

The determinant factors of Indonesian competitiveness of cocoa exports to Germany

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Abstract: Cocoa is one of the leading commodities from the plantation sub-sector in Indonesia. At the world level, Indonesia is the third-largest producer of cocoa beans after Côte d'Ivoire and Ghana (FAO, 2017). However, Indonesia still exports cocoa in the form of (raw) beans which results in the loss of added value and not developing the domestic cocoa industry. For this reason, the government issued No. 67/PMK.011/ 2010 concerning the imposition of Export Levy and Export Levy Tariffs to suppress the export of cocoa beans and then increase the competitiveness of processed cocoa exports. The purpose of this study was to determine the competitiveness performance of Indonesian processed cocoa to Germany and what factors influenced the export competitiveness in 1992-2017. This study uses secondary data from various sources that were analyzed using Revealed Comparative Advantage (RCA) and Error Correction Mechanism (ECM). The analysis shows that in the long run the variable exchange rate, world cocoa prices, and dummy export duty significantly affect competitiveness while in the short term, population variables and world cocoa prices significantly influence competitiveness.

Keywords: Cocoa; Export, RCA; Competitiveness

JEL Classification: F10, F15, Q17

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1. INTRODUCTION

Theobroma Cacao L (Cocoa) is one of the leading plantation commodities whose role is quite important for the national economy, especially as a source of income, foreign exchange, and employment providers for the community (Departemen Perindustrian, 2007). Besides, cocoa also plays a role in encouraging regional development and agro-industry development (Kementerian Pertanian, 2016). Cocoa plantations in Indonesia have experienced quite rapid development. Based on Indonesian Cocoa Statistics published by BPS in 2017, the total area of Indonesian cocoa plantations in 2016 was recorded at 1.72 million ha, growing very rapidly from 1990 which was only 357 thousand ha. As many as 1.67 million ha (97.55%) of the total area of cocoa are community plantations, 27 thousand ha (1.59%) are large private plantations and the remaining 14 thousand ha (0.85%) are large state plantations. The main production centers of cocoa beans are in Central Sulawesi, South Sulawesi, Southeast Sulawesi, West Sulawesi, Lampung, and West Sumatra (Indonesian Cocoa Statistics, 2017).

In 2017, Indonesian cocoa became one of the sixth-largest national plantation products after oil palm, rubber, coconut, sugar cane, and coffee (BPS, 2017). Indonesia's achievements in the world are no less good, becoming the third-largest producer of cocoa beans in the world after Côte d'Ivoire and Ghana from 2002 to the present (FAO, 2017). Indonesia has succeeded in becoming

the third largest cocoa producer in the world thanks to the success in the program of expansion and increase in production which began in the early 1980s (Departemen Perindustrian, 2007).

According to data obtained from the UNCOMTRADE (2017), Indonesia ranks seventh as the largest exporter of cocoa beans in the world, with the largest export destinations namely Malaysia, America, China, and has penetrated to European markets such as Germany and the Netherlands. However, on the other hand, exports in the form of (raw) seeds that are more dominant will cause problems. It was recorded that 78% of Indonesia's cocoa exports until 2010 were still in the form of cocoa beans (BPS, 2016). This makes Indonesia lose the potential added value that can be generated from the processed cocoa industry.

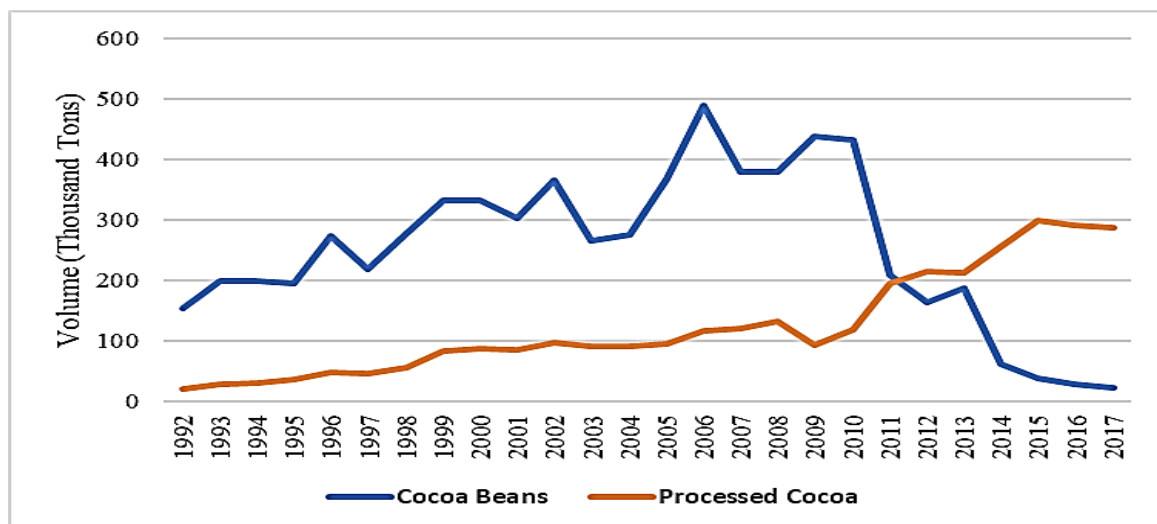


Figure 1. Comparison of the exports volume of Indonesian cocoa beans and processed, 1992-2017
Source: UNCOMTRADE, 1992-2017 (Author calculation)

The development of cocoa bean exports (HS 1801) from 1992-2010 fluctuated but has an upward trend. Processed cocoa (HS 1803, 1804, 1805, 1806) from year to year its exports almost always increase. But from 2010 to 2011, Indonesia's cocoa bean exports to the world declined sharply. This is in line with the policy written in Minister of Finance Regulation (PMK) No. 67 / PMK.011 / 2010 concerning the Determination of Export Goods that are subject to Export Levy and Export Levy Tariffs on commodities in Indonesia, one of which is cocoa beans. The amount of export duty (BK) and the export benchmark price (HPE) of cocoa beans are determined based on the reference price of cocoa beans. This policy is carried out to reduce exports and meet domestic demand so that domestic downstream industries can meet the needs of raw materials without having to import and minimize the loss of value-added caused by exports in raw form.

The export tax policy implemented has been able to reduce the volume of Indonesian cocoa bean exports and increase the availability of domestic cocoa beans supply (Agung et al, 2019 and Afrianingsih, 2012). For this reason, the increasing supply of domestic cocoa beans is expected to increase the national downstream cocoa industry. Another advantage is that the cocoa processing industry can buy cocoa at a better price level. This in turn will certainly also be able to encourage the growth of domestic processed cocoa industries so that Indonesia can export processed cocoa in the form of competitiveness at the international level.

All importing countries have an upward trend in exports every year except Germany, wherein 2016 and 2017 experienced a significant decline. The decline in processed cocoa exports to Germany is interesting to study the article, Germany is one of the countries in Europe which is famous for its chocolate products. The decline in exports can also reduce export performance and the competitiveness of Indonesia's processed cocoa exports at the level of world trade (Agung et al, 2019). In the movement of the cocoa trade, the European market has become excellent because it is known as a producer of processed cocoa and chocolate. Europe has controlled 73% of the world's chocolate market, where consumers are mostly outside Europe such as the United

States, Japan, Canada and Australia (Eurostat, 2017). When viewed from its consumption, the World Cocoa Foundation (WCF) states that cocoa consumption in Europe reached more than 50% of world cocoa consumption in 2009. Therefore, there is no doubt that Europe is a promising cocoa export target.

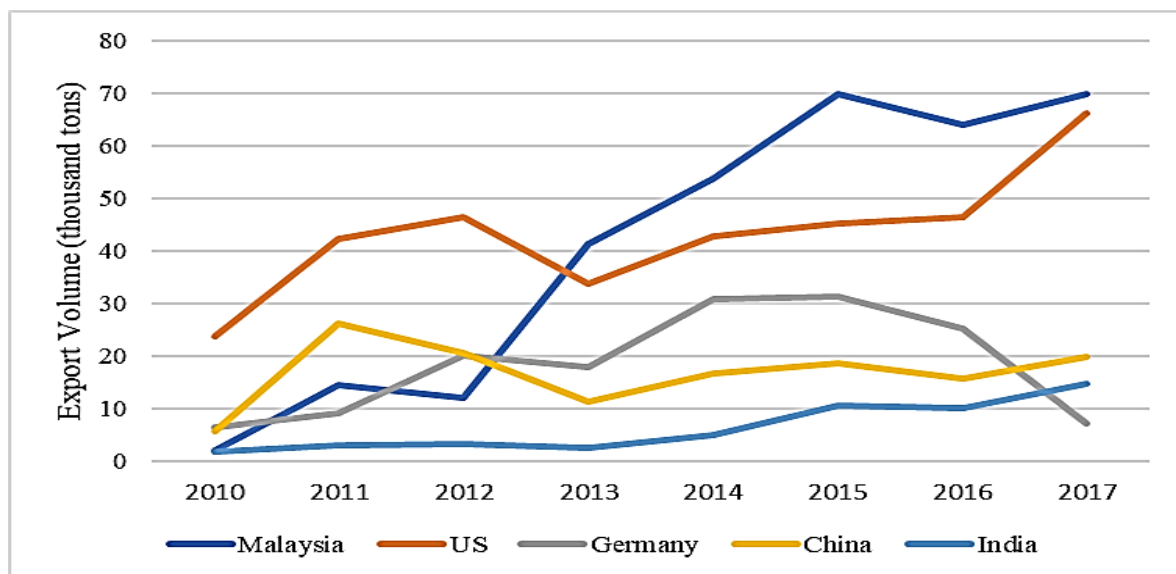


Figure 2. The growth of Indonesia's cocoa export volume to main destination countries, 2010-2017
Source: UNCOMTRADE 1992-2017 (Author calculation)

One country that is famous for its cocoa industry is Germany. In 2016, Germany was the largest exporter of chocolate and chocolate bars in Europe with 540 thousand tons followed by the Netherlands with 270 thousand tons and Belgium with 250 thousand tons (Eurostat, 2016). In terms of consumption, Germany has the third-highest level of per capita cocoa consumption in the world after Switzerland and Austria which reached 7.89 kg/year in 2017 (Statista, 2017). Meanwhile, Indonesia in 2016 only had a per capita cocoa consumption level of 0.4 kg/year (Departemen Perindustrian, 2016). With a high level of consumption, Germany is the main attraction for cocoa producers.

The development of Indonesia's processed cocoa export volume to Germany seems to fluctuate but tends to increase. The increase in processed cocoa exports will encourage Indonesia as one of the main producers of cocoa to seize available market opportunities. However, in 2016 Indonesian processed cocoa exports to Germany experienced a sharp decline and increasingly dropped in 2017. With the change in the composition of exports of types of cocoa products, Indonesia needs to see an opportunity to export processed cocoa to Europe, especially Germany by knowing competitiveness Indonesian processed cocoa. For this reason, this research needs to be conducted in order to be able to know the description and position of Indonesia's processed cocoa exports to Germany so that it can determine the direction of further cocoa export policies.

2. LITERATURE REVIEW

International trade is an exchange process that arises between countries to meet the needs of the people of that country. In the theory of international trade, there is an analysis of the fundamentals of trade between countries, the flow of goods and services, related policies, and their effects on the countries involved. One theory in international trade is the Comparative Advantage Theory introduced by David Ricardo states that a country will benefit from international trade if it specializes in producing and exporting goods that are relatively more efficient and imports goods whose production is less efficient in the country. Besides, there is a Competitive Advantage Theory introduced by Michael E. Porter where competitive advantage is influenced by four factors namely demand conditions, factor conditions, related and supporting

industries, as well as structure, competition, and industry strategy. The approach that is often used to measure competitiveness is seen from several indicators, namely comparative advantage, and competitive advantage. The comparative advantage factor can be considered as a natural factor and competitive advantage factor is considered as a factor that is acquired or developed/created. Thus, good competitiveness can be seen if the commodity has a comparative advantage and competitive advantage in it.

Previous studies on competitiveness, Dunmore (1987), which obtained short-term results, competitiveness in the agricultural sector, are influenced by government policies, exchange rates, and stochastic events such as weather and production levels. Whereas in the long run, the factors that influence the competitiveness of the agricultural sector are the influence of technology, investment, and productivity growth and production capacity.

3. MATERIALS AND METHODS

There are several analyzes in this study, Revealed Comparative Advantage (RCA) to measure the competitiveness of Indonesia's processed cocoa exports. Systematically, the RCA is formulated as follows:

$$RCA_{ijt} = \frac{X_{ijt}/X_{it}}{W_{jt}/W_t} \quad (1)$$

Where:

- X_{ijt} : The value of commodity exports j by country i in year t
- X_{it} : The total export value of country commodity i in year t
- W_{jt} : The value of commodity exports j in the world in year t
- W_t : Total world export value in year t

The next analysis is EPD (Export Product Dynamics) to determine the position of competitiveness in dynamic performance or not. Systematically, business strength/market share and market attractiveness are formulated as follows:

X axis (market share growth):

$$\frac{\sum_{t=1}^t \left(\frac{X_{ij}}{W_{ij}} \right)_t \times 100\% - \sum_{t=1}^t \left(\frac{X_{ij}}{W_{ij}} \right)_{t-1} \times 100\%}{T} \quad (2)$$

Y axis (product demand growth/market appeal):

$$\frac{\sum_{t=1}^t \left(\frac{X_t}{W_t} \right)_t \times 100\% - \sum_{t=1}^t \left(\frac{X_t}{W_t} \right)_{t-1} \times 100\%}{T} \quad (3)$$

Where:

- X_{ij} : The value of commodity exports j from Indonesia to country i
- X_t : The total export value of Indonesia to the world
- W_{ij} : The value of world commodity exports to Indonesia
- W_t : Total world export value
- T : number of years of analysis

The next analysis is a time series analysis namely ECM (Error Correction Mechanism) to find out how the rupiah exchange rate affects the dollar, world cocoa prices, cocoa bean production, destination country populations, and export duty dummy on the competitiveness of Indonesia's processed cocoa exports to Germany in the short term and long term. There are several steps to

produce an ECM regression model, namely the variable stationarity test in the same order. Next, do a co-integration test to see if there is a long-term relationship in the model to be formed.

The following long-term equation is used to test the existence of co-integration between variables:

$$RCA_t = \beta_0 + \beta_1 KURS_t + \beta_2 HD_t + \beta_3 PB_t + \beta_4 POP_t + \beta_5 DBK_t + u_t \quad (4)$$

Where:

RCA_t : Competitiveness (RCA) of processed cocoa in period t

$KURS_t$: Exchange rate in period t (rupiah/USD)

HD_t : World cocoa price in period t (USD/ton)

PB_t : Cocoa bean production in period t (ton)

POP_t : German population in period t

DBK_t : dummy of export duty in period t (0=not enforced;1=enforced)

After the stationary long-term residual equation is at the level, the next step is to form a short-term equation or what is more commonly called the ECM model. The ECM model is obtained by estimating parameters through stationary variables at the first difference and adding residual variables with lag 1 that were previously stationary. The short-term equation (ECM model) formed is as follows:

$$\Delta RCA_t = \beta_0 + \beta_1 \Delta KURS_t + \beta_2 \Delta HD_t + \beta_3 \Delta PB_t + \beta_4 \Delta POP_t + \beta_5 DBK_t + \beta_6 ECT_{t-1} + u_t \quad (5)$$

The coefficient value β_6 must be negative and significant. If the results are positive, the ECM model cannot be used. After the ECM model is formed, then the significance of the model is tested using simultaneous tests, partial tests, and testing classic assumptions such as normality test with Jarque-Bera test, non-autocorrelation test with Breusch-Godfrey Serial LM test, homoscedasticity test with Breusch-Pagan-Godfrey test, and non-multicollinearity test by looking at the VIF value.

4. RESULTS AND DISCUSSION

4.1. Competitiveness of Indonesia's Cocoa Exports to Germany

The competitiveness approach used in this study is Revealed Comparative Advantage (RCA), an index introduced by Balassa (1965) that is used to identify whether a country has a comparative advantage in terms of its export performance.

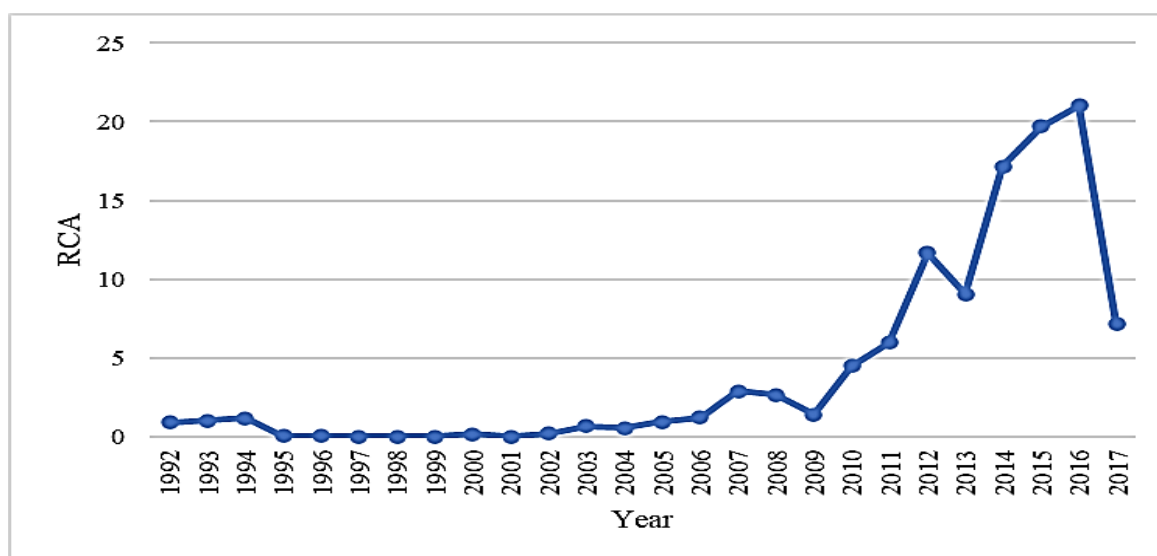


Figure 3. Growth of Indonesian processed cocoa RCA to Germany in 1992-2017

Source: UNCOMTRADE 1992-2017 (Author calculation)

In line with the export volume of processed cocoa, Figure 3 shows similar things where the RCA Index tends to increase and increase sharply starting from 2009 to 2016 but experienced a sharp decline in 2017. This is because processed cocoa exports in 2017 dropped dramatically due to export volume which also decreases.

Export Product Dynamic is one indicator of competitiveness that can determine whether a product has a good performance or not in the German processed cocoa market. The following is a matrix of the competitiveness position of EPDs from major exporting countries of processed cocoa to Germany or Indonesian competitors in the German market:

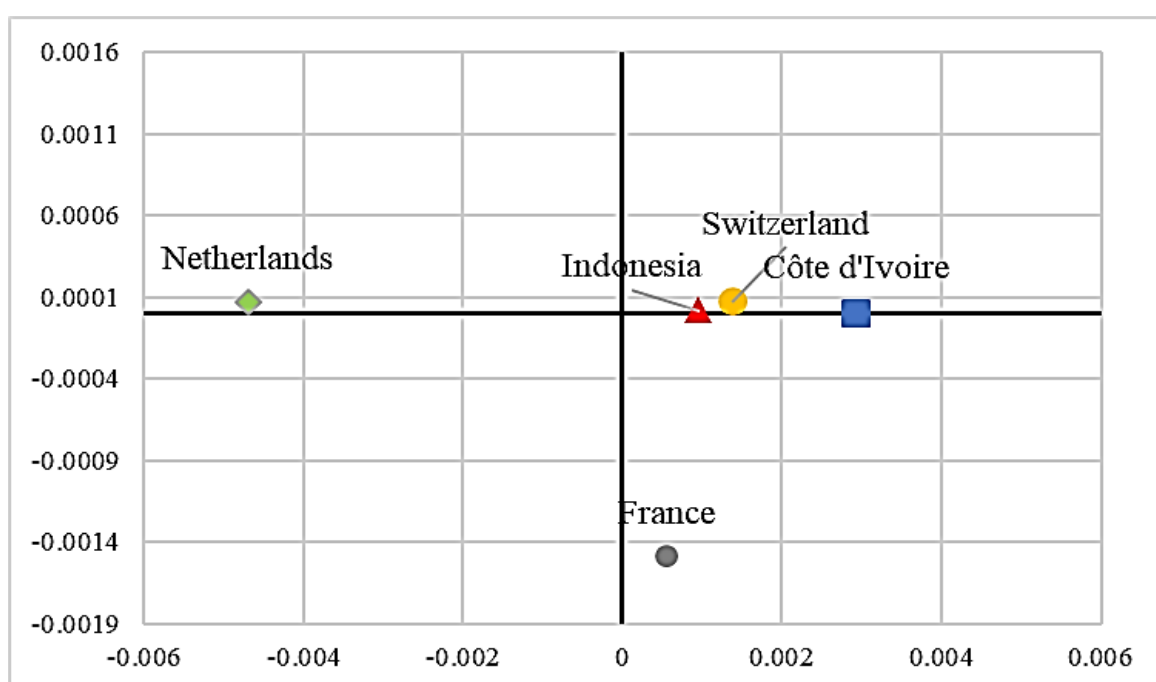


Figure 4. Matrix of the competitive position of processed cocoa exports to Germany in 1992-2017
Source: UNCOMTRADE 1992-2017 (Author calculation)

Based on Figure 4, the competitiveness position of Indonesian, Switzerland and Côte d'Ivoire processed in rising star conditions means that the country's ability to meet the needs of Germany processed cocoa is in a dynamic condition so that it has the opportunity to increase exports of processed cocoa to Germany. France is in the position of the falling star which means that French processed cocoa still has a competitive advantage but the demand for the German cocoa market has decreased. Meanwhile, the Netherlands is in a position of lost opportunity which means there is an increase in demand for processed cocoa but there is a decline in the market share of processed cocoa to Germany.

4.2. The determinant factors of Indonesian Competitiveness of Cocoa Exports to Germany

The test results show that all variables used in this study are stationary at first difference. After the ECM requirements have been fulfilled, the next step is co-integration testing of the long-term equation residuals. With the adjusted R-squared obtained 0.77, it can be said that 77.50% of the variation of the processed cocoa RCA can be explained by the rupiah exchange rate, world cocoa prices, domestic cocoa bean production, and dummy policy on the tariff of cocoa beans, while the remaining 22.50% is explained by other variables outside the model. The F test probability value is smaller than the 0.05 significance level, the decision rejects H_0 or it can be concluded that there is at least one independent variable that has a significant effect on the RCA variable of processed cocoa.

Table 1. The estimation results of the long-run model

Variables	Coefficient	t-test	Prob.
KURS (Exchange rate)	0,00085600**	2,325080	0,0307
HD (Cocoa world price)	0,00370900*	2,019139	0,0571
PB (Cocoa bean production)	0,00001650**	-2,630415	0,0160
POP (German population)	0,00000022	0,015592	0,9877
DBK (Dummy of export duty)	5,76749400*	2,018196	0,0572
Obs.	26		
R ²	0,796788		
R ² adjusted	0,745985		
f-test	15,68388		0,000003

Note: **) significant in $\alpha = 5\%$; *) significant in $\alpha = 10\%$

Source: Author calculation

After estimating the long-term equation, the next step is to do a co-integration test to find out the whether there are long-term equilibrium (co-integration) variables used. Testing is done by looking at ECT stability using the ADF test. The results show that ECT is stationary at the level so that the variables in the study are co-integrated or in other words the processed cocoa RCA variable, the rupiah exchange rate, world cocoa prices, population, cocoa seed production, and export duty dummy have a long-term balance which can then be carried out ECM analysis.

After co-integration testing and the results meet the requirements, it can proceed to the next stage, namely the formation of the ECM model or called the short-term equation. The following short-term equation is obtained:

Table 2. The estimation results of the short-run model (ECM)

Variables	Coefficient	t-test	Prob.
KURS (Exchange rate)	0,0001300	0,298686	0,7686
HD (Cocoa world price)	4,0312840**	2,624752	0,0172
PB (Cocoa bean production)	-0,0000141	-1,471223	0,1585
POP (German population)	0,0000036**	2,273620	0,0355
DBK (Dummy of export duty)	1,0025130	0,795873	0,4365
ECT (-1)	-1,137796**	-5,047846	0,0001
Obs.	25		
R ²	0,620148		
R ² adjusted	0,493530		
f-test	4,897809		0,003933

Note: **) significant in $\alpha = 5\%$; *) significant in $\alpha = 10\%$

Source: Author calculation

The adjusted determination coefficient value of 0.49 shows that 49.35% of the variation from the processed cocoa RCA to Germany can be explained by the rupiah exchange rate variable, world cocoa prices, domestic cocoa bean production, population and dummy export duty. Meanwhile, the remaining 50.65% is explained by other variables outside the model. Partially, there are only two variables that have a significant effect on the RCA of processed cocoa, namely world cocoa prices and the population of the German state.

The ECT coefficient value obtained is -1,1378 which means that this year's imbalance will be corrected by 113.78% in the following year due to the short-term influence of the exchange rate, world cocoa prices, seed production, population, and dummy export duty. Meanwhile, -13.78% will be corrected in the following years. A negative sign indicates that when the dependent variable moves away from equilibrium, in the next period, the imbalance will begin to be corrected towards equilibrium. The imbalance corrected in the following year converges towards 0 but never reaches 0.

4.3. Discussions

In the long run, the rupiah exchange rate has a significant positive effect on the competitiveness of processed cocoa. Research by Zakariya (2016) also revealed that when the exchange rate of the rupiah strengthened against the US dollar, it could cause the volume of Indonesian cocoa exports to decline and vice versa.

In the long and short-run equation, world cocoa prices have a significant and positive effect on processed cocoa exports. This is caused by the increase in high world cocoa prices which will encourage domestic exports. According to Darmansyah (1986) in Syarif (2018), one of the factors affecting export volume is the international price of the commodity. The greater the difference between the prices on the international market and the domestic prices, the greater the number of commodities to be exported.

The long equation, the production of cocoa beans significantly influences the competitiveness of processed cocoa, but it is not following the initial hypothesis where the coefficient is negative, meaning that any increase in seed production will not increase exports and competitiveness of processed cocoa. However, this phenomenon is explained in the research conducted by Hasibuan et al. (2012) where there is a preference for exporting cocoa beans compared to processed cocoa, which is considered to require higher production costs and is still competitive. Cocoa beans produced by farmers are still not well processed or fermented but most of them are directly exported in the form of beans (Departemen Perindustrian, 2007).

The population of Germany has a positive and significant effect in the short term, where an increase in population will increase the competitiveness of cocoa exports. The increase in population will increase cocoa consumption in Germany so that demand for German cocoa will increase and encourage it to import.

The export duty dummy only has a significant effect in the long term while in the short term it has no significant effect on the competitiveness of processed cocoa exporters. The export duty, besides aiming to encourage downstream, also aims to compensate for the discriminatory treatment of European Union import duty tariffs on cocoa imports originating from Indonesia. Because the import of cocoa beans from Indonesia is subject to a 0% import duty, while processed cocoa exports are subject to an import tariff of 7-9%. This tariff structure forces Indonesia to continue exporting cocoa in its raw form (cocoa beans) rather than processed products and makes it difficult for Indonesian cocoa to compete with competing countries for market share in the European Union (Hanafi, 2016).

5. CONCLUSIONS

From the research conducted, several conclusions can be drawn, namely: (1) the competitiveness of Indonesia's processed cocoa exports to Germany in the 1992-2017 period tends to increase and has begun to increase sharply since the policy on the tariff for cocoa beans was issued. But in 2017 it experienced a sharp decline due to export volume which also experienced a decline. The competitive performance of Indonesia's processed cocoa exports is in a rising star position, which means that the ability to meet the needs of Germany processed cocoa is in a dynamic condition so that it can increase exports of processed cocoa to Germany; and (2) the results of the analysis show that in the long run, the variables that have significant influence are the rupiah exchange rate, world cocoa prices, cocoa bean production, and dummy of export duty. Whereas in the short term, the variables which have significant influence are the population of Germany and the production of cocoa beans.

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