ECONOMIC EFFECTS OF TRADE LIBERALIZATION: AN EXPERIENCE ON THE INDONESIAN COCONUT INDUSTRIES

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ABSTRAK

Indonesia sebagai salah satu anggota WTO harus menghadapi liberalisasi perdagangan. Berdasarkan trend tersebut, sejumlah reformasi kebijakan telah dilaksanakan. Pengurangan tariff dan hambatan non tariff telah menimbulkan beberapa konsekuensi yang mempengaruhi keberadaan dan keunggulan kompetitif dari ekspor kelapa. Studi membuktikan bahwa industri kelapa Indonesia memperoleh manfaat dari liberalisasi perdagangan. Liberalisasi perdagangan mempunyai efek positive terhadap produksi, konsumsi, volume ekspor, perdagangan bersih, *competitiveness index* (CM) dan *revealed comparative advantage* (RCA) dari kelapa.

Analisis membuktikan bahwa CM, liberalisasi perdagangan, produksi, dan nilai tukar secara positive mempengaruhi volume ekspor dari tepung kelapa, minyak kelapa dan kopra. Harga ekspor mempunyai efek negative terhadap ekspor kopra karena tingginya permintaan kopra sebagai bahan baku minyak kelapa. RCA secara negative mempengaruhi ekspor tepung kelapa dan kopra sedangkan tingkat bunga mempengaruhi secara negative hanya pada ekspor minyak kelapa dan harga produsen mempunyai efek negative hanya pada ekspor kopra. Keberhasilan ekspor kelapa Indonesia tidak hanya tergantung dari liberalisasi perdagangan tetapi pada kemampuan bersaing di pasar ekspor. Keunggulan kompetitif perlu ditingkatkan melalui perbaikan produktivitas dan kualitas. Depresiasi dari nilai tukar dan tingkat bunga yang rendah akan meningkatkan volume ekspor kelapa.

Kata kunci: efek ekonomi dan liberalisasi perdagangan.

ABSTRACT

Indonesia, being a member of WTO is moving unavoidably towards trade liberalization. In line with this trend, a number of policy reforms were conducted. The reduction of tariff and non-tariff barriers would raise some consequences that would affect the performance and competitiveness of coconut exports. The study revealed that Indonesian coconut industries benefited from trade liberalization. Trade liberalization has a positive effect on the production, consumption, volume of export, net trade, CM and RCA of coconut.

The regression analysis identified the factors that influenced the export volumes of coconut meal, coconut oil and copra. The analysis showed that CM, trade liberalization dummy, production, and exchange rate positively affected export volumes of coconut meal, coconut oil and copra. The export price has a negative effect on copra since high domestic demand of raw material for coconut oil. RCA negatively affected the export volume of coconut meal and copra while interest rate negatively affected coconut oil only. Producer price has a negative effect for copra.

The success of the Indonesian coconut export was not only dependent on the trade liberalization, but on its ability to compete in the export market. The competitiveness of coconut products in the export market could be strengthened through the improvement of its productivity and quality. The depreciation of exchange rate and offering of low interest rate by the banks will increase the export volume of this commodity.

Key words: economic effects and trade liberalization

INTRODUCTION

Background

In welcoming the era of globalization and trade liberalization, Indonesia started adjusting some of its trade policies. Prior to GATT-Uruguay Round agreement, the Indonesian government's commitment on agriculture encompasses four different types of obligations for agricultural reform including: improvement in market access, reduction in domestic support to agriculture, reduction in export subsidies, and sanitary and phytosanitary measures (Nainggolan, 1996; Anindita and Reed, 2008). In the context of the GATT/WTO and the growing blocks of free trade regions, ASEAN, where Indonesia is a member, set up economic cooperation among the members by establishing the ASEAN Free Trade Area (AFTA). Under AFTA, the Common Effective Preferential Tariff (CEPT) scheme was instituted to reduce tariff to a range of 0 – 5% on all manufactured goods and

agricultural products. Erwidodo (1999) stated that the CEPT includes the elimination of agricultural subsidies, tariff and non-tariff protections that used to be limited on imported agricultural commodities.

After independence in 1945, Indonesia adopted a protectionist stance for agriculture trade. High import tariffs and exchange rate incentives for exporters were the policies used to boost the export of agri-based products, such as coconut. The exporters of agri-based products enjoyed a preferential exchange rate that was 10 percent higher than official exchange rate. The period between 1970 to 1980s was characterized by policies aimed to develop domestic processing industries where the traditional exports was banned or taxed to pursue self-sufficiency in rice and used oil revenues to set up import substituting manufacturing industries (Nainggolan, 1996 and Fane, 1996). In 1969, the government subsidized the price of fertilizers to influence the rice farmers' usage while the tree crops enjoyed fertilizer subsidies only after 1973. In 1978, the agriculture sector also enjoyed the pesticide subsidies.

Since the early 1980s, Indonesia had undertaken a series of trade reforms that shifted Indonesia from having an inward-looking to an outward-looking development strategy (Kustiari et al., 1998). The need to speed up trade and economic reforms is now a must, particularly in relation to Indonesia's commitment under the CEPT scheme of the AFTA, which is to be fully implemented by 2003. Accordingly, the government announced a major tariff reduction schedule in its deregulation package of May 1995. In the more recent deregulation packages of 1996 and 1997, the government consistently reduced import and export tariff rates on capital goods, eliminated export and import tariff surcharges for most products, simplified import regulations and facilitated exports.

In 1986, the government reduced the fertilizer and pesticide subsidies. The pesticide subsidy was abolished in 1990 but the fertilizer was eliminated in 1993. At the same time, the government re-opened the pesticide and fertilizer trade. The government maintained a tariff at 5% and a VAT at 10% for pesticide import but the fertilizer import imposed only a VAT at 10% in 1993.

The export duty of copra and coconut oil was 10 percent of fob price in 1976 and it was reduced at 5 percent of standard fob price in 1980. The standard fob price was determined by the Ministry of Industry and Trade. In 1981, the minimum standard fob price was US$ 285/MT for copra and US$ 438/MT for coconut oil but it was practically without export duty when the price fell below the standard fob price.

In the context of trade liberalization, a reduction of protection will reduce the trade barriers and thereafter, the volume of trade will increase. The increase in the volume of trade, however, does not mean that the participating countries will gain from trade. The benefits derived from the trade liberalization depend on the openness and the economic reforms of each country (Anderson and Tyers, 1990). Goldin and Knudsen (1990) stated that the developing countries will be among the most affected, either positively or negatively, by the outcome of the GATT negotiations on agricultural trade liberalization. The result in the Asia-Pacific region showed that the impact of trade liberalization on each participating country depends on at least four factors. The first is the scope of liberalization, whether this is multilateral, regional, or unilateral in nature. The second is the form of the commitment to conduct liberalization, whether this is based on a request-offer approach, involuntary, or voluntary commitments. The third is coverage of the liberalization scheme; for example, whether this involves removal of domestic distortions, elimination of non-tariff barriers, or merely reduction in border tariff; and finally, the speed with which the liberalization schemes proceed. The interaction among these factors will determine the changes in resource allocation and the amount of benefit or loss accrued by each country (Feridhanusetyawan, 1999). Matin et al. (1990) showed that the result of the trade liberalization in Uganda is not only dependent on the trade reforms but also on the appropriate macroeconomic policies or indirect protection instruments, especially the exchange rate reform. The exchange rate reforms will directly or indirectly affect overvalued (or undervalued) currency and this could be traced through the nominal protection coefficient of the commodity (Goldin and Knudsen, 1990).

Agricultural importables, with some exceptions, are likely to benefit from liberalization. Surcharges maintain the levels of direct nominal protection for agricultural importables, which also benefit from lower negative protection as protection is reduced for the rest of the importables. The exceptions are products whose level of protection will be reduced, but these products have little weight among importables. In short, agricultural importables are likely to be more favored than exportables (Hachette, et al., 1992).

On the demand side, trade liberalization affects the consumption through increasing exports and imports. The lowering of tradable prices through eliminating the trade barriers will raise the consumption.

Study Objectives

The general objective of the study was to identify and describe the economic effects of trade liberalization on the Indonesian coconut industries. Specifically, the study aimed to: (1) assess the effects of trade liberalization on production, consumption and trade of coconut products; (2) determine the export competitiveness of coconut; (3) determine the factors that influence the volume of export of coconut products and (4) recommend trade policy reforms to address the problems and constraints affecting the coconut industries.

METHODOLOGY

This study analyzed the economic effects of pre- and post-trade liberalization on the coconut industries from 1969 to 1999. The periods before and after trade liberalization were from 1969-1985 and 1986-1999, respectively.

Primary and secondary data were used in this study. Primary data were collected at the exporters' level to determine the marketing costs, identify and analyze the problems related to Export Parity Price. Secondary data collected comprised of the time series data (1969-1999) on production and domestic wholesale prices of Indonesian coconut. The data were gathered from the Directorate General of Estate Crops of the Department of Agriculture and the Statistic Office in Indonesia.

The empirical analysis involved the measurement of degree of trade liberalization and export competitiveness. The policy effects was determined by regression analysis.

The degree of trade liberalization was implicitly measured by the Nominal Protection Rate (NPR). The NPR was estimated with the following formula:

$$NPR = \frac{(P_d - P_w)}{P_w} \cdot 100\%. \qquad \text{...........................1}$$

where :
P_d = domestic wholesale prices in domestic currency (Rp/kg)
P_w = world prices in domestic currency (Rp/kg)
The NPR has three general interpretations:
(1) NPR < 0 implies that the government gives penalty or provides no incentives to domestic producers
(2) NPR = 0 implies that there is no distortion; and
(3) NPR > 0 implies that government provides protection or incentives to domestic producers

The export competitiveness was measured using three types of analyses: the competitiveness index, revealed comparative advantage index and export parity price index.

Athukorala (1998) proposed the competitiveness index to identify products that are substitutes or competitive to each other. In the export and import markets, the comparative advantage is measured by the formula:

$$CM_t = 100 \left[\sum_{i=1}^{n} XP_{it} / \sum \beta_i XW_{it} \right] \qquad \text{.............................(2)}$$

where CM_t is the competitiveness index for each i-th principal commodity, XP_{it} is the export earnings of the given country, XW_{it} represents world export earnings, and β_i is the initial period's world market share (1961-1962 annual average). The CM_t can be interpreted as follows:
(1) $CM_t = 0$ implies no competitive advantage
(2) $CM_t > 0$ implies there is competitive advantage;
(3) The larger the CM_t, the higher is the competitive advantage.

In most literature, post-trade observations are often used in an attempt to approximate comparative advantage or the so-called revealed comparative advantage (RCA). Balassa's (1965) RCA index has already been used by Yanagida (1997), Wongsgulgeard (1998), and Chang and Hsu (1999) which is defined below:

$$RCA_i^k = (X_i^k / X_i) / (X_w^k / X_w) - (M_i^k / M_i) / (M_w^k / M_w) \qquad \text{...............................(3)}$$

where X is the value of exports; M is the value of import and the superscript k denotes the commodity group; the two subscripts i and w are, respectively, the exporting country and the world. A value greater than unity indicates a stronger comparative advantage for the country in the export of a given commodity. Note that this index cannot capture the potential "future" comparative advantage. The RCA can be interpreted as follows:
(1) RCA ≤ 0 implies no competitive advantage
(2) RCA > 0 implies there is competitive advantage;
(3) The larger the RCA, the higher is the competitive advantage.

In the context of competitive analysis using primary data, export parity price are the measures of the level of competitiveness by comparing the domestic wholesale price and the world price (Gonzales in Lantican, 2000). The export parity price of coconut products using analysis of the ratio between the export parity (Pe) and the domestic wholesale price (Pd) has two general interpretations:
(1) If Pe/Pd >1, this implies that the agri-based products are competitive in the export market;
(2) Conversely, If Pe/Pd <1, this implies that the agri-based products are not competitive in the export market.

The effects of trade liberalization were determined using regression analysis. The volume of export function for coconut product was regressed following the same methodology adopted by Athukorala (1998) and Lantican (2000).

The multiple regression model of the volume of export expressed in linear form is as follow:
$$Y_t = c_0 + c_1 CM_t + c_2 RCA_t + c_3 RER_t + c_4 T + c_5 D_t + c_6 C_t + c_7 P_t + c_8 P_t^e + c_9 NPC_t + c_{10} Int_t \text{...(4)}$$
where:
Y_t = Volume of export of coconut products at year t (million MT)
CM_t = Competitive index of the coconut products at year t
RCA_t = Revealed comparative advantage of the coconut products at year t
RER_t = Real exchange rate at year t (Rp/US$)
T = Dummy variables with value of 0 before trade liberalization and 1 after trade liberalization
D_t = Domestic production of the coconut products at year t (million MT)
C_t = Domestic consumption of coconut products at year t (million MT)
P_t = Real producer price of coconut products at year t (Rp/kg)

P^e_t = Real export price of the coconut products at year t (Rp/kg)

NPC_t = Nominal protection coefficient of the coconut products at year t

Intt = Nominal interest rate at year t (%/year)

RESULTS AND DISCUSSION

The economic effects of trade liberalization area are shown in Table 1. After trade liberalization, the NPR for coconut was positive and higher than before trade liberalization implying that this product received government protection. The government provided protection to the coconut industry to address the need for cooking oil, such as coconut oil, in Indonesia.

The average productivity of coconut increased from 0.93 ton/ha in 1969-1985 to 1.04 ton/ha in 1986-1999. This result conforms to the hypothesis that the average productivity would be higher after trade liberalization.

The per capita consumption of coconut meal increased after trade liberalization, from 0.50 kg/capita/year in 1969-1985 to 0.69 kg/capita/year in 1986-1999, respectively. The per capita consumption of coconut oil declined from 3.51kg/capita/year in 1969-1985 to 2.26 kg/capita/year in 1986-1999. The per capita consumption of coconut oil decreased due to an upsurge in the production of palm oil.

The average export volume for coconut rose after trade liberalization, although that of copra declined. The decline in the average export volume for copra decreased as the domestic demand for copra was relatively high on account of the large domestic consumption of coconut oil. The high population growth in Indonesia and high consumption of cooking oil led to a rise in domestic demand for coconut oil despite of a more than a kilogram reduction in consumption on a per capita basis.

The net trade increased for all commodities, except that of copra, after trade liberalization. The net trade of all coconut increased from US$ 28.76 million in 1969-1985 to US$ 186.23 million in 1986-1999. The decline in the net trade for copra was due to the high domestic demand for copra as the raw material for coconut oil.

The level of RCA differed from the results of the CM for two reasons. First, the CM is weighted by the initial period's share. If the initial period's share is greater than the latter period, this will result to a greater CM value. Trade liberalization resulted to increases in both exports and imports. The value of the CM will not be affected, but the RCA value will be lesser if the import share of the country increases. If the export share of the commodity in the world market increases, the CM will also increase but RCA will remain the same.

The results of the analysis indicated that the CM and RCA for all commodities increased after trade liberalization. The CM of all coconut increased from 17.84 in 1969-1985 to 101.92 in 1986-1999. The

Table 1. The different economic indicators of coconut by products, Indonesia, 1969-1999.

Indicators	Before Trade Liberalization (1969-1985)	After Trade Liberalization (1986-1999)	T-value
1. Nominal Protection Rate (%)	0.16	1.85	0.84[ns]
2. Productivity (ton/ha)[a]	0.93	1.04	7.32***
3. Consumption (Kg/capita/year)			
- Coconut meal	0.50	0.69	2.37**
- Coconut oil	3.51	2.26	-5.76***
4. Export Volume (MT/year)			
- Coconut meal	23.64	272.16	6.035***
- Coconut oil	296.99	342.48	1.714*
- Fresh coconut	-0.01	0.09	1.570[ns]
- Desiccated coconut	1.09	13.81	4.715***
- Copra	34.58	12.45	-1.362[ns]
Total	356.29	640.99	5.093***
5. Net trade (US$/year)			
- Coconut meal	6.94	140.75	4.930***
- Coconut oil	26.35	35.93	2.153**
- Fresh coconut	-0.01	1.99	1.972*
- Desiccated coconut	0.99	11.18	4.300***
- Copra	-5.52	-3.62	-0.676[ns]
Total	28.76	186.23	5.457***
6. Competitiveness Index			
- Coconut meal	4,466.81	43,267.15	6.525***
- Coconut oil	107.29	114.76	0.842[ns]
- Fresh coconut	9.12	5,343.50	2.169**
- Desiccated coconut	69.77	575.04	4.544***
- Copra	23.78	31.42	0.488[ns]
Total	17.84	56.56	6.512***
7. RCA			
- Coconut meal	2.69	19.23	6.661***
- Coconut oil	60.37	38.86	-1.272[ns]
- Fresh coconut	0.03	4.63	2.121**
- Desiccated coconut	0.62	5.89	4.881***
- Copra	9.94	4.52	-1.062[ns]
Total	10.52	18.09	2.332**

[a])- The weight of coconut is converted to its equivalent weight of copra
***, ** and * indicate significant relationship at 1%, 5% and 10% probability levels.
ns-not significant at 10% probability level.

RCA increased from 10.52 in 1969-1985 to 18.09 in 1986-1999. However, the RCA of coconut meal and copra declined after trade liberalization but it was not statistically significant. This evidence showed that after trade liberalization the increase in export was followed by a similar increase in import. This also suggested that if the government intends to improve the competitiveness of its agri-based products, it should examine its supply and demand side policies.

The results of the price competitiveness analysis showed that the export parity price ratio of copra and coconut oil were 0.84 and 0.89, respectively (Table 2). This reflected the price control policy enforced by the Indonesian government on copra and coconut oil in order to protect the consumers. Nevertheless, such intervention could result to a higher domestic price compared to the world price. The sensitivity analysis of price competitiveness was done by depreciating the rupiah to US dollar. Results indicated that the exchange rate has an important role in the competitiveness of copra and coconut oil export. (Table 2).

The behavior patterns of the factors that influenced the export volume of coconut reflected the policies implemented by Indonesia. Not all variables were included in the analysis due to the multicollinearity problem.

The regression results on the export volumes of

Table 2. Export parity price of copra and coconut oil, Muara Sabak, Jambi Province, Indonesia, September 2001.

Particulars	Exchange Rate, Rp 9,635/US$[a]		Exchange Rate, Rp 11,562/US$[b]	
	Copra	Coconut Oil	Copra	Coconut Oil
FOB Price (US$/kg)	0.162	0.275	0.162	0.275
Foreign Exchange Rate (Rp/US$)	9,635.00	9,635.00	11,562.00	11,562.00
Export Price in Local Currency (Rp/kg)	1,560.87	2,649.63	1,863.00	3,162.50
Port Costs (Rp/kg)	15.00	15.00	15.00	15.00
Storage Costs (Rp/kg)	30.00	34.00	30.00	34.00
Transport Costs (Rp/kg)	17.92	16.00	17.92	16.00
Other Costs (Rp/kg)	10.00	15.00	10.00	15.00
Packaging Costs (Rp/kg)	12.00	15.00	12.00	15.00
Certificate of SPS (Rp/kg)	3.33	3.42	3.33	3.42
Certificate of Weight (Rp/kg)	3.90	1.50	3.90	1.50
Insurance (Rp/kg)	46.83	78.04	56.19	93.39
Export Parity Price (Rp/kg)	1,421.89	2,471.67	1,724.70	2,984.24
Domestic Wholesale Price (Rp/kg)	1,700.00	2,750.00	1,700.00	2,750.00
Export Parity Ratio	0.84	0.89	1.01	1.09

[a] The actual exchange rate in September 2001
[b] Exchange rate is depreciated by 20 %
Source of basic data: Primary data from exporters, shipping line company and Quality control agency under the MOIT (Ministry on Industry and Trade).

Table 3. Results of the regression analysis on the export volumes of coconut products, Indonesia, 1969-1999.

Item	Coconut Meal		COCONUT OIL		COPRA	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant	0.048[ns] (0.07)	-1.37*** (-4.01)	-8.61*** (-7.06)	-5.40*** (-8.25)	0.58[ns] (0.39)	-0.47[ns] (-0.36)
NPC	-	-	0.20[ns] (0.36)	-0.01[ns] (-0.08)	0.14[ns] (1.24)	-
Dummy	0.04[ns] (0.18)	0.21** (2.30)	0.09[ns] (0.39)	0.79*** (4.12)	0.45[ns] (1.52)	0.40[ns] (1.43)
Production	1.30*** (4.78)	-	0.70* (1.76)	-	-1.05[ns] (-0.62)	0.33*** (5.28)
Consumption	-0.37*** (-3.68)	-0.28** (-2.65)	-0.01[ns] (-0.04)	-	1.30[ns] (0.86)	-
CM	0.35[ns] (1.06)	0.58*** (4.39)	1.46 (12.05)	0.77*** (72.78)	0.12[ns] (0.90)	0.19* (1.68)
RCA	-0.07[ns] (-0.66)	-0.17** (-2.24)	-0.50*** (-5.76)	-	-0.13[ns] (-0.86)	-0.21* (-1.70)
Export Price	-0.20[ns] (-0.84)	-	-0.60*** (-5.02)	-	-0.06[ns] (-0.26)	-
Producer Price	-	-	-	-	-0.23[ns] (-0.38)	-0.21* (-1.66)
Exchange Rate	0.35* (1.76)	-	0.60** (2.70)	-	-0.41[ns] (-1.33)	-
Interest rate	-0.12[ns] (-0.45)	-	-0.12[ns] (-0.46)	-0.48*** (-1.92)	-0.14[ns] (-0.45)	-0.36[ns] (-1.41)
R²	0.79	0.51	0.99	0.99	0.44	0.35
Adjusted R²	0.71	0.44	0.99	0.99	0.15	0.19
F-value	10.32***	6.845***	2658.1***	1901.3***	1.54[ns]	2.19*
DW statistic	2.520	1.528	1.337	1.306	1.915	1.977

Note: Figures in parentheses are t-values
[a] The model shows that all the variables in logarithmic form.
***, ** and * indicate significant relationship at 1%, 5% and 10% probability levels.
[ns]-not significant at 10% probability level.

coconut meal, coconut oil and copra are shown in Table 3. The regression analysis for coconut meal and coconut oil did not include the NPC and producer price due to the data limitations and not all equations were statistically significant. In terms of the standard F-test, model 1 for copra was not statistically significant. The Durbin-Watson test indicated no evidence of a significant serial correlation. The regression results, together with standard test statistics relating to the OLS error process such as the coefficient for the dummy representing the periods before and after trade liberalization, were not statistically significant. The production for copra had a negative effect in model 1, but positive effect in model 2 after some variables were deleted (Table 3). The correlation matrix is shown in Appendix Tables 1-3 to aid in the interpretation of the results.

Regression results for coconut meal indicated that the dummy was not statistically significant due to the multicollinearity problem between dummy and exchange rate (r = 0.89), dummy and production (r = 0.67), dummy and interest rate (r = 0.59), dummy and consumption (r = 0.76), and between the dummy and the export price (r = 0.90) compared to the correlation between the dummy and the dependent variable (r = 0.26). (Appendix Table 1). Based on these conditions, the variables were deleted in model 2. The results for model 2 are shown to support the analysis.

Results of coconut oil regression have the same problem with the coconut meal, the dummy coefficient was not statistically significant due to multicollinearity problem between dummy and exchange rate (r =0.88), dummy and production (r = 0.67), dummy and consumption (r = -0.273), and between dummy and export price (r = 0.76). The deletion of these variables gave

better result on the model 2. (Appendix Table 2).

Results of regression for copra using model 1 was not statistically significant and suggested that the model has a specification error in terms of the standard F-test. The deletion of variables which have multicollinearity problems with the dummy resulted to the significance in terms of the standard F-test. Strong multicollinearity were indicated between the exchange rate and dummy (r = 0.89), consumption and production (r = 0.99), consumption and dummy (r = 0.88) and between the export price and exchange rate (r = 0.92). (Appendix Table 3) The NPC was deleted from the model since this variable was not expected as hypothesized due to a multicollinearity problem with the RCA. However, the deletion of this variable increased the standard F-test indicating that model 2 was more appropriate in estimating the regression for copra. Model 2 was used in the discussions of results for coconut meal, coconut oil and copra.

The degree of trade liberalization, as reflected by NPC, was not statistically significant. This implied that the degree of trade liberalization has no significant influence on the volume of exports for coconut oil owing to Indonesia's policy of controlling the domestic price of cooking oil.

The increase in the export volume of coconut products before trade liberalization and after trade liberalization is reflected in the regression coefficients of the dummy variable. The trade liberalization dummy for

coconut meal and coconut oil was statistically significant at 5% and 1% probability levels, respectively. This implied that trade liberalization has a positive effect in increasing the volume of export of these coconut products.

An increase in the production of coconut meal, coconut oil and copra likewise increased their export volumes. However, only the production elasticity of copra was considered in the analysis. The elasticity of the export volume for copra with respect to its production was 0.33 % and is statistically significant at the 1% probability level. This implied that the increase in the export volume of copra was predominantly due to an increase in its production.

CONCLUSION AND RECOMMENDATIONS

The study revealed that trade liberalization has a positive effect on the coconut industries. Domestic production, consumption, export price, competitiveness (CM and RCA), exchange rate, interest rate, producer price and export price has played a role to determine the export volume of the coconut product. The protection of coconut oil price as the Indonesian basic food of cooking oil indicated by the high value of NPR and the in-competitiveness of coconut oil and copra in terms of export parity ratio.

The following recommendations are made for trade policy reforms to address the problems and constraints affecting the coconut industries.

First, improvement in the quality of coconut products should be prioritized to increase its export competitiveness and revenues. The improvement in quality should be strengthened to produce better quality products to increase their value added. The development of quality control standards and the management of the same must be done starting from the farmers' level up to the exporters level.

Second, since the export performance of coconut was not solely dependent on trade liberalization, the government should consider others factors such as exchange rate and interest rate. The depreciation of exchange rate and offering of low interest rates by the banks will encourage more investments in the coconut industry resulting in an increase in the export volume for the commodities. Policies on these aspects should be strengthened to create a favorable export-oriented environment.

Further research and development must be done focusing on improved processing technologies and quality control to improve the quality and productivity of the coconut industries. The key research and development area should focus on creation of alternative uses for these agri-based products to increase their value.

Lastly, further study must be conducted using more sophisticated models, such as computable general equilibrium model, to determine other dynamics in the economy.

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Appendix Table 1. Correlation matrix among variables used in estimating the export volume function for coconut meal, Indonesia, 1969-1999.

Pearson Correlation									
	Volume	CM	RCA	Exchange Rate	Dummy	Produc tion	Consump tion	Export Price	Interest Rate
Volume	1.000	0.554	-0.041	0.264	0.124	0.615	-0.040	0.351	-0.156
CM	0.554	1.000	0.341	0.172	0.089	0.506	0.126	0.423	-0.102
RCA	-0.041	0.341	1.000	-0.157	-0.368	-0.343	-0.295	-0.383	0.380
Exchange Rate	0.264	0.172	-0.157	1.000	0.884	0.601	0.647	0.810	0.593
Dummy	0.124	0.089	-0.368	0.884	1.000	0.640	0.738	0.899	0.442
Production	0.615	0.506	-0.343	0.601	0.640	1.000	0.655	0.818	-0.026
Consumption	-0.040	0.126	-0.295	0.647	0.738	0.655	1.000	0.714	0.311
Export Price	0.351	0.423	-0.383	0.810	0.899	0.818	0.714	1.000	0.146
Interest Rate	-0.156	-0.102	0.380	0.593	0.442	-0.026	0.311	0.146	1.000

Appendix Table 2. Correlation matrix among variables used in estimating the export volume function for coconut oil, Indonesia, 1969-1999.

Pearson Correlation									
	Volume	CM	RCA	Exchange Rate	Dummy	Production	Consump-tion	Export Price	NPC	Interest Rate
Volume	1.000	0.997	0.988	0.572	0.525	0.383	-0.137	0.390	0.071	0.404
CM	0.997	1.000	0.996	0.536	0.489	0.332	-0.147	0.356	0.080	0.403
RCA	0.988	0.996	1.000	0.476	0.438	0.267	-0.159	0.283	0.083	0.408
Exchange Rate	0.572	0.536	0.476	1.000	0.884	0.752	-0.225	0.920	-0.015	0.442
Dummy	0.525	0.489	0.438	0.884	1.000	0.674	-0.273	0.760	-0.100	0.593
Production	0.383	0.332	0.267	0.752	0.674	1.000	0.205	0.747	-0.230	0.058
Consumption	-0.137	-0.147	-0.159	-0.225	-0.273	0.205	1.000	-0.065	-0.013	-0.743
Export Price	0.390	0.356	0.283	0.920	0.760	0.747	-0.065	1.000	-0.003	0.205
NPC	0.071	0.080	0.083	-0.015	-0.100	-0.230	-0.013	-0.003	1.000	-0.014
Interest Rate	0.404	0.403	0.408	0.442	0.593	0.058	-0.743	0.205	-0.014	1.000

Appendix Table 3. Correlation matrix among variables used in estimating the export volume function for copra, Indonesia, 1969-1999.

Pearson Correlation										
	Volume	CM	RCA	Ex change Rate	Dum-my	Produc tion	Consump-tion	Export Price	Producer Price	NPC	Interest Rate
Volume	1.000	-0.240	-0.265	0.124	0.264	0.276	0.313	0.207	0.272	-0.176	-0.156
CM	-0.240	1.000	0.998	0.150	0.081	0.061	-0.006	0.049	-0.115	0.305	0.445
RCA	-0.265	0.998	1.000	0.120	0.060	0.023	-0.045	0.019	-0.161	0.313	0.462
Exchange Rate	0.124	0.150	0.120	1.000	0.884	0.945	0.926	0.922	0.870	-0.015	0.442
Dummy	0.264	0.081	0.060	0.884	1.000	0.881	0.869	0.783	0.704	-0.100	0.593
Production	0.276	0.061	0.023	0.945	0.881	1.000	0.992	0.903	0.906	-0.066	0.312
Consumption	0.313	-0.006	-0.045	0.926	0.869	0.992	1.000	0.882	0.921	-0.080	0.263
Export Price	0.207	0.049	0.019	0.922	0.783	0.903	0.882	1.000	0.859	0.024	0.267
Producer Price	0.272	-0.115	-0.161	0.870	0.704	0.906	0.921	0.859	1.000	-0.074	0.006
NPC	-0.176	0.305	0.313	-0.015	-0.100	-0.066	-0.080	0.024	-0.074	1.000	-0.014
Interest Rate	-0.156	0.445	0.462	0.442	0.593	0.312	0.263	0.267	0.006	-0.014	1.000