2007	21,197	1.81	13,210	-1.23	7,991	7.10
2008	21,047	-0.71	15,647	18.45	5,411	-32.29
2009	23,189	10.18	18,532	18.44	4,677	-13.56
2010	23,712	2.26	17,864	-3.60	5,895	26.04
2011	25,137	6.01	15,560	-12.90	9,579	62.49
Average		11.15		12.04		17.37

Source: Food and Agricultural Policy Research Institute (FAPRI), CIC
(2012)

Figure 18. Correlation between CPO International Price and CPO Export

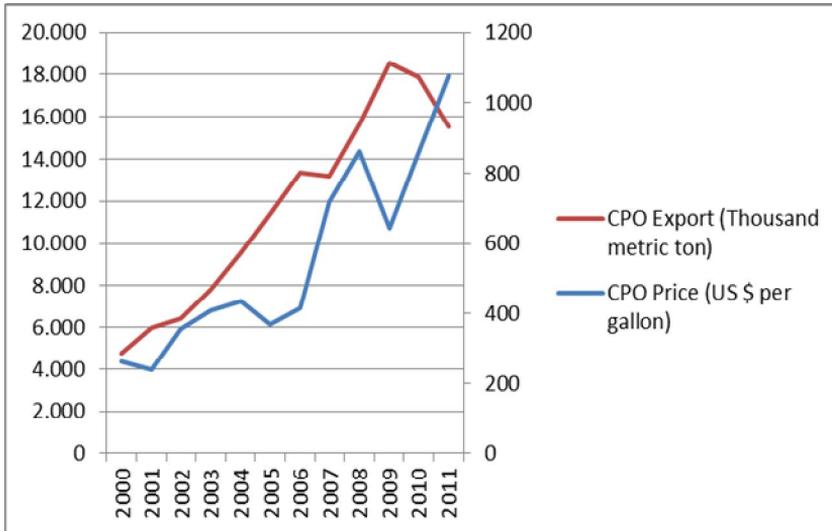
Time Period	Correlation
2000- 2011	0.8104
2000 - 2006	0.7108
2007 - 2011	-0.1627

The correlation result between CPO international price and CPO export during 2000 to 2011 is 0.8104 meaning it has strong relationship and positive effect. If the CPO international price is rising, the domestic CPO producer would likely to export the CPO rather than keeping for CPO domestic supply. They will get more incentives from exporting CPO rather than selling it on the domestic market. With this situation, the domestic producer of palm cooking oil, oleo-chemical and bio-diesel is having difficulties in getting the raw material. They cannot maximize their production capacity with the limited supply of CPO and the higher price. The CPO international price factor is has more influence on the CPO export rather than the CPO export tariff policy.

In the year 2000 to 2006 the result is 0.7108; it was obvious that the rising price of CPO in international has made the CPO export increasing. However in 2007 to 2011, the result is -0.1627 which means it has a negative correlation although it is very weak. There is a tendency that the

CPO export tariff on 2007 has made a little impact in reducing the CPO export.

Figure 19. CPO Export and CPO International Price Graph



Source: CIC, 2012

According to the research that conduct by Abidin (2008), the CPO international price has positive impact on CPO export with coefficient regression 6.177 meaning if the international price of CPO rise U.S \$ 1 then CPO export increase 6.177 ton. Abidin (2008) also mentioned about the factors that influence the Indonesia's CPO export as:

1. Domestic CPO price negatively affect Indonesia's exports, with a coefficient of 3.549 meaning if the domestic CPO price rising Rp 1 then Indonesia's CPO exports will fall by 3.549 ton.

2. The international price of CPO has a positive impact on exports of CPO with a regression coefficient of 6.117, meaning if the international price of CPO rise by US \$ 1 then export CPO will also rise by 6.117 ton.

Figure 20. Correlation between Cooking Oil Production and CPO International Price

Time Period	Correlation
2000 - 2011	0.7117
2000 - 2006	0.5789
2007 - 2011	0.6566

According to the correlation between CPO international prices with Indonesia's cooking oil production, the result is 0.7117 during 2000 to 2011. From the result above, it means they have a quite strong correlation. However, this also means that the cooking oil production is not affected with the increasing price of CPO in the international market. The palm cooking oil industry is growing along the increasing of the population and the GDP per capita in Indonesia. In this period, they are all increasing along with the CPO international price as the palm cooking oil production is rising too. Although the result is a positive strong relation, but it does

not mean that the CPO international price had impact on the palm cooking oil production in Indonesia.

Despite the increasing of CPO international price, the production of CPO cooking oil in Indonesia also increase. Demand from the domestic market of cooking oil keep the cooking oil production growing, this situation is because the population and the income per capita of Indonesian society also growing.

The trends according the figure 20 below are Indonesia's population and GDP per capita are increasing from 2000 to 2011. The production of cooking oil in general is increasing although there is a fluctuating because of the financial crisis in 2007-2008 that affected the production of cooking oil industry in Indonesia. The ratio of cooking oil to CPO production is decreasing because they have to share the amount of CPO for other industries such as oleo-chemical and bio-diesel industries.

Figure 21. Cooking Oil Volume, CPO International price, CPO Production Volume, Cooking Oil to CPO Ratio, Indonesia's Population, Indonesia's GDP per Capita and Inflation Rate

Year	Cooking Oil Volume (1)	CPO International Price (2)	CPO Production Volume (3)	Cooking oil to CPO Ratio (4)	Population (5)	GDP per capita (6)	Inflation Rate (7)
	(Million Tons)	(US \$ per gallon)	(Million Tons)	(1/3)	People	US \$	%
2000	3.53	261.1	8.3	0.4253	224,784,200	2,900	9
2001	3.89	238.4	9.2	0.4228	228,437,900	3,000	11.5
2002	4.2	356.7	10.3	0.4078	231,328,100	3,100	11.9
2003	4.22	410.4	11.97	0.3525	234,893,500	3,200	6.6
2004	4.7	434.7	13.56	0.3466	238,453,000	3,500	6.1
2005	5.39	367.7	15.56	0.3464	241,973,900	3,600	10.5
2006	7.461	416.8	16.6	0.4495	245,452,700	3,900	13.2
2007	7.991	719.1	18	0.4439	234,694,000	3,600	6.3
2008	5.441	862.9	20.5	0.2654	237,512,400	3,900	9.9
2009	4.677	644.1	21	0.2227	240,271,500	4,000	4.8
2010	5.895	859.9	23	0.2563	242,968,300	4,200	5.1
2011	9.579	1076.5	24.686	0.3880	245,613,000	4,700	5.4

Source: Indexmundi, 2012.

Figure 22. Correlation between Cooking Oil Production and Indonesia's Population

Time Period	Correlation
2000 - 2011	0.6771
2000 - 2006	0.9954
2007 - 2011	0.6740

According to the correlation above between cooking oil production with Indonesia's population, the result is 0.6771 during 2000 to 2011. It means they have a positive correlation but not a strong correlation. It is obvious that the cooking oil production is along with the rising population in Indonesia. Huge population in Indonesia triggers the cooking oil demand, large population means have a large market or demand. Household is the biggest consumer of the cooking oil industry in Indonesia, as the majority of Indonesian people use it for cooking their food.

During the year 2000 to 2011 the correlation is strong and positive (0.9954), the increasing of Indonesian population has a positive relationship on the increasing of cooking oil production. However in 2007 to 2011 the correlation is still positive but it is not as strong as before (0.6740). The Indonesian population is increasing but the cooking production is fluctuated but still in the positive trend.

Figure 23. Correlation between Cooking Oil Production and Indonesia's GDP per Capita

Time Period	Correlation
2000 - 2011	0.7777
2000 - 2006	0.9406
2007 - 2011	0.4419

According to the correlation above between cooking oil production with Indonesia's GDP per capita, the result is 0.7777 during 2000 to 2011. From the result above, it means they have a positive and strong correlation. The increasing of GDP per capita will stimulate their consumption of cooking oil in Indonesia.

During 2000 to 2006 the correlation is strong and positive (0.9406), the increasing of Indonesia's GDP per capita has a positive relationship on the increasing of cooking oil production. The cooking oil producer is increasing their productivity because they believe the consumer will buy it as they getting wealthier in general. In 2007 to 2011 the correlation result is dropped (0.4419) but still has positive correlation. During the financial crisis on 2007, the cooking oil production was fluctuated so that can affect correlation.

According to Djaenuddin and Gonarsyah (2002) research, the production of cooking oil is influenced by several variables such as the cooking oil

price itself. Manufacturers produce cooking because the cooking oil price provide indicator that can influence the behavior of producers to manage their production. The price effect will be seen in the long term because it related with the provision of infrastructure and raw materials.

Other reason why palm cooking oil is increasing is because a research from the medical expert that claims palm oil has advantages in terms of health than non-tropic oils (soybean oil and sunflower oil). Palm oil contains high monounsaturated fatty acids (MUFA), which can lower the cholesterol. Palm oil also contains beta-carotene, vitamin E, antioxidants and most important is free of trans-fatty acids. With some advantages that an increase in consumption of palm oil rapidly, especially in Europe, palm oil is also starting to be used as biodiesel feedstock other than rape seed oil, because palm oil has competitive prices. GAPKI (Association of Palm Oil in Indonesia) is organization of palm oil (CPO) producers, which consist of private company and government owned company. GAPKI as a government partners have provided suggestion in formulating the government policies on palm oil industry. (Herianto, 2008). The consumer preference related to the health issues increase the consumption of palm cooking oil in the world. The cooking industry itself does not need a high technology and high cost for producing it.

To analyze the oleo-chemical industry Indonesia, I conduct several correlation tests between CPO production, CPO supply, CPO international

price, Indonesian population and Indonesian GDP per capita. The correlation tests and the result will be explained below.

Figure 24. Correlation between Oleo-Chemical Production and CPO International Price

Time Period	Correlation
2000 - 2011	0.8991
2000 - 2006	0.2249
2007 - 2011	0.8297

According to the correlation test between oleo-chemical production and CPO international price is positive and strong correlation. During the period of 2000 to 2011 the correlation is 0.8991; this means the increasing of CPO international price is in line with the increasing of oleo-chemical industry production. Although it is not as simple as that, the rising price of CPO in international market could actually impact their production. Because as we know, that many CPO producer prefer to export than sell it in domestic market due to the more profitable to export.

During the year 2000 to 2006 the correlation result was 0.2249 which means they have positive correlation but weak. At this period, the amount of CPO international price is stable and also with the oleo-chemical

production. After 2007, the CPO international price is rising, and oleo-chemical production is on the rising trend.

Figure 25. Correlation between Oleo-Chemical Production and Indonesia's Population

Time Period	Correlation
2000 - 2011	0.5422
2000- 2006	0.1697
2007 - 2011	0.9653

According to the correlation test between oleo-chemical production and Indonesia's population, the result is 0.5422 which means that they have a positive correlation but not strong during 2000 to 2011. The relationship of oleo-chemical production with Indonesian population is quite stable in the positive way.

In the year 2000 to 2006 the correlation result was 0.1697 which means they have a weak and positive correlation. In this period, the Indonesian population growth doesn't impact much on the oleo-chemical production. During 2007 to 2011 the correlation is positive and strong (0.9653). After the financial crisis in 2007-2008, the financial situation is getting better and attract new investment therefore the oleo-chemical production is

growing along with the population growth. The oleo-chemical production have slower pace than the population.

Figure 26. Correlation between Oleo-Chemical Production and Indonesia's GDP per Capita

Time Period	Correlation
2000 - 2011	0.8503
2000 - 2006	0.2730
2007 - 2011	0.9902

According to the correlation between oleo-chemical production and Indonesia's GDP per capita, the result is 0.8503 which means that they have a strong and positive correlation during 2000 to 2011. In 2000 to 2006, the correlation result was 0.2730 which means that they have a weak and positive correlation. At this period the growth of Indonesian GDP per capita does not affect much on the oleo-chemical production. However, after 2007 the oleo-chemical production is rising in line with the Indonesian GDP per capita growth. With this situation, the Indonesian people are expected to consumer more of oleo-chemical products.

In order to analyze the bio-diesel industry Indonesia, I conduct several correlations between CPO production, CPO supply, CPO international price, Indonesian population and Indonesian GDP per capita. In general the result is positive correlated

Figure 27. Correlation between Bio-Diesel Production and CPO Production

Time Period	Correlation
2004 - 2011	0.7865
2004 - 2006	0.9980
2007 - 2011	0.7857

According to the correlation between bio-diesel production and CPO production in 2004 to 2011, the result is 0.7865 which means that the bio-diesel production has positive and strong correlation with the CPO production. There is a tendency that the more CPO produced will increase the bio-diesel production. Bio-diesel production in Indonesia start growing since 2006 as the PERTAMINA as a state owned oil company launch their product called bio-solar which contains diesel (fossil fuel) blended with CPO.

During the year 2004 to 2006 the correlation was 0.9980 which means they have strong and positive correlation. The increasing amount of CPO production is followed by the booming of bio-diesel on that period. In 2007 to 2011, the correlation result still positive but there is some reduction (0.7857) because of the fluctuating bio-diesel production caused by the increasing price of CPO that burden the bio-diesel producer. After the financial crisis and the rising price of CPO, the bio-diesel production is coming back to the positive trend.

Figure 28. Correlation between Bio-diesel Production and CPO International Price

Time Period	Correlation
2004 - 2011	0.9198
2004 - 2006	0.1751
2007 - 2011	0.8574

According to the correlation between bio-diesel production and CPO international price, the result is 0.9198 in 2004 to 2011. This means the bio-diesel production has positive and strong correlation with the CPO international price. The CPO international price is increasing along with the increase production of bio-diesel.

During the year 2004 to 2006 the correlation was positive but very weak. In this period, the CPO international price is fluctuated while the bio-diesel production is still growing. After 2007, the correlation is 0.8574 which means they have strong positive correlation. During the year 2007 to 2011, the CPO international price is rising in line with the bio-diesel production. However, the increase of CPO international price is not the only reason why the bio-diesel production is rising.

Figure 29. Correlation between Bio-Diesel Production and Indonesia's Population

Time Period	Correlation
2004 - 2011	0.3011
2004 - 2006	0.9045
2007 - 2011	0.7618

According to the correlation between bio-diesel production and Indonesia's population during 2004 to 2011, the result is 0.3011 which means that the bio-diesel production has positive but weak correlation with the Indonesian population. The bio-diesel production growth is not as fast as the Indonesian population growth.

During the year 2004 to 2006 the correlation was 0.9045 which means that they have a strong and positive correlation. In this period, the bio-diesel industry just started to grow and the Indonesian population is increasing. In 2007 to 2011 the correlation was still positive but less strong because there is a fluctuation in bio-diesel production. High price of CPO and financial crisis has affected the bio-diesel production.

Figure 30. Correlation between Bio-diesel Production and Indonesia's GDP per Capita

Time Period	Correlation
2004 - 2011	0.8967
2004 - 2006	0.9879
2007 - 2011	0.8898

According to the correlation between bio-diesel production and Indonesia's GDP per capita in 2004 to 2011, the result is 0.8967 which means that the bio-diesel production has positive and strong correlation with the Indonesia's GDP per capita. The increasing Indonesia's GDP per capita will create a middle class economic society which most of the use their own transportation vehicle and most of the bio-diesel production is used for transportation sector.

In 2004 to 2006 the correlation was strong and positive (0.9879). Bio-diesel production starts growing at this period in line with the increasing of Indonesia's GDP per capita. During 2007 to 2011 the correlation still positive but a little less (0.8898) from the previous period. At that period, there is fluctuation in bio-diesel production because of the rising price of CPO.

5. Conclusion

The CPO export tariff has a weak impact on reducing of the ratio of CPO export to CPO production. The ratio of CPO export to CPO production is not decreasing significantly because the increasing of CPO production is still followed by the CPO export. The CPO producer still prefers to export their CPO.

From the correlation that has been conducted between CPO export tariff and the three CPO industries (cooking oil, oleo-chemical, and bio-diesel) the result were positive in general, especially after 2007 when the CPO export tariff was imposed at that time. The correlation between CPO export tariff with the three CPO industries are stronger and positive correlated in 2007 to 2011 compared to 2000 to 2011 and 2000 to 2006. Somehow the CPO export tariff has a positive impact on these industries, but it is difficult to find whether it has direct impact or not.

According to the correlation between cooking oil production with demographic and market factors (population and GDP per capita) the result were positive. Huge population in Indonesia triggers the cooking oil demand, large population means have a large market or demand. Household is the biggest consumer of the cooking oil industry in Indonesia, as the majority of Indonesian people use it for cooking their

food. The increasing of GDP per capita will stimulate their consumption of cooking oil in Indonesia. Other variables also influenced the production of cooking oil such as the cooking oil price itself.

According to the correlation between oleo-chemical production with demographic and market factors (population and GDP per capita) the result were positive. After the financial crisis in 2007-2008, the financial situation is getting better and attract new investment therefore the oleo-chemical production is growing along with the population growth. The oleo-chemical production have slower pace than the population.

According to the correlation between bio-diesel production with demographic and market factors (population and GDP per capita) the result were positive. In 2007 to 2011 the correlation was still positive but less strong because there is a fluctuation in bio-diesel production. High price of CPO and financial crisis has affected the bio-diesel production. The increasing Indonesian GDP per capita will create a middle class economic society which most of the use their own transportation vehicle and most of the bio-diesel production is used for transportation sector.

CPO international price has a positive and strong correlation with CPO export during the year 2000 to 2011. If the CPO international price is rising, the domestic CPO producer would likely to export the CPO rather than keeping for CPO domestic supply. They will get more incentives

from exporting CPO rather than selling it on the domestic market. With this situation, the domestic producer of palm cooking oil, oleo-chemical and bio-diesel is having difficulties in getting the raw material. They cannot maximize their production capacity with the limited supply of CPO and the higher price. The CPO international price has more influence on the CPO export rather than the CPO export tariff policy.

The CPO export tariff policy is not effective in reducing the CPO export and encourages the palm oil based industries. However this policy is not useless, because it helps to maintain the CPO domestic supply and helps to stabilize the domestic price of CPO.

The limitation of this research is the difficulties in finding the direct impact of the CPO export tariff on the cooking oil, oleo-chemical and bio-diesel industries. The revenue from the CPO export tariff goes to state revenue; however there are no clear details about the amount of CPO export tariff revenue that goes back for the development of the CPO industries (cooking oil, oleo-chemical and bio-diesel industries). Recommendation for the next research is to consider analyzing the impact of government policy about the palm oil industrial area to the development of palm oil based industry in Indonesia.

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국문초록

CPO 수출관세가 인도네시아 산업에 미치는 영향에 관한 연구: 조리용 기름, 유지화학, 바이오디젤 산업을 중심으로

MARDHIKATAMA Ginanjar

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팜오일(CPO)은 콩, 유채, 코코넛등을 이용하여 만드는 기름으로서 중요한 소비재이다. 인도네시아는 2006년 이래 세계 제1의 팜오일 생산국가이다. 인도네시아에는 조리용 기름, 유지화학 그리고 바이오디젤 산업 등 세 개의 팜오일 관련 산업이 있다. 그러나 팜오일 생산의 급증에 비하여 팜오일 산업의 발달속도는 더딘 편이다. 대부분의 제품은 해외로 수출되고 있으며 인도네시아 국내적으로 볼 때 팜오일 원료생산뿐만 아니라 이를 산업화함으로써 얻을 수 있는 혜택이 미미하다. 때문에 정부는 팜오일 산업을 촉진하고자 노력하는 동시에 팜오일 수출을 제한하고 있다. 대표적인 정책으로서 팜오일 산업발달과 국내사용을 촉진하기 위하여 정부는 팜오일 수출관세를 부과하고 있다. 이에 본 연구는 이러한 관세가 팜오일 수출에 미치는 영향과 산업발달에 미친 영향을 분석하였다. 또한 시장과 인구학적 요인이 팜오일 산업에 미친 영향에 대해서도 분석하였다.

분석결과, 수출관세가 팜오일 수출에 음(-)의 상관관계가 있는 것을 확인하였지만 그 영향력은 아주 작았다. 그보다는 시장과 인구학적 요인에 더 크게 영향을 받는다는 것을 발견하였다.

주요어: 팜오일, 수출관세, 인도네시아

학번: 2011 - 24177