

# Analysis of the Impact of Export Duty Policy, Total Production of Cocoa Beans, and Imports of Cocoa Beans on Cocoa Butter Exports in Indonesia

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## ABSTRACT

The purpose of this research is to analyze the influence of export duty policies, the amount of cocoa bean production and imports of cocoa beans on the volume of cocoa butter exports in the short and long term. This research uses a descriptive approach with quantitative methods, the focus is testing theories using number-based analysis and statistical analysis. The data used is a time series from 1993 to 2022. In this research, the model used is the Error Correction Model (ECM). The ECM method aims to identify the influence of independent variables on the dependent variable in both the short and long term by focusing on the variables of cocoa butter exports, export duty policies, production quantities and imports of cocoa beans. The analytical tool in this research uses Eviews-12. The conclusion of this research is as follows: Export duty policy (dummy variable) in the long term has a significant positive effect on cocoa butter exports. The amount of cocoa bean production does not have a significant impact on cocoa butter exports, both in the long and short term. The volume of cocoa bean imports has a significant impact on cocoa butter exports, both in the long and short term.

**Keywords:** export policy, production amount, import and export volume.

## INTRODUCTION

Every country in the world tends to participate in international trade with other countries (Sadono Sukirno, 2019). This involvement occurs because the country is unable to produce certain goods or services that are not available within the country. Apart from that, international trade is also intended to expand markets, increase production, increase foreign exchange through export and import activities, create job opportunities, and encourage technology transfer (Nugroho, 2020).

Indonesia has great potential in terms of land area and diversity of natural resources. Utilization of abundant natural resources can provide significant economic benefits for this country. One of the benefits lies in increasing trade (Aurul, 2019). Efforts to increase exports, especially in terms of quantity and variety of goods or services, are always carried out through various strategies. The main focus is on non-oil and gas exports, including goods and services, with the aim of increasing the global competitiveness of Indonesian products and making a positive contribution to economic growth. (Ayu & Permatasari, 2015).

Therefore, it is not surprising that the agricultural sector has an important impact on the Indonesian economy. This sector makes a substantial contribution to Gross Domestic Product (GDP), reaching around 12.40% in 2022. Its position is in fourth place after the wholesale and retail trade sector as well as car and motorbike sales which reached 12.85% (BPS, 2022). This confirms that the agricultural sector has an important impact on the formation of Indonesia's Gross Domestic Product (GDP).

The Plantation Subsector, as an important part of the agricultural sector, has significant potential. Its contribution to Gross Domestic Product (GDP) will reach 3.76% in 2022, as well as 0.30% for the agriculture, forestry and fisheries sectors (BPS, 2022). This shows that the plantation sector has a significant role in the national economy, especially by relying on several superior commodities that are exported internationally

(Lestari, 2018). One of these superior commodities is cocoa, which is one of Indonesia's ten main export commodities (Niko Ramadhani, 2021).

Cocoa beans, which come from the cocoa fruit (*Theobroma cacao* L.) are the main basic ingredient in making chocolate. The characteristics of cocoa beans vary and influence the quality of the chocolate produced. Popular processed cocoa bean products include cocoa butter, chocolate paste, chocolate bars and chocolate powder. Cocoa butter, as one of the processed cocoa bean products, is one of Indonesia's leading exports. Cocoa butter comes from solid fat with a melting point of around 32-35°C, bright yellow in color, which is extracted from cocoa beans. The benefits of cocoa butter are for the food and cosmetics industry as well as skin health (Ditpui, 2021).

According to data from the International Cocoa Organization (ICCO), world cocoa production will reach 3.67 million tons in 2022, a decrease of 7.99% from the previous year which reached 5.24%. Ivory Coast is the world's largest cocoa producer with production reaching 2.20 million tons, followed by Ghana with production of 700,000 tons and Ecuador with production of around 400,000 tons. Indonesia occupies seventh position in the list of world cocoa producers with production of 180,000 tons.

Even though Indonesia is ranked seventh as the world's cocoa producer, the potential for a decline in cocoa production is still possible. Cocoa plants often face challenges such as climate fluctuations, increasingly limited land area and declining plant productivity. Challenges in the cocoa growing process can also affect the price of this commodity. Price increases during the production process have the potential to increase the selling price of produced goods and vice versa. An increase in prices can result in a decline in cocoa commodities.

The large plantation area supports cocoa production and the availability of sufficient supply (Aziziah & Setiawina, 2021). Based on a study (Alkamalia et al., 2017) which concluded that "area size has a partially significant impact and is positively related to cocoa production from smallholder plantations in Aceh Province". However, the area of cocoa plantations in Indonesia has decreased from 2018 to 2022. In 2018, the area of cocoa plantations reached 16.1 million hectares, but experienced a decrease of 11.79% to 14.2 million hectares in 2022. This decrease is partly caused by land conservation to other commodities that are considered more profitable (BPS, 2023). The reduction in cocoa land area has a direct impact on production, which will reach 650.6 thousand tons in 2022.

Before the implementation of the export duty policy in 2009, around 93% of raw cocoa beans were exported abroad (Trisanti Saragih et al., 2021). The export value was US\$ 1.08 billion in 2009 then increased to US\$ 1.19 billion in 2010.

Cocoa beans still dominate in raw form in exports, which often causes Indonesian cocoa beans to receive discounts in their export prices. This is due to the fact that the price of cocoa beans listed on the New York commodity exchange generally reflects the price of cocoa beans that have undergone a fermentation process (Trisanti Saragih et al., 2021). As one of the largest producers of cocoa beans, Indonesia supplies raw materials for the cocoa processing industry in other countries. This phenomenon is proven by the increase in the cocoa processing industry in countries that previously did not produce cocoa beans as raw materials for industry.

As the largest producer of cocoa beans, Indonesia has a great opportunity to develop the downstream cocoa industry, in line with the government's efforts to promote cocoa in processed and bean form. Therefore, the government has started steps to downstream cocoa by strengthening the domestic cocoa processing industry. The development of the cocoa industry will provide significant added value to the industrial sector, especially in agro-industry which can contribute greatly to the economy (Quddus, 2009). Herman (2016) and Sultan (2008) also expressed the same thing, showing that the agro-industrial sector can increase the added value of products and income distribution. Therefore, the government issued Minister of Finance Regulation No. 67/PMK.011/2010 with the aim of strengthening the fulfillment of domestic industrial needs (Haifan, 2015).

The government has implemented an Export Duty policy as one of the steps in advancing the cocoa processing industry since the early 2000s. In 2007, the Value Added Tax (VAT) policy of 10% in domestic cocoa bean trade was abolished. This policy is expected to create a supportive business environment for cocoa processing companies, but it seems that it has not been completely successful. Of the 40 cocoa processing companies that previously existed, only 15 remained able to survive after the elimination of VAT. However, not all of these 15 companies can operate effectively. Only five companies managed to maintain their operations, while 10 others were forced to stop their operations. Three years later, a new policy regarding

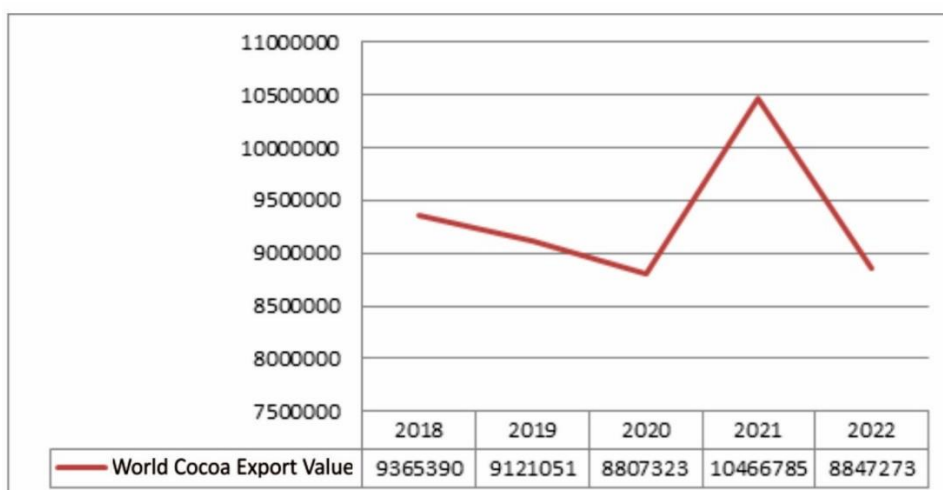
export tax, which was a new Export Duty policy, was implemented in 2010.

In 2010, the Indonesian government implemented a progressive export levy system for every ton of cocoa bean export transactions, where the amount of export tax depends on the New York Board of Trade (NYBOT) CIF export benchmark price in New York. The implementation of this export tax creates differences in views between cocoa bean producers and cocoa processing entrepreneurs as customers. For cocoa bean producers, export levies have the potential to reduce their surplus because producer profits will be eroded by export taxes. This is confirmed by research (Permani, 2013) which shows that the higher the export tariff imposed, the less excess production will be carried out by producers and also excess consumption and government income. This step was taken to ensure that the implementation of the cocoa bean export tax can increase the competitiveness and exports of Indonesian cocoa in processed form.

The high international demand for cocoa beans encourages producers to prefer selling cocoa beans in foreign markets rather than domestic markets. As a result, the domestic supply of cocoa beans is limited, making it difficult for cocoa bean processing factories to obtain sufficient supplies. To overcome the domestic supply problem, the government finally implemented an export tax. Government trade policies, especially in this context, have the potential to cause turmoil in the cocoa bean market, both domestic and international. (Dominick Salvatore, 1997), emphasizes that actions like this will result in price fluctuations in local and global markets. In principle, the policy instrument chosen must provide benefits for the industry as a whole.

However, the implementation of the cocoa export tariff policy resulted in a decrease in the volume of cocoa bean exports and the income of producers who exported cocoa also decreased. The impact of the export duty policy on cocoa producers is a reduction in cocoa prices at the domestic level (Ananda et al., 2018). The international cocoa market is competitive, so any increase in export taxes will have a direct impact on reducing cocoa prices in the domestic market compared to international cocoa prices and domestic cocoa prices. This finding is in line with research (Permani, 2013) that the higher the export tariff applied, the consumer surplus and government income will increase.

The cocoa bean commodity (HS 1801) has played an important role in the Indonesian economy since 1930. Indonesian cocoa bean exports cover five continents, namely Asia, Africa, Oceania, America and Europe with the main market share in Asia. Based on Harmonized System (HS) cocoa data in 2022, there are 16 main HSs of Indonesian cocoa export commodities. Cocoa Butter (HS 18040000) is the most dominant with an export volume of 153.75 thousand tons or 39.89% of total cocoa exports. Followed by cocoa flour (HS 18050000) with 112.28 thousand tons or 29.13% and cocoa paste (HS 18032000) with 49.23 thousand tons or around 12.77%. The total volume of cocoa exports was 385,421 tons (BPS, 2022).



**Figure 1 World Export Value Chart**  
Source : UN COMTRADE (Data processed )

The export value of global cocoa beans experiences fluctuations every year, with the highest noted enhancement in 2021, reaching \$10,466,785. Ivory Coast remains the largest cocoa producer in the world, followed by Ghana and Ecuador.

Over the last five years, the volume and value of Indonesian cocoa bean exports have also fluctuated. In 2018, the export volume reached 380,827 tons with a total export value of \$1.25 billion. However, the volume decreased in 2019 to 358,481 tons, with an export value of \$1.20 billion. From 2020 to 2022, the export volume increased, but in 2021, the increase in cocoa export volume was not balanced with an enhancement in export value.

Currently, the domestic cocoa processing industry is spread across six provinces: South Sulawesi, East Java, West Java, North Sumatra, and Southeast Sulawesi. The policy of imposing export duties has successfully attracted investment from multinational companies in Indonesia. These companies, which produce processed cocoa products for export to their countries of origin, are not subject to export duties. This allows the industry to operate smoothly without worrying about a shortage of raw materials.

The export of intermediate processed cocoa products has made Indonesia a major provider in the global supply chain, contributing 9.17% of the total world demand (Putu, 2023). The enhancement of processed cocoa exports is driven by the export duty policy on cocoa beans, which has attracted investors to develop the cocoa processing industry. As a result, the production capacity of the cocoa processing industry has increased from 560,000 tons per year to 739,250 tons per year. Indonesia has become a major player in the global processed cocoa market, ranking second after the Netherlands in cocoa butter exports (Eri and Elvira, 2023).

Maintaining the success of the downstream industry is crucial for continuously increasing added value for national interests and state progress. In recent years, cocoa bean production has experienced a significant decline due to reduced land area and plantation productivity (Rubiyo et al., 2012).

Alongside the growth of the cocoa processing industry, domestic cocoa bean production has experienced a striking decline, from 837,918 tons in 2010 to 650,612 tons in 2022. Due to this decline, industry players prefer to import cocoa beans to meet their raw material needs. Consequently, cocoa bean imports have drastically increased from 47,453 tons in 2010 to 146,833 tons in 2022, despite the export duty policy aimed at reducing cocoa bean export volumes for domestic needs. However, declining cocoa bean productivity and shrinking land area mean that Indonesian cocoa bean production cannot meet domestic industry needs.

With the decline in cocoa bean production, Indonesia must import to fulfill domestic needs. The main countries exporting cocoa beans to Indonesia are Malaysia, Singapore, Ecuador, Ivory Coast, and Nigeria. Indonesia primarily imports unfermented cocoa beans (HS 18010090), amounting to 72.49 thousand tons or 49.37% of total cocoa imports (BPS, 2022).

The volume and value of Indonesian cocoa imports from 2018 to 2022 have fluctuated. In 2019, the import volume reached 309,737 tons, then decreased to 243,334 tons in 2020, with a value of \$650.71 million. In 2022, the volume and value of Indonesian cocoa imports drastically decreased, reaching just 146,833 tons or \$447.71 million.

Based on the previous explanation, this research is important to understand whether the export duty policy effectively ensures the availability of raw materials for the cocoa industry. This study is also crucial to identify the factors driving the enhancement of cocoa butter exports in Indonesia. Therefore, the author is interested in discussing the topic “Analysis of the Impact of Export Duty Policy, Cocoa Bean Production, and Cocoa Bean Imports on Cocoa Butter Exports in Indonesia.”

## METHOD

This study uses a descriptive approach with a quantitative method, focusing on testing theories using numerical and statistical analysis. The data used is time series data from 1993 to 2022. The objective of this study is to explore the short-term and long-term relationships between the independent variables—Export Duty Policy (X1), Total Cocoa Bean Production (X2), and Cocoa Bean Imports (X3)—and the dependent variable, Cocoa Butter Exports (Y). The analytical method used is the Error Correction Model (ECM).

In this study, the author employs a descriptive research method with a quantitative approach. Descriptive quantitative methods, based on the philosophy of positivism, are used to research a population or specific sample, focusing on theory testing with quantitative data (in the form of numbers and statistical analysis) aimed at testing hypotheses determined in the study (Sugiyono, 2019).

The data used in this study is secondary annual time series data from 1993 to 2022, obtained from various sources such as documents, books, research reports, and authorized institutions. The data is sourced from the Central Statistics Agency (BPS), the Directorate General of Plantations, and UN COMTRADE.

The study population includes all research objects such as humans, animals, plants, air, phenomena, values, events, life attitudes, and so on. These objects can serve as data sources for the study (Bungin, 2006). In this context, the population consists of export duty policies, cocoa bean production quantities, cocoa bean imports, and cocoa butter exports from 1993-2022. According to Steel and Torrie's definition (1980:3) as cited in Rijanto (2012), a sample is a part of the population that represents the entire population. Sometimes the sample covers the entire population, but generally, information from the sample is used to make conclusions about the population. In this study, the sample consists of export duty policies, cocoa bean production quantities, cocoa bean imports, and cocoa butter exports from 1993 to 2022.

The model used in this study is the Error Correction Model (ECM). The ECM method is used to identify the influence of independent variables on the dependent variable both in the short term and the long term, focusing on variables such as cocoa butter exports, export duty policies, production quantities, and cocoa bean imports. The analytical tool used in this study is Eviews-12. The ECM model implemented is the Engle-Granger ECM model. The ECM model popularized by Engle and Granger (EG) requires two stages, commonly referred to as the Two-Step EG method.

## RESEARCH RESULTS AND DISCUSSION

### Statistical Test Results

#### Data Stationarity Test Results

**Table 1. Unit Root Test Results**

Variable	Unit Root Test					
	Levels			1 <sup>st</sup> Difference		
	ADF	Prob	Conclusion	ADF	Prob	Conclusion
Export <i>Cocoa Butter</i> (Y)	0.171767	0.9656	No Stationary	-5.318847	0.0002	Stationary
Export Duty Policy (X1)	-0.861892	0.7852	No Stationary	-5.196152	0.0002	Stationary
Amount Production Seed <i>Cocoa</i> (X2)	-2.244514	0.1961	No Stationary	-2.886911	0.0406	Stationary
Import Seed <i>Cocoa</i> (X3)	-1.434921	0.5509	No Stationary	-5.363951	0.0002	Stationary
ECT	-4.667339	0.0009	Stationary			

Source : Data Analysis Results , 2024

### Stationarity Test Results

The stationarity test using the Augmented Dickey-Fuller (ADF) test at the level can be seen in Table 1. It shows that the probability values for the variables—cocoa butter exports, export duty policies, cocoa bean production quantities, and cocoa bean imports—are greater than the significance level  $\alpha = 5\%$  (0.05). Therefore, it can be concluded that all variables are not stationary at the level. To determine the degree to which the data will become stationary and to avoid spurious correlation, it is necessary to conduct integration degree testing or unit root testing at the first difference level.

### Integration Degree Results

The integration degree test results at the first difference level, as seen in Table 1, indicate that the probability values for the variables—cocoa butter exports, export duty policies, cocoa bean production quantities, and cocoa bean imports—are smaller than  $\alpha = 5\%$  (0.05). This indicates that the data tested are stationary at the first difference level.

### Cointegration Test Results

The cointegration test results in this study use the Engle-Granger (EG) method, which is conducted when the data are not stationary at the level. From the test results shown in Table 4.2, the probability value of the ECT

variable (0.0009) is less than  $\alpha = 5\%$  (0.05), indicating that the ECT is stationary. Therefore, based on the probability results, it can be concluded that there is cointegration between the variables. This indicates that the ECT variable is stationary in the unit root test, showing that the dependent and independent variables are cointegrated, and the ECM model is considered valid, allowing the analysis to proceed to the next stage.

**Long Term Model Estimation Results**

Estimation results period long as following:

**Table 2 Long Term and Term Test Results Short**

Long Term Model			Model (ECM) Term Short		
Variable	efficient	Probability	Variable	Coefficient	Probability
Export Duty Policy (X1)	43076.41	0.0000*	Export Duty Policy (X1)	-404.6023	0.9564
Amount Production Seed Cocoa (X2)	0.013107	0.4690	Amount Production Seed Cocoa (X2)	0.002813	0.8862
Import Seed Cocoa (X3)	0.263804	0.0000*	Import Seed Cocoa (X3)	0.092004	0.0044*
			ECT (-1)	-0.824652	0.0000*
C	21374.26	0.0506	C	3154,218	0.0400
Significant at 5 % : *					

Source : Data Analysis Results , 2024

Based on results estimate period long so obtained results equality long term as following:

$$ECB = 21374.26 + 43076.41 KBED + 0.013107 JPR + 0.263804 IMBK + \epsilon t$$

1. Constant value amounting to 21374.26 can interpreted that if variable policy duty export (X1), amount production seed cocoa (X2), and imports seed cocoa (X3) is stable so export *cocoa butter* will increase by 21374.26 tons.
2. Policy duty export worth 43076.41. It means every happen policy duty go out will increase export *cocoa butter* amounting to 43076.41 tons.
3. Coefficient value amount production 0.013107 with probability 0.4690. These results show variable amount production No significant with correlation positive to export *cocoa butter*. Every increase of 1 ton in quantity production will increase export volume *cocoa butter* amounted to 0.013107 tonnes, however conclusion This No can accepted Because no results significant with probability (0.4690) > 0.05.
4. Import seed cocoa worth 0.263804. It means every decline one ton of imports seed cocoa will increase export *cocoa butter* amounting to 0.263804 tons.

**Term Model Estimation Results Short**

Based on results cointegration that has been done previously that change to export *cocoa butter*, policy duty exports, quantity production seed cocoa, and imports seed cocoa own connection cointegration. Estimation results from *Error Correction Model* in table 4.3, obtained results equality period short ECM as following:

$$DECB_t = 3154.218 - 404.6023 KBED_t + 0.002813 JPR_t + 0.092004 IMBK_t - 0.824652 ECT_t$$

Based on results estimate above can show that:

1. Constant value amounting to 3154,218 can interpreted that if variable policy duty export (X1), amount production (X2), and imports seed cocoa (X3) is stable so export *cocoa butter* will increase amounting to 3154,218 tons.
2. Policy duty export mark the coefficient amounting to -404.6023. These results show variable policy duty export No significant with correlation negative to export *cocoa butter*. Every happen determination policy duty export will reduce export volume *cocoa butter* worth -404.6023 tons. However conclusion This No can accepted Because no results significant with probability (0.9564) > 0.05.

3. Coefficient value amount production 0.002813 with probability 0.8862. These results show variable amount production No significant with correlation positive to export *cocoa butter*. Every increase of 1 ton in quantity production will increase export volume *cocoa butter* amounted to 0.002813 tons, however conclusion This No can accepted Because no results significant with probability  $(0.8862) > 0.05$ .
4. Import seed cocoa worth 0.092004. It means every 1 ton reduction in imports seed cocoa will increase export *cocoa butter* amounting to 0.092004 tons.
5. Coefficient value *Error Correction Term* (ECT) in the model significant that is of  $0.0000 < 0.05$  which shows *Error Correction Model* (ECM) used is valid. Whereas mark balance of -0.824652 can interpreted that adjustment process to imbalance change export *cocoa butter* the period 1993-2022 is relative slow. An ECT value of -0.824652 has meaning that if there is past imbalances by 100% then change export *cocoa butter* will adapt self with decrease amounting to 82.46%. With thereby can interpreted that export *cocoa butter* need time 8-9 years for reach balance full (100%) change export *cocoa butter*.

### Assumption Test Results Classic

In a regression model, assumptions basically is that the estimator is not biased or nature *Best Linear Unbiased Estimated* (BLUE) in regression models. When assumptions base fulfilled, the results obtained become more accurate and close reality. There is four testing classic in study These are the Multilinearity Test, Heteroscedasticity Test, Autocorrelation Test and Normality Test.

**Table 3 Assumption Test Results Classic**

<b>Multicollinearity Test (VIF)</b>	D (Export Duty Policy)	1.002599 (<10)
	D (Total Production Seed Cocoa)	1.090530 (<10)
	D (Import Seed Cocoa)	1.173049 (<10)
	ECT (-1)	1.269189 (<10)
<b>Heteroscedasticity Test</b>	Prob. Chi- Square (4)	0.3430 (>0.05)
	Prob. Chi-Square (4)	0.6117 (>0.05)
	Prob (F-statistic)	0.380289 (>0.05)
<b>Autocorrelation Test</b>	Prob (F-statistic)	0.255770 (>0.05)
	F-statistic	0.951328 (>0.05)
<b>Normality test</b>	Jarque-Bera	1.413994 (>0.05)
	Probability	0.493123 (>0.05)

Source : Data Analysis Results , 2024,

### Multicollinearity Test Results

Test result seen in Table 4.4 Multicollinearity test results show VIF value on the variable policy duty export equal to  $1.002599 < 10$  then No There is symptom multicollinearity. The VIF value of the variable amount production seed cocoa  $1.090530 < 10$  then No There is symptom multicollinearity. Likewise variables import seed cocoa own VIF value  $1.173049 < 10$  then No There is symptom multicollinearity. So from whole variable can concluded that regression free from symptom multicollinearity Because mark *Variance Inflation Factor* (VIF) is less of 10.

### Heteroscedasticity Test Results

For detect heteroscedasticity can compare mark *Prob. Chi-Square* with  $\alpha$  5% (0.05) with using the *White Heteroschedasticity* test. Heteroscedasticity test results can seen in Table 4.4 results heteroscedasticity show mark Chi-Square probability on Obs \*R-Squared is  $0.3430 > 0.05$  So can concluded, that No there is heteroscedasticity .

**Autocorrelation Test Results**

In study This uses the *Breush Godfrey Serial Correlation LM* test, autocorrelation test results can seen in Table 4.4 Autocorrelation test results shows prob. Chi-Square on Obs \*R Square is  $0.255770 > \alpha = 5\% (0.05)$ . So can concluded that no happen problem autocorrelation.

**Normality Test Results**

Test result normality with *the Jarque-Bera* test can seen in table 4.4 shows that on the results testing mark probability equal to  $0.493123 > 0.05$ . It means that the residual results regression the normally distributed.

**Hypothesis Test Results**

**F Test Results (Simultaneous Test)**

**Table 4. Hypothesis Test Results**

Long Term Model				Term Model Short (ECM Models)			
Variable	t-Statistics	t- table	Conclusion	Variable	t-Statistics	t- table	Conclusion
Export Duty Policy (X1)	5.766670	2.0553	Significant	Export Duty Policy (X1)	-0.0553226	2.0553	No Significant
Amount Production Seed Cocoa (X2)	0.735250	2.0553	No Significant	Amount Production Seed Cocoa (X2)	0.144676	2.0553	No Significant
Import Seed Cocoa (X3)	7.019817	2.0553	Significant	Import Seed Cocoa (X3)	3.153606	2.0553	Significant
F- stactic	96.11269			F- stactic	8.810178		
R <sup>2</sup>	0.920214			R <sup>2</sup>	0.605087		

Source : Data Analysis Results , 2024

In estimate period short mark probability F count is  $0.000182 < 0.05$ . This matter indicated that policy duty exports, quantity production seed cocoa, and imports seed cocoa in a way together or simultaneous influential significant to export *Cocoa butter*. With so, deep estimate period short, variable independence is included to in the model together own significant influence to variable dependent.

Whereas in estimate period long mark probability F count equal to  $0.000000 < 0.05$ . So can concluded variable policy duty exports, quantity production seed cocoa, and imports seed cocoa in a way together or simultaneous influential significant to export *cocoa butter*.

**t Test Results (Partial)**

Based on results regression period long then the partial t test is as following:

1. Value of t- statistics policy duty export (X1) is amounting to 5.766670. It means that t- statistical value ( $5.766670 > t\text{-table } (2.05553)$ ). So that based on the policy t test duty export influential positive significant to export *cocoa butter*.
2. Value of t- statistics amount production seed cocoa (X2) is amounting to 0.735250. It means that t - statistical value ( $0.735250 < t\text{-table } (2.05553)$ ). It means amount production seed cocoa positive No significant to export *cocoa butter*.
3. -statistical value on the variable import seed cocoa (X3) is amounting to 7.019817. It means that t- statistical value ( $7.019817 > t\text{-table } (2.05553)$ ). It means import seed cocoa influential positive significant to export *cocoa butter*.



Whereas t test results in period short as following:

1. -statistical value on the variable policy duty export (X1) is  $-0.0553226$ . It means that t- statistical value ( $-0.0553226$ )  $<$  t- table (2.05553). Variable policy duty export influential negative No significant to export *cocoa butter*.
2. -statistical value on the variable amount production seed cocoa (X2) is 0.144676. It means that t -statistical value (0.144676)  $<$  t- table (2.05553). Amount production seed cocoa influential positive No significant to export *cocoa butter*.
3. -statistical value on the variable import seed cocoa (X3) is 3.153606. It means that t- statistical value (3.153606)  $>$  t- table (2.05553). Export influential positive significant to export *cocoa butter*.

## Discussion

**Influence of Export Duty Policy on Cocoa Butter Exports in Indonesia** Research results show that the export duty policy variable has a significant negative impact on cocoa butter exports in the short term. However, in the long term, the export duty policy variable has a significant positive impact on cocoa butter exports. Theory suggests that an export duty policy on certain commodities will affect those commodities. Mankiw, in his book "Macroeconomics Theory," explains that trade policies designed to directly intervene in the quantity of goods and services exported or imported will influence commodities directly in the long term. The export duty policy will cause longer and deeper changes in the economy, affecting economic structure, prices, investment, and public welfare. The export duty policy reduces the volume of cocoa bean exports from Indonesia. Thus, with the reduction in raw exports, there will be an overflow of cocoa beans available as raw material, which can drive investment in the national cocoa processing industry. The increase in the cocoa processing industry will boost the production of processed cocoa, thereby increasing the export volume of processed cocoa from Indonesia.

**Influence of Production Quantity on Cocoa Butter Exports in Indonesia** Research results show that both in the short term and the long term, the quantity of cocoa bean production does not have a significant impact, with a positive correlation, on cocoa butter exports in Indonesia. This finding does not align with the theory proposed by Adam Smith, which states that increased production will be followed by an increase in export volume. This research is supported by studies conducted by Septyana & Taufiq (2022) and Putri (2020), which use different methods but arrive at the same conclusion—that the production variable does not significantly impact the export of processed cocoa and raw cocoa. Smallholder plantations are still managed traditionally, leading to very low land utilization optimization. Cocoa farmers still use local seed sources (without selection), resulting in cocoa plants that are prone to disease and have low productivity. The decline in productivity is also due to cocoa plants being over 25 years old, whereas the most productive age for cocoa plants is 12-18 years. Additionally, pests and diseases such as cocoa pod borer (PBK), cocoa pod rot (BBK), and vascular streak dieback (VCD) can reduce productivity by up to 80% (Ariningsih et al., 2019).

**Influence of Cocoa Bean Imports on Cocoa Butter Exports in Indonesia** Based on the test results, the cocoa bean import variable significantly influences cocoa butter exports in both the short term and the long term. This means that cocoa bean imports are a factor in the rise and fall of cocoa butter exports. This research is also supported by a study conducted by Hermawan (2019), which uses different methods but arrives at the same conclusion—that cocoa bean imports have a positive coefficient, meaning the higher the cocoa bean imports, the greater the increase in cocoa butter exports. Thus, it can be concluded that raw materials sourced domestically and internationally significantly influence the performance of the processed cocoa industry. Improving the quality and quantity of domestic cocoa is also necessary to reduce cocoa bean imports. This variable supports the hypothesis that cocoa bean imports influence cocoa butter exports in both the short and long term.

## CONCLUSIONS

Based on hypothesis testing and data analysis conducted in this study, the following conclusions can be drawn:

1. The export duty policy (dummy variable) has a significant positive impact on cocoa butter exports in the long term. Each determination of the export duty policy will increase cocoa butter export volume by 43,076.41 tons. However, in the short term, the export duty policy has a significant negative impact on cocoa butter exports. Each determination of the export duty policy will reduce cocoa butter export volume by 404.6023 tons. However, this conclusion cannot be accepted as the results are not significant, with a probability  $(0.9564) > 0.05$ .
2. The quantity of cocoa bean production does not significantly impact cocoa butter exports in either the long term or the short term. Thus, every 1-ton increase in cocoa bean production will increase cocoa butter export volume by 0.013107 tons in the long term. However, this conclusion cannot be accepted as the results are not significant, with a probability  $(0.4690) > 0.05$ . Similarly, in the short term, every 1-ton increase in cocoa bean production will increase cocoa butter export volume by 0.002813 tons, but this conclusion cannot be accepted as the probability  $(0.8862) > 0.05$ .
3. The volume of cocoa bean imports has a significant impact on cocoa butter exports in both the long term and the short term. In the long term, each 1-ton reduction in cocoa bean imports will cause an increase in cocoa butter exports by 0.263804 tons. In the short term, a 1-ton decrease in cocoa bean imports will increase cocoa butter exports by 0.092004 tons.

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