The Impact of Export Tax Policy on Cocoa Farmers and Supply Chain

Amzul Rifin[a]

[a] Department of Agribusiness, Faculty of Economics and
Management, Bogor Agricultural University, Indonesia
Published online: 26 Sep 2014.

CrossMark

Click for updates

PLEASE SCROLL DOWN FOR ARTICLE

Routledge
Taylor & Francis Group

The Impact of Export Tax Policy on Cocoa Farmers and Supply Chain

AMZUL RIFIN

*Department of Agribusiness, Faculty of Economics and Management,
Bogor Agricultural University, Indonesia*

Since April 2010, the government of Indonesia has imposed an export tax on cocoa beans that aims to increase the availability of the cocoa beans for domestic processing companies at an affordable price. The objective of this article is to analyze the effect of the export tax on farmers and the supply chain. This study was conducted by a survey in North Luwu, South Sulawesi, which is the central production area of cocoa beans in Indonesia. The results show that, after the export tax was imposed, farmers maintained the same marketing channel, but margins decreased on the exporters' side.

KEYWORDS   cocoa, export tax, supply chain

I. BACKGROUND

Indonesia is the third largest producer of cocoa beans in the world, with an estimated production of 450,000 tons in 2011–12. The largest producer is the Ivory Coast, with 1.49 million tons of cocoa beans in 2011–12 (Figure 1). In terms of growth, during the period 2005–06 until 2011–12, Indonesia's production decreased by an average of 3.16%, while the Ivory Coast and Ghana had a production growth of 1.63% and 5.99%, respectively.

In order to be used by the food industry, cocoa beans are processed into intermediate products, such as cocoa butter, paste, or powder. In 2010, the domestic consumption of cocoa beans reached 377,498 tons or 44.7% of cocoa production (Media Data 2011). These intermediate products, along
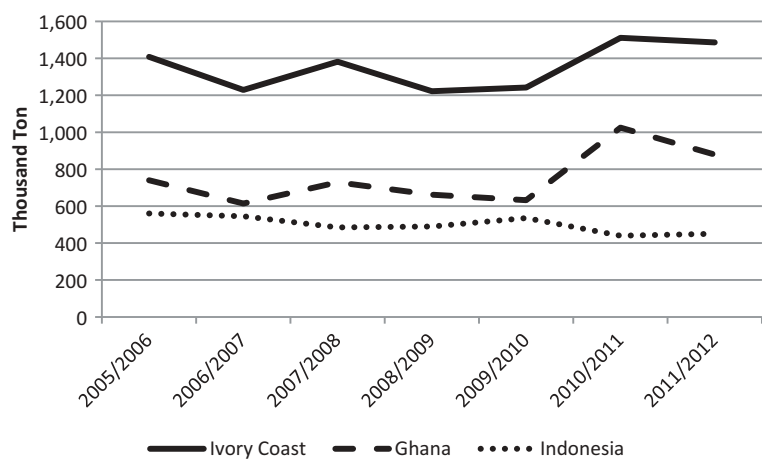
FIGURE 1 Production of three largest cocoa beans producer, 2000–2012. *Source:* ICCO 2012.
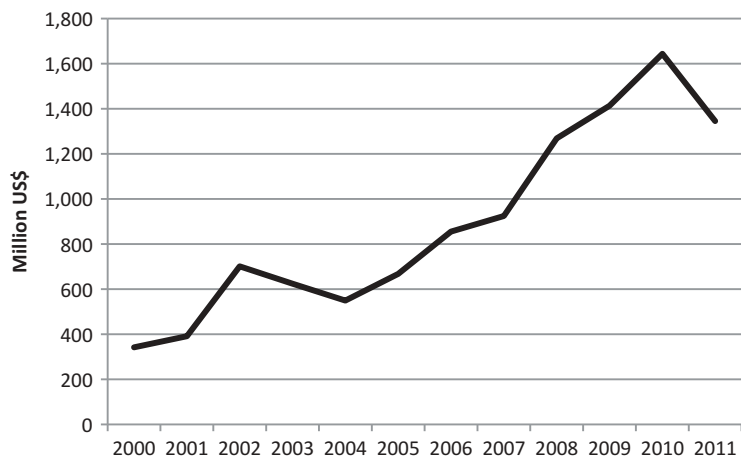
FIGURE 2 Indonesia's export value of cocoa and cocoa preparations (HS 18). *Source:* United Nations 2012.

with cocoa beans and cocoa husks, are also important export commodities for Indonesia. The total export value of the six commodities reached more than US$1 billion in 2012 (Figure 2). During the period of 2000 until 2012, export value grew at an average rate of 13%, with the highest growth in 2002, when exports grew by 79%. In 2012, cocoa and cocoa preparation (HS 18) exports decreased by 21.7%, after reaching a record high of US$1.6 billion in 2010. The significant decrease was caused by the implementation of the export tax on cocoa beans in April 2010.

The objective of the export tax on cocoa beans was to guarantee the availability of cocoa beans in the domestic market for raw materials in the processed cocoa industry, which will eventually develop the downstream
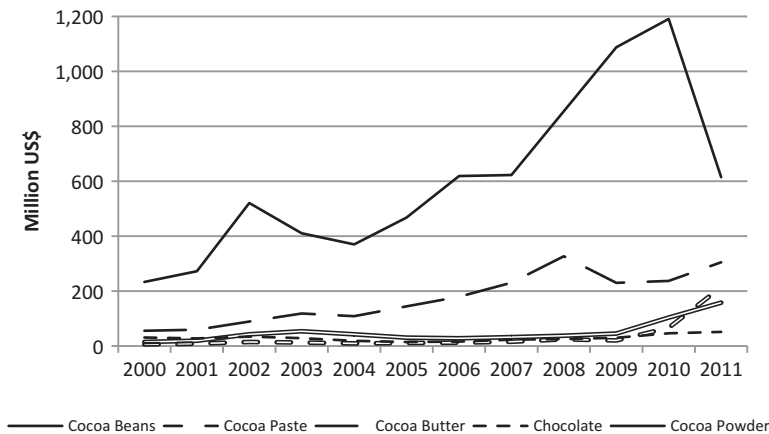
FIGURE 3 Indonesia's export value of cocoa products, 2000–2011. *Source:* United Nations 2012.

cocoa industry. The government of Indonesia issued the Ministry of Finance Regulation No 67/PMK.011/2010, which was renewed with the Ministry of Finance Regulation No 128/PMK.011/2011, regarding the implementation of cocoa beans export tax.

The impact of the export tax is clearly shown in the composition of cocoa and cocoa preparations product exports (Figure 3). The implementation of the export tax on cocoa beans decreased the export value of cocoa beans by 48.3% and export quantity by 51.4% in 2011. Moreover, the export value and quantity continued decreasing in 2012, with a decrease of 37.4% and 22.2%, respectively. On the other hand, in 2011, export of cocoa paste (HS 1803), cocoa butter (HS 1804), cocoa powder (HS 1805), and chocolate (HS 1806) increased by 224%, 28.6%, 53.1%, and 11.3%, respectively, although in 2012 they remained relatively constant.

The implementation of the export tax also shifted the contribution of cocoa product exports from cocoa beans to processed cocoa products (Figure 4). In 2009, before the implementation of the export tax, 76% of cocoa exports was contributed by cocoa beans. In 2011, after the implementation of the export tax, the contribution of cocoa beans to exports decreased significantly, by 46%. On the other hand, processed cocoa products' contribution (cocoa paste, butter, powder, and chocolate) increased significantly after the implementation of the export tax. In addition, the cocoa processing supported the export tax policy, which caused production to increase from 130,000 tons in 2009 to 280,000 tons in 2011; also, it is predicted that production will increase to 500,000 tons in 2015 (Media Data Riset 2011). Most of the increase has been caused by the expansion of established cocoa processing companies.

The impact of the export tax on exports is obvious; however, the impact on farmers is still to be analyzed. This article examines the impact of the

A. Rifin
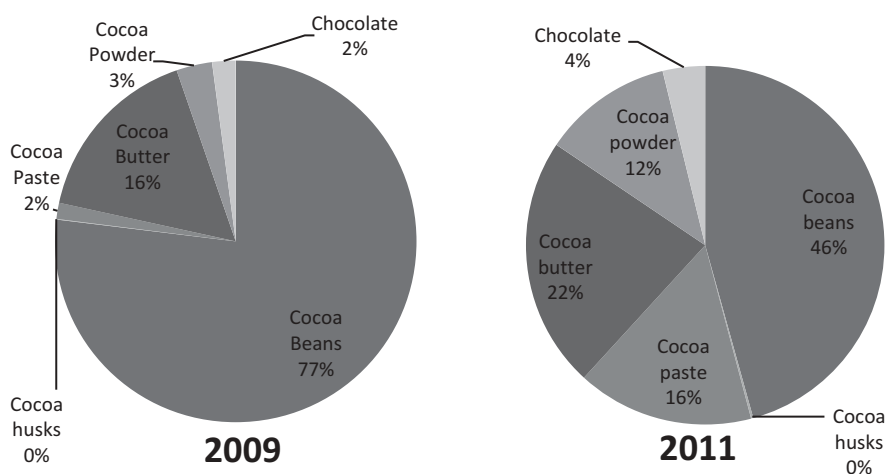
FIGURE 4 Cocoa and cocoa preparations product composition for export, 2009 and 2011. *Source:* United Nations 2012.

export tax on farmers, as well as on the cocoa supply chain. The analysis is conducted at the farmers' level since, in Indonesia in 2011, 94% of the cocoa-planted area was operated by farmers and, in terms of production, 92% of cocoa was produced by smallholder farmers (Ministry of Agriculture 2012).

II. LITERATURE REVIEW

Theoretically, the export tax will decrease the domestic price of cocoa beans, which will benefit the downstream cocoa industry since raw materials will be available at a lower price; however, the impact on farmers remains unclear.

Figure 5 illustrates the impact of the export tax at a rate of *t* in a case where the producing country accounts for a large share of world trade. The domestic price of export falls to pt, reducing the sum of consumer and producer surplus by the area of pFDCpt on the graph. However, the tax yields revenue equal to after tax volume multiplied by the tax rate, or the area of p*tACpt. The loss of tax is equal to the area of BCD, while a terms of trade gain is equal to the area of p^*tABp_F (Helpman & Krugman 1989).

Many scholars have analyzed the impact of export taxes on specific commodities. Those articles can be classified into two groups. The first group calculates the optimum export tax (Akiyama 1992; Trivedi & Akiyama 1992; Yilmaz 1999; Burger 2008; Permani, Vanzetti, & Setyoko 2011; Permani 2013) and analyzes the impact on welfare. Burger (2008) analyzed the impact of a cocoa beans export tax in Ivory Coast and found that, in the short-run, the country would benefit from the policy since it has a high share of cocoa bean exports, while, in the long-run, the tax may have a negative impact.
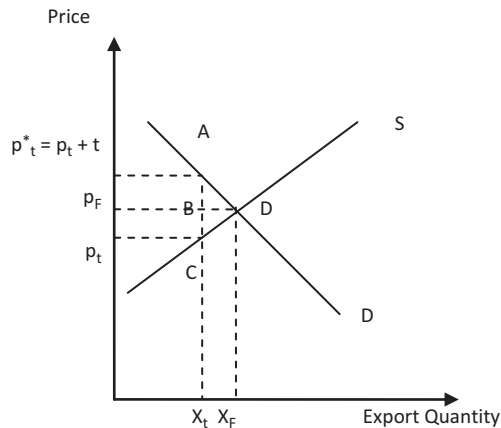
FIGURE 5 The imposition of export tax. *Source:* Helpman and Krugman 1989.

For producers, the export tax caused their welfare to decrease significantly. In other words, in total, welfare will not change in the short-run, but the distribution will shift. Processing companies will get the benefits while the producers will suffer. Permani et al. (2011) utilized an approach similar to Burger (2008) for the case of the cocoa bean export tax in Indonesia.

The second group of studies only analyzes the impact of the export tax on welfare and the economy (Marks, Larson, & Pomeroy 1998; Hasan, Reed, & Marchant 2001; Warr 2001; Susila 2004; Rifin 2010; Nyein, Sirisupluxana, & Titapiwatanakun 2010; Pradiptyo, Widodo, & Hardi, 2011). All of these studies indicate that export taxes will have a negative impact on the economy and decrease its competitiveness.

Moreover, Piermartini (2004) indicates that the impact of the export tax depends on market power. Countries with market power will have more impact on the international price, trade volume, income distribution, and terms of trade than countries without market power when they implement an export tax. Meanwhile, the negative impact on economic growth and national welfare is more severe when the export tax is implemented by a country without market power (Devarajan et al. 1996). If a country with market power implements an export tax, there will also be an efficiency loss because of the distortionary impact of the export tax. However, there will be an improvement in terms of trade since the export price increases (Piermartini 2004).

In terms of commodity coverage, several studies have analyzed specific commodities, such as palm oil (Marks et al. 1998; Hasan et al. 2001; Susila 2004; Putri et al. 2008; Rifin 2010; Obado, Syaukat, & Siregar 2009), rice (Warr 2001), coconuts (Warr 2002), and coffee (Lam 1979). Studies on the impact of the export tax on cocoa in Indonesia is limited as the export tax was only imposed in April 2010. Pradiptyo et al. (2011), Permani et al. (2011), and Permani (2013) conducted studies on the impact after the policy was

imposed. However, since the idea of an export tax on cocoa beans was discussed for several years, several scholars analyzed the theoretical impact of the export tax on cocoa beans before it was adopted. Only a few articles have since analyzed the actual impact of the policy. Articles that analyzed the policy before it was imposed include Rifin and Nurdiyani (2007), Arsyad (2007) and Arsyad, Sinaga, and Yusuf (2011).

Rifin and Nurdiyani (2007) assessed the plan to impose an export tax on cocoa beans by analyzing market integration between domestic and international prices in Indonesia. The results indicated that generally the domestic and international markets are segmented and not integrated in the short run. Therefore, the domestic price is not affected by the international price because it is not directly transmitted in the domestic market. Meanwhile, in the long run, the domestic market has a strong relationship with the international market. The authors concluded that the implementation of the export tax would make the market more disintegrated. The same analysis was also conducted by Firdaus and Ariyoso (2010). The authors analyzed market integration between the cocoa price in South Sulawesi, Indonesia, and New York in order to analyze factors that affect the Indonesian cocoa price. The authors used price data from Statistics Indonesia to represent the domestic price of cocoa beans. This study found that there was no market integration in either the short term or long term. Some factors that significantly affected the Indonesian cocoa price were the New York Board of Trade (NYBOT) cocoa price, world consumption, and the exchange rate.

Arsyad (2007) and Arsyad et al. (2011) analyzed the combined impact of the fertilizer subsidy and the export tax on Indonesian cocoa exports and production using the two-stage least square (2SLS) method. The authors concluded that the export tax would decrease exports and production. The authors simulated a 5% export tax, which resulted in a decrease in cocoa production of 0.14% and a decrease in cocoa exports of 0.63%.

Permani et al. (2011), using the partial equilibrium approach, indicated that the cocoa bean export tax in Indonesia would divert some beans from exports to domestic use, which would cause losses for producers. The article also concluded that the policy would have little impact on developing the processing industry. Meanwhile, Permani (2013), using the vector error correction approach, concluded that, at the current level, the tax rate imposed by Indonesian government on cocoa beans is above the optimal rate.

Pradiptyo et al. (2011) analyzed the impact of the export tax on farmers and found that the cocoa bean export tax was borne by the farmers fully or partially. This is because the exporters are price takers in the world market; therefore, they cannot transfer the export tax onto the international market, but can transfer it to the domestic market, which is the farmer. In addition, after the implementation of the export tax, cocoa bean exports did not decrease significantly; therefore, the research concluded that the policy had no affect on cocoa bean exports.

After examining the articles on export taxes for all commodities, there are three issues missing. First, the articles do not analyze the impact of an export tax at the micro level, such as farms, and, therefore, the real situation on the field cannot be captured. Second, most of the articles do not calculate the value of the export tax, especially given that the value changes every month. Third, this article utilized company data for purchasing cocoa beans from farmers to represent the farm gate price; therefore, the data were more reliable than those collected by the local government. This article attempts to fill the gap on these issues. In addition, this research aims to contribute to and enrich the studies on the export tax, especially at the farmers' level. The impact of the export tax on farmers will be analyzed and the calculation of export tax value will be presented on a monthly basis.

III. EXPORT TAX POLICY

The processed cocoa industry reached its golden period in 2001. At that time, there were forty processed cocoa companies in Indonesia, with a capacity of 362,186 tons per year (Media Data, 2011). In 2001, the government implemented Regulation Number 18 2000, regarding the value added tax (VAT) on primary products, which required that the cocoa processing companies pay a 10% VAT on cocoa beans. In addition, several exporting countries also imposed import tariffs on processed cocoa products.

In 2007, the VAT on primary products was abolished. At the same time, world agricultural product prices increased, including for cocoa beans. In order to address the price increase, the government issued the export tax policy in April 2010. According to Ministry of Finance Regulation No 67/PMK.011/2010, the export tax for cocoa beans is calculated as follows:

$$\text{Export Tax} = \text{Export Tax Tariff} \times \text{Check Price} \times \text{Export Volume}$$

$$\times \text{Exchange Rate}$$

This calculation is similar to the export tax for palm oil products. The export tax tariff and check price are announced on a monthly basis. The export tax tariff is based on the reference price, which is tied to the world price (Table 1). The reference price and check price are usually announced by the Ministry of Trade at the end of every month to be applied in the coming month. The reference price determines the export tax tariff based on the Ministry of Finance Regulation No 67/PMK.011/2010, which states that a higher reference price will induce a higher tariff (Table 1). The reference price is based on the average international price for the previous month. For example, the export tax for April 2012 was announced at the end of March 2012, based on the average international price of February 2012.

TABLE 1 The Relation between Reference Price and Cocoa Beans Export Tax Tariff

Reference Price (US$)	Tariff (%)
<2,000	0
2,000–2,750	5
2,750–3,500	10
>3,500	15

Source: Ministry of Finance 2010.
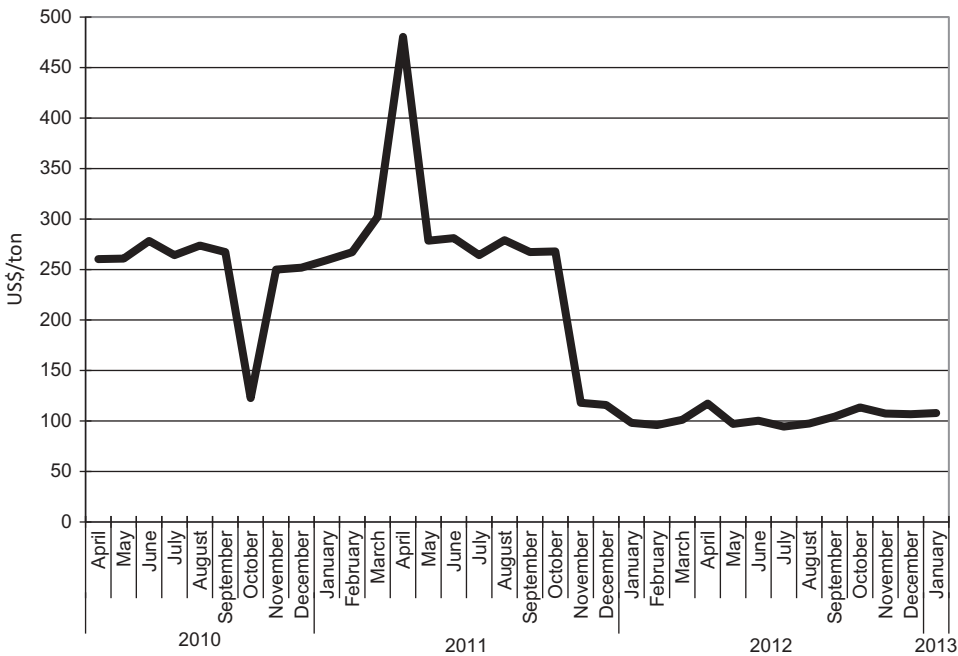
FIGURE 6 Export tax value of cocoa beans, April 2010–January 2013. *Source*: Ministry of Trade 2010–2013.

From the period of April 2010 to January 2013, the highest tax rate was 15%, in April 2011, when the reference price was US$3,516. Therefore, the export tax was US$480.45 per ton of cocoa beans. The lowest export tax value occurred in July 2012, when the export tax was 5% and the check price was US$1,888, making the export tax US$94.4 per ton (Figure 6) (Table 2).

IV. METHODOLOGY

The impact of the export tax on farmers is predicted to be due to changes in income and the supply chain. The impact on income is predicted to be due to price changes. In order to analyze whether the price change is

TABLE 2 Cocoa Beans Check Price, Reference Price, and Tariff, April 2010–January 2013

Month	Check Price (US$/ton)	Reference Price (US$/ton)	Tariff (%)
April 2010	2,603	2,900.06	10
May 2010	2,608	2,905.68	10
June 2010	2,783	3,084.81	10
July 2010	2,643	2,941.88	10
August 2010	2,738	3,038.91	10
September 2010	2,673	2,972.23	10
October 2010	2,452	2,744.90	5
November 2010	2,500	2,794.85	10
December 2010	2,519	2,814.48	10
January 2011	2,593	2,890.66	10
February 2011	2,671	2,970.00	10
March 2011	3,021	3,329.20	10
April 2011	3,203	3,516.11	15
May 2011	2,786	3,088.20	10
June 2011	2,811	3,113.57	10
July 2011	2,643	2,941.81	10
August 2011	2,791	3,093.88	10
September 2011	2,673	2,972.69	10
October 2011	2,679	2,978.28	10
November 2011	2,359	2,649.83	5
December 2011	2,316	2,606.38	5
January 2012	1,962	2,243.47	5
February 2012	1,918	2,197.77	5
March 2012	2,022	2,304.35	5
April 2012	2,345	2,061.00	5
May 2012	1,941	2,221.52	5
June 2012	2,006	2,287.74	5
July 2012	1,888	2,166.92	5
August 2012	1,950	2,231.04	5
September 2012	2,087	2,371.08	5
October 2012	2,268	2,557.15	5
November 2012	2,146	2,431.79	5
December 2012	2,133	2,418.66	5
January 2013	2,156	2,442.33	5

Source: Ministry of Trade and Ministry of Finance 2010–2013.

caused by the changes in international price or by the export tax, an analysis regarding the linkage between farmers' level and international price was conducted. Meanwhile, the analysis on the impact on the supply chain was conducted through a survey of the farmers and institutions in the cocoa supply chain. Supply chains before and after the export tax were compared to see if there were changes in the supply chain for cocoa beans, especially for farmers.

The survey was carried out in the province of South Sulawesi because the province is the largest producer of cocoa beans in Indonesia, with its production of 164,444 tons or 20% of Indonesia's cocoa bean production in 2009 (Ministry of Agriculture, 2012). The survey was conducted from January to April 2012. North Luwu, which has the largest production of cocoa beans

in South Sulawesi, reaching 31,667 tons in 2009 (Ministry of Agriculture, 2012), was chosen as the location of the survey. The research was conducted in two sub-regencies (*kecamatan*), Sabbang and Sukamaju. In each sub-regency, the two villages that are the largest producers of cocoa beans in the sub-regency were chosen. The Sabbang sub-regency is mainly occupied by the members of the Bugis ethnic group, while the Sukamaju sub-regency is a transmigration area and mainly occupied by people of Balinese descent. In each village, fifteen farmers were interviewed, totaling sixty farmers who were interviewed.

The methodology utilized in this research includes both qualitative and quantitative approaches. The qualitative approach was used in analyzing the cocoa supply chain before and after the implementation of export tax. Meanwhile, the quantitative analysis consists of three analyses: marketing system, efficiency analysis, and price linkage.

The marketing system analysis was carried out using the institution and functional approach of Kohl and Uhl (1998). This analysis was carried out in order to analyze the institutions involved in the cocoa supply chain, from farmers as producers to consumers or exporters, as well as the function of every institution before and after the implementation of the export tax on cocoa beans.

The efficiency analysis consisted of two analyses: marketing margin and benefit and cost ratio. The marketing margin analysis consisted of total margin, which was the difference between price at the farmer's level (producer) and price at the consumer level (or exporter), and margin in every institution in the cocoa supply chain, which was the difference between selling price and buying price, including cost during handling. The formula is given in Equation 1.

$$M_T = P_r - P_f \ or \ M_T = \sum\nolimits_{i=1}^{n} M_i \qquad (1)$$

$$M_i = P_i - P_{i-1} \ or \ M_i = B_i + \pi_i$$

Where

M_T = Total marketing margin (Rp)
M_i = Marketing margin in institution i, $i = 1,2, \ldots$ n (Rp)
P_r = Consumer's Price (Rp)
P_f = Farmer's price (Rp)
P_i = Price in institution i
P_{i-1} = Purchasing price in institution i
B_i = Marketing cost in institution i
π_i = Profit in institution i

Second, the analysis of the benefit and cost ratio was carried out in order to calculate the ratio between benefit and cost in every institution involved in cocoa supply chain (see Equation 2).

$$B \; C \; ratio = \frac{\pi_i}{C_i} \qquad (2)$$

Where

π_i = Profit in institution i
C_i = Cost in institution i

The price linkage analysis was utilized to analyze the link between the farmers' level price and the international price. The analysis was conducted before and after the implementation of the export tax. The Vector Error Correction Model (VECM) or Vector Autoregression (VAR) was utilized to analyze the price linkage between those two prices. VECM is a VAR model adding the error correction equation. The error correction equation is added when there is a cointegration in the model. If there are two variables, X and Y, and both variables are cointegrated, the first difference of X_t and Y_t can be modeled using a VAR and augmented by including $Y_{t-1} - \theta X_{t-1}$ as an additional regressor (Stock & Watson 2007), as shown in Equation 3.

$$\Delta Y_t = \beta_{10} + \beta_{11}\Delta Y_{t-1} + \ldots + \beta_{1p}\Delta Y_{t-p} + \gamma_{11}\Delta X_{t-1} + \ldots +$$
$$\gamma_{1p}\Delta X_{t-p} + \alpha_1(Y_{t-1} - \theta X_{t-1}) + u_{1t} \qquad (3)$$

$$\Delta X_t = \beta_{20} + \beta_{21}\Delta Y_{t-1} + \ldots + \beta_{2p}\Delta Y_{t-p} + \gamma_{21}\Delta X_{t-1} + \ldots +$$
$$\gamma_{2p}\Delta X_{t-p} + \alpha_2(Y_{t-1} - \theta X_{t-1}) + u_{2t}$$

Meanwhile, if there is no cointegration between those prices, the first difference VAR will be utilized.

V. IMPACT OF EXPORT TAX POLICY

The implementation of the cocoa bean export tax in April 2010 is expected to affect farmers. During the interview, almost all of the respondents knew of the policy. The impact that the tax had on farmers was mostly on the price they received when the price was lowered and the traders responded that it was caused by the export tax. These findings are similar to the research conducted by Pradiptyo et al. (2011).

On the other hand, no significant changes in operations were made by the farmers after the implementation of the export tax. Farmers did not shift

their marketing channel since the price given by buyers was relatively similar and because some of the farmers are attached to the buyers by training or contracts. Also, on the buyer's side, no significant changes were made. Company X, which purchases wet cocoa beans, had been purchasing the same product before the export tax policy was implemented.

In regard to determining the purchasing price of farmers based on the information from Company Y, it is based on the international price (NYBOT price), exchange rate, transportation cost to move the beans from North Luwu to Makassar, where the processing unit is located, and a term the exporters' called "price differential," which is the margin that the exporter obtains.

In the field, there is some information that the farmer bears the effects of the export tax at a fixed level of 15%, even though the export tariff differs between 0 and 15%. In order to prove this statement, the price differential is calculated by subtracting the international price and the farmer's price (Figure 7).

Figure 7 indicates that the price differential decreased after April 2010, when the government implemented the export tax, but there was a one-off shift that month. This suggests that the implementation of the export tax had a negative impact on the exporters' profits. The decrease in the price differential can be caused by increasing competition between exporters and the processing industry for cocoa beans. In reference to the price linkage equation, which shows that the international price is perfectly transmitted to the farmer's price, it indicates that the exporters determine the purchasing price based on the international market, and when one exporter tries to decrease the purchasing price, the farmer will just shift to another buyer who offers a better price, since the competition is tight in obtaining cocoa beans.
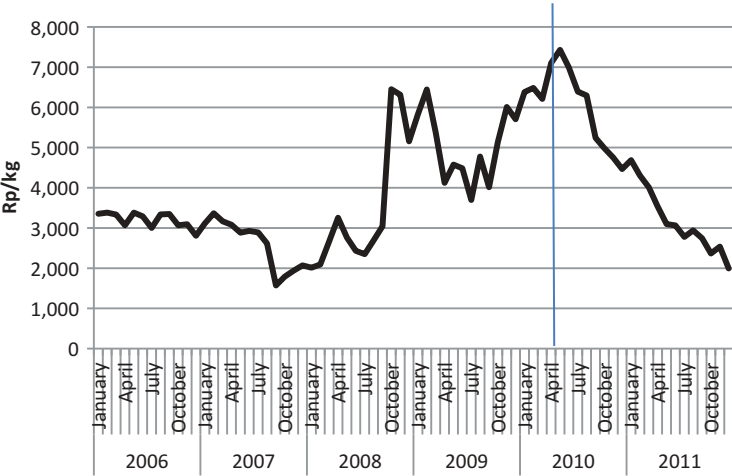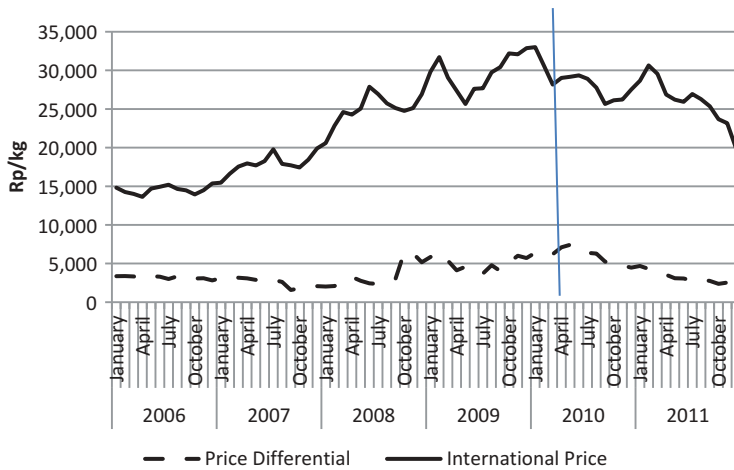

FIGURE 7 Price differentials of dried cocoa beans, January 2006–December 2011.

FIGURE 8 The relation between price differential and international price, January 2006–December 2011. *Source:* ICCO 2012.

In addition, the price differential and the international price have a high positive correlation (0.507). Figure 8 shows that the differential on price tends to have the same movement, especially after the implementation of the export tax policy in April 2010. This indicates that a high international price has a positive impact on the price differential, or, in other words, the exporters will earn higher profits when the international price is high. When the international price is low, on the other hand, the exporter will earn fewer profits to compete with other exporters or the processing industry.

In conclusion, the marketing institution that bears the export tax is the institution that has the least bargaining power in the market. From the discussion, the export tax is borne by the exporters, which is indicated by the decrease in the marketing margin when the export tax was imposed. Meanwhile, farmers have higher bargaining power since they have the independence to sell their beans to any institution that offers a better price. Although farmers are attached to the buyers through training and contracts, they can still sell their beans to other buyers.

The other impact of the export tax is the increase in the capacity of processing companies, either in the form of new investment or re-opening of companies that were closed before the implementation of the export tax. In 2011, there were five processing companies in South Sulawesi that re-opened their factories, with the capacity of 79,000 tons (380,000 tons in whole Indonesia) of cocoa beans per year (Media Data, 2011). As production of cocoa beans increased by 24,612 tons, the competition in obtaining cocoa beans from farmers has become more intense. In addition, there has also been a shift in the utilization of cocoa beans from being exported to being sold to processing companies. This is proven by the fact

that Indonesia's cocoa bean exports in 2011 decreased significantly, by 48%
(United Nations 2012).

VI. PRICE LINKAGE BETWEEN FARMERS' PRICE AND INTERNATIONAL PRICE

The farmers' price and the international price move in the same direction
(Figure 9). In Figure 9, the international price is based on the NYBOT
price of dried unfermented cocoa beans gathered by the International
Cocoa Organization (ICCO). The NYBOT price is used because the price
is for unfermented beans, which is what most cocoa beans exported from
Indonesia are. Meanwhile, the farmers' price is based on the purchasing
price of one exporter operating in North Luwu (Company Y). The price data
from Company Y were used since there were no time series data available
from the farmers. The data from Statistics Indonesia are also available, but
the purchasing price of Company Y is more reliable. This indicates that the
farmers' price is determined by the international price. In the field, farmers
receive daily information about the price from exporters using short message
service (SMS), which is based on the NYBOT price.

In order to analyze the price linkage, a VAR or VECM method is utilized.
The data used for the analysis were from the period of January 2006 until
December 2011. Before estimating the VAR or VECM model, a unit root test
was conducted to detect the data stationarity, using an Augmented Dickey
Fuller test (Table 3). Table 3 indicates that both data is stationary after first
differencing I(1).

FIGURE 9 International price and farmer's price of dried cocoa beans. *Source:* ICCO 2012
and Company Y 2012.

TABLE 3 Unit Root Test

Variable	ADF Test	p-value
Farmers' Price	−1.001	0.936
D(Farmer's Price)	−5.266	0.000
International Price	−0.875	0.953
D(International Price)	−6.068	0.000

TABLE 4 Johansen Cointegration Test

Hypothesized No. of CE	Trace		Max Eigen	
	Trace Statistic	p-value	Max Eigen Statistic	p-value
None	8.599	0.773	6.066	0.781
At most 1	2.533	0.671	2.533	0.671

The next step is to conduct a cointegration test in order to determine whether both prices have long-run equilibrium (Table 4). The result indicates that the prices do not have a long-run relation since in the field the farmers' price is determined by the previous-day NYBOT price; therefore, the relation is in the short run rather than in the long run. The same result was also obtained by Firdaus and Ariyoso (2010), using the Ravallion method, and by Mananyi and Struthers (1997), who found no cointegration between spot and futures price in the London cocoa market. The authors used the London price since their study was based on Ghana's domestic price and the Ghana mostly exported in the forms of fermented beans, whose price is based on the London price.

The VAR model is in the first difference form because no conintegration exists. In addition, since international prices affect farmers' prices in the same period, the model is as given in Equation 4.

$$\Delta LFAR_t = c + \Delta LFAR_{t-1} + \Delta LINT_t + \Delta LINT_{t-1} + \varepsilon_t \qquad (4)$$

The result is shown in Table 5. The R^2 was relatively high, at 84.6%, indicating that the model can explain 84.6% of the variation in the dependent variable. The result shows that only one variable, the international price, is

TABLE 5 Estimation Result

Variables	Coefficient	p-value
Constant	0.003	0.414
$\Delta LFAR_{t-1}$	0.095	0.426
$\Delta LINT_t$	1.001	0.000
$\Delta LINT_{t-1}$	−0.201	0.121
R^2	0.846	
F-stat	120.657	0.000

FIGURE 10 Farmer's price and export tax value after implementation of export tax. *Source:* ICCO 2012.

significant. The coefficient for the international price was 1, indicating that a change in the international price will change the farmers' price by the same amount; in other words, the international price is perfectly transmitted to the farmers' price. This confirms the information from the field survey, that the farmers' price is based on the international price (NYBOT price) on a daily basis.

In regard to the impact of the export tax value on farmers' price, both values are shown in Figure 10, which shows no trend between both values. However, when acorrelation analysis was conducted to analyze the relation between both values, it indicates that both values (farmers' price and lag export tax) are correlated and significant at a 10% level, even though the relation is relatively low (0.384). The lagged export tax was used because the value of the export tax is determined by the previous month's international price. The positive correlation shows that the impact of the export tax is not through the domestic price, as shown in Figure 5, but through the international price. International prices affect domestic prices and the export tax. The small correlation shows that the export tax has a slight relation to the farmers' price even though the international price is well transmitted to the domestic price. The slight relation of the export tax to the farmers' price is caused by the fact that Indonesia is not a major producer of cocoa beans; therefore, the export tax is not perfectly transmitted to the domestic price.

VII. COCOA MARKETING CHANNEL IN NORTH LUWU REGENCY

The hypothesis of this research was that the farmers would change their marketing channel from exporters to domestic traders who sell to domestic

processing companies. The research plan for this study was to analyze the marketing channel before and after the implementation of the export tax. However, during the field survey, it was found that there was no change in the marketing channel caused by the export tax policy. Therefore, only the recent marketing channel is discussed in this article.

There were sixty farmers interviewed from two sub-regencies, Sabbang and Sukamaju. The number of farmers' interviewed was adequate as in each region the marketing channel is relatively homogenous. These two sub-regencies are in the North Luwu Regency, which is the central production area of cocoa beans in Indonesia. In terms of age and land ownership, the characteristics of the respondents from these two sub-regencies are similar. Meanwhile, in terms of education level and land area, there are some differences among the respondents from the two sub-regencies.

In terms of age, 83% of the respondents were in the age range of 31–41 years old. In Sukamaju, most of the respondents were second-generation farmers who inherited their land from their parents. All of the respondents in both sub-regencies owned land.

In terms of education level, there are significant differences among the farmers in the two sub-regencies. In Sukamaju, all of the respondents had only an elementary school education. On the other hand, in Sabbang, 90% of the respondents had a junior high school education, and 10% had a senior high school education.

Fifty percent of respondents in the Sabbang sub-regency had more than two hectares of land planted with cocoa; in Sukamaju, only 13% had cocoa plots of more than two hectares. Sukamaju is a transmigration area where previously every farmer was provided with two hectares of land. Since the farmers in Sukamaju are the second-generation of farmers, they inherited less than two hectares depending, on the number of siblings that their parents had. The farmers with more than two hectares usually accumulated the land by purchasing the other area from other farmers.

In the regency, there are several cocoa commodities sold by farmers or farmers' organizations. These commodities are wet, dry, and fermented cocoa beans. Each commodity has a single marketing channel. Unlike the other areas, such as Southeast Sulawesi (Komisi Pengawas Persaingan Usaha 2009), Papua (Wally 2001) or Lampung (Slameto 2003), the exporters and processing industry have more dominance than the village and sub-regency traders. These exporters and processing industries are mainly multinational companies from the United States or Europe. There are five main multinational exporters in Sulawesi, accounting for 80% of cocoa purchases: EDF and Man, Olam, Cargill, ADM, and Continaf (USAID 2006). Meanwhile, in Indonesia, there are thirteen multinational companies involved in the cocoa bean trade, six of which purchase directly from farmers, while the rest purchase cocoa beans from the traders (Media Data 2011).

In the North Luwu Regency, there are three primary marketing channels, which involve several institutions, such as traders, processing industries, and exporters. The first marketing channel is used in the Sukamaju sub-regency, while the second and third marketing channels are used in the Sabbang sub-regency. The first marketing channel is for wet beans in the Sukamaju sub-regency. It can be described as follows:

Farmer → Processing Industry → Domestic/Foreign Consumer

All of the thirty respondent farmers in the Sukamaju sub-regency sell their products in this marketing channel, with the value of 8,100 kg of wet cocoa beans or around 2,700 kg of dried cocoa beans. They sell their beans in wet form since it is more practical. The farmers feel that selling beans in the dry form is more difficult since it takes time to dry the beans and the weight will be reduced by 30% after drying. In addition, when the beans are sold in the dry form, the requirements to obtain good prices are more complicated, such as water content, bean cleanliness, and bean quality. However, when they are sold in wet form, the price is only determined by the beans' cleanliness, without worrying about other requirements.

The processing industry purchases wet cocoa beans directly from farmers; the only company that conducts this activity in North Luwu Regency is an American company (Company X). The farmers will be paid several days after the wet beans are tested for dirt or other external objects, which determine the price.

Company X has a processing unit in the regency that processes the wet cocoa beans into fermented cocoa beans. These fermented cocoa beans are then exported or sold to domestic buyers. The reason that the company purchases wet cocoa beans rather than dried or fermented cocoa beans is that the company intends to produce high-quality output. Therefore, it purchases wet cocoa beans to control the quality of the drying and fermenting process. In order to keep the farmers loyal, Company X also gives loans to them, which can be repaid after the harvesting period.

Looking at the farmer's margin for comparison, I used a selling price of cocoa beans converted into dried beans, which was assumed to be three times higher than that of wet beans. The price of wet beans that the farmers obtained in March 2012 was Rp 7,031 per kg (US$1 = Rp 9,386). Therefore the assumed price of dried beans is Rp 21,093 per kg, with a cost of producing the beans of Rp 12,327 per kg. The profit generated was Rp 8,766 per kg dried beans or, if converted to wet beans, Rp 2,922 per kg (Table 6). The margin in the processing industry was not calculated since there was a difficulty in obtaining the data, and it is quite difficult to calculate the conversion from wet beans to cocoa paste and powder production.

The second marketing channel involves selling fermented beans. The marketing channel of this product is as follows:

TABLE 6 Marketing Margin of Marketing Channel 1, March 2012

Items	Rp/kg
Selling Price	21,093
Cost	12,327
Farmer's Profit	8,766
Benefit to Cost Ratio	0.711

Farmers → Farmer's Organization → Processing Industry

→ Domestic/Foreign Consumer

All of the thirty farmers respondent in the Sabbang sub-regency sell their beans using this marketing channel, with a total amount of cocoa beans of 3,040 kg. In this channel, the farmers either sell dry beans to the farmer's organization (called Gapoktan Pada Idi Pada Elo) or ferment their own beans, which are then sold to the farmer's organization. The local government encourages the farmers to sell fermented cocoa beans since they have higher value added. The local government has supported the program by giving fermentation tools (a wood box) to farmer's organizations. The fermentation process takes six to seven days. The price of fermented beans is between Rp 2,000 and Rp 3,000 per kg higher than dried beans.

After the fermentation process, the cocoa beans are shipped to Company Z in Tangerang, Banten, located in Java Island. This company has a formal contract with the farmer's organization. Each shipment is around 500 kg to 1 ton of fermented cocoa beans. Although the price is higher than the price of the dry cocoa beans, the farmers do not receive payment until two to three months after the shipment is received, since the payment is only transferred after 1.5–2 tons of fermented cocoa beans have been shipped to the buyer. Company Z is the second largest cocoa processing company in Indonesia, with a capacity of 80,000 tons per year, and 90% of its production is exported (Media Data 2011).

The farmers sell dried cocoa beans to traders in the third channel. The marketing channel is as follows.

Farmers → Village Trader → Sub-regency Trader → Exporter

→ Foreign Consumer

All of the farmers in the second marketing channel also used this marketing channel, with a total of 1,615 kg of cocoa beans. The advantage of this channel is that the farmers are paid immediately, rather than two to three months later as in the second channel. The farmers often need cash for daily needs; as a result, in order to obtain quick cash, they sell their

low-quality (high water level) dried cocoa beans to village traders. These village traders then sell the dried cocoa beans to sub-regency traders. The sub-regency traders dry the beans in order to meet the requirements of the exporter. The exporters are all foreign companies that have representatives in North Luwu. The dried cocoa beans are transported to Makassar and then exported to be processed in other countries. Most of these companies have their processing units abroad, in countries such as Malaysia. Therefore, their Indonesian operations only produce dry or fermented cocoa beans.

Looking at the marketing margins, in the second marketing channel, Company Z pays for beans at a price set in advance by contract. In March 2012, the contract price was set at Rp 24,500 which includes fermentation cost and transportation cost to ship the fermented beans. The farmer's organization buys the cocoa beans from farmers for Rp 23,000 per kg; the farmers' cost of production is Rp 13,414 per kg, giving a profit of Rp 9,586 per kg. When compared to the first marketing channel, the farmers will obtain higher profits and a slightly higher benefit and cost (BC) ratio.

In Company Z, the fermented beans will be processed to cocoa powder and, according to the information obtained from the farmer's organization, Company Z makes a profit of approximately as much as Rp 1,000 per kg fermented beans purchased.

In the third marketing channel, the farmers in the Sabbang sub-regency sell their cocoa beans to village traders. They sell the beans in the form of dried beans that still have a high water level for the price of Rp 18,000 per kg. The price is lower than the price at the farmer's organization since the quality is lower. The production cost is similar to the second marketing channel; therefore the BC ratio of the third marketing channel is lower than the second marketing channel (Table 7).

The village traders sell the dried beans to the sub-regency traders after bearing the cost of transportation from farmers to the sub-regency traders. The sub-regency trader will buy the beans from the village traders for Rp 18,500 per kg of dried beans. In order to meet the requirements of the exporter, the sub-regency traders dry the beans once more, therefore incurring additional costs.

The exporter buys the dried beans from the sub-regency traders for Rp 20,000 per kg. Besides buying from these traders, the exporter also buys from his partner farmers. These farmers are given extensions and inputs in order to produce better quality of cocoa beans.

The exporter then transports the dried beans to facilities in Makassar, an approximately eight-hour drive from North Luwu, and this cost is borne by the exporter. From Makassar, these dried beans will be exported. In Table 7, it is assumed that beans are sold by the exporter in the form of dried beans.

In recent years, exporters have become more dominant in purchasing cocoa beans, especially in Sulawesi. These exporters directly purchase cocoa

TABLE 7 Marketing Margins of Marketing Channels 2 and 3, March 2012

	Marketing Channel 2	Marketing Channel 3
Farmer		
Selling Price	23,000	18,000
Cost	13,414	13,414
Profit	9,586	4,586
Benefit to Cost Ratio	0.714	0.342
Farmer's Organization		
Purchasing Price	23,000	
Cost	1,325	
Profit	175	
Selling Price	24,500	
Benefit to Cost Ratio	0.132	
Village Trader		
Purchasing Price		18,000
Marketing Cost		250
Profit		250
Selling Price		18,500
Benefit to Cost Ratio		1.000
Sub-regency Trader		
Purchasing Price		18,500
Marketing Cost		400
Profit		1,100
Selling Price		20,000
Benefit to Cost Ratio		2.750
Processing Industry		
Purchasing Price	24,500	
Marketing Cost	500	
Profit	500	
Selling Price	25,500	
Benefit to Cost Ratio	1.000	
Exporter		
Purchasing Price		20,000
Marketing Cost		605
Profit		1,145
Selling Price		21,750
BC Ratio		1.892

beans from farmers. Therefore, the role of local traders has diminished over the years, causing many of them to shift to palm oil. Besides the exporters, processing companies have also increased their role in purchasing cocoa beans in the form of wet beans from the farmers. In order to guarantee the supply of cocoa beans, exporters and processing companies keep in close contact with the farmers, using personal connections or frequent visits to them.

Several exporters have partnerships with farmers. Besides guaranteeing supply from the farmers, these partnerships also guide the farmers in producing higher quality and quantity of cocoa beans. Despite their partnership, there is no obligation for the farmers to sell their products to their partner exporters. Price information is very transparent, and they even receive a text

through short message service (SMS) every day about the price; therefore, the farmers can compare prices among the exporters.

From the three marketing channels, it is clear that all cocoa beans end up being sold to an exporter or a processing company. As both ultimately export some product, this implies that the international price is significant in determining payments to the farmers, which was verified in our field work and other research.

VIII. CONCLUSION

The export tax policy on cocoa beans mostly affected the exporters by reducing their margin. Meanwhile, for the farmers, there has been no change in their marketing channels before or after the export tax policy. There are three marketing channels in North Luwu Regency and three cocoa products are sold. In the first marketing channel, farmers sell wet cocoa beans to the cocoa processing company of Company X; this marketing channel is viewed as the most convenient by the farmers. The second marketing channel involves the farmer's group in fermenting the cocoa beans that are then sold to Company Z; this channel provides the highest profit for the farmers. In the third channel, the beans are sold as dried beans to local traders; in this channel, the farmers receive the money directly after selling the cocoa beans.

The farmers' cocoa bean price is determined by the international price. The international price is nearly perfectly transmitted to the farmers' price. This has caused the farmers to have a higher bargaining position compare to the exporters after the implementation of the export tax in April 2010. With the implementation of the export tax, exporters' margins decreased due to fierce competition in obtaining cocoa beans from the farmers.

ACKNOWLEDGMENTS

REFERENCES

Akiyama, T. 1992. Is There a Case for an Optimal Export Tax for Perennial Crops. Policy Research Working Paper. Washington, DC: World Bank.

Arsyad, M. 2007. The Impact of Fertilizer Subsidy and Export Tax Policies on Indonesia Cocoa Exports and Production. *Ryokoku Journal of Economic Studies* 47(3): 1–27.

Arsyad, M., Sinaga, B, M., and Yusuf, S. 2011. Analysis of the Impact of Export Tax and Price Subsidy Policies on Indonesian Cocoa Exports and Production Post-Uruguay Round. *Jurnal Sosial Ekonomi Pertanian* 8(1): 63–71.

Burger, K. 2008. Optimal export taxes: The case of cocoa in Cote d'Ivoire. Paper presented at the 107th European Association of Agricultural Economists Seminar *Modelling of Agricultural and Rural Development Policies*, Sevilla, Spain.

Devarajan, S., Go, D., Schiff, M., and Suthiwart-Narueput, S. 1996. The Whys and Why Nots of Export Taxation. Policy Research Working Paper. Washington, DC: World Bank

Firdaus, M., and Ariyoso. 2010. Market Integration and Factors Affecting Indonesia's Cocoa Bean Price. *Jurnal Ekonomi dan Kebijakan Pembangunan* 3(1): 69–79.

Hasan, M. F., Reed, M. R., and Marchant, M. A. 2001. Impacts of an Export Tax on Competitiveness: The Case of the Indonesian Palm Oil Industry. *Journal of Economic Development* 26(2): 77–90.

Helpman, E., and Krugman, P. R. 1989. *Trade Policy and Market Structure*. Cambridge, MA: MIT Press.

International Cocoa Organization (ICCO). 2009. *ICCO Annual Report 2008/2009*. London: Author.

International Cocoa Organization (ICCO). 2010. *ICCO Annual Report 2009/2010*. London: Author.

International Cocoa Organization (ICCO). 2012. *ICCO Annual Report 2011/2012*. London: Author.

Kohl, R., and Uhl, J. N. 1998. *Marketing of Agricultural Products*. New York: MacMillan.

Komisi Pengawas Persaingan Usaha. 2009. *Cacao's Industry and Trade*. Jakarta: Author.

Lam, N. V. 1979. Incidence of Agricultural Export Taxation in Papua New Guinea. *Journal of Development Studies* 15(2): 177–193.

Mananyi, A., and Struthers, J. J. 1997. Cocoa Market Efficiency: A Cointegration Approach. *Journal of Economic Studies* 24(3): 141–151.

Marks, S. V, Larson, D. F., and Pomeroy, J. 1998. Economic Impacts of Taxes on Exports of Palm Oil Products. *Bulletin of Indonesian Economic Studies* 42(3): 7–58.

Media Data Riset. 2011. *Revitalization Progress of Cocoa's Industry in Indonesia*. Jakarta: PT Media Data Riset.

Ministry of Agriculture. 2013. *Agriculture Database Production*. Jakarta: Author.

Nyein, K. M., Sirisupluxana, P., and Titapiwatanakun, B. 2010. Welfare Impacts of Export Tax Implications on Sesame in Myanmar. *Journal of Global Business and Economics* 1(1): 162–179.

Obado, J., Syaukat, Y., and Siregar, H. 2009. The Impacts of Export Tax Policy on the Indonesian Crude Palm Oil Industry. *Journal International Society for Southeast Asian Agricultural Sciences (ISSAAS)* 15(2): 107–119.

Permani, R. 2013. Optimal Export Tax Rates of Cocoa Beans: A Vector Error Correction Model Approach. *The Australian Journal of Agricultural and Resource Economics* 57(1): 1–22.

Permani, R., Vanzetti, D., and Setyoko, N. R. 2011. Optimum Level and Welfare Impacts of Export Taxes for Cocoa Beans in Indonesia: A Partial Equilibrium

Approach. Paper presented at the 2011 AARES Annual Conference, Melbourne, February.

Piermartini, R. 2004. The Role of Export Taxes in the Field of Primary Commodities. Switzerland: World Trade Organization.

Pradiptyo, R., Widodo, T., and Hardi, A. S. 2011. Cocoa's Export Tax Policy Evaluation. Yogyakarta: Penelitian Pelatihan Ekonomika dan Bisnis, Gadjah Mada University.

Putri, E. I., Widyastutik, Rifin, A., Hartoyo, S., and Daryanto, H. 2008. Crude Palm Oil Export Tax Policy: Development and Mechanism. *Jurnal Agribisnis dan Ekonomi Pertanian* 2(1): 17–28.

Rifin, A. 2010. The Impact of Export Tax on Indonesia's Crude Palm Oil (CPO) Export Competitiveness. *ASEAN Economic Bulletin* 27(2): 173–184.

Rifin, A., and Nurdiyani, F. 2007. Indonesia's Cocoa Market Integration. *Jurnal Agribisnis dan Ekonomi Pertanian* 1(2). 1–10.

Slameto. 2003. Cocoa's Production, Supply and Marketing Analysis in Lampung. Master's thesis, Bogor Agricultural University.

Stock, J. H., and Watson, M. W. 2007. *Introduction to Econometrics*. Boston, MA: Pearson Addison Wesley.

Susila, W. R. 2004. Impacts of CPO-Export Tax on Several Aspects of Indonesian CPO Industry. *Oil Palm Industry Economic Journal* 4(2): 1–13.

Trivedi, P. K., and Akiyama, T. 1992. A Framework for Evaluating the Impact of Pricing Policies for Cocoa and Coffee Cote d'Ivoire. *The Work Bank Economic Review* 6(2): 307–330.

United Nations. 2012. Commodity Trade Statistics Database (COMTRADE). New York: Author. http://unstats.un.org/unsd/comtrade (accessed March, 2013).

USAID. 2006. Indonesia Cocoa Bean Value Chain Case Study. Microreport 65. Washington, DC: Author.

Wally, F. 2001. Marketing Cacao Analysis and Factors Affecting Option in Farmer's Marketing Institution in Jayapura District. Master's thesis, Bogor Agricultural University.

Warr, P. G. 2001. Welfare Impacts of an Export Tax: Thailand's Rice Premium. *American Journal of Agricultural Economics* 83(4): 903–920.

Warr, P. G. 2002. Export Taxes and Income Distribution: The Philippines Coconut Levy. *Weltwirtschaftliches Archiv* 138(3): 437–458.

Yilmaz, K. 1999. Optimal Export Taxes in a Multi-country Framework. *Journal of Development Economics* 60(2): 439–465.