J. ISSAAS Vol. 15, No. 2:107 -119 (2009)

THE IMPACTS OF EXPORT TAX POLICY ON THE INDONESIAN CRUDE PALM OIL INDUSTRY

Joseph Obado[1], Yusman Syaukat[2] and Hermanto Siregar[3]

[1] Postgraduate Student, Bogor Agricultural University (IPB), Email: nyakwarchoda@yahoo.com
[2] Associate Professor, Department of Resource and Environmental Economics, IPB, Kampus IPB Darmaga, Bogor, Indonesia 16680. E-mail: ysyaukat2@yahoo.com
[3] Professor of Economics, Department of Economics, IPB. E-mail: hermanto@mma.ipb.ac.id

(Received: August 11, 2009; Accepted: November 16, 2009)

ABSTRACT

The impacts of the crude palm oil (CPO) export tax policy on the Indonesian CPO industry was assessed the 2SLS method which is an econometric model. The export tax was found to be negatively related to mature area of oil palm plantation, production, export, and domestic price of CPO and positively related to CPO consumption and stock. The export tax policy benefitted the domestic consumers of CPO. Clearly, the export tax policy reduces competitiveness of the Indonesian palm oil industry since it hurts producers of CPO. It is recommended that the export tax formulation with well considered and sound justifications is needed and from the study, 11.13 percent export tax on Indonesian CPO was recommended.

Key words: Competitiveness; effects of tax to local CPO producers, domestic consumers, consumers in importing countries; cooking oil price

INTRODUCTION

Agricultural products have a very important role to perform in the development of the Indonesian national economy. These commodities, and specifically crude palm oil (CPO), have contributed immensely to the gross domestic product (GDP) of Indonesia, led to growth in production and areal development, created various forms of employment for more than 3.5 million people in this sub-sector, increased international and national trade and improved the living standards as well as the financial status of the local people (Siregar and Sinaga, 2006). Indonesia is one of the highest CPO producers in the world. This can be attributed to the country's favorable climatic conditions, the large area of production potential, its investment in research and technology, as well as the availability of trained manpower that have necessary skills to bring about improvements in CPO production. Such improvements have uplifted the quality of Indonesian CPO to meet the specifications of the international market for crude palm oil (Siregar and Sinaga, 2006). The development of CPO needs to focus on the prospects and other means that would make it meet the basic customer requirements for the commodity for use in the food industry, industrial applications, and as an alternative source of energy.

The crude palm oil industry in Indonesia has evolved from government sponsorship and market interventions to a private sector initiative in response to international price signals and continuous market growth. Induced by the profitability in this sector, oil-palm plantations in Indonesia have expanded from 600 000 hectares in 1985 to more than 6 million hectares by early 2007, and are expected to reach 10 million hectares by 2010. At the same time, Indonesian palm-oil

production has increased from 157 000 metric tons to 16.4 million metric tons in the same period, while exports have increased from 126 000 metric tons to 12 million metric tons (Butler, 2007).

The world CPO production has grown steadily and relatively faster as compared to other oil yielding crops. During the period 2001-2005 the world CPO production grew on average 8.78 percent per year (Soeherman *et al.*, 2006). However, CPO production in Indonesia has been constantly lower than that in Malaysia. Export growth of Indonesian CPO can be attributed to three factors: world demand factor, product and market effects and competitiveness effects. The world demand factor reflects growth in exports that can be attributed to rising international demand, i.e. the stronger global import demand, the stronger the country's export growth (Susila, 2004). However, an increase in a country's share of world trade can only be explained by factors beyond world demand effects. The foreign currency contribution of CPO increases year by year (Tambunan, 2006).

The CPO industry is expected to play a greater role in the international market for oils and fats. Basiron (2002) and Pasquali (1993) projected that the growth rate of CPO production would be the fastest among edible oils. The market development of CPO will even be faster because of the success of the Uruguay Round (Susila *et al.*, 2004 and Barton, 1993). By engaging in trade, countries that specialize in producing goods in which they are relatively efficient will maximize their economic benefits. Trade therefore plays a very significant role in the economies and the developing countries like Indonesia are relatively small open-economies and therefore, rely on income earned from export to create jobs, buy imports, and maintain an overall healthy balance in external accounts (Aoki *et al.*, 1997 and Balassa, B. 1989).

Due to the importance of the crude palm oil to the Indonesian economy, and the world over, the Indonesian government decided to impose export tax on its CPO. This was intended to improve the benefits of the local CPO producers and consumers. The effect of this export tax needs to be critically studied to find out whether it has positively contributed to the Indonesian CPO sector or it has led to a deterioration of the sector. Therefore, the study wishes to find out the impact of the CPO export tax on Indonesian CPO industry and specifically on domestic price, investment, production, consumption, export, employment, added-value, cooking oil price, government revenue, producer surplus and consumer surplus.

This study sought to assess the impact of the export tax on the Indonesian CPO industry.

METHODOLOGY

Theoretical Framework

The government of Indonesia considers agriculture as a very important sector in the national economy. Agriculture provides job opportunities for majority of labor forces in Indonesia. At the same time, the government makes efforts to maintain the prices of basic needs including cooking oil to be affordable to low-income people. Therefore the price of cooking oil should remain at an affordable level. When the price of palm oil in international market went up in 1994, the price of cooking oil in domestic market experienced similar increase. In order to lower the price of cooking oil, the government applies export tax on crude palm oil and refined products. By export tax, the local price of the crude palm oil can be brought down to a considerable level which is affordable (Tambunan, 2006).

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 (Reed, 2000). From the previous studies, Mohamad *et al.* (2001) found out that Indonesian palm oil's net export shares fell by 44.5 percent in October 1994 after the implementation of the export tax in September 1994. The effect of

the export tax on Indonesian palm oil reached a peak in December 1994, when it reduced net export shares by 64.4 percent.

The most devastating impact of the policy had been on the export and farm income. The tax policy when enacted results in the reduction in export and income resulting in substantial loss for farmers. On the other hand, this policy had been proven to be effective in controlling domestic cooking oil price. With this policy, the government had been successful to keep the cooking oil price down when the world CPO price increased or when rupiah was substantially depreciated. Moreover, from the government point of view, significant tax revenue is also considered to be a positive result of the policy (Susila, 2004).

Under the export tax 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 (Simeh, 2004). 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. 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 (Reed, 2000).

When Bartholomew (1997) analyzed the effect of an export tax for palm oil on the distribution of income in Indonesia using a static model, he found that an export tax reduced the price of palm oil products, ceteris paribus, thus, benefiting consumers. In addition, he 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. This 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.

Clearly, the export tax policy reduces not only competitiveness of the Indonesian palm oil industry but also hurts producers of CPO, some of them are small-holder farmers, due to the lower price of CPO relative to the world market price. On the other hand, refiners that process CPO into various products such as cooking oil, margarine, shortening gain from this policy since they get CPO at lower prices (Mohamad *et al.*, 2001). The export tax policy also hinders the development of the cooking oil industry in Indonesia as a whole and does not encourage diversification in cooking oils. The imposition of an export tax 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 (Soeherman, *et al.,* 2006).

Empirical Model of Indonesian Crude Palm Oil Industry

Simulation approaches on the econometric model of the industry was used to assess the impacts of CPO-export tax on various aspects of the Indonesian CPO industry. The use of a simultaneous equation system approach was expected to yield better estimates because this approach is considered more appropriate in dealing with a system of commodity market in which some variables are simultaneously related or interdependent (Koutsoyiannis, 1977). A simplified theoretical model illustrated in Figure 1 shows the hypothetical relationships between variables in the model.

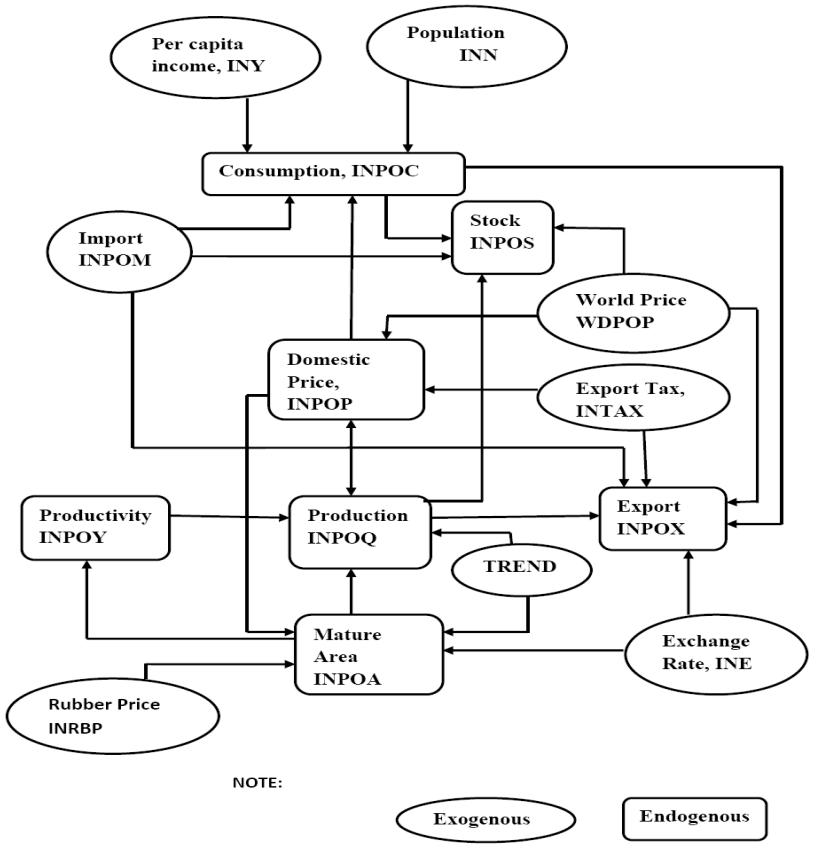

Fig. 1. General empirical model of Indonesian crude palm oil.

Indonesia equation-block consisted of seven equations as follows:

Identity equations

$INPOQ_t = INPOY_t * INPOA_t$

$INPOS_t = INPOQ_t - INPOC_t + INPOS_{t-1} + INPOM_t - INPOX_t$

Structural equations

$INPOA_t = a_0 + a_1(INPOP/INRBP)_t + a_2 TREND + U_1$ ……. (1)

Hypothesis: a_0, $a_1 > 0$; $a_2 < 0$

$INPOY_t = b_0 + b_1\, INPOA_t + b_2\, INPOY_{t-1} + U_2$ ……..... (2)

Hypothesis: b_0, $b_2 > 0$; $b_1 < 0$

$INPOC_t = c_0 + c_1 INPOP_t + c_2 INY_t + c_3 INN + U_3$ …… (3)

Hypothesis: c_0, $c_1 < 0$; c_2, $c_3 > 0$

$INPOX_t = d_0 + d_1 INPOQ_t + d_2 INTAX_t + d_3 WDPOP_t + d_4 INE_t +$
$d_5 INPOC_t + U_4$…….(4)

Hypothesis: d_0, d_2, $d_5 < 0$; d_1, d_3, $d_4 > 0$

$INPOP_t = f_0 + f_1 WDPOP_t + f_2 INPOS_t + f_3 INPOP_{t-1} + U_5$ …….. (5)

Hypothesis: f_0, $f_2 < 0$; f_1, $f_3 > 0$

Where: INPOA = oil palm mature area of Indonesia (1000 ha)
INPOQ = palm oil production of Indonesia (1000 t)
INPOC = palm oil consumption of Indonesia (1000 t)
INPOX = palm oil export of Indonesia (1000 t)
INPOS = palm oil stock of Indonesia (1000 t)
INPOP = domestic price of palm oil (Rp/kg)
INPOM = palm oil import of Indonesia (1000 t)
INPOY = palm oil yield of Indonesia (Ton/ha)
RPORBP = $INPOP_t$ /$INRBP_t$
= Price ratio of palm oil and rubber
WDPOP = world palm oil price (USD/t)
INTAX = CPO export tax (%)
ING = Indonesia gross domestic product (USD million)
INI = Indonesian lending interest rate (% per annum)
INN = Indonesian population (million)
INE = Indonesian exchange rate on average market rate (rupiah/USD)
INY = Indonesian income per capita (USD/capita)
INRBP = domestic rubber price (Rp/kg)

Model Identification, Estimation and Simulation

Model identification to be used in this study was found to be of order condition. With endogenous variables (equations), pre-determined variables, and explanatory variables in each equation and using order condition, the model qualified as definitely over-identified. The model was identified based on its order condition as follows: $(K-M) \geq (G-1)$
Where:
K = total variables in the model (endogen and exogen variables)
M= total endogen and exogen variables in the a given equation
G= Total equations that exist in the model excluding identity equations

If (K-M) is greater than (G-1), the problem is over-identified; if (K-M) is equal to (G-1), then it is exactly identified; while if (K-M) is less than (G-1), then the condition is unidentified. Based on the above definitions, the equations on the Indonesian block can be identified as follows.

Table 1. Model identification

No.	Equation	K	K-M	G-1	Condition
1	Mature area	15	12	6	Over identified
2	Productivity	15	13	6	Over identified
3	Crude Palm Oil consumption	15	12	6	Over identified
4	Crude Palm Oil export	15	10	6	Over identified
5	Crude Palm Oil Production	15	13	6	Over identified
6	Domestic price of palm oil	15	12	6	Over identified
7	Crude Palm Oil Stock	15	10	6	Over identified

Given that the model was over identified, the 2SLS method of estimation was applied. Koutsoyiannis (1977) stated that under the circumstance of the existence of model misspecification, missing of relevant variables, multicolinearity and autocorrelation error, 2SLS tends to yield more robust estimates. Moreover, 2SLS method is arguably the simplest method among methods suited to

over-identified model. Based on previous export tax rates, four scenarios associated with the tax rates were analyzed in this study, namely:

1. Scenario I was used as the basic scenario that is a scenario in which the values of the parameters were estimated and predicted means used as the true values for the model.
2. Scenarios II, III, and IV were further used to predict the impacts of export tax on various aspects of Indonesian CPO industry using time horizon of the year after 2007. Arbitrary values of export tax were used in scenario II, III and IV based on an assumption that the export tax rate in that time horizon increased with time. Scenario III was taken as 7.5 percent scenario IV as 15 percent and scenario V as 20 percent. These values were converted into effective export tax that makes the export tax to be based on the profit got not on the price of CPO.

Model Validation

Model validation was undertaken by using the standard t-tests, F-tests, and R^2 procedures where applicable in this analysis. Mean Squared Error (MSE) and Theil's inequality coefficient techniques were applied to assess the overall reliability of each model. MSE depends upon the units in which the variable is expressed. The magnitude of the error does not give any indication of how large the error is, therefore, this error can be assessed only by comparing it with the average size of the variable in question. However, the main advantage of MSE is that it can be decomposed into various components, which show the deviation between the simulated and actual values. Theil's method of decomposition was applied

Data Sources and Descriptions

In general, two groups of data were used in this study, namely, palm oil and macro-economic related data. The data sources for CPO included Oil world, 2007, Indonesia central bureau of statistics (BPS) 2007 and palm oil statistics 2007. Macro-economic related data were got from Bank of Indonesia and BPS, 2007. The econometric data covered the period from 2000 to the first quarter of 2007 hence the analysis was on the quarterly basis interval.

RESULTS AND DISCUSSION

Model Estimation

From the estimation of the results using econometric model, the mean values of the variables were found as reported in Table 2 below. Palm oil mature area was estimated as 871,160 tons while production was 322.5 tons.

Table 2. Model estimation.

Variable	Observations	Actual		Predicted		
		Mean	Std	Mean	Std	Label
INPOA	20	868.95	142.8	871.16	203.21	PO Area (000 ha)
INPOY	20	3.68	0.20	3.68	0.18	PO Yield (Tons/ha)
INPOC	20	849.85	66.53	849.84	65.03	PO Consmpn (000 tons)
INPOX	20	2353	624.53	2360	724.25	PO Export (000 tons)
INPOQ	20	3217	656.26	3225	839.15	PO Prodn (000 tons)
INPOC	20	849.85	66.53	849.84	65.03	PO Consmpn (000 tons)
INPOP	20	4088	515.98	4089	487.33	Dom. Price PO (Rp/Kg)

Model Validation

After estimating all the equations, the model was solved simultaneously in a simulation program using SAS (Statistical Analysis System v6.12). Historical simulation of the model's equations was used to validate the estimated model using the components of the Mean Squared Error (MSE) and the Theil inequality coefficients. Table 3 presents the decomposition of the MSE and Theil U coefficient. The decomposition of MSE provides two sets of statistics. The first decomposition suggested by Theil gives bias (UM), variance (US), and covariance (UC) statistics. The second decomposition, as suggested by Maddala, consists of bias (UM), regression (UR), and disturbance (UD) components.

An adequate model produces projections in which UM approaches zero, i.e. the model is without consistent bias; US approaches zero, implying variability of the predicted series closely resembles the variability of the actual series; and the random deviation (UC) is a large number. In the second decomposition, the bias and regression components capture the systematic divergence of the prediction from actual values. Therefore, for a model that fits the data well, the proportion of UM and UR should approach zero. The UD component, which captures the random divergence of the prediction from the actual values, should approach one. The Theil U coefficient should approach zero when the predicted series is close to the actual series.

Table 3**.** Model validation statistics.

Variable	RME %	Bias (UM)	Reg (UR)	Dist (UD)	Var (US)	Covar UC	U
INPOA	20.4975	0.000	0.515	0.485	0.133	0.867	0.0909
INPOY	1.8588	0.000	0.000	1.000	0.032	0.968	0.0092
INPOQ	20.7416	0.000	0.395	0.605	0.094	0.906	0.0882
INPOS	16.4653	0.000	0.243	0.757	0.001	0.999	0.0868
INPOC	1.6342	0.000	0.000	1.000	0.011	0.989	0.0081
INPOX	28.5781	0.000	0.302	0.697	0.032	0.967	0.1103
INPOP	3.5065	0.000	0.003	0.997	0.038	0.962	0.0174

The MSE and its decomposition reported in Table 3 show that the majority of the UM values are close to zero. This suggests that those simulated values are close to their actual values. Consequently, disturbance terms are low, which implies that errors of these simulated variables are not captured by the randomness contained in the actual data series. Contrary to UM and UD, some of the UR values are close to zero. In the second decomposition, US component performs well; however, UC values in some instances are fairly low. Compared to the decomposition of MSE statistic, almost all the Theil's U-Statistic are close to zero for the endogenous variables for the model. This suggests that overall the simulation model has reasonably good forecasting ability.

Evaluation of the Impacts of Crude Palm Oil Export Tax

From the study, it has been realized that the export tax policy has had significant impact on the CPO industry in Indonesia. For the period under study, 2002-2007, while the export tax fluctuated from 3 percent in the year 2002 to 1.5 percent in 2004, and then 6.5 percent in 2007, the average effective tax of the entire period stood at 2.31 percent for the entire period. For the time horizon of beyond 2007, the impacts of three export tax rates of 7.5, 15, and 20 percent were simulated. In this case, the export tax is not charged on the price but on the difference between the current world price

of CPO and the minimum price taxed locally in Indonesia so as to take into account the welfare of both consumers and producers.

The impact of these tax rates are summarized in Table 4. With export tax of 7.5 percent, the mature area will reduce by 0.521 percent. An increase in export tax has a negative impact on the mature area of oil palm in Indonesia. When the government increases export tax to 15 percent, there was a dramatic reduction in area under palm oil cultivation. The mature area reduced by 1.043 percent, indicating that 9 086 ha of land lost. This was low as compared to that of 20 percent increase in effective export tax that resulted in 1.38 percent reduction, and this implies that the imposition of the export tax has significantly depressed the development of oil palm plantation in Indonesia.

In addition to its negative impact on mature area, the export tax has also depressed production. The impact of export tax was evident on the quantity of CPO produced in Indonesia. With 7.5 percent export tax implemented, production reduced by 0.124 percent or 16 000 tons per year. In case the tax is increased to 20 percent by the government, the Indonesian CPO production reduced by 0.341 percent translating to 44 000 ton reduction in production level in a year.

The negative impact of this policy is more substantial in terms of export volume. If the government imposes more export tax on CPO, the export volume of CPO reduces significantly. From the simulation analysis, if the government imposes 7.5 percent export tax on CPO, export volume decreases by 3.263 percent that can be reported as 77 000 tons reduction in export, 15 percent export tax reduces the quantity by 6.271 percent or 148 000 tons reduction while 20 percent export tax would lead to 8.22 percent hence resulting in 194 000 tons less export to other countries by Indonesian CPO producers.

On the other hand, this export tax policy has provided substantial benefit to consumers. Table 4 shows that the implementation of this policy has caused domestic CPO price and by extension cooking oil price to be lower than they should be. For example, if the government imposes an export tax of 7.5 percent, then the domestic price of CPO will be about Rp 112/kg or 2.739 percent lower compared to that without export tax. A further increase in export tax on CPO would be beneficial to domestic consumers.

Table 4. Projection of impacts of export tax on crude palm oil industry.

	Estimate	**Predicted values (percent)**		
		7.5	**15**	**20**
Mature area (000 ha)	871.16	-0.52	-1.04	-1.38
CPO consumption (000 tons)	849.84	0.03	0.07	0.09
CPO Export (000 tons)	2360.00	-3.26	-6.27	-8.22
CPO Domestic price (Rp/kg)	4089.00	-2.74	-5.38	-7.04
Palm Oil Productivity (Ton/ha)	3.68	-0.02	-0.03	-0.04
CPO Stock (000 Tons)	930.79	1.19	2.38	3.17
Production (000 tons)	3225.00	-0.12	-0.28	-0.34

Clearly, the export tax policy reduces not only competitiveness of the Indonesian palm oil industry but also hurts producers of CPO (some of them small-holder farmers) due to the lower price of CPO relative to the world market price. On the other hand, refiners that process CPO into various products - such as cooking oil, margarine, shortening - gain from this policy since they get CPO at lower prices. Finally, consumers 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 a potential oligopolistic market structure, it is not likely that the consumers fully benefit from the lower price of cooking oil. The imposition of an export tax diverts CPO from the export market to the domestic market, lowering all cooking oil prices. This leads to competition with the domestic coconut oil industry, which otherwise would provide more of the raw material for domestic cooking oil. Considering that significant amount of copra is made from coconuts that come from small-holder farmers, the export tax policy on CPO could further lower price of coconuts and pressure farm incomes.

An Alternative Formulation of Export Tax Rate

From the analysis undertaken considering the effects of export tax government policy on Indonesian CPO industry, the results indicate that the implementation of the CPO export tax has significant advantages and disadvantages to the CPO industry. It has been realized that export tax policy has a redistribution impact to all stakeholders involved in the industry and government revenue. This policy has benefitted both consumers and the government making them better off. On the contrary, producers have become worse off, indicated by the decline in mature oil palm area, production, export, farm income and employment.

Considering the benefits and costs of the policy, the government is likely to maintain this policy in the future. This is because it would enable the government to redistribute income to the majority of the population who are consumers of CPO by products like cooking oil. The government also depends so much on the revenue earned from export through export tax policy. As this policy has substantial impacts on the industry, it needs to be reformulated in such a way that consumers are fairly protected from a sharp fluctuation of the international market, while producers still gain a normal profit or incentive to develop their plantations. Following this, the magnitude/rate of CPO tax should consider the following facts:

1. Investment in oil palm plantations is a long-term venture and therefore, price fluctuation cannot be avoided by the investors/ producers. Within a certain period of time, CPO price may well be above production cost and *vice versa*. Production cost in this case includes variable cost and capital accumulation for reinvestment or rehabilitation (sustainable development approach);

2. Using this approach, production cost (assuming that the exchange rate is Rp 9000/USD) is around USD 165.2/t or Rp 1 487/kg. therefore, the value to be taxed should be the profit between the market price and the production cost;

3. Profits/losses strongly depend on the world price (WDPOP) and exchange rate (INE). Therefore, these two factors should be explicitly considered to determine the rate of the tax. Thus, profit (P) = (WDPOP*INE - 1 487);

4. When the price of CPO is below the production cost, the producers/smallholders suffer from a loss. Using world CPO price in the last two decades, it was found that the number of times that CPO prices were below the production cost, or probability (P) to get profit is around 0.7 (P =0.7). This means that if the producers/smallholders have to transfer part of their profit to consumers and government, it is only around 0.7 of the time can that be transferred. This coefficient acts as the first weight in distributing welfare as represented by Equation 6;

5. On the basis of the secondary rights theory which states that profit gain of an industry is not merely enjoyed by the people involved in the industry, but also by people, who because of some obstacles cannot participate in the industry. In line with this argument, it is assumed

that 75 percent of the profit belongs to producers as primary right, while the rest of about 25 percent will belong to consumers as a secondary right (SR);

6. The magnitude of the tax should also consider the number of producers and consumers, as a proxy of political power/pressure group. The number of producers together with their family members is assumed to be 5 percent of the total population in Indonesia. In this study, the number of consumer (NC) and producers together with family members (NP) are 232 million and 11.6 million, respectively; and

7. The magnitude of the tax should also consider the income share of oil palm plantation to total farmers' income (IS), and share of cooking oil expenditure to total household expenditure (ES). Within this study, the former is estimated to be around 80 percent and the latter to be 4 percent (BPS, 2001).

Following all these arguments then, the formulation of an alternative export tax is as follows:

PE = Π□* P * SR * (NC/NP) *(ES/IS)
= (WDPOP*INE-1 487)*0.7*0.25*(232/11.6)*(4/80)..... (6)
= (WDPOP*INE-1 487)*0.175
= (WDPOP*INE-1 487)*17.5 %.....(7)

Therefore, nominal tax is 17.5 percent

where:
PE = Export tax rate (Rp/kg)
WDPOP = Export price (USD/t)
INE = Exchange rate (Rp/USD)

Estimating effective tax for Indonesian CPO industry using the above formulated equation is as follows;
Therefore

$$EET = \frac{(WDPOP - INPQ)}{WDPOP} * Tax$$

$$EET = \frac{(454 - 165.2)}{454} * 17.5$$

= 11.13 percent

Where: WDPOP = USD 454/ton (average price for entire period studied)
INPQ = USD 165.2/ton (average cost of production)
Tax = Nominal export tax rate (percent)

Effect of Recommended Export Tax on CPO Industry

The Indonesian government should implement the CPO export nominal tax of 17.5 percent that translates to 11.13 percent effective export tax. With this export tax rate, the mature area will reduce at the rate of 1.228 percent. In other words, the mature area will reduce by about 42 300 tons per year due to tax implementation as reported in Table 5. According to the plan of the Ministry of Agriculture of Indonesia of reducing the area under palm oil so as to have a stable price, an increase in the export tax would be of importance as it will lead to voluntary reduction in production area under palm oil as it would result into reduction of export to other countries. In this scenario, with implementation of export tax policy recommended, the export volume will reduce by 7.331 percent

or about 170 000 tons for quarter year period hence increasing the quantity of CPO in Indonesian domestic market.

The domestic consumers of CPO and cooking oil will be the greatest beneficiaries in the new tax scheme. With tax implemented at 11.13 percent, the price of palm oil will reduce by 6.261 percent. This will make the consumers of palm oil in Indonesia to pay for palm oil at Rp 255.12/kg less than without an increment in tax. The cost of cooking oil will be expected to reduce as a result of the reduction in CPO price since it is the main source of raw materials for the cooking oil industry in Indonesia.

The main losers with the implementation of the proposed export tax rate will be consumers in the importing countries and the local producers of CPO. The production reduces by about 6 000 tons in that period (0.186 percent) translating to over 24 000 tons reduction per year. This effect of the export tax is great on the producers than on traders because the exporters always shift the tax bundle to the producers hence offering reduced prices for their products.

Table 5. Effect of the recommended export tax on the crude palm oil industry

Variable	Mean	Percent	Value
Mature area (000 ha)	871.16	-1.228	-10.562
CPO consumption (000 tons)	849.84	0.078	0.663
CPO Export (000 tons)	2360.00	-7.331	-169.994
CPO Domestic price (Rp/kg)	4089.00	-6.261	-255.120
Palm Oil Productivity (Ton/ha)	3.68	-0.030	-0.001
CPO Stock (000 Tons)	930.79	1.770	16.436
Production (000 tons)	3225.00	-0.186	-5.999

This export tax formulation has some sound justifications. Firstly, the tax will be effective if the producers gain profit, at least enough to rehabilitate their plantation. This represents sustainable development argument. Secondly, the benefits gained due to price increase or currency depreciation are distributed among producers, consumers and the government after considering secondary rights (equity argument), the number of producers and consumers that could be a proxy of political power or pressure group (political argument) and the importance of CPO in the producer and consumer perspective (economic or welfare argument).

CONCLUSIONS AND RECOMMENDATIONS

The study found out that the export tax policy has significant impact on the CPO industry in Indonesia. The export tax led to the reduction of the mature area of oil palm plantation. It can also be concluded that the export tax policy benefitted the domestic consumers of both CPO and cooking oil as it was effective in controlling domestic cooking oil price as it reduced the domestic prices of these products. With this export tax policy, the government can successful to keep the cooking oil price down when the world CPO price increased or when rupiah was substantially depreciated.

The impact of export tax led to depression of production resulting to reduced quantity produced. Producers, mainly smallholders, have suffered a great deal due to the policy. As the domestic price of CPO is depressed by this policy, the farm gate price of the farmers' product (fresh fruit bunch or FFB), declines substantially.

The following recommendations should be considered to improve the competitiveness of Indonesian CPO in the world market.

1. There should be an increase in investment in research and development in the palm oil sector. This would result in improved human resources technology that would result in improved production by the farmers hence would result in high productivity.

2. The government policy on imports should promote investment in the agricultural sector by guaranteeing security, permit ownership of plantations by individuals, reducing import cost on farm machines and implements used in palm oil industry, provide incentives on imports of agricultural machines.

3. The Indonesian government in conjunction with investors in the CPO sector must invest in infrastructure to make them competitive. This investment should be in the fields of transport network, production firms and marketing systems. There should be the provision of credit to the palm oil producers. The banking system can enable the palm oil investors to access loans that would increase their production and the pay back at an appropriate interest rate after an appropriate time.

4. The export tax formulation with well considered and much sounder justifications is needed so that benefits gained from price increases or currency depreciation are distributed among producers, consumers and the government after considering secondary rights (equity argument). The results of this study show that the effective export tax rate should be around 11.13 percent.

REFERENCES

Aoki, M., H. K. Kim, and M. O. Fujiwara. 1997. The Role of Government in East Asian Economic Development: Comparative Institutional Analysis. Clarendon Press, Oxford.

Balassa, B. 1989. Comparative Advantage, Trade Policy and Economic Development. Harvester Wheatsheaf, New York.

Bartholomew, S. 1997. National Systems of Biotechnology Innovation: Complex Interdependence in the Global System. Journal of International Business Studies.

Barton, J. H. 1993. Implication of GATT of World Trade in Vegetable Oils. Paper Presented at the 1993 PORIM International Palm Oil Congress. Kuala Lumpur.

Basiron, Y. 2002. Palm Oil and its Global Supply and Demand Prospects. Oil Palm Industry Economic Journal.

BPS. 2001. Statistik Kelapa Sawit Indonesia. Badan Pusat Statistik, Jakarta.

BPS. 2007. Statistik Kelapa Sawit Indonesia. Badan Pusat Statistik, Jakarta.

Butler R A. 2007. Is peat swamp worth more than palm oil plantations? www.mongabay.com

Koutsoyiannis, A. 1977. Theory of Econometrics. Second Edition. MacMillan Publishing Company, New York.

Mohamad, F. H., M. R. Reed and M. A. Marchant. 2001. Effects of an Export Tax on Competitiveness: The Case of the Indonesian Palm Oil Industry. Journal of Economic Development.

Oil World. 2007. World Oil Database. Oil World, Hamburg.

Pasquali, M. 1993. Prospects to the Year 2000 in the World Oilseeds, Oils and Oilmeals Economy, Policy issues and Challenges. Paper Presented at the 1993 PORIM International Palm Oil Congress. Kuala Lumpur.

Reed, M. R. 2000. International Trade in Agricultural Products. Upper Saddle, Prentice Hall, New Jersey.

Simeh, M. A. 2004. Comparative Advantage of the European Rapeseed Industry vis-à-vis Other Oils and Fats Producers. Oil Palm industry Economic Journal.

Siregar H. and R. H. Sinaga. 2006. Cukup Berdaya Saingkah Minyak Sawit Indonesia di China? Agrimedia Journal, 11(2): 57-67.

Soeherman, G., D. Dharsono and L. Buana. 2006. Road Map Industri Kelapa Sawit. Jakarta.

Susila, W. R. 2004. Impacts of CPO Export Tax on Several Aspects of Indonesian CPO Industry. Indonesian Institute for Estate Crops, Bogor.

Tambunan, T. 2006. Indonesian Crude Palm Oil: Production, Export Performance and Competitiveness. Jakarta.