DEVELOPMENT OF INDONESIAN COCOA BEAN EXPORTS TO MALAYSIA

Rizqiana Dewi[1], Mubarokah[2], Ida Syamsu Roidah[3]
[1]Universitas Pembangunan Nasional "Veteran" Jawa Timur
[2]Universitas Pembangunan Nasional "Veteran" Jawa Timur
[3]Universitas Pembangunan Nasional "Veteran" Jawa Timur
Corresponding Email: mubarokah@upnjatim.ac.id

Abstract

Cocoa is one of the commodities that has the largest contribution to the Indonesian economy. Indonesia is one of the largest cocoa producers in the world, most of its production is exported in the form of cocoa beans (HS: 180100). Malaysia is the main export destination for Indonesian cocoa beans. However, exports of Indonesian cocoa beans to Malaysia have decreased due to the decline in Indonesian cocoa production from 2008 to 2022. The aim of this research is to analyze the development of Indonesian cocoa bean exports to Malaysia using trend analysis and identifying factors that influence demand for cocoa bean exports. Indonesia to Malaysia using VECM (Vector Error Correction Models) analysis with the help of Eviews 12 software. The results of this research show that the volume of Indonesian cocoa bean exports to Malaysia has decreased. The factors that significantly positively influence demand for Indonesian cocoa bean exports to Malaysia are the exchange rate, while those that have a significantly negative influence are international cocoa bean prices and inflation.

Keywords: ***Exports, Cocoa Beans, Development Trends, VECM***

1.INTRODUCTION

The agricultural sector has a fairly important role in economic activities in Indonesia, this can be seen from its contribution to Gross Domestic Product (GDP), which is quite large, namely around 13.28 percent in 2021(BPS, 2021). One of the agricultural sub-sectors that has an important influence on Indonesia's development into the developing country it is today is the plantation sub-sector. This can be seen from the trade balance of the plantation sub-sector which is always positive with an average growth of 9.09% per year during the 2017-2021 period, which means that the export value is greater than the import value.(RI Ministry of Agriculture, 2022). One of the plantation commodities that contributes to international trade and has an important role in improving the Indonesian economy is the cocoa plant. The cocoa plant (Theobrema cacao L.) makes a significant contribution as a source of foreign exchange considering that the export volume of cocoa and its processed products in Indonesia will reach 385,981 tons with a value of US$ 1.26 billion in 2022. This amount has increased by 0.85% compared to 2021 which was 382,712 tonnes with a value of US$1.21 billion(Sadya, 2023).This is possible considering that cocoa can be harvested throughout the year even though the volume varies between months.

According to UN Comtrade data (2023), cocoa beans (HS: 180100) are a product from the cocoa plant that has the highest export volume of other cocoa products from 2000 to 2022. The relationship between Indonesian cocoa bean production and Indonesian cocoa bean export volume is namely When Indonesian cocoa bean production increases, the availability of cocoa bean commodities increases and the supply of cocoa commodities at home and abroad also increases, causing the export volume of Indonesian cocoa beans to the world market to also increase. On the other hand, when Indonesian cocoa bean production declines, the volume of Indonesian cocoa bean exports to the world market will also decline. The greater the production of cocoa beans, the greater

the exports made. This is in accordance with the theory of the production function(Hasmiani, 2023).

According to data obtained from BPS, from 2015 to 2022 the volume of Indonesian cocoa bean exports to Malaysia has always been higher than other countries, so that Malaysia has become the main country as a destination for Indonesian cocoa bean exports.(Arianda et al., 2022).This is because Malaysia is one of the countries known as the largest producer of final chocolate products in the world, but its production volume is relatively very small. Geographically, Malaysia is very close to Indonesia so transportation costs are low. One of the efforts made to increase cocoa exports is to increase the competitiveness of these export products. This means that competitiveness must go hand in hand with the trend of increasing cocoa exports in Indonesia to see the trend of cocoa exports in the future. Factors that influence cocoa bean exports also need to be considered, such as the international price of cocoa beans, the rupiah exchange rate, GDP per capita of the importing country, and inflation. Therefore, the aim of this research is to analyze the development of Indonesian cocoa bean exports and the factors that influence the volume of Indonesian cocoa bean exports. It is hoped that this research will be able to provide considerations to the government and relevant stakeholders in making decisions to increase the potential for sustainable exports of Indonesian cocoa beans.

2. RESEARCH METHOD

The type of data that will be used in this research is secondary data. The secondary data used is time series data. Data was obtained from related parties via official websites such as the Central Statistics Agency (BPS), Bank Indonesia, Ministry of Trade, Directorate General of Plantations, Food and Agriculture Organization (FAO), Trademap, United Nations Commodity of Trade (UN Comtrade), Worldbank, and other related agencies, as well as several other libraries in the form of literature from books and journals. The annual time series data used is 23 years, starting from 2000 to 2022. The analytical method used to determine trends in Indonesian cocoa export volume is trend analysis using the Least Square method and estimating cocoa export volume through a trend equation using time series data. This method was chosen because it suits the purpose of being able to provide clues about conditions that will occur in the future based on data that occurred in the past. In addition, the Vector Error Correction Models (VECM) method is used to analyze factors that influence cocoa export volume. VECM is used because it can determine short-term and long-term relationships. The rationale for this research is as follows:

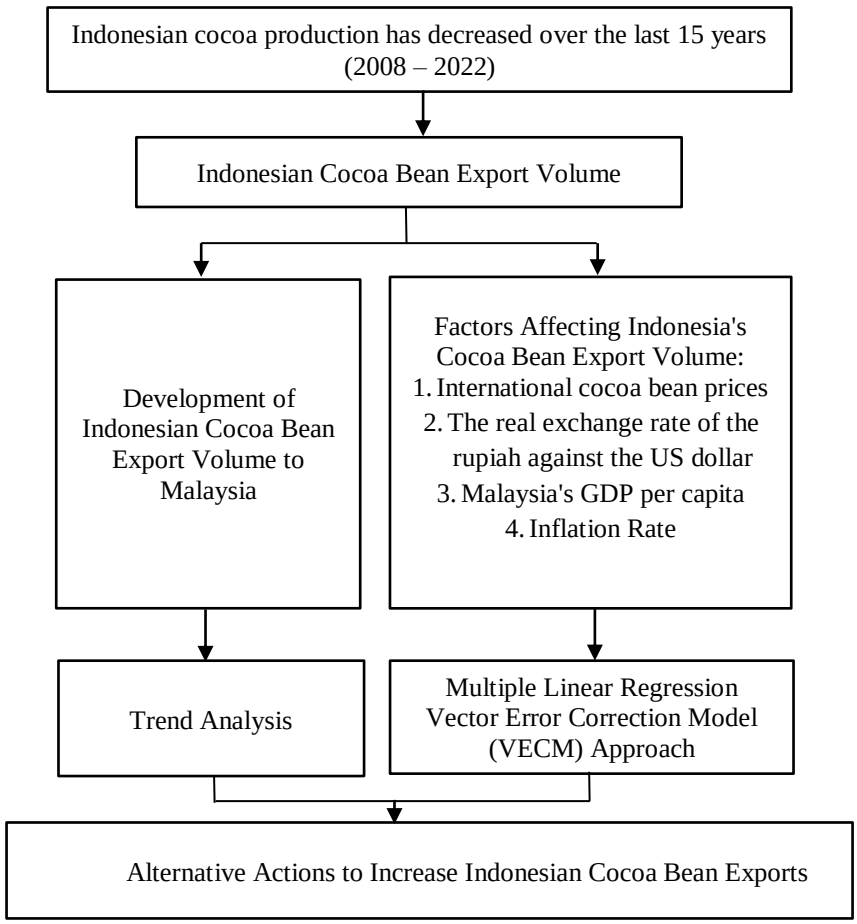


Figure 1. Research Rationale Framework

Based on the background, description of previous research and theoretical framework, the following hypothesis can be proposed:

1. It is suspected that the development of the volume of Indonesian cocoa bean exports to Malaysia in the period 2023 to 2027 has a trend value that tends to decrease.
2. The price of cocoa on the international market, GDP per capita of the destination country, and the exchange rate have a significant positive influence on the volume of Indonesian cocoa exports. Meanwhile, inflation has a significant negative effect on the volume of Indonesian cocoa bean exports to Malaysia.

3. RESULTS AND DISCUSSION

3.1. Development of Indonesian Cocoa Bean Export Volume to Malaysia

The trend method used in this research is to calculate the development of the volume of Indonesian cocoa bean exports to Malaysia using past data and observations. The data used to carry out trend analysis of Indonesian cocoa bean export volumes in this research is from 2000 to 2022, namely data for 23 years obtained from UN Comtrade 2023.

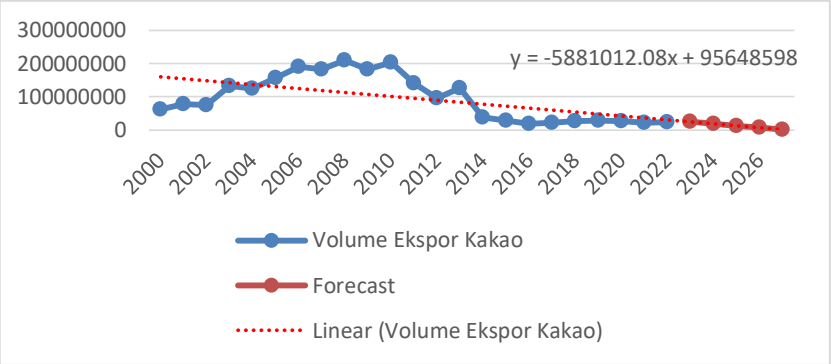


Figure 2. Trend graph of Indonesian cocoa bean export volume to Malaysia 2002-2022

Figure 2 illustrates that the volume of Indonesian cocoa bean exports to Malaysia from 2000 to 2022 tends to decrease every year. This is also supported by a decrease in export volume in 2022 amounting to 23,715,734 kg from 61,820,612 kg in 2000 (-94.02%.). The blue line shows the total volume of Indonesian cocoa bean exports to Malaysia from 2000 to 2022, while the red line is the trend line for the volume of Indonesian cocoa bean exports to Malaysia. From this data, trends and forecasting of the volume of Indonesian cocoa bean exports to Malaysia from 2023 to 2027 were created.

Table 1. Forecasting Export Volume of Indonesian Cocoa Beans to Malaysia from 2023 to 2027

Year	Forecast Results (Y')
2023	25076453
2024	19195441
2025	13314429
2026	7433417
2027	1552405

Source: Secondary data (processed, 2023)

Forecasting The volume of Indonesian cocoa bean exports to Malaysia in 2023 will continue to decline. The decline in the export volume of cocoa beans was mainly caused by the implementation of export duties on cocoa beans set by the Ministry of Finance number 67/PMK.011/2010 which aims to inhibit cocoa bean exports and to increase the supply of domestic industrial cocoa beans. This was done as a form of realization of the development of the forest and plantation products industry as stated in the 2014-2019 National Medium Term Development Plan (RPJMN). Apart from the enactment of the cocoa bean export tax policy, the decline in export volume of Indonesian cocoa beans was caused by the decline in Indonesian cocoa production from 2013 to 2022 due to poor rehabilitation of unproductive plants over 25 years old so that their productivity was very low.(Wahyudi et al., 2009). Data for 2021 shows that around 19% of cocoa plants in Indonesia are categorized as damaged or non-productive. The decline in the area of cocoa plantations also occurred in the same period due to the conversion of cocoa plantations into oil palm, rice, corn and soybean plantations.(Wijaya, 2023).

3.2. Factors Affecting Exports of Indonesian Cocoa Beans to Malaysia

The method used to analyze factors that influence cocoa export volume uses multiple linear regression analysis tools with the Vector Error Correction Model (VECM) approach. VECM can be used to see short-term and long-term relationships from time series data. VECM is a Vector Auto Regression (VAR) analysis designed for use on non-stationary data which is known to have a

cointegration relationship, in other words VECM can be said to be a restricted form of VAR. The stages of VECM analysis are as follows:

Stationarity Test

The first step in analyzing time series data is to carry out a stationarity test to find out whether the variables being tested are stationary or not. The data stationary test can be carried out using the unit root test, namely by using Augmented Dickey-Fuller (ADF) at degrees (level or first difference) and with the same real level so that stationary data is obtained. If the t-ADF value is smaller than the Mackinnon crisis value then it can be concluded that the data used is stationary (does not contain unit roots)(Basuki & Prawoto, 2016)

Table 2. ADF Stationarity Test Results at Level Level

Variable	ADF Statistics			
	t-statistics	Critical Value 5%	Prob	Information
Export Volume (Y)	-1.951543	-3.029970	0.3037	Not Stationary
International Price (X1)	-2.632731	-3.012363	0.1025	Not Stationary
Exchange Rate (X2)	-0.388562	-3.004861	0.8951	Not Stationary
Malaysian GDP Per Capita (X3)	-0.942419	-3.004861	0.7547	Not Stationary
Indonesian Inflation (X4)	-4.376763	-3.004861	0.0026	Stationary

Source: Secondary data (processed, 2023)

Based on table 2 of the stationarity test with the ADF test at level level using a critical value of 5%, it is known that of the five variables used in the research, only one variable passed the stationary test at level level. The variable that passes the stationarity test at level level is Indonesian inflation with a value of t-ADF < t-statistic, namely -4.376763 < -3.004861 (stationary). Therefore, it is necessary to carry out a stationarity test at the first difference level to make the data stationary. This can be useful for avoiding spurious regression problems that may arise from regressing non-stationary time series data.(Yusuf & Widyastutik, 2007). Table 3 below is the results of the stationarity test at the first difference level.

Table 3. ADF Stationarity Test Results on First Difference

Variable	ADF Statistics			
	t-statistics	Critical Value 5%	Prob	Information
Export Volume (Y)	-5.009988	-3.012363	0.0007	Stationary
International Price (X1)	-3.496499	-3.012363	0.0361	Stationary
Exchange Rate (X2)	-4.530429	-3.012363	0.0020	Stationary
Malaysian GDP Per Capita (X3)	-4.542135	-3.012363	0.0019	Stationary
Indonesian Inflation(X4)	-7.233682	-3.012363	0.0000	Stationary

Source: Secondary data (processed, 2023)

Table 3 of the stationarity test results at the first difference level shows that all variables used in the research have met the stationarity requirements of the ADF test data. This is known from the ADF t-statistic value which is smaller than the Mackinnon Critical Value of 5%. In the export volume variable, t-ADF is obtained -5.009988 < critical value -3.012363 with a probability value of 0.0007 < α 0.05. The international cocoa bean price variable obtained t-ADF -3.496499 < critical value -3.012363 with a probability value of 0.0361 < α 0.05. The exchange rate variable obtained is

t-ADF -4.530429 < critical value -3.012363 with a probability value of 0.0020 < α 0.05. In the Malaysian GDP per capita variable, t-ADF is obtained -4.542135 < critical value -3.012363 with a probability value of 0.0019 < α 0.05. Finally, for the Indonesian inflation variable, the t-ADF value is -7.233682 < critical value -3.012363 with a probability value of 0.0000 < α 0.05. These results show that at the first difference level, hypothesis H0 is rejected. H1 is accepted, namely that the time series data does not contain unit roots, meaning the data is stationary. Thus, it can be explained that all the variables that will be estimated in the research are stationary at the same degree, namely the first difference.

Optimal Lag Test

Determining the lag length is used to identify how long it takes for one variable to react to another variable to eliminate the problem(Basuki & Prawoto, 2016). The lag length of the data used greatly influences the VECM estimation. Determination of the optimal lag length will be sought using existing information criteria. The selected lag candidate is the lag length according to the Likehood Ratio (LR), Final Prediction Error (FPE), Akaike Information Crition (AIC), Schwarz Information Crition (SC), and Hannan-Quinn Crition (HQ) criteria. From the results of the optimal lag test, it is known that the optimal lag length is located at lag 1, that is, there are more indications of lag order selected by the criterion (*). Therefore, the optimal lag length used in this research is lag 1. The following are the results of the optimal lag test.

Table 4. Optimal Lag Determination Test Results

	LogL	L.R	FPE	AIC	S.C	HQ
0	-858.9712	NA	8.88e+27	78.54283	78.79080	78.60125
1	-779.2217	115.9993*	6.57e+25*	73.56561*	75.05339*	73.91608*

Source: Secondary data (processed, 2023)

Stability Test

The stability test functions to ensure that the VECM model can be forecasted using IRF and VD. In addition, using an unstable model will result in the estimation results being less valid.

Table 5. Stability Test Results

Root	Modulus
0.947485	0.947485
0.677678 - 0.205322i	0.708099
0.677678 + 0.205322i	0.708099
0.524306	0.524306
-0.067155	0.067155

Source: Secondary data (processed, 2023)

The results of the stability test can be seen in Table 5. The results of the stability test with the condition first different lag 1 show that the VAR model is stable and has passed the stability test. This can be seen by looking at the overall value of the modulus which is less than 1, none of which exceeds 1.(Faizin, 2020).

Cointegrity Test

This cointegration test aims to determine whether data from variables that are not stationary at this level fulfill the requirements of the integration process, namely where all variables are stationary at the same degree, namely degree 1, I(1). Based on the results seen in table 6, the cointegration test in this study used the cointegration test method from the Johansen Trace Statistics Test. The cointegration testing criteria in this study are based on trace statistics. If the

trace statistic value is greater than the critical value of 5% then the alternative hypothesis which states the amount of cointegration is accepted so that it can be known how many equations are cointegrated in the system(Basuki & Prawoto, 2016). Table 6 below shows the results of the Johansen Cointegration test which is used to determine the number of cointegration equations.

Table 6. Cointegration Test Results (Johansen Cointegration Test)

Hypothesized No. of CE(s)	Eigenvalues	Trace Statistics	0.05 Critical Value	Prob.**
None *	0.785594	83.61260	69.81889	0.0027
At most 1*	0.663437	51.27502	47.85613	0.0230
At most 2	0.626094	28.40667	29.79707	0.0717
At most 3	0.305714	7.747888	15.49471	0.4927
At most 4	0.004067	0.085588	3.841465	0.7699

Source: Secondary data (processed, 2023)

Based on Table 6 above, it is known that None and At most 1 are significant with trace statistical values of 83.61260 and 51.27502 respectively which are greater than the critical value of 5% (H0 is rejected, H1 is accepted). This shows that there is at least 1 cointegration equation (at most 1). Thus the VECM model estimation can be used(Indrajaya, 2021).

Granger Causality Test

The Granger Causality Test is used to determine whether two variables have a reciprocal relationship or not. In other words, does one variable have a significant causal relationship with other variables, because each variable in the research has the opportunity to be an endogenous or exogenous variable. In this research, the Granger Causality test is shown more on the factors that cause cointegration and the influence of factors that influence demand for exports of Indonesian cocoa beans to Malaysia, where the factors that influence demand for exports of Indonesian cocoa beans to Malaysia consist of the price of cocoa beans. international exchange rate, Malaysia's GDP per capita, and Indonesia's inflation rate. The bivariate causality test in this study used the VAR Pairwise Granger Causality Test and used a significance level of 5%. The results of the Granger causality test carried out in this study are shown in table 7.

Table 7. Granger Casuality Test Results

Null Hypothesis:	**F-Statistics**	**Prob.**
X1 does not Granger Cause Y	5.47017	0.0304*
Y does not Granger Cause X1	1.85197	0.1895
X2 does not Granger Cause Y	1.70323	0.2075
Y does not Granger Cause X2	2.90232	0.1048
X3 does not Granger Cause Y	9.05823	0.0072*
Y does not Granger Cause X3	1.18905	0.2892
X4 does not Granger Cause Y	0.28549	0.5993
Y does not Granger Cause X4	1.36290	0.2575

Source: Secondary data (processed, 2023)

The results of the Granger causality test in Table 7 show that the F-statistic and probability values for international cocoa bean prices significantly influence the export volume variable with a probability value of 0.0304 < α 0.05, meaning that H0 is rejected and H1 is accepted. On the other hand, the export volume variable does not significantly influence the international cocoa bean price

variable with a probability value of 0.1895 > α 0.05, meaning accepting H0 and rejecting H1. So it can be concluded that there is a unidirectional causality relationship between the international cocoa bean price variable and export volume and the reverse does not apply. This condition also occurs in the Malaysian GDP per capita variable which significantly influences the export volume variable with a probability of 0.0072 < α 0.05, meaning rejecting H0 and accepting H1. On the other hand, the export volume variable does not significantly affect Malaysia's GDP per capita with a probability value of 0.2892 > α 0.05, meaning that it accepts H0 and rejects H1. So it can be concluded that there is a unidirectional causality relationship between the Malaysian GDP per capita variable and export volume and the reverse does not apply. Meanwhile, the Indonesian exchange rate and inflation variables do not significantly influence export volume with respective probability values of 0.2075 > α 0.05 and 0.5993 > α 0.05, likewise the export volume variable does not significantly influence the exchange rate and inflation variables. Indonesian inflation with respective probability values of 0.1048 > α 0.05 and 0.2575 > α 0.05. This means accepting H0 and rejecting H1, so it can be concluded that there is no causal relationship between these variables.

Estimation Results of the Vector Error Correction Model (VECM) Method

After carrying out various stages of pre-estimation tests, namely data stationarity test, determining lag length, Granger causality test, stability test, cointegration test at a 5% test level in this research, the model used is VECM (Vector Error Correction Model). The use of VECM estimation is in accordance with the problem in this research, namely to find out the factors that influence the independent variable on the dependent variable. The following table 8 shows the short-term VECM estimation results.

Table 8. VECM Model Estimation Results for Factors Affecting Bean Export Volume Indonesian Cocoa to Malaysia in the Short Term

Variable	Coefficient	t-statistics
CointEq1	0.184528	[3 .87620]*
D(Y(-1))	-0 .651769	[-2 .90963]*
D(X1(-1))	-3236660	[-0 .20775]
D(X2(-1))	18271 .16	[2 .11531]*
D(X3(-1))	-11076 .14	[-1 .14976]
D(X4(-1))	-9530881	[-2 .45473]*
C	5651115	[0.77367]
R-squared= 0.570639		
F-statistic= 3.101097		

Source: Secondary data (processed, 2023)
Note: * Significant at the 5% real level (f-table= 2.928) (t-table= 2.074)

Based on the VECM model estimation results in table 4.8, it shows that the F-statistics has a value greater than the F-table at the 5% real level (3.101 > 2.928). This shows that all the independent variables in the model together have a significant effect on the dependent variable. . The R-square value obtained is 0.570639 which means that the independent variables International Price, Exchange Rate, Malaysian GDP Per Capita and Indonesian Inflation together can explain the dependent variable of Indonesian Cocoa Bean Export Volume to Malaysia of 57.0639% and the rest is explained by other variables outside the model. The VECM equation model in the short term can be written as follows:

$$Y = 5651115 - 0{,}651769D\big(Y(-1)\big) - 3236660D\big(X_1(-1)\big) + 18271{,}16D\big(X_2(-1)\big) - 11076{,}14\mathrm{D}\big(X_3(-1)\big) - 9530881D\big(X_4(-1)\big) + 0{,}184528$$

Based on the estimation results of the short-term VECM model above, the significant variables are the Indonesian exchange rate and inflation rate, because the absolute value of the t-statistic for

each variable is greater than the t-table value. Meanwhile, what is not significant is the international cocoa bean price variable and Malaysia's GDP per capita, because the t-table value is smaller than the absolute value of the t-statistic.

Table 9. Long Term VECM Model Estimation Results

Variable	Coefficient	t-statistics
Export Volume (Y)	1 ,000000	
International Price (X1)	-177543687	[-2.98216]*
Exchange Rate (X2)	61597 .47	[4.21060]*
Malaysian GDP per capita (X3)	-28792 .44	[-1.57464]
Inflation Rate (X4)	-84085431	[- 4.08871]*
C	-305062277	

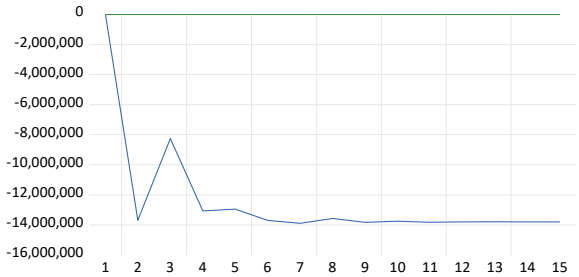
Source: Secondary data (processed, 2023)

Based on the long-term VECM estimation results in table 4.9, it shows that international price variables, exchange rates and inflation rates have an influence on the export volume of Indonesian cocoa beans to Malaysia. From the results of the analysis in table 4.9, the long-term equation in this research is as follows:

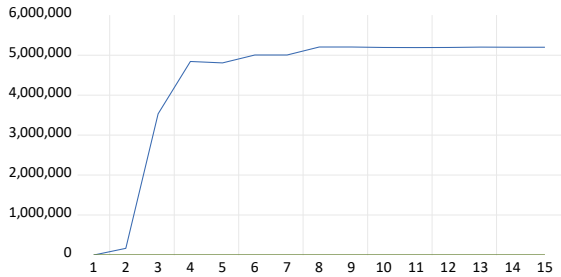
$$\Delta Y_t = -305062277 + 1{,}000000\Delta Y_{t-1} - 177543687\Delta X_{1(t-1)} + 61597{,}47\Delta X_{2(t-1)} - 28792{,}44\Delta X_{3(t-1)} - 84085431\Delta X_{4(t-1)}$$

Impulse Response Function (IRF)

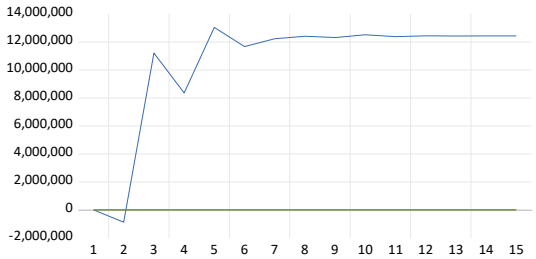
Impulse Response Function (IRF) is used to describe the level of shock rate of the variables used in the research. In this way, the duration of the impact of a disturbance (shock) on another variable until the effect disappears or returns to the balance point can be seen. The Impulse Response Function provides an illustration of how a variable will respond in the future if there is a disturbance in another variable. To facilitate interpretation, the analysis results are presented in graphical form below in 15 periods. The results of this test are in the form of a graph where the response graph will show the positive or negative response of the variables used. The results of the Impulse Response Function (IRF) can be seen as follows:



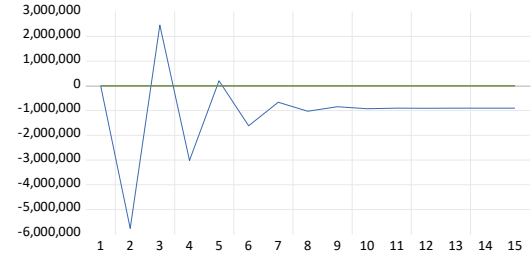
Response of Export Volume to X1



Response of Export Volume to X2



Response of Export Volume to X3



Response of Export Volume to X4

Figure 3. Graph of Impulse Response Function (IRF) Results

Variance Decomposition (VD)

After analyzing dynamic behavior through Impluse Response, we will then look at the model characteristics through variance decomposition. Variance Decomposition (VD) analysis is used to explain the contribution of each variable to the shocks it causes to the main observed endogenous variables. The variance decomposition procedure is by measuring the percentage of surprises for each variable. The following are the results of the Variance Decomposition analysis to see the influence of international cocoa price variables, exchange rates, Malaysian GDP per capita, and inflation on the volume of Indonesian cocoa bean exports to Malaysia.

Table 10. VD Results on Cocoa Bean Export Volume Levels

Period	S.E	Y	X1	X2	X3	X4
1	25762509	100,0000	0.000000	0.000000	0.000000	0.000000
2	37876013	83.45416	13.06137	0.001928	0.054252	1.465890
3	57924884	76.64858	7.616386	0.372959	3.772632	0.982410
4	72269262	74.28172	8.164094	0.688864	3.762242	0.836781
5	87178325	71.36239	7.817111	0.777352	4.824243	0.626444
6	99832874	70.30353	7.843800	0.844129	5.047146	0.525280
7	1.11E+08	69.34494	7.872299	0.881687	5.270891	0.437137
8	1.22E+08	68.77619	7.809540	0.918351	5.436505	0.379290
9	1.31E+08	68.32538	7.812891	0.945288	5.545630	0.334043
10	1.41E+08	67.97730	7.794292	0.963678	5.646014	0.299997
11	1.49E+08	67.71692	7.792473	0.978283	5.711475	0.272748
12	1.57E+08	67.50133	7.786047	0.989849	5.769027	0.250628
13	1.65E+08	67.32900	7.780573	0.999760	5.814631	0.232280
14	1.72E+08	67.18267	7.776913	1.007907	5.853321	0.216843
15	1.79E+08	67.05957	7.773270	1.014759	5.886168	0.203692

Source: Secondary data (processed, 2023)

Based on the table above, it explains the VD test results in the first period, the export volume of cocoa beans was influenced by the export volume itself. Meanwhile, in the first period the variables of international cocoa bean prices, exchange rates, Malaysian GDP per capita and inflation had no influence on export volume. As the period increases, other variables begin to influence, although the magnitude is not as large as the influence of export volume. The international cocoa bean price variable has the second largest influence after the export volume variable. This variable contributed 13.06% and decreased in the 3rd period, then increased again in the 4th period to 8.16%. However, in the 5th to 15th periods, the contribution of international cocoa bean prices fell again with a large shock reaching 7.77% at the end of the period. The Malaysian GDP per capita variable is in second place which contributes to export volume, namely 0.05% in the 2nd period and increased until the end of the period by 5.89%. Furthermore, in third place, the exchange rate variable contributed to the export volume of 0.002% in the second period and increased until the end of the period by 1.01%. The inflation variable had the smallest influence on export volume of 1.46% in the second period and then continued to decline until the end of the period by 0.2%.

3.3. Alternative Actions to Increase Indonesian Cocoa Bean Exports

Based on the research results above, it was found that the international cocoa bean price variable had a significant negative effect in the long term. This is in accordance with demand theory, namely that when the price of an item increases, the quantity of the item demanded will decrease. Rising prices on the international market will result in Indonesia offering its products, but this is not followed by high demand from importing countries because rising prices result in the volume of Indonesian cocoa bean exports decreasing. This influence is an impact as a result of the

interaction between demand and supply of exports in the international market. The increase in prices on the international market was also caused by Minister of Finance Regulation no. 67/PMK.011/ 2010, starting in 2010. Indonesia implemented a policy of export duties on cocoa beans of up to 15%(AT Suryana et al., 2014). This policy causes losses to cocoa producers (exporters). For cocoa exporters, the losses can be passed on to farmers, so that cocoa bean production also decreases. As a result, Indonesian cocoa exports experience a decline every year. In fact, one of the requirements for export activities is to meet the needs of the domestic market. So what can be done is to provide subsidies for environmentally friendly fertilizers, seeds and pesticides to local cocoa farmers so that their selling prices can be competitive in the international market, especially Malaysia because this is an attraction for Indonesian cocoa in the international market where importing countries can get their needs. at low prices. This is in line with research(A. Suryana et al., 2015) that Indonesian cocoa exports in the form of beans have the highest competitiveness compared to cocoa in processed form.

The results of this research also show that the exchange rate against the US Dollar has a significant positive effect in the long and short term on the volume of Indonesian cocoa bean exports to Malaysia. This states that the depreciation and appreciation of the exchange rate against the US Dollar greatly affects the volume of Indonesian cocoa bean exports. If the rupiah exchange rate against the US Dollar weakens, it will cause higher prices and the value of exports to be obtained, so that the volume of exports increases. Therefore, export players must be able to take advantage of the situation to increase their export volume in order to improve the country's economy. The real exchange rate of the Rupiah against the US Dollar must be maintained at the right level, so that the Indonesian economy remains stable at a macro level. The results of this research also show that the influence of inflation is significant on export volume in both the long and short term with a significant negative impact on the export volume of Indonesian cocoa beans to Malaysia. This is in accordance with Ball's theory which states "when inflation is high, the price of goods offered by a country increases, so that these goods become less competitive and can reduce exports". Efforts that can be made to reduce the inflation rate include implementing modern agricultural programs and technology to increase the productivity of cocoa plantations and providing training to farmers in implementing efficient and sustainable agricultural practices. So this can increase cocoa production and productivity, thereby helping reduce inflationary pressures. By increasing the supply of goods and services, demand can be met without causing significant price pressure(Rangkuti, 2023).

4. CONCLUSION

Based on the research results, the following conclusions can be drawn.

1. The development of Indonesia's cocoa bean export volume from 2000 to 2022 is experiencing a downward trend.
2. The variables of international cocoa bean prices, exchange rates, Malaysia's GDP per capita, and the inflation rate together significantly influence the volume of Indonesian cocoa bean exports to Malaysia. In the long and short term the exchange rate variable shows a significant positive influence, the inflation variable in the long and short term shows a significant negative influence, the international cocoa bean price variable only has a significant negative influence in the long term, while the Malaysian GDP per capita variable shows no significant influence on volume. export of Indonesian cocoa beans to Malaysia.

REFERENCES

Arianda, ME, Nugroho, A., & Deli, A. (2022). Analysis of Intra-Industry Trade in Indonesian and Malaysian Cocoa Commodities. Agricultural Student Scientific Journal, 7(1), 150–160.

Basuki, AT, & Prawoto, N. (2016). Regression Analysis in Economics and Business Research. PT Raja Grafindo Persada.

BPS. (2021). Indonesian Cocoa Statistics 2021 (H. and P. Directorate of Food Crop Statistics, Ed.). BPS RI.

Faizin, Moh. (2020). Application of the Vector Error Correction Model to Macroeconomic Variables in Indonesia. Journal of Economics, 25(2), 287. https://doi.org/10.24912/je.v25i2.671

Hasmiani. (2023). Analysis of Factors that Influence the Export Volume of Indonesian Cocoa Beans in the International Market. Jambi University.

Indrajaya, D. (2021). Analysis of Cointegration and VECM of FDI, Labor Force, Government Expenditure and GDP in Indonesia (2005-2019). International Journal of Economics Development Research, 2(1), 65–77.

Republic of Indonesia Ministry of Agriculture. (2022). Agricultural Sector GDP Analysis in 2022 (Mas'ud & S. Wahyuningsih, Eds.). Ministry of Agriculture's Center for Agricultural Data and Information Systems.

Rangkuti, M. (2023). How to Prevent and Overcome Inflation. UMSU Faculty of Economics and Business. https://feb.umsu.ac.id/cara-precede-dan-mengatasi-inflasi/

Sadya, S. (2023, May). Indonesian Cocoa Exports Will Reach 385,981 Tons in 2022. DataIndonesia.Id. https://dataindonesia.id/agribisnis-kehutanan/detail/ekspor-kakao-indonesia-soleh-385981-ton-pada-2022

Suryana, A., Fariyanti, A., & Rifin, A. (2015). Competitiveness of Indonesian Cocoa in the International Market. Journal of Management and Agribusiness.

Suryana, AT, Fariyanti, A., & Rifin, A. (2014). Analysis of Indonesian Cocoa Trade in the International Market. Journal of Industrial and Refreshing Plants, 1(1), 29. https://doi.org/10.21082/jtidp.v1n1.2014.p29-40

Wahyudi, T., Panggabean, T., & Pujianto. (2009). Complete guide to cocoa, agribusiness management from upstream to downstream (2nd ed.). Self-Help Spreader.

Wijaya, S. (2023). National Cocoa Production in Indonesia Continues to Decline. Medan Area University Faculty of Agriculture. https://pertanian.uma.ac.id/produk-kakao-di-indonesia-cepat-nasional-terus-merosot/#:~:text=Satu%20Sindra%20Wijaya%2C%20pelaku%20industri,217%20kg%2Fhectare%2Fyear.

Yusuf, & Widyastutik. (2007). Analysis of the Effect of Export-Import of Main Food Commodities and Trade Liberalization on Indonesia's Trade Balance. Journal of Agribusiness Management, 4(1), 46–56.