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Impacts of Export Tax of Cocoa Beans on Indonesian Economy

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Abstract

In recent years, there is a significant decline of cocoa beans in terms of exports value and share after 2010. Several studies claimed that this downward trend was caused by the introduction of an export tax on cocoa beans in 2010. Nevertheless, there are limited studies on the impacts of decreasing cocoa beans exports to the Indonesian economy. Therefore, this study aimed to simulate the impacts of the imposition of export tax on cocoa beans to the economy as well as unemployment. Methodology of this study utilised the Input-Output Table. In particular, this study calculated the impacts of export tax on cocoa beans to the changes of output, primary inputs, and unemployment in several scenarios. The main result of this study was that at extreme scenario, where the cocoa beans sector's export was eliminated, the impacts on the whole economy and unemployment were insignificant. Moreover, this study found that the impacts on value added such as decreasing of profit were relatively higher than decreasing rate on the output and others value added such as salary and wages and indirect taxes. On the other hand, this study argued that even though the introduction of export tax effectively reduced raw cocoa beans exports, there was an increasing on the exports' value on the down stream industries.

Keywords: cocoa, export taxes, agricultural policy, taxation

INTRODUCTION

Permani *et al*. (2011) claimed that cocoa beans sector is an export-oriented sector. For example, more than 65% of domestic production was exported in 2008 with value around USD1.3 million and ranked at thrid position after palm oil and rubber in the plantation sub-sector. Moreover, Indonesian cocoa beans export was ranked at third largest at world cocoa market after Ivory Coast and Ghana (KPPU, 2009). In addition, KPPU (2009) claimed that the cocoa sector had employed around 900 thousand employees mostly live in the eastern region of Indonesia. Therefore, economically the cocoa beans is an important exported commodity in Indonesia.

In recent years, the contribution of cocoa beans export to total export had declined precipitously. In 2009, the share was around 0.94% which was the highest since the 1960s. In term of nominal value, the value of export for raw and roasted cocoa beans was around USD1,190,740 thousand in 2010, the highest before it had started to decline in 2011. Nevertheless, in 2014, the share was approximately 0.11%. There was a similar trend in term of nominal export value. In 2008 the export value was around USD1.1 billion, decreasing significantly to around USD196 million in 2014. The net weight had decreased as well since 2006 from around 490 thousand tons to 63 thousand tons in 2014 or equal

to more than 85% reduction in less than a decade.

Several studies such as Arsyad *et al*. (2011), Syadullah (2012), and Rifin & Nauly (2013) claimed that this significant decrease was due to the imposition of export tax on cocoa beans in 2010. Basically, the Indonesian Government enacted an export tax on cocoa beans as an effort to provide incentives for overcoming the problem in a shortage of domestic supply of cocoa beans which hampered development of the downstream industries (Permani *et al*., 2011).

Theoretically, the imposition of the export tax will increase the price in the export market and reduces the price in domestic market. Due to the price adjustment in domestic market, the excess of supply in domestic market decreased since the producers tended to reduce its supply while the consumers increase their demand due to a lower price.

Shamsudin (1998) claimed that due to export tax on cocoa beans countries, there was a burden shared between producers and importers. Moreover, Piermartini (2004) argued that the impacts of an export tax on commodity should be different between large and small countries. In large countries, the imposition of export tax on commodity causes the world price to increase. The consumers and government receive benefits in form of lower price and revenue, respectively, while the producers receive negative impacts such as decreasing output, unemployment, and profit. There is a distribution of income from producers to consumers and government. However, in small country case, the export tax (levy) causes the domestic price decreases and the world price unchanged.

Rifin (2013) claimed that since 1982, Indonesian cocoa bean has gained competitiveness which indicated the value of revealed comparative advantage (RCA) by more than one. In addition, it was he argued the highest value of RCA was in 2006 at approximately 16.96. However, since the imposition of export tax on cocoa bean in 2010, the RCA value dropped to around 5.54. On the other hand, cocoa beans from Ivory Coast, Ghana, and Nigeria had relatively higher RCA values. Rifin (2013) claimed that these higher values in RCA due to the domination of cocoa beans exports in Ivory Coast, Ghana, and Nigeria at around 24.52, 45.89, and 3.74%, respectively. Furthermore, Rifin (2013) argued that cocoa beans were inelastic which implies that price relatively insignificant to determine the level of cocoa's sales. Moreover, Rifin (2013) claimed that since the cocoa beans were inelastic, the only way to increase the export revenue from cocoa bean was through increasing the export volume and not by decreasing the price.

Rifin & Nauly (2013) utilising constant market share (CMS) approach argued that decreasing in cocoa beans and cocoa products price due to the imposition of the export tax in 2010 was a result of commodity composition and competitive effects. They claimed that due to the export tax, the competitiveness of cocoa beans decreased. Moreover, the negative value of commodity composition implies that there was a high dependency on cocoa bean exports. On the other hand, the value of market composition in 2011 was positive which implied that there was an expansion of the market to several partner's countries.

Hasibuan *et al*. (2012) utilising dynamic system approach argued the impact of exports tax on cocoa would cause increasing in the domestic cocoa production and exports. However, the negative impacts were decreasing in the cocoa farmers' income as well as a reduction in the cocoa area. Moreover, several empirical studies such as Arsyad *et al*. (2011) found that increasing of export tax on cocoa beans by 5% caused decreasing in the export

volume by around 0.63% and decreasing in domestic price of cocoa by approximately 2.51%. Similar to Arsyad *et al*. (2011), Syadullah (2012) claimed that due to the enactment of export taxes on cocoa beans in 2010, there was a significant decreasing of cocoa exports by more than 12.5% of cocoa export in 2010. Moreover, the precipitous decline in the Indonesian cocoa exports in 2010 was not due to deterioration of the world demand, since in general there was an increasing trend of cocoa exports in Ghana and Uganda.

Regarding the impacts on employment, Wibowo (2013) utilising labour multiplier in the Input-Output Table, argued that changes in the export value caused significant changes in employment. For example, if there is decreasing in the non-oil exports by around 5.5%, the worse impacts will occur in the agriculture sector where more than 200 thousand people being unemployed.

This study aims to simulate the impacts of increasing export taxes rate on Indonesian economy, in term of the level of output and primary inputs and employment in the labour market, since there is less empirical evidence on the impacts of cocoa export taxes on economy and labour market in Indonesia. The main contribution of this paper is to provide empirical evidence on impacts of the imposition of export tax on cocoa beans to macroeconomics variables such as output and primary input. Moreover, the best knowledge of the author, this paper is the first attempt to calculate the impacts on employment by including the demand for employment based on the final demand matrix in the Input-Output Table.

MATERIALS AND METHODS

Data

This study used the 2005 Input-Output (IO) Table published by the Statistics Indonesia (BPS, 2007). The IO Table is relatively not up to date since the BPS already published the update of 2008 IO. Nevertheless, the 2005 IO Table is the latest IO Table where there is a disaggregation of the crop sector into details and covers cocoa sector in particular, which is the main topic of this study.

Table 1 presents the outline of the IO Table. In general, the IO Table consists of intermediate inputs, primary inputs or gross value added, and final demands. In order to produce products, there are supply and demand interactions among production sectors from sector 1 to sector n. For example, to produce a certain amount of output X_1, the first sector requires inputs from sector 1, 2, …, n by around x_{11}, x_{12}, … x_{1n} with primary inputs' value at V_1. The primary inputs can be divided into wages and salary, profits, indirect taxes, depreciation, and subsidy. Moreover, there are several final

Table 1. Lay out of the Input-Output Table

Input structure \ Output allocation			Intermediate demand: Production sectors 1	2	.....	n	Final demand	Total output
Intermediate input	Production sectors	1	x_{11}	x_{12}	…	x_{1n}	F_1	X_1
		2	x_{21}	x_{22}	…	x_{2n}	F_2	X_2
		…	…	…	…	…	…	…
		n	X_{n1}	X_{n2}		X_{nn}	F_n	X_n
Primary inputs			V_1	V_2	…	V_n		
Total inputs			X_1	X_2	…	X_n		

Source: Modified from BPS (2007a)

demands such as households' consumption, government consumption, investment, and exports. Finally, the last column in Table 1. is a total of final and intermediate demands. In other words, the total row of the 1st sector is equal to the total column of the 1st sector or mathematically can be expressed as belows:

$x_{11} + x_{12} + \ldots + x_{n1} + F_1 = X_1$.

Analysis Methods

This study utilised two different sets of the IO Table which were 175 x 175 sectors and 66 x 66 sectors. Basically, the main difference of both IO Tables was in the aggregation of the production sectors. The first IO Table was used to simulate the impacts of exports decreasing in the cocoa sector and increasing in other sectors' exports in detail. However, the 175 x 175 IO Table did not provide detail on the employment distribution for each sector. This distribution was only available for 66 x 66 sectors of the IO Table. Therefore, to simulate the impacts on the employment, this study generated the 66 x 66 sectors IO Table in line with BPS (2007a) on sectoral aggregation.

There were two steps of analysis in this study. Firstly, to simulate the impacts on the economy, this study utilised several multiplier such as output, primary inputs, and profits multiplier. Equation 1 implies that the total output which is represented by the X term consists of intermediate goods or inter-sector transaction (*AX*) and final demand (*F*). Term A is a value between 0 and 1 which implies that the inter-sector transaction will never greater than final output.

$$AX + F = X \quad \ldots\ldots (1)$$

Moreover, the final demand can be defined as in Equation 2.

$$F = C + I + G + E \quad \ldots\ldots (2)$$

where *C* is households' consumption, *I* is gross capital formation, G is government's expenditure, and E is exports of goods and services.

To generate the correlation between the final demand and production sectors, Equation 1 is derived by utilising matrix operations such as matrix multiplication and inverse. The final result as presented in Equation 3.

$$(I - A)^{-1} \Delta F = \Delta X \quad \ldots\ldots (3)$$

Basically, Equation 3 implies if there is a change in the final demand (ΔF), then total output for each sector (ΔX) will change as well (Hara, 2008).

The multiplier effects in the IO model are calculated through several steps. Firstly, the calculation of input coefficient which is defined as:

$$a_{ij} = \frac{a_{ij}}{a_{ij}} \quad \ldots\ldots (4)$$

where a_{ij} is input coefficient sector *i* to sector *j;* x_{ij} is usage of sector input by sector (in monetary unit); x_j is the sector output. This first step produces matrix *A*. Secondly, the subtraction of Matrix *A* from Matrix *I* which is an identity matrix with a similar dimension with Matrix *A* and symbolized as (*I-A*) Matrix. Finally, generating the inverse matrix of the matrix (*I-A*). This last matrix is the multiplier matrix or usually called the Leontief Inverse Matrix (Miller & Blair, 2009).

In term of the gross value added, which consists of wages and salary, profit, depreciation, and indirect taxes, the multiplier effect of each component can be calculated based on Equation 5 (BPS, 2008).

$$V = \hat{V} [I - A]^{-1} F \quad \ldots\ldots (5)$$

where V the gross value added matrix and F is the diagonal matrix of the gross value added coefficient. In addition, the term can be defined in Equation (6).

$$\hat{V} = \frac{Gross\ Value\ Added}{Output_i} \quad \ldots\ldots (6)$$

where the value of gross value added for sector i and is the output of sector i (BPS, 2008).

Secondly, regarding the impacts on employment, basically there are two types of methods to simulate the impacts on labour force which are multiplication of the labour coefficient matrix to the changes in the final demand which is suggested by Wibowo (2012) and multiplication of the labour coefficient matrix to the final demand as recommended by BPS (2007b).

Wibowo (2012) claimed that labour multiplier as presented in Equation 7 is able to calculate the impacts of changes in the final demand, in particular, exports on employment.

$$M_{TK} = \hat{L}\,[I - A]^{-1} \quad \text{..... (7)}$$

where the labour multiplier is the diagonal matrix of labour coefficient, and the Leontief Inverse Matrix is generated from Equation 3.

Moreover, to calculate the impact on employment, Wibowo (2012) generated the changes in employment by multiplying the labour multiplier to the changes in the final demand as presented in Equation 8.

$$\Delta TK = M_{TK}.\Delta F \quad \text{..... (8)}$$

where ΔTK are the changes in employment and ΔF is the changes in the final demand as presented in Equation 3.

Another method, which is suggested by the BPS (2007b), is to calculate the impacts on employment after the final demand for each sector is defined.

Basically, the method which is suggested by the BPS (2007b) is similar to Wibowo (2012). Nevertheless, the main difference is the BPS (2007b) suggests to utilise not the changes in the final demand but the level of final demand as presented in Equation 9.

$$TK = M_{TK}.F = \hat{L}\,[I - A]^{-1}.\,F \quad \text{..... (9)}$$

By utilising this method, the final demand impacts on the production sector are different. For example, introducing a shock in the household consumption has different impacts than introducing a shock in the exports demand. The main advantage of this method is differentiation of the employment demand of final demand, which is not covered in the first method. Moreover, the method which is suggested by BPS (2007b) is suitable for this study since this study evaluates the impacts of export tax which might results in a substitution from exports to domestic consumption.

Finally, due to lack of data availability, to estimate the impacts on labour, this study utilised less disaggregate IO Table with 66 x 66 sectors which is derived from the IO Table of 175 x 175 sectors. For example, the cocoa sector which is the 21st Sector and the chocolate and confectionery sector which is the 64th Sector in the IO Table 175 x 175 sectors are separated into the 16th (other plantation crops) and 32nd (other food industry) Sectors in the IO Table 66 x 66 sectors.

Since this study utilised the IO Table, there are several drawbacks of this method. First, the IO model is a static model. The presence of the structural change may lead to invalid results and conclusions (Swenson & Moore, 1987). Moreover, Briassoulis (1991) claimed that projecting the current situation into the future by assuming that there are constant technical coefficients, in the long run, is not visible. However, Kweka *et al. cit.* Atan & Arslanturk (2012) argued that in developing countries, the structural coefficients change slowly as expected.

Scenario Setting

As presented in Equation (3), any changes in the final demand will have impacts on the output. Therefore, this study will simulate the changes in the final demand,

in particular in the consumption and exports. The main assumption in this simulation is that any changes in the exports, in term of decreasing value of exports can be substituted by increasing value in the consumptions. BPS (2008) claimed that basically the general equation in Equation (3) can be defined specifically for each component of final demand. For example, the changes in consumptions can affect the changes in output. Similarly, the changes in exports affect the output as well.

The impacts of an export tax on cocoa beans have direct impacts on the decreasing value of cocoa bean exports. Several studies such as Arsyad *et al*. (2011) and Syadullah (2012) claimed different decreasing rate of cocoa beans exports due to the export tax policy. Based on the trade data, which is provided by UNCTSD, revealed that in general, decreasing in nominal value and net weight of the exports of the raw and roasted cocoa beans in 2011 were around 48.39 and 51.42%, respectively. In the same year, there was increasing in the exports of intermediate products of cocoa as well as chocolate and other preparations containing cocoa by around 11.26% of the nominal value.

Therefore, there were two main scenarios in this study (Table 2). Firstly, there was decreasing in cocoa beans exports with various percentages (Scenario 1 to 3). The 1st Scenario was a pessimist scenario where there was a decreasing cocoa beans export by 100%, while in optimist scenario the declining on exports was only at 10%. The moderate scenario was decreasing by around 50% which was similar to the historical data on the raw or roasted cocoa beans exports. Secondly, decreasing in the cocoa beans exports was simultaneously accompanied by increasing in the intermediate products of cocoa as well as chocolate and confectionery sector. The chocolate and confectionery sectors were selected in the scenario since even though this sector was a second highest user of the cocoa sector's output, the chocolate and confectionery sector had relatively higher final demand in total compared to peeled seed sector as presented in Table 4. The last scenario was to distribute increasing in the consumption of other related sectors to cocoa bean sector up to big four sectors in Table 4.

RESULTS AND DISCUSSION

Cocoa Supply and Demand

Based on the 2005 IO Table, demand for cocoa is utilised as an intermediate input at approximately 23%, followed by household's consumption and exports with around 3% and 69% respectively. On the

Table 2. Scenarios' setting

Scenario	Description
1	Decreasing in the cocoa sector's export by 100%.
2	Decreasing in the cocoa sector's export by 50%.
3	Decreasing in the cocoa sector's export by 10%.
4	Decreasing in the cocoa sector's export by 100% and increasing in intermediate products of cocoa as well as chocolate and confectionery sector's export by similar value.
5	Decreasing in the cocoa sector's export by 50% and increasing in intermediate products of cocoa as well as chocolate and confectionery sector's export by similar value.
6	Decreasing in the cocoa sector's export by 10% and increasing in intermediate products of cocoa as well as chocolate and confectionery sector's export by similar value.
7	Decreasing in the cocoa Sector's export by 100% and increasing in intermediate products of cocoa as well as other related sector consumption according to the percentage of usage in Table 3 up to the top three sectors.

supply side, cocoa is dominantly supplied from domestic rather than imports by more than 90%.

Regarding the cocoa as an intermediate input, Table 3 also reveals that the output from the cocoa sector is dominantly processed as input in the peeled seeds sector (23%), chocolate and confectionery sector (18%), and non-alcohol beverage sector (12%).

In term of final demand from the two biggest cocoa sector's user, which are the peeled seeds sector as well as the chocolate and confectionery sector, Table 5 reveals that both sectors have a similar pattern of usage. For example, around 70% of cocoa is used for household and the rest is exported. However, in term of value, there was a significant difference. For instance, the total final demand for chocolate and confectionery

Table 3. Supply and demand of cocoa sector

Demand	Value (IDR million)	%	Supply	Value (IDR million)	%
Intermediate demand	1,323,684	0.23	Import	491,516	0.08
Final demand	4,495,481	0.77	Domestic production	5,327,648	0.92
Household	184,390	0.03			
Government	0	-			
Investment	8,482	0.00			
Stock	298,988	0.05			
Export	4,003,621	0.69			
Total	5,819,165	1.00		5,819,164	1.00

Source: Extracted from IO 2005 (BPS).

Table 4. Distribution of the cocoa sector's output

Description	Value, IDR million	%
Peeled seed	310,255	0.23
Chocolate and confectionery	238,878	0.18
Cocoa	169,391	0.13
Non alcohol beverages	160,030	0.12
Medicine	124,739	0.09
Other foods	120,673	0.09
Restaurant services	109,773	0.08
Processed tea	46,516	0.04
Grinded coffee and peeled	24,397	0.02
Private health service	9,140	0.01
Animal and vegetable oils	3,357	0.00
Animal feed	3,010	0.00
Basic chemical excluded fertiliser	1,797	0.00
Thread	1,721	0.00
Processed and preserved fruits and vegetables	8	0.00
Total	1,323,684	1.00

Notes: Peeled seeds industry covers cocoa cleaning and drying industry, seed except coffee and cocoa peeling and cleaning industry, and beans peeling and cleaning industry. Chocolate and confectionery industry includes chocolate powder industry and food contains chocolate industry, and confectionery. Non-alcohol beverages industry covers syrup industry, soft drink industry, and bottled water (BPS, 2007, pp. 208-209).

Source: Extracted from IO 2005 (BPS).

sector was approximately IDR6.76 trillion while the seeds and peeling sector was around IDR1.41 trillion.

Regarding of the gross value added, Table 6 shows that in total, the cocoa sector has the highest value added. Furthermore, this sector also has highest profits' value compared to two other sectors. Conversely, the chocolate and candy sector has the highest impact on the labour's income which is indicated by the higher value of salary or wages. In addition, the peeled seed sector has the lowest value added nominal.

Simulation Results

The simulation results reveal that in the extreme scenario, where it is assumed that all the cocoa export decreasing at 100% without any changes in other sectors (*ceteris paribus*), the impacts are output decreasing at around 0.17% and primary input decreasing at approximately 0.13%. In the 4th Scenario, where there is an offset of decreasing in the cocoa sector's export with increasing in the chocolate and confectionery sector with 100% increasing in the export value, the impacts on output and primary inputs are relatively smaller about 0.08% and 0.10%, respectively. In addition, the changes in profit of the firms are relatively higher than primary inputs which imply that the owner of assets or production sectors receives a larger reduction in their income.

Furthermore, on the optimist scenario (3rd Scenario), where the reduction in the export value is around 10%, the simulation

Table 5. Final demand from seeds and peeling and chocolate and confectionery sectors

Description	Sector			
	Peeled seeds (IDR million)	%	Chocolate and confectionery (IDR million)	%
Households	1,062,455	0.75	4,689,126	0.69
Government	0	-	0	-
Investment	0	-	0	-
Stock	6,809	0.00	12,922	0.00
Export	346,009	0.24	2,058,269	0.30
Total final demand	1,415,273	1.00	6,760,316	1.00

Source: Extracted from IO 2005 (BPS).

Table 6. Gross value added composition

Primary input/ gross value added	Cocoa (IDR million)	%	Peeled seeds (IDR million)	%	Chocolate and confectionery (IDR million)	%
Salary and wages	778,179	0.18	272,954	0.25	998,770	0.30
Profit	3,420,760	0.81	736,117	0.67	2,012,004	0.61
Depreciation	15,142	0.00	50,809	0.05	166,268	0.05
Indirect taxes	29,829	0.01	40,853	0.04	110,843	0.03
Subsidy	0	-	0	-	0	-
Total	4,243,910	1.00	1,100,733	1.00	3,287,885	1.00

Source: Extracted from IO 2005 (BPS).

reveals that the level of output, as well as primary input, are relatively unchanged with the percentage of changes less than 0.02% (Table 7).

Finally, the indirect taxes have a negative value for all scenarios. BPS (2008) defined the indirect taxes covers several taxes such as import taxes, export taxes, and value added tax (VAT). Therefore, the negative value in the indirect taxes might imply that as the exports diminish completely in the 1st Scenario, there is a decreasing on the indirect taxes by around 0.025%. However, if there is an offset of decreasing exports in the cocoa sector with increasing exports in the chocolate and confectionery sector as simulated in the 4th Scenario, the value of indirect taxes are positive. Moreover, in the 7th Scenario, the value of indirect taxes is relatively higher than other scenarios.

The findings in the changes on the indirect taxes also imply that in order to increase the tax revenues, the Government should concern more on developing high value-added sector rather than raw material exported sector which is in line with the long-term plan of cocoa industry roadmap 2010-2025 (Kemenperin, 2009).

In term of sectoral impacts, the impacts of an export tax on cocoa beans for the 1st Scenario are negative for all sectors (Table 8). Nevertheless, the sectors which have smaller impacts, in term of percentage of changes to the baseline, are the sector which relatively unlinked to the cocoa sector. For example, in the 1st Scenario, there are less negative impacts on the output received by the oil and gas sector, oil refinery sector as well as financial services sector by less than 0.0001%. On the other hand, the sectors which have a relatively strong link with the cocoa sector, such as beverage industry had a higher negative impact at around 0.79%. Furthermore, in the 4th Scenario, the sector which has higher increasing on output and primary inputs compared to the baseline is tea sector at around 4.74 and 1.80%, respectively. In the 7th Scenario, the tea sector is at the second place after the beverages industry.

Regarding employment creations which is generated by the final demand, Table 8 reveals that the chocolate and cocoa seeds sector have relatively higher employment than cocoa and non-alcohol sector. This high demand for employment in the chocolate and seed sector is derived from domestic consumption which accounted by more than 85%. Similar to the chocolate and seed sector, the non-alcohol beverage sector's demand for employment is dominantly derived by the consumption. On the other hand, in the cocoa sector, demand for employment is derived from exports by around 50% and relatively higher about 10% from consumption.

Table 7. Simulation result (%)

Description	Scenario						
	1	2	3	4	5	6	7
Output	-0.170	-0.085	-0.017	-0.079	-0.039	-0.008	-0.060
Primary input	-0.138	-0.069	-0.014	-0.103	-0.052	-0.010	-0.088
Wages and salary	-0.083	-0.041	-0.008	-0.048	-0.024	-0.005	-0.042
Profit	-0.194	-0.097	-0.019	-0.156	-0.078	-0.016	-0.136
Indirect taxes	-0.025	-0.012	-0.002	0.005	0.003	0.001	0.053

Source: Author's estimation

Table 10 presents the simulation results for employment creation based on Table 9 and labour multiplier. In general, the impacts of changes in the exports of the cocoa sector are relatively small for all scenarios which is less than one per cent of changes. However, Table 10 reveals that without substitution of labour demand from other sectors, the First Scenario has the worst impacts of increasing of unemployment by around 0.09%. In the 4th Scenario where there is an increasing in the demand from the chocolate and confectionery sector, the impact is relatively small about 0.02%. Nevertheless, increasing more demand from other related sectors has a similar percentage of changes to the 4th Scenario.

Table 8. Sectoral impacts (%)

Sectors with the highest changes to the baseline								
Scenario								
1			4			7		
Sector	Output	NTB	Sector	Output	NTB	Sector	Output	NTB
25	-0.000021	-0.000018	13	4.74	1.80	33	4.50	3.57
41	-0.000059	-0.000075	32	4.46	4.29	13	1.81	0.61
61	-0.000534	-0.000609	20	3.01	1.63	32	1.75	1.58
53	-0.000634	-0.000723	18	2.60	1.07	20	1.18	0.60
60	-0.000640	-0.000611	33	2.17	1.02	18	1.02	0.39
Sectors with the highest changes to the baseline								
Scenario								
1			4			7		
Sector	Output	NTB	Sector	Output	NTB	Sector	Output	NTB
16	-33.91	-33.91	16	-33.86	-33.89	16	-33.89	-33.90
66	-26.64	-36.30	66	-26.43	-36.18	66	-26.55	-36.25
33	-0.79	-1.58	31	-0.06	-0.29	31	-0.11	-0.35
13	-0.24	-0.22	40	-0.03	-0.10	40	-0.04	-0.11
15	-0.22	-0.18	45	-0.02	-0.10	50	-0.04	-0.12

Notes: The number in the sector column is used for the sector identification as follow: 13 = Tea; 15 = Fiber crops products; 16 = Cocoa; 18 = Livestock; 20 = Fowl and products; 25 = Oil and gas; 31 = Sugar industry; 33 = Beverages industry; 32 = Other food industry; 40 = Chemical industry; 41 = Oil refinery; 45 = Basic steel industry; 50 = Other industry; 53 = Trade; 60 = Communication services; 61 = Financial services; and 66 = Undefined activities.
Source: Author's estimation.

Table 9. Employment demand derived from final demand (persons)

Sector	Final demand						
	C	G	GFCF	S	X_G	X_S	Total
Cocoa	124,970	5,939	18,410	9,565	165,234	3,416	327,534
Chocolate and seeds	364,688	8,656	5,977	2,775	32,916	8,138	423,150
Non-alcohol beverages	51,335	593	1,095	(273)	1,939	1,257	55,947
Total	540,993	15,188	25,482	12,067	200,089	12,811	806,631

Note: Where C = Household consumption; G = Government consumption; GFCF = Gross fixed capital formation; S = Changes in stock; X_G = Exports in goods; and X_s = Exports in services.
Source: Author's estimation

Table 10. Simulation result on unemployment

Scenario	Unemployment	% changes
1	84,285	0.09
2	42,142	0.04
3	8,428	0.01
4	68,972	0.07
5	34,486	0.04
6	6,897	0.01
7	65,007	0.07

Source: Author's estimation

Relatively small impacts of decreasing cocoa beans exports to the output and primary inputs, as well as employment, it might be correlated with the significance of cocoa sector's contribution to the economy and connectivity of the cocoa sector to forward and downward linkages.

Regarding contribution of the cocoa sector to total exports, the UNCTSD (2015) data pointed out that the share of cocoa beans export to total exports on Indonesia was less than 0.11% in 2014 or equal to USD196 million value with weight 63,334 kg. In 2009, a year before the enactment of cocoa's export taxes, the share was relatively higher at around 0.95% as presented in Figure 1.

In term of linkages among sectors, the backward and forward indexes reveal that the cocoa sector is not a potential sector which is indicated by the value of backward and forward indexes less than 1. However, the downstream industry of cocoa sector such as the chocolate and confectionery as well as non-alcohol beverages sectors have backward index values more than 1. Nevertheless, the forward index values for these sectors are less than 1 at around 0.66 and 0.55, respectively.

Therefore, there are several significant impacts which should be anticipated by both Government and private sectors in term of decreasing profits and increasing output in the downstream industry. Firstly, decreasing of profit which is relatively higher than decreasing the output. For example, as presented in Table 6, in the first scenario, the output decreases by 0.17% while the profit, as a part of primary inputs, is relatively higher at approximately 0.19%. Moreover, in the 7th Scenario, the decrease in the profit is twice as the output with -0.13% and -0.60%, respectively.

This study finding on decreasing profits is consistent to Rifin (2012) who utilised the price differential methods claimed that since 2010, the enactment of an export tax on cocoa beans only affected the exporters' profit. He claimed that the exporters experienced less profits since when the exporters tried to decrease the purchasing price, the farmers easily shift to other exporters. In short, there is a competition in the cocoa beans' market. Furthermore, Permani *et al*. (2011) claimed that even though there was an increasing in the tax revenue, the change in tax receipts was still greater than decreasing in the producers surplus.

There are at least two impacts of the higher decreasing rate of profit, directly and indirectly. Decreasing in profit affects the fiscal side directly through tax revenues. As described by the BPS (2008) that the profit term in 2005 IO included earnings before taxes, interest revenue from capital ownerships, land rent, and other ownerships revenue. Indirectly, as the profit decreasing, the firms tend to optimise its inputs' costs such as capital

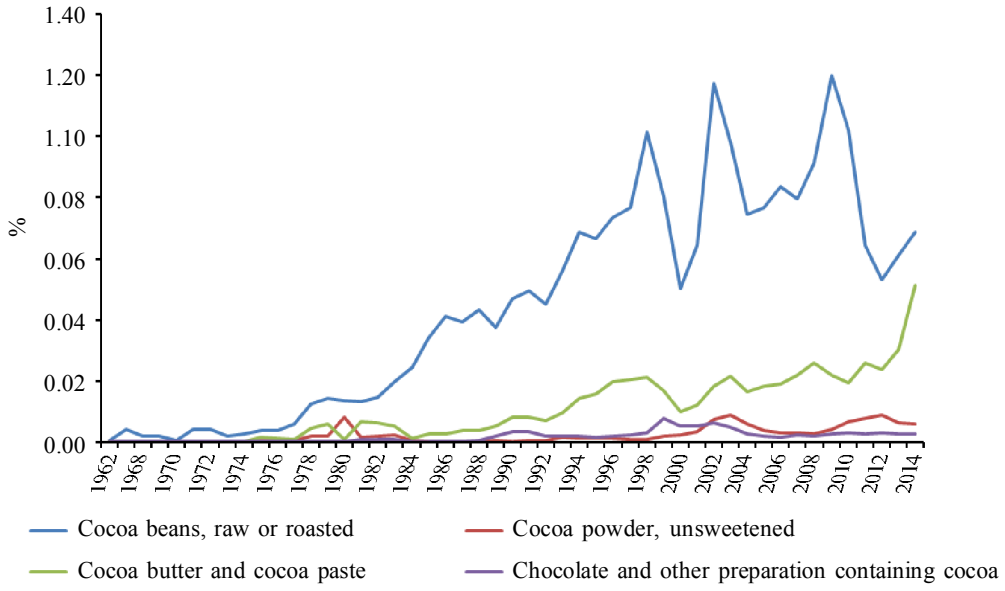

Figure 1. The share of cocoa sector to total Indonesian exports (%)
Source: Extracted from UNCTSD (2015).

and labour utilisation. For example, due to lower profit, the firm might reduce capital utilisation as well as unemploy the labour.

Secondly, the introduction of export taxes effectively reduced the export of raw or roasted cocoa beans and increases exports on down streaming industries. For example, the impacts of the export tax on cocoa beans are channeled to a significant increasing in the cocoa butter and paste exports in recent years. Figure 1 describes that since 2012, the share of cocoa butter and paste to total exports has increased significantly from 0.24 to 0.51% or more than twice in two years. However, the exports of cocoa powder and chocolate and confectionery were relatively stable.

Due to increasing domestic supply and lower domestic price on the raw cocoa beans, there should be an increasing in the investment of machinery on the downstream industry. Nevertheless, Syadullah (2012) claimed that even though the number of cocoa processing firms increased from 5 to 16 firms, the production capacity did not increase significantly. For example, in 2011 from 16 firms in cocoa processing industry, there were only 4 firms which utilised at full capacity, 3 firms at production utilisation around 80-90%, and 9 firms below 80%. Figure 2 also confirms that the nominal value of imports of cocoa processing machinery has increased by more than twice in 2011. However, since 2013, the imports value has been relatively stable at around USD40 million. Moreover, Lubis & Nuryanti (2011) claimed that to increase the investment in the cocoa's downstream industry, there should be more fiscal incentives, easiness of investment permits, and raw material availability domestically and internationally. Before export taxes was levied in 2010, the area for cocoa plantations decreased significantly for both the private and Government since 1994 (DGEC, 2014). On the other hand, the small holder's area has kept growing until 2012 when its started to decrease.

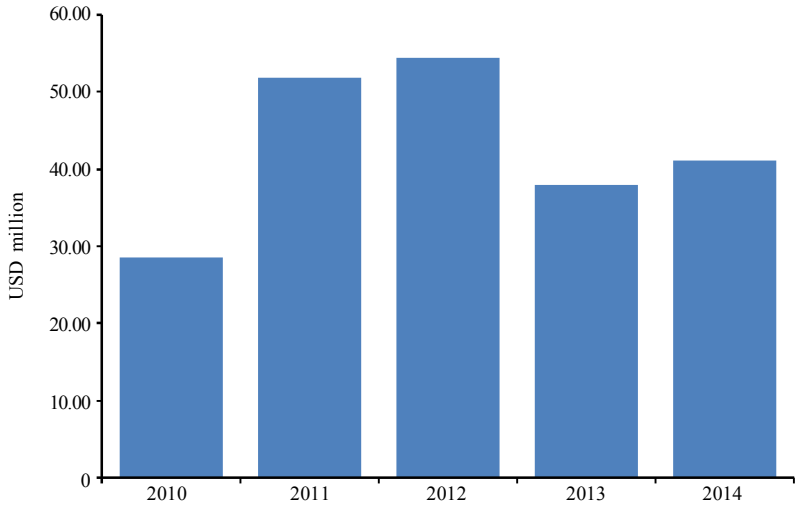

Figure 2. Imports of machinery in cocoa processing value (USD million)
Source: Extracted from UNCTSD (2015).

In term of cocoa beans quality, even though Indonesian cocoa beans have several advantages such as higher melting point and non-pesticide compared to cocoa beans from Ghana and Ivory Coast, the main weaknesses are low productivity and quality (Lubis & Nuryanti, 2011). Nabhani *et al*. (2015) also claimed that due to the low quality of cocoa beans, Indonesian cocoa's price is discounted at around 15 to 25% of the world price. Furthermore, Syadullah (2012) claimed that in order to enhance the efficiency in the cocoa sector, in particular, cocoa processing industry, increasing the quality of cocoa bean is substantial.

Hasni (2014) argued that issue on cocoa bean quality could not be solved by export tax imposition, and claimed that to increase the quality and quantity of cocoa beans it could be done through financing strategy to the cocoa bean producers. Furthermore, by utilising warehouse receipt subsidy, the supply of local fermented cocoa increased by more than twice and decreased the imports by more than two-thirds (Hasni, 2014).

There are several recommendations of this study. Firstly, there is an evidence of increasing of exports of cocoa butter and paste products as a compensation of decreasing raw cocoa exports. Therefore, there should be a policy to stimulate this growing downstream industry. Secondly, even though the impacts on economy and employment relatively insignificant by percentage, the number of unemployment due to a decrease in the cocoa beans exports is relatively high. For example, in the 1st Scenario, there is a possibility of more than 60 thousand new unemployed due to the elimination of cocoa beans exports. Therefore, the Government should consider the impacts more on the availability of alternative employment from the cocoa bean sector. Finally, to increase the domestic supply availability through an export tax on cocoa beans, it might be a short-term solution. In the long-term, integrated and comprehensive strategy is essential to ensure the optimum contribution of the cocoa beans sector to the whole economy.

CONCLUSIONS

By utilising the Input Output approach, this study finds that at the pessimist scenario where exports of cocoa beans sector completely eliminated, the impacts on the economy as well as employment are relatively insignificant. This study argues that this insignificance is due to the relatively small contribution of the cocoa beans sector's export to total exports. Nevertheless, this study finds that decreasing in the cocoa beans exports has relatively higher impacts on the profits rather than primary inputs. This finding implies that there is a possibility that production sector owner receives less income and subsequently the owner will reduce capital and labour utilisation.

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