# REDUCTION IN EXPORT DUTY AND ITS IMPLICATION TO THE MALAYSIAN PALM OIL INDUSTRY[1]

**Oleh: DR. Ernawati,[2]**

*ABSTRAK*

*Dengan menggunakan data seri masa pada periode 1969-2001, kajian ini menggunakan pendekatan ekonometrik terutama dengan pendekatan "error correction model". Kajian ini bertujuan untuk menguji dampak dari perubahan kebijakan perdagangan bebas (AFTA-penurunan pajak ekspor) terhadap Industri kelapa sawit Malaysia melalui simulasi kebijakan penurunan pajak ekspor sebesar 10, 30, 50 dan 100 persen.*

*Hasil simulasi menunjukkan bahwa dampak langsung dari kebijakan perdagangan bebas-penurunan pajak eksport ini akan meningkatkan harga minyak sawit domestik dan penurunan harga minyak sawit dunia, yang pada akhirnya berdampak pada kondisi industri minyak sawit dalam negeri (Malaysia) yaitu peningkatan luas areal tanam, luas areal kelapa sawit yang dipanen, produktivitas minyak sawit, dan ekspor minyak sawit.*

*Analisis kesejahteraan menunjukkan bahwa kebijakan penurunan pajak ekspor akan dinikmati oleh produsen yang ditunjukkan oleh peningkatan dalam "produsen surplus" sementara yang menanggung kerugian dari kebijakan penurunan pajak ekspor adalah konsumen yang ditunjukkan oleh penurunan di dalam "konsumen surplus" dan juga pemerintah.*

***Kata Kunci: AFTA-penurunan pajak ekspor, harga, luas areal tanam, luas areal panen, produktivitas dan ekspor minyak.***

## INTRODUCTION

The arguments that trade liberalization increased welfare in the economies adopting it still remain debatable. Many researchers have agreed that the term trade liberalization should permit specialization, efficiency gains and increase trade. Trade liberalization should reduce distortions; Robinson and De Rosa (1995), Thomas F. Rutherford and David G. Tarr (1997), Feridhanusetyawan (1998), Feridhanusetyawan (1999) and Kazarian and Ames (2000). Meanwhile, international trade theory suggested that trade liberalization could improve the welfare of member countries if total volume of trade by those countries increased; through trade creation exceeding trade diversion from nonmember countries.

[1] Paper submitted to "Perspective Journal" University Brunei Darussalam

[2] Lecturer, Faculty of Economics and Management Wijaya Kusuma University

In this paper, the concept of partial equilibrium consumer and producer surpluses is used to analyze economic gains and losses for the Malaysian palm oil industry from the changes in trade liberalization policies. Consumer surplus refers to the area above the equilibrium price line but below the demand curve. It represent the difference between the amount consumers are willing to pay for a given quantity of good and the amount they actually have to pay before receiving that given quantity. Producer surplus refers to the area below the equilibrium price line but above the supply curve. It represents the difference between the total revenue received by producers for producing a given quantity and the total costs incurred to produce that given quantity.

Hence, this study is an attempt to examine welfare effect of trade liberalization policy changes-the reduction in export duty. This study is useful since many of palm oil study were conducted, but none of them focused to see the welfare effect. For example, Lubis, A. (1994), Shamsuddin, M.N. et al (1994) and Susila, W.R. (1996) focused on palm oil modeling. Meanwhile, Dradjat, B. et al., (1994), Simatupang and Purwanto (1995), and Sumaryanto and Rantenata, (1996) focused on the domestic demand for palm oil in Malaysia. Among of them tried to see the impacts of government policy such as Larson, D. F. (1996), and Shamsuddin, M. N. et al (1997). Suryana, A (1986), Tondok, A. R. (1998), Ibrahim, A. (1999), Basiron, Y. (2001) also focused on the factors affecting the palm oil industry including the policy variable.

Furthermore, the usefulness of this study is in that it can indicate to planners and policy makers the favourable impact or otherwise arising from the arising from the reduction of export duty and import tariff on palm oil industry, one of the country's primary commodity exports.

## CONCEPTUAL FRAMEWORK

A graphical exposition on the effect of trade liberalization - reduction of export tax - on the Malaysian palm oil industry is shown in Figure 1. With the presence of export tax, the world trade equilibrium is determined by the intersection of the world excess supply curve ($ES_w^*$) with the world excess demand curve ($ED_w$) for palm oil (panel F).

The $ES_w^*$ is the summation of Malaysia's and the rest of the world's export, and the $ED_w$ is the summation of imports by all importing countries. The Quantity traded is $Q_w^*$ and the world price is $P_w^*$. The quantity of palm oil exported by Malaysia and the rest of the world is $Q_{IX}^*$ and $Q_{XROW}^*$ in panel B and C respectively. The price paid by the importers of the Malaysia palm oil is $P_w^*$ and the price received by the Malaysian producer $P_I^*$.

The difference between $P_W^*$ and $P_I^*$ is the amount of export duty per ton. As shown in panel B, the burden of the tax is shared by both the producers and importers (assuming that the import demand curve faced by the Malaysian producers is not perfectly elastic). Malaysian production of CPO is $Q_{SI}^*$ and domestic consumption is $Q_{CI}^*$.

With the liberalization of the Malaysian export duty on CPO, the Malaysian excess supply curve shifts from $ES_I^*$ to $ES_I$ by the amount of the levy. This will cause a shift in the world excess supply curve from $ES_W^*$ to $ES_W$ and a decline in the world price from $P_W^*$ to $P_W$. In the free trade situation (without the Malaysian export duty on CPO) the export and domestic prices on the Malaysian domestic and export markets is equal to $P_W$. The amount of export increases from $Q_{IX}^*$ to $Q_{IX}$. The domestic supply increases from $Q_{SI}^*$ to $Q_{SI}$ and the domestic utilization decline from $Q_{CI}^*$ to $Q_{CI}$.

## METHOD

A number of studies have been carried out to analyse the palm oil market in Indonesia and Malaysia. The notables ones are: Lubis (1994), Shamsuddin et al., .(1994) and Susila (1996) which examined supply demand system of the Malaysian palm oil. Dradjat et al. (1994), simatupang and Purwanto (1995), and Sumaryanto and Rantenata (1996) investigated the domestic demand for palm oil in Indonesia. Larson (1996), and Shamsuddin et al. (1997) examined the determinants and implications of policy instruments on the Indonesian and Malaysian palm oil market respectively. Suryana (1986), Tondok, (1998), Ibrahim (1999), Basiron (2001) examined the prospect of palm oil in the international market in the case of both Indonesia and Malaysia.

These studies however address the stationarity problem of time series data which might render the resulting regression coefficients as spurious. According to Engle and Granger (1987) if non-stationary time series variables are not co-integrated, then they have no long-term relationship. Co-integration, introduced by Granger (1981), is relevant to the problem of the determination of long-run or 'equilibrium' relationships in economics. The basic idea behind co-integration is that if, in the long run, two or more series move closely together, even though the series themselves are trended, the difference between them is constant. It is possible to regard these series as defining a long-run equilibrium relationship, as the difference between them is stationary (Hall and Henry, 1989). A lack of co-integration suggests that such variables have no long-run relationship: in principal they can wander arbitrarily far away from each other (Dickey, 1991). Existence of a high degree of correlation between two variables does not mean there is a causal relationship between the variables. For example, a high $R$ may only indicate correlated trends

and it is not the implication of a real economic relationship. To remedy this problem, the co-integration technique and error correction modeling are recommended (Bahmani-Oskooee and Alse, 1993).

Some recent studies have confirmed the existence of a co-integrating long-run relationship between the agricultural commodity and economic variables, such as McKay (1998), Angulo and Zapata (2000), Warr and Wollmer (2000), Mushtaq and Dawson (2000), Thompson et al. (2000) and Salih (2001).

**Model Specification**

The model is based on the assumption that the world palm oil market is at equilibrium. Basically, the equilibrium condition is met when the world excess supply of palm oil is equal to the world excess demand from palm oil. Therefore, the model is divided into two components: (1) world excess supply and (2) the world excess demand. The structural modeling can be seen in Table 1. The model is structured into eleven behavioral equations and it has been applied to supply and demand analysis. Specifically, the model incorporated specific equations for acreage, harvested area, yield, domestic demand, rest of the world excess supply, Malaysian excess demand to India, China, Europe, and rest of the world, rest of the world excess demand and export price.

**Table 1: Equation System of the Malaysian Palm Oil Industry**

| Equation System | Sign Hypothesis |
|---|---|
| 1. Production of Palm Oil<br>$MQP_t = HA_t * Y_t$ | |
| 2. Harvested of palm oil<br>$HA_t = a_0 + a_1 DP_{t-1} + a_2 LA_t + a_3 HA_{t-1} + U_1$ | $a_1>0; a_2<0;$<br>$0< a_3<1$ |
| 3. Acreages of palm oil<br>$LA_t = b_0 + b_1 DP_{t-1} + b_2 PR_{t-1} + b_3 LA_{t-1} + b_4 D_1 + b_5 D_2 +$<br>$b_6 D_3 + U_2$ | $b_1>0; b_2<0;$<br>$0< b_3<1$ |
| 4. Palm oil yields<br>$Y_t = c_0 + c_1 Trend + c_2 DP_t / PF_t + c_3 Y_{t-1} + U_3$ | $c_2>0;\ 0<c_3<1$ |
| 5. Domestic Demand for palm oil<br>$MDD_t = d_0 + d_1 DP_t + d_2 PCO_t + d_3 MIPI + d_4 POP_t$<br>$+ d_5 MDD_{t-1} + U_4$ | $d_1<0;$ |

| | |
|---|---|
| | $d_2>0$; $d_4<0<1$ |
| 6. Malaysian Excess Supply<br>$MQX_t = MQP_T - MQDD_T$ | |
| 7. Rest of world excess supply<br>$ROWQX_T = e_0 + e_1 WPO_t + e_2 ROWQP_t + U_5$ | |
| 8. World Excess Supply<br>$WQX_t = INDQX_T + ROWQX_T$ | $e_1, e_2 > 0$ |
| 9. Total Export Demand<br>$MXT_t = MX_{It} + MX_{Ct} + MX_{EUt} + MX_{ROWt}$ | |
| 10. Export Demand to India<br>$MX_{It} = f_0 + f_1 WPO_t + f_2 PSO_t + f_3 PGO_t + f_4 PRO_t + f_5 IPI_t + f_6 EX_t + f_7 MX_{It-1} + U_6$ | $f_1, f_6<0$,<br>$f_2, f_3, f_3, >0$,<br>$0<f_5<1$ |
| 11. Export Demand to China<br>$MX_{Ct} = g_0 + g_1 WPO_t + g_2 PSO_t + g_3 PGO_t + g_4 PRO_t + g_5 IPC_t + g_6 EX_t + g_7 MX_{Ct-1} + U_7$ | $g_1, g_6<0$,<br>$g_2, g_3, g_3, >0$,<br>$0<g_5<1$ |
| 12. Export Demand to EU<br>$MX_{EUt} = h_0 + h_1 WPO_t + h_2 PSO_t + h_3 PGO_t + h_4 PRO_t + h_5 IPEU_t + h_6 EX_t + h_7 MX_{EUt-1} + U_8$ | $h_1, h_6<0$,<br>$h_2, h_3, h_3, >0$,<br>$0<h_5<1$ |
| 13. Export Demand to Rest of the World<br>$MX_{ROWt} = i_0 + i_1 WPO_t + i_2 PSO_t + i_3 PGO_t + i_4 PRO_t + i_5 IPROW_t + i_6 EX_t + i_7 MX_{ROWt-1} + U_9$ | $i_1, i_6<0$,<br>$i_2, i_3, i_3, >0$,<br>$0<i_5<1$ |
| 14. Rest of the World Excess Demand<br>$ROWQM_T = j_0 + j_1 WPO_T + j_2 PSO_T + j_3 WGDP_T + U_{10}$ | $j_1<0$, $j_2, j_3>0$; |
| 15. World Excess Demand<br>$WQM_T = ROWQM_T + MXT_T$ | |

| | |
|---|---|
| 16. Export price of Malaysian palm oil<br>$PX_t = k_0 + k_1 WPO_t + U_{10}$<br>17. Domestic Price of Malaysian Palm Oil<br>$DP_t + XP_t - XT_t$<br><br>18. World Price of Malaysian Palm Oil if Importing Countries Imposed Tariff<br>$WPO^i_t = PX_t(1+t)$<br><br>19. Closing identity $WQX_T = WQM_T$ | $k_1 > 0$ |

An econometric approach, mainly the error correction model on a simultaneous equation model, was employed in this study to investigate the determinant of economic variable on the Malaysian palm oil industry. Before estimating the model, the two data tests was conducted in this study including the unit root data test using both the standard Augmented Dickey Fuller (ADF) and Phillips-Perron (PP); and the co-integration test using the Johansen procedure.

In order to evaluate the sensitivity of Malaysian palm oil acreage, harvested area, yield, domestic demand, rest of the world excess supply, export demand to Indian, China, Europe, and rest of the world, rest of the world excess demand, export price, domestic price, and world price, the model was simulated starting with the actual domestic price during 1969-2001 as the base condition of pre-trade liberalization to generate the base simulations. Then the model was simulated again by decreasing export duty by 10, 30, 50, and 100 percent. The effects of the export duty reduction are seen by the difference in the simulated values and the base solutions.

The estimated equations are presented in Table 2. The definition of the variables in the estimated equation is shown in Table 3. The estimation results indicate that the model is satisfactory in terms of correct signs and significance of variables concerned.

**Table 2: Summary of Estimates of the Equations in the Malaysian Palm Oil Industry Model**

| Variables | Estimated Equation Results |
|---|---|
| Acreage ($LA_{t-1}$) | $49.45^{**} + 0.06DP_{t-1} - 0.03PR_{t-1} + 0.84^{***}LA_{t-1} + 0.32ECLA_t$ |

| | |
|---|---|
| Harvested ($HA_{t-1}$) | -28.83 + 0.098***$LA_t$ + 0.92***$HA_{t-1}$ +0.56***ECH1 |
| Yield ($Y_t$) | 1.66*** + 0.23***$DP_{t-2}/PF_{t-2}$ + 0.30***D + 0.43**$Y_{t-1}$ – 0.05EC2YT |
| Production ($INDQP_t$) | $LA_t$ * $HA_{t-1}$ |
| Domestic Demand ($DD_t$) | -33.51-1.48**$DP_t$ + 1.26$PSO_t$ + 0.85$IPIM_t$ - 0.57***$DD_{t-1}$ – 0.80**ECMDD |
| Malaysian Excess Supply ($INDQX_t$) | $INDQP_t$ - $DD_t$ |
| ROW Excess Supply ($ROWQX_t$) | -4553.67***+2.64$WPO_t$ + 86.38**$WGDP_t$ - 0.14 ECROWX |
| World Excess Supply ($WQX_t$) | $INDQX_t$ + $ROWQX_t$ |
| Export Demand to India ($IX_{It}$) | 6.11- 5.79** $WPO_t$ + 4.98$PSO_t$ + 136.68**D + 2.25IPI + 11.01ERI + 0.86***$IX_{It-1}$ + 14.37IC1$IX_I$ |
| Export Demand to China ($IX_{Ct}$) | -5.76 – 1.70*$WPO_t$ + 3.44***$PGO_t$ + 0.99**IPC +215.81***ERC + 0.31***$IX_{Ct-1}$ – 31.33EC1IXc – 79.32***EC2$IX_C$ |
| Export Demand to Europe ($IX_{EUt}$) | -1005.66 – 0.98$WPO_t$ + 15.16**$PRO_t$ + 13.85**$PSO_t$ + 1.31 $IPEU_t$ + 8.61$EREU_t$ + 0.79***$IX_{EUt-1}$ + 140.79***$ECIX_{EU}$ – 37.53 $EC2X_{EU}$ |
| Export Demand to ROW ($IX_{ROWt}$) | -833.58 – 14.66***$WPO_t$ + 12.66**$PSO_t$ + 0.54***$IX_{ROWt-1}$ + 21.09ECM1$IX_{ROWt}$ + 0.05 ECM2 $IX_{ROWt}$ |
| Total Export Demand ($IXT_t$) | $IX_{It}$ + $IX_{Ct}$ + $IX_{EUt}$ + $IX_{ROWt}$ |
| ROW Excess Demand ($ROWQM_t$) | -1995.71* - 10.64 $WPO_t$ + 11.75$PRO_t$ + 38.02*** $WGDP_t$ + 0.55***$ROWQM_{t-1}$ + 0.63 ECROWM1 |
| World Excess Demand ($WQM_t$) | $IXT_t$ + $WQM_t$ |
| Export Price of Malaysian PO | 36.23** + 0.55*** $WPO_t$ + 0.08***$PX_{t-1}$ + 0.026ECMPX |
| Domestic Price ($DP_t$) | $PX_t$ - $XT_t$ |
| World Price ($WPO_t$) | $PX_t$ (1+t) |
| Equilibrium | $WQX_t$ = $WQM_t$ |

**Table 3: Definition, Measurement and Data Sources of the Variables Included in the Model**

| Variables definition | | Measurement | Source of Data |
|---|---|---|---|
| $MQP_t$ | palm oil Supply | 000 tonnes | Oil World, MPOB |
| $LA_t$ | palm oil acreage | 000 hectares | Oil World, MPOB |
| $Y_t$ | palm oil productivity | ton/hectare | Oil World, MPOB |
| $DP_{t-1}$ | lagged of palm oil price | Rupiah/ton | Malaysian Statistic Bureau |
| $PR_{t-1}$ | lagged of rubber price | Rupiah/ton | Malaysian Statistic Bureau |
| $LA_{t-1}$ | Lagged of palm oil acreage | 000 hectares | Oil World |

| | | | |
|---|---|---|---|
| U1 – U9 | Error term | | - |
| DPt/DFt | ratio of palm oil price and fertilizer price | - | |
| Yt-1 | lagged of yields palm oil | Ton/hectare | Malaysian Statistic Bureau |
| DDt | Domestic Demand for Palm Oil | 000 tones | Oil World, MPOB |
| PCOt | coconut oil price | Ringgit/ton | Oil World, MPOB |
| EA | Economic Activity | - | |
| POP | Malaysian Population | million people | Malaysian Statistic Bureau |
| $DD_{t-1}$ | Lagged of Domestic Demand for Palm Oil | 000 tones | Oil World, Malaysian Statistic Bureau |
| $MX_t$ | Total Export Demand Malaysian palm oil | 000 tones | Oil World, Malaysian Statistic Bureau |
| $MQX_t$ | Malaysian excess supply | | Oil World, Malaysian Statistic Bureau |
| $ROWQX_t$ | | 000 tones | Oil World, Malaysian Statistic Bureau |
| $ROWQP_t$ | rest of world excess supply Rest of the world supply | | Oil World, Malaysian Statistic Bureau |
| $WQX_t$ | World excess supply | 000 tones | Oil World |
| $MX_{It}$ | Export Demand to India | 000 tones | Oil World, MPOB |
| $MX_{Ct}$ | Export Demand to China | 000 tones | Oil World, MPOB |
| $MX_{EUt}$ | Export Demand to Europe | 000 tones | Oil World, MPOB |
| $MX_{ROWt}$ | Malaysian Export Demand to Rest of the world | 000 tones | Oil World, MPOB |
| $PSO_t$ | world price of soybean oil | USD/ton | World Bank, IMF |
| $PGO_t$ | world price of Groundnut oil | USD/ton | World Bank, IMF |
| $PRO_t$ | world price of rapeseed oil | USD/ton | World Bank, IMF |
| $IPI_t$ | Indian industrial production index | | ASEAN Development Bank (ADB) |
| $IPI_C$ | Chinese industrial production index | - | ADB |
| $IPI_{EUt}$ | EU industrial production Index | | ADB |
| $IPI_{ROW}$ | ROW industrial production Index | - | ADB |
| $MX_{It-1}$ | lagged export demand to India | 000 tones | Oil World, Malaysian Statistic Bureau |
| $MX_{Ct-1}$ | lagged export demand to China | 000 tones | Oil World, Malaysian Statistic Bureau |
| $MX_{EUt-1}$ | lagged export demand to EU | 000 tones | Oil World, Malaysian Statistic Bureau |
| $MX_{ROWt-1}$ | lagged export demand to ROW | 000 tones | Oil World, |

| | | | |
|---|---|---|---|
| | | | Malaysian Statistic Bureau |
| $ROWQM_t$ | Rest of world excess demand | 000 tones | Oil World, |
| | | | Malaysian Statistic Bureau |
| $WPO_t$ | World price of palm oil | USD/ton | Malaysian |
| $WGDP_t$ | World GDP | | Statistic Bureau, ADB |
| $WQM_t$ | World excess Demand | 000 tones | Oil World, MPOB |
| | | | Malaysian Statistic Bureau |
| | Export price of Malaysia | USD/ton | Oil World, Malaysian |
| $PX_t$ | palm oil | | Statistic Bureau |
| $EX_t$ | exchange rate | domestic currency to USD | Malaysian Statistic Bureau |
| $XT_t$ | export tax | percent | |
| $HA_t$ | harvested area | 000 hectares | Oil World, MPOB |
| | | | Malaysian Statistic Bureau |

## RESULTS AND DISCUSSION

### Reduction in Export Duty

Table 4 presents the historical simulation on the major variables in Malaysia's palm oil industry before and after trade liberalization - reduction of export duty by 10, 30, 50 and 100%. The table shows the comparison between the conditions when the government imposed export duty and the changes of trade liberalization policy – reduction in export duty.

From Table 4, due to reduction in export duty by 10% domestic price increased from $32.56/ton to $32.22/ton. The domestic consumption decreased from 628.30 thousand tones to 627.31 thousand tones. The negative impact of increasing the domestic price also caused a reduction in the ROW excess supply. It reduced from 2768.64 thousand tones to 2768.47 thousand tones when export duty is reduced by 10%.

**Table 4: Historical Simulation on the Major Variable on Malaysia's Palm Oil Industry Before and After Trade Liberalization – Reduction of Export Duty**

| Variables | Based Scenario | Reduction of Export Duty | | | |
|---|---|---|---|---|---|
| | | 10% | 30% | 50% | 100% |
| Acreage | 1309.75 | 1309.79 | 1309.88 | 1309.92 | 1309.96 |
| Harvested | 945.27 | 945.27 | 945.28 | 945.29 | 945.29 |

| | | | | | |
|---|---|---|---|---|---|
| Yield | 2.28 | 2.28 | 2.28 | 2.28 | 2.28 |
| Production (Harvested*Yield) | 2151.50 | 2152.57 | 2154.71 | 2155.78 | 2156.84 |
| Domestic Demand | 628.30 | 627.31 | 625.33 | 624.34 | 623.35 |
| Malaysian Excess Supply (Production-DD) | 1523.20 | 1525.26 | 1529.38 | 1531.44 | 1533.49 |
| ROW excess supply | 2768.64 | 2768.47 | 2766.14 | 2765.97 | 2761.80 |
| World Excess Supply (ESi+ESrow) | 4291.84 | 4293.73 | 4305.52 | 4313.41 | 4331.30 |
| Export demand to India | 286.05 | 295.06 | 313.07 | 322.08 | 331.09 |
| Export demand to China | 608.36 | 611.05 | 616.42 | 619.10 | 621.79 |
| Export demand to Europe | 467.88 | 469.44 | 472.56 | 474.11 | 475.67 |
| Export Demand to ROW | 280.26 | 291.59 | 316.23 | 320.37 | 330.43 |
| Total Export Demand (Xi+Xc+Xeu+Xrow) | 1532.55 | 1567.14 | 1618.28 | 1635.67 | 1758.98 |
| ROW excess Demand | 2580.11 | 2596.92 | 2630.54 | 2647.35 | 2664.16 |
| World Excess Demand (TEDi+ROWED) | 4291.84 | 4293.73 | 4305.52 | 4313.41 | 4331.30 |
| Export price of Malaysian PO | 106.33 | 105.46 | 103.73 | 102.87 | 102.00 |
| Domestic price | 31.56 | 32.22 | 33.56 | 34.23 | 37.57 |
| World price | 103.72 | 102.14 | 98.98 | 97.40 | 89.50 |

The positive impact of changes in trade liberalization policy – reduction in export duty – have increased Malaysian palm oil production, Malaysian excess supply, and world excess supply. Malaysian palm oil production have increased from 2151.50 thousand tones to 2152.57 tones when export duty is decreased by 10%. Due to increasing palm oil production, the Malaysian excess supply – which is exported to India, China, Europe and ROW - will increase.

In Table 4 it increased from 1523.20 thousand tones to 1525.26 thousand tones when export duty is reduced by 10%. In the world market, the world excess supply increased from 4291.84 thousand tones to 4293.73 thousand tones when export duty is reduced by 10%. Moreover, Table 4 shows the impact of changes in trade liberalization policy-reduction of export duty by 30, 50, and 100% on the major variables in Malaysian palm oil industry. The results of reduction in export duties suggest that the higher the percentages of export duty, the larger the changes in variable consistent with the previous finding.

Table 5 estimated the welfare gain from reduction of export duty on Malaysian palm oil industry. Due to the absence of export duty on Malaysian palm oil, the net social welfare effect gain for Malaysia is $ 6.88 thousand with reduction in export duty by 10%. This number increased along with the increase in the percentage reduction of export duty. The net social welfare gain for Malaysia can be mostly attributable to the reallocation of production resources from the government to the producer and gains in producer's surplus due to the higher prices.

**Table 5 : Estimated Welfare Gain from Reduction of Export Duty on Malaysian Palm Oil Industry**

| Effect of Trade | Reduction of Export Duty | | | |
|---|---|---|---|---|
| | 10% | 30% | 50% | 100% |
| Loss in Consumer Surplus (a) | 419.21 | 1253.66 | 1668.90 | 3749.06 |
| Gain of Deadweight Loss (b) | 0.33 | 2.98 | 5.30 | 14.89 |
| Loss in Government Revenue (c) | 1017.90 | 3053.71 | 4071.61 | 9161.12 |
| Gain of Deadweight Loss (d) | 0.36 | 3.21 | 5.71 | 16.06 |
| Gain of Producer Surplus (a+b+c+d) | 1438.13 | 4316.54 | 5756.81 | 12956.03 |
| Net Gain of Trade Policy (b+d) | 6.88 | 61.90 | 110.05 | 309.52 |

Estimation yields a gain in Malaysian producer surplus of $ 1.44 million (areas a, b, c, d), when export tax is reduced by 10%. The value of a ($ 419.21 thousand) is loss in consumer surplus due to increase production at higher prices. The value c ($1.02 million) is loss in tax government revenue collected from export of $D_k^t S_k^t$ units. The area d ($ 0.36 thousand) represents a net gain because $S_k^t S_k^e$ units that could be sold for $P_w^e$ are produced after the levy is reduced. Area b ($ 0.33 thousand) represents a net gain because $D_k^e D_k^t$ is sold to foreign buyers at $P_w^e$ rather than to domestic buyers at $P_k^t$.

Then the triangle b and d ($ 6.88 thousand) is a net gain of trade liberalization policy-reduction of export duty by 10% - which attributable to the transfers of production resources to more efficient sectors.

## CONCLUSION

The central theme of this paper is to analyze the economic impact of trade liberalization on the Malaysian palm oil industry. The findings indicate that trade liberalization will increase domestic price acreage, harvested area, yield, rest of the world excess demand and quantity exported. On the other hand it will reduce world price, domestic demand, export price and rest of the world excess supply. In terms of welfare analysis, the gainers are producer, and the losers are consumers and government.

The implication of the changes in trade liberalization policy, taking into consideration the welfare impacts of the trade policy changes on consumer and producer surpluses, obviously shows that Malaysian palm oil industry will be better off without any intervention. The cost of the policy intervention such as export duty to the society as a whole will be the dollar amount of the deadweight loss. The

calculations show that the deadweight loss varies depending on the amount of duty. The number increased along with the increase in the percentage of duty imposed. This amount of deadweight loss will be a net gain from trade liberalization policy.

The most significant trade liberalization impact will accrue when exporter becomes eligible to ship most of the palm oil without constraints to trade, which will occur after the 5- years transition period is phased out in 2005. Taking into account such sharp increases in world palm oil demand, Malaysia's palm oil exports would have great potential in the world market by 2009.

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