

## Comparative Analysis and Factors Affecting The Competitiveness of Indonesian Cocoa Commodities In The German Market

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### ABSTRACT

*Indonesia is a best three biggest producer bean of cocoa in this world, Indonesia is an important player on world market structure. Germany is one of Indonesia's cocoa export destinations, because Germany is the largest importer of cocoa products in the European Union. This research proposed to analyze competitiveness and factors that affect the competitiveness of Indonesian cocoa commodity exports in German market. This paper used secondary data which is got from legal source with time series data from 2006-2021 and used Revealed Comparative Advantages (RCA) analysis to known the competitiveness (comparative) of a commodity and use multiple regression analysis with the Error Correction Models (ECM) approach to determine the effect of variables tested in this study. The results of RCA calculation of Indonesian cocoa on German market shown that the average RCA value of the cocoa commodity for the period 2006-2021 is more than one ( $RCA > 1$ ), meaning that Indonesian cocoa commodity had a strong competitiveness in German market, Indonesian cocoa bean commodity had a stronger competitiveness than its processed cocoa on that period. However, on the 2011-2021 period the average value of RCA of cocoa beans was 0.27 and the average value of processed cocoa RCA was 8.32, meaning that Indonesian processed cocoa commodities had a stronger competitiveness than its cocoa beans. The results of ECM analysis showed that international cocoa price variables and Indonesian export duty policy have a positive and significant effect, while the Indonesian cocoa productivity and chocolate consumption per capita.*

## 1. INTRODUCTION

Indonesia's agricultural sector plays an important role in national economic growth. The plantation sub-sector plays a role as a foreign exchange earner, absorbs labor in the sector, and contributes to GDP. Cocoa is a plantation sub-sector commodity that plays a role in supporting the increase in non-oil and gas exports and the development of agro-industry in Indonesia. In terms of international trade according to (International Cocoa Organization (ICCO), 2017). Indonesia is the third largest cocoa bean producing country in the world. Cocoa commodity is also included in the 10 main export commodities of Indonesia (Kemendag, 2015b). Where all the results of cocoa bean products that are exported are used to meet world needs which reach around 80 percent of total production (Muhammad Arsyad, 2011). Cocoa production in Indonesia, according to the status of its exploitation, is produced by smallholder plantations, large state plantations and large private plantations. Of these three groups, the amount of cocoa production is dominated by the production of smallholder plantations.

Indonesia must be able to increase cocoa production both in quantity and quality. Due to Indonesia has been in third ranked as the largest cocoa bean producer in the world according to ICCO (Kemendag, 2015). With the hope that Indonesia can occupy the top rank in terms of cocoa exports, it is hoped that it can even enter the international market in various countries in the world. One effort that can be domestic and international scale will become easier to obtain. Conversely, if the country is unable to improve the quality and competitiveness of its products, then the country will be easily pushed aside by its competitors (Yogaswara Indra Ghardika Hamzah, n.d., 2020)

The study on the competitiveness of cocoa products conducted by (Hasibuan, 2012) stated that Indonesia as a cocoa exporter has superior competitiveness for cocoa bean and processed cocoa products in the international market. The results of (Suryana et al., 2014) stated that during the 2003-2013 period, Indonesian cocoa bean products had strong competitiveness compared to their competitors (Malaysia) in the Singapore market, while Indonesian processed cocoa products had weak competitiveness compared to Malaysia. (Ayu et al., n.d., 2015) in her research stated that Indonesia has strong competitiveness for cocoa bean commodities in the ASEAN market compared to Malaysia and Singapore. The results of the analysis also stated that cocoa bean products were of low quality which could threaten their exports.

The decline in cocoa bean exports was due to the Republic of Indonesia's cocoa processing industry down streaming program and implementation of the export duty policy through Minister of Finance Regulation no. 67 of 2010 concerning Stipulation of Export Goods Subject to Export Duty and Export Duty Tariff (Kemendag, 20114). This policy aims to guarantee the availability of raw materials and increase the competitiveness of domestic industrial processing. (Hasibuan, 2012) in their research stated that the Duty Policy Export could be increased the domestic cocoa bean processing industry. This policy can increase export volume of processed cocoa than the raw cocoa bean where is volume export of cocoa bean decreased comparing export volume of cocoa processing. The thing that became a concern after the policy was issued was that Indonesia experienced a decline in total cocoa

exports. Even the decline was the biggest decline from 1967 to 2012. This was because the percentage decline in cocoa bean exports was greater than the increase in exports that occurred in processed cocoa (Naully et al., 2014)

Germany, as the largest cocoa importing country as well as the largest cocoa bean milling industrial country in the European Union, requires supplies of raw materials for the industry. This is a potential for Indonesia to enter the export market for cocoa commodities in Europe, especially in the German market. Because Germany is one of the cocoa export destination countries, the cocoa products exported by Indonesia to Germany are as follows. During the last twelve years, Germany has become one of the biggest country that import Indonesian cocoa commodity. In 2016, was recorded as the highest year of imports of cocoa commodities from Indonesia to the German market with a value of US\$ 114.680 billion. However, it immediately experienced a very significant decline in the following year, reaching a value of US\$ 33.67 billion and becoming the lowest export value for Indonesia to Germany. This figure continues to increase until 2020, which in 2021 will decrease by 15% from the previous year (Rojaba & Jalunggono, n.d., 2020).

**Table 1.** Cocoa Products Exported by Indonesia to Germany (HS-18)

<b>HS Code</b>	<b>Description</b>
1801	Cocoa beans, whole or cracked, raw or roasted.
1803	Cocoa paste, whether or not defatted.
1804	Cocoa butter, fat and oil.
1805	Cocoa Powder, contains no added sugar or other artificial sweeteners.
1806	Chocolate and other food preparations containing cocoa.

*Source: UN Comtrade (2022)*

Processed cocoa products in the form of paste made Indonesia the fifth ranked cocoa paste exporter in the world in 2018 with an export value of US\$ 233,729,000 and a market share of 6.88 percent. Germany is the world's third largest importer of cocoa paste products, with imports worth US\$ 384,241,000 in 2019 (Kemendag, 2015). The most cocoa product exported by Indonesia to Germany is cocoa butter (HS 1804).

Germany as a member country of the European Union applies the minimum quality standard requirements set by the European Union for food products including cocoa circulating in their market and applies a zero percent import duty rate for cocoa beans, while processed cocoa is subject to varying tariffs for import duties. This tariff is set based on the Generalized System of Preferences or GSP tariff provisions imposed by European Union countries to make it easier for developing countries including Indonesia to enter the European Union market (Kemendag, 2015).

The GSP policy of the destination country can affect the competitiveness and market share of exporting countries (Ayub Ali, 2017). Germany with an average per capita consumption of 8-9 kg is known as a country with a high consumption of chocolate and cocoa products. Because of this, many large chocolate processing industries built in Germany are export-oriented (ITPC, 2010).

By looking at the facts of Germany's potential as one of the largest cocoa importing countries, as well as the second largest cocoa bean grinding country, as well as with the third highest level of chocolate consumption in the European Union and the GSP policy that makes it easier for Indonesia to export cocoa products, Indonesia must be able to involved in Germany market to get the market share of the world (ITPC, 2010). In facing this German market opportunity, efforts are needed to increase cocoa exports in order to be able to compete with other world cocoa producers where the competition will increase in the future. Therefore, a more in-depth analysis will be carried out regarding the competitiveness of Indonesian cocoa exports in the German market.

The objectives to be achieved in this study are: 1) to analyze the comparative advantages of Indonesian cocoa exports in the German market, where is Indonesia as one biggest cocoa bean producer and biggest cocoa exporter but it had lost value added because only cocoa bean exporting and 2) to analyze the influence of cocoa productivity variables, international cocoa prices, Indonesian export duty policies, and the German variable per capita chocolate consumption in short term and long term on the competitiveness of Indonesian cocoa.

## 2. RESEARCH METHODS

This research uses time series data with the time period 2006-2021, with use Revealed Comparative Advantage (RCA) method to measure the export competitiveness of Indonesian cocoa commodities in the German market. RCA analysis is also used to explain the comparative advantage of a commodity in a country. Mathematically, RCA can be formulated as follows:

$$RCA = \frac{X_{ij} / X_j}{X_{iw} / X_w} \dots\dots\dots (1)$$

Explanation:

- X<sub>ij</sub> = Export value of Indonesian cocoa commodities to Germany (000 US\$)
- X<sub>j</sub> = Indonesia's total export value to Germany (000 US\$)
- X<sub>iw</sub> = World cocoa commodity export value to Germany (000 US\$)
- X<sub>w</sub> = Total world export value to Germany (000 US\$)

If the value is greater than one (RCA > 1), the Indonesian cocoa commodity has strong competitiveness in the German market. If the RCA value < 1, Indonesian cocoa has weak competitiveness in the German market. Another competing country for cocoa exporters in this study is Ivory Coast, Netherland, Belgium, Ghana, and Nigeria where they are the world's largest cocoa bean producer.

This research uses a quantitative method with Error Correction Model (ECM) analysis which is used to analyze the factors that affect the competitiveness of Indonesian cocoa. The variables studied are 1) the competitiveness of Indonesian cocoa in the German market (Y) as the dependent variable, the data comes from the results of RCA analysis of Indonesian cocoa in the German market. 2) Indonesia's cocoa productivity (X1), this variable comes from data from the Central Bureau of Statistics (BPS) and the Indonesian Directorate General of Plantation. 3) International Cocoa Prices (X2), sourced from the official website of the International Trade Center (ITC), United Nations Commodity and Trade Database (UN

Comtrade) and from ICCO. 4) Indonesian Cocoa Export Duty Policy (X3), in this study using a dummy variable with a value of 0 before this policy was issued and a value of 1 after the Government of Indonesia issued this policy. 5) Consumption of chocolate per capita in Germany (X4), this variable is sourced from the official websites of BDSI, CAOBISCO, Eurostat, and Verein der am Rohkakaohandel beteiligten Firmen e.v. (German Cocoa Trade Association). Data processing was carried out using Eviews software version 9. Systematically, the conceptual framework for this study using ECM analysis is as follows:



**Figure 1:** Effect of Cocoa Productivity Variables, International Cocoa Prices, Indonesian Export Duty Policy, and German Consumption of Chocolate Per Capita on Indonesian Cocoa Competitiveness.

Source: Researcher, 2022

This conceptual framework is used to map a complete thought to seek scientific answers to the problem being researched by explaining the variables and relationships between variables that are theoretically related to the results of previous research where the truth is worthy of being tested empirically. The results of (Widayunita Pristia, 2007) state that the variable that has a positive effect on the competitiveness of the Indonesian cement industry is the productivity variable so that productivity can be said to be synonymous with competitiveness. (Hanafi, 2016) states that the variable price of cocoa in Indonesia influences the volume of Indonesian cocoa exports in export destination countries, namely Malaysia, the United States, China, the Netherlands, Singapore and Germany. The results of research conducted by (Maulana & Kartiasih, 2017) stated that the export duty policy had a positive and significant effect on the volume of cocoa exports. (Buana Sandry & Malik, 2017) states that in the short-term effects and long-term models, the cocoa consumption variable affects the amount of cocoa exports in America.

Error Correction Model (ECM) approach has the objective of analyzing the influence between variables in the short and long term. ECM is used because it is able to analyze economic phenomena with many variables that can be covered. Using ECM can solve the problem of non-stationary time series data (Widyawati and Setyo, 2016). Based on this conceptual framework, the basic equation is obtained as follows:

$$\text{LnDS}_t = \alpha_0 + \alpha_1 \text{LnPRDV}_t + \alpha_2 \text{LnHRG}_t + \alpha_3 \text{LnBKE}_t + \alpha_4 \text{LnKONS}_t + U_t \dots \dots \dots (2)$$

Then, the equation is made into an Error Correction Model (ECM) and becomes:

$$DLnDS_t = \alpha_0 + \alpha_1 DLnPRDV_t + \alpha_2 DLnHRG_t + \alpha_3 DLnBKE_t + \alpha_4 DLnKONS_t + \alpha_5 LnPDRV_{t-1} + \alpha_6 LnHRG_{t-1} + \alpha_7 LnBKE_{t-1} + \alpha_8 LnKONS_{t-1} + \alpha_9 ECT + U_t \dots \dots \dots (3)$$

Where is,  $ECT = LnPDRV_{t-1} + LnHRG_{t-1} + LnBKE_{t-1} + LnKONS_{t-1} - LnDS_{t-1}$

Explanation:

$DLnDS = DS_t - DS_{t-1}$ ,  $DLnPRDV = PRDV_t - PRDV_{t-1}$ ,  $DLnHRG = HRG_t - HRG_{t-1}$ ,  $DLnBKE = BKE_t - BKE_{t-1}$ ,  $DLnKONS = KONS_t - KONS_{t-1}$ ,  $\alpha_0 = \text{constant}$ .

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8 = \text{ECM coefficient}$ ,  $\alpha_9 = \text{coefficient of Error Correction Term (ECT)}$ ,  $U_t = \text{Confounding Variable}$ , and  $t = \text{time period}$ .

### 3. RESULTS & DISCUSSION

#### Revealed Comparative Advantage (RCA)

Cocoa has a strategic role in the Indonesian economy, one of which is one of the 10 main Indonesian export commodities (Kemendag, 2015) One of the efforts that can be made to increase cocoa exports is to increase the competitiveness of cocoa exports. Export competitiveness is the ability of a commodity to enter a foreign market which then can maintain that market.

The following is the RCA calculation result for Indonesian cocoa and competitors in the German market.

**Table 2.** Value of RCA Cocoa Beans Indonesia and Competitors in German Market

Year	Value of RCA					
	Indonesia	Netherland	Belgium	Nigeria	Ivory Coast	Ghana
2006	12,45	0,37	1,75	336,87	333,42	946,42
2007	1,21	0,34	1,65	66,62	498,07	516,03
2008	0,86	0,32	1,66	166,97	224,16	391,81
2009	8,48	1,94	0,90	36,39	348,85	537,97
2010	11,09	2,61	1,31	73,95	293,01	183,38
2011	0,30	3,20	1,56	28,57	276,83	335,26
2012	0,40	2,80	2,23	33,51	266,13	764,61
2013	0,37	4,31	2,70	28,68	318,61	574,15
2014	0,84	5,97	3,86	15,37	591,68	N/A
2015	0,74	3,88	2,62	15,04	366,40	N/A
2016	0,05	3,67	4,32	25,70	511,53	911,91
2017	0,06	3,86	4,53	19,44	631,20	493,38
2018	0,08	3,78	3,62	15,04	354,40	503,27
2019	0,07	3,67	3,86	19,44	366,40	508,17
2020	0,06	3,56	3,42	15,01	344,40	383,38
2021	0,05	3,37	3,23	14,44	271,20	365,26
<b>Average</b>	<b>2,32</b>	<b>2,98</b>	<b>2,70</b>	<b>56,94</b>	<b>374,77</b>	<b>529,64</b>

Source: ITC based on UN Comtrade (2022)

**Table 2** shows that the average RCA value of the six countries of cocoa bean exporting has an RCA value of  $> 1$ , which means that Indonesia and the other five exporting countries have a comparative advantage in cocoa beans and have strong competitiveness in the German market. The highest average RCA value for cocoa beans is Ghana, then in second place is Ivory Coast, this is because these two countries are the largest producing countries for cocoa bean products (International Cocoa Organization (ICCO)., 2017). Belgium and the Netherlands also have RCA values  $> 1$  for cocoa bean products, these two countries are known as the largest countries in the cocoa bean grinding industry in Europe so that the raw material for these cocoa beans is needed by their industry (International Cocoa Organization (ICCO)., 2017) So it can be concluded that even though countries are not producing cocoa beans, they are able to process these cocoa beans according to market demand so that industrial processed products are able to have a comparative advantage and have strong competitiveness.

Since the 2011-2021 period, the RCA value for Indonesian cocoa beans has been below 1. This is because in 2010 the Indonesian government issued an Export Duty Policy through Minister of Finance Regulation No. 67/PMK.011/2010 which implements up to 15% export duty for cocoa beans which aims to grow the domestic cocoa processing industry which will increase exports of processed cocoa products that are competitive and shift from cocoa beans to processed cocoa products (Suryana et al., 2014).

**Table 3.** Value of RCA Processed Cocoa Indonesia and Competitors in German Market

Year	Value of RCA					
	Indonesia	Netherland	Belgium	Nigeria	Ivory Coast	Ghana
2006	0,69	3,55	2,39	0	3,18	136,95
2007	1,77	3,60	2,35	1,39	19,10	103,20
2008	1,68	3,58	2,12	1,35	11,10	18,89
2009	0,81	3,39	2,09	7,93	8,06	26,52
2010	2,88	3,07	2,03	2,05	24,59	138,46
2011	3,91	3,20	2,05	1,28	36,61	65,88
2012	6,85	2,32	2,11	1,87	17,11	47,35
2013	6,95	2,37	2,02	8,83	24,45	65,60
2014	11,61	2,53	1,86	6,85	40,82	N/A
2015	12,45	3,47	2,17	11,50	41,65	N/A
2016	12,46	3,11	2,04	7,43	87,63	0,00
2017	12,47	3,09	2,01	7,40	85,83	0,01
2018	12,45	3,47	2,17	11,50	81,65	0,00
2019	12,46	3,11	2,04	7,43	83,63	0,01
2020	10,61	2,53	1,86	6,85	60,82	0,00
2021	9,03	2,24	1,56	4,85	61,72	0,002
<b>Average</b>	<b>7,44</b>	<b>3,04</b>	<b>2,05</b>	<b>5,53</b>	<b>43,00</b>	<b>43,06</b>

Source: ITC based on UN Comtrade (2022)

**Table 3** also shows the average value of RCA  $> 1$  for processed cocoa in Indonesia and the five competing countries in the German market, which means that processed cocoa has a comparative advantage and has strong competitiveness. Processed cocoa commodity is a

processed product of cocoa beans in the form of various cocoa paste, cocoa butter, cocoa powder, and chocolate.

The 2010 Indonesian Export Duty Policy proved effective, this can be seen in table 2 since 2011-2021 the RCA value of Indonesian processed cocoa was above 1. This policy was able to increase the production capacity of the downstream cocoa industry in Indonesia so that it could increase the export volume of processed cocoa products (Hanafi, 2016).

### Error Correction Model (ECM)

In the early stages, the validity of the data was tested by testing the stationarity of the data using the eviews program. The following is the result of the data stationarity test.

**Table 4.** The results of the data stationarity test at the 2nd difference level

Variabel	Nilai ADF	Nilai Kritis MacKinnon			Prob.	Keterangan
		1%	5%	10%		
LN_DS	-3.923101	-4.420595	-3.259808	-2.771129	0.0197	Stasioner
LN_PRDV	-7.574172	-4.803492	-3.403313	-2.841819	0.0008	Stasioner
LN_HRG	-5.200454	-4.420595	-3.259808	-2.771129	0.0037	Stasioner
BKE	-5.916080	-4.803492	-3.403313	-2.841819	0.0033	Stasioner
LN_KONS	-4.452075	-4.420595	-3.259808	-2.771129	0.0096	Stasioner

Source: Data Processed (2022)

**Table 4** shows that the five variables are stationary at the second difference level as indicated by the ADF value of each variable which is smaller than the critical value at the 5 percent significance level, so data testing can be carried out in the next stage, namely the cointegration test (long term estimate). Here are the test results.

**Table 5.** Cointegration Test Results

Variabel	Koefisien	t-Statistic	Prob.
C	27.46623	0.875232	0.4105
LN_PRDV	-3.818756	-0.794196	0.4532
LN_HRG	1.401589	1.947093	0.0926
BKE	1.074784	2.430808	0.0454
LN_KONS	-1.192150	-0.733740	0.4869
R-squared	0.823879	F-statistic	8.186370
Prob(F-statistic)	0.008904		

Source: Data Processed (2022)

From **table 5**, the long-term equation is obtained as follows:

$$\text{LnDS}_t = 27,46623 - 3,818756 \text{ LnPRDV}_t + 1,401589 \text{ LnHRG}_t + 1,074784 \text{ LnBKE}_t - 1,192150 \text{ LnKONS}_t + U_t \dots\dots\dots(3)$$



Based on the results of the cointegration regression equation above, the interpretation is as follows:

A constant of 27,46623 means that in the long run all the independent variables are zero, so the value of competitiveness Indonesian cocoa exports will increase by 27,46623. Table 5 shows that the international price variable (HRG) and cocoa export duty (BKE) policy have a positive and significant impact on the export competitiveness of Indonesian cocoa commodities in the German market. While the productivity variable (PRDV) and Germany's per capita chocolate consumption (KONS) have a negative but not significant effect on the competitiveness of Indonesian cocoa exports in the German market in the long term.

PRDV coefficient is negative by -3.818756, which means that in the long run, an increase in cocoa productivity by 1 percent will decrease competitiveness Indonesian cocoa exports by 3.818756 in each unit, assuming that the variables of international cocoa prices, Indonesian Cocoa Export Duty Policy and Consumption of chocolate per capita in Germany are fixed. HRG coefficient is 1.401589, which means that in the long run, an increase in international cocoa prices by 1 percent will increase competitiveness Indonesian cocoa exports by 1.401589 in each unit, assuming that the variables of Indonesia cocoa productivity, Indonesian Cocoa Export Duty Policy and Consumption of chocolate per capita in Germany are fixed. BKE coefficient is 1.074784, meaning that if export duties are still applied, competitiveness will increase by 1.074784 in each unit, assuming that the variables of Indonesia cocoa productivity, international cocoa prices and Consumption of chocolate per capita in Germany are fixed. This means that the Indonesian government's export export duty policy will encourage the growth of the cocoa bean processing industry in Indonesia in the long run, so that it can increase the export volume of processed cocoa and increase its competitiveness, especially export competitiveness in the German market. KONS coefficient is -1.192150, which means that in the long run, an increase in Germany chocolate consumption increases by 1 percent will decrease competitiveness Indonesian cocoa exports by 1.192150 in each unit, assuming that the variables of Indonesia cocoa productivity, international cocoa prices and Indonesian Cocoa Export Duty Policy are fixed.

Cointegration test results show an R-squared value of 0.823879 meaning that 82.38 percent of the DS model can be explained by the variables PRDV, HRG, BKE, and KONS. While the remaining 17.62 percent can be explained by other variables outside the model in the long term.

The cointegration test results also show an F-statistic value of 8.186370 with a probability value of  $0.008904 < \alpha = 0.05$  meaning that together the independent variables (PRDV, HRG, BKE, and KONS) have a significant effect on the dependent variable, namely DS in the long run.

After estimating the cointegration model and obtaining the residual series values, the next step is to test the ECM (short-term estimation). The results of the Error Correction Model are:

**Table 6.** Error Correction Test Results (ECM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.125612	0.176122	-0.713210	0.5076
D(LN_PRDV)	-3.114387	3.541202	-0.879472	0.4194
D(LN_HRG)	1.956293	0.860114	2.274458	0.0720
D(BKE)	0.934579	0.457854	2.041213	0.0967
D(LN_KONS)	-3.068191	2.552371	-1.202095	0.2831
ECT(-1)	-1.201916	0.462242	-2.600185	0.0482
R-squared	0.794968	Akaike info criterion		1.403625
Prob(F-statistic)	0.081624			

Source: Processed Data (2022)

**Table 6** shows the results of the ECM (short term) estimation. It can be seen that the ECT value is negative and significant, which means that the model used can be estimated and is valid. A constant of -0,125612 means that in the short run all the independent variables are zero, so the value of competitiveness Indonesian cocoa exports will decrease by -0,125612. The results of the ECM test show that the variables of price and export duty have a significant effect on the competitiveness of Indonesian cocoa in the short term. Meanwhile, the variables of productivity and cocoa consumption per capita in Germany have a negative but not significant effect on the competitiveness of Indonesian cocoa in the German market in the short term.

PRDV coefficient is negative by -3.114387, which means that in the short term, an increase in cocoa productivity by 1 percent will decrease competitiveness Indonesian cocoa exports by 3.114387 in each unit, assuming that the variables of international cocoa prices, Indonesian Cocoa Export Duty Policy and Consumption of chocolate per capita in Germany are fixed. HRG coefficient is 1.956293, which means that in the short term, an increase in international cocoa prices by 1 percent will increase competitiveness Indonesian cocoa exports by 1.956293 in each unit, assuming that the variables of Indonesia cocoa productivity, Indonesian Cocoa Export Duty Policy and Consumption of chocolate per capita in Germany are fixed. BKE coefficient is 0.934579, meaning that if export duties are still applied in short term, competitiveness will increase by 0.934579 in each unit, assuming that the variables of Indonesia cocoa productivity, international cocoa prices and Consumption of chocolate per capita in Germany are fixed. The government policy regarding export duty is very effective in increasing the export volume of cocoa, especially processed cocoa so that its competitiveness will also increase. KONS coefficient is -3.068191, which means that in the short term, an increase in Germany chocolate consumption increases by 1 percent will decrease competitiveness Indonesian cocoa exports by 3.068191 in each unit, assuming that the variables of Indonesia cocoa productivity, international cocoa prices and Indonesian Cocoa Export Duty Policy are fixed.

The estimation results of the ECM test above show the value of R-squared = 0.794968, meaning that 79.49 percent of the DS model can be explained by changes in PRDV, HRG, BKE, and KONS variables in the previous year's period. The remaining 20.51 percent is explained by other changing variables outside the model. The ECM test results also show the Prob value. The F-statistic of 0.081624  $< \alpha = 0.10$  means that simultaneously there is a

significant influence between all the independent variables namely PRDV, HRG, BKE, and KONS on the dependent variable (competitiveness or DS) in the short term.

#### **4. CONCLUSION & SUGGESTION**

Based on the presentation of the research result and the discussion presented earlier, the conclusions that can be drawn are:

Based on the results of RCA calculations from 2006-2021, Indonesian cocoa bean and processed cocoa products and their five competitor countries (Netherlands, Belgium, Nigeria, Ivory Coast and Ghana) have a comparative advantage and have strong competitiveness in the German market, with a value average  $RCA > 1$ . Specifically for Indonesia, it can be seen from the results of  $RCA < 1$  for cocoa bean commodities in the 2011-2021 period that Indonesia does not have a comparative advantage or competitiveness of cocoa beans in the German market compared to its competitor countries, this is due to the implementation of the policy export duty in 2010 by the Indonesian government where the effect of this policy can reduce the export volume of cocoa beans and increase the cocoa processing industry so as to increase exports of processed cocoa commodities. This can be seen from the results of RCA calculations  $> 1$  for Indonesian processed cocoa during the 2011-2021 period, which has a comparative advantage and is highly competitive in the German market.

Indonesian cocoa productivity and German chocolate consumption in the short and long term have no significant effect on the competitiveness of Indonesian cocoa exports in the German market. In addition, fluctuations in international cocoa prices can significantly affect the competitiveness of Indonesian cocoa exports to Germany both in the short and long term. Likewise, the implementation of the export duty policy by the Government of Indonesia since 2010 when applied both in the short and long term can significantly affect the competitiveness of Indonesian cocoa exports to Germany.

The implication of the research is that the research is conducted as empirical support that processed cocoa commodities in Indonesia must be taken into account in order to compete in the German market. With the potential of cocoa as Indonesia's export commodity and the high demand for cocoa raw materials for the processing industry in the European Union, especially Germany, Indonesia must further increase the volume of processed cocoa exports in order to add value to the domestic cocoa industry by continuing to enforce the export duty policy which has proven to be effective in increasing volume export of processed cocoa which can provide value added to the cocoa product.

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