Analysis Of Factors Influencing The Volume Of Cocoa Bean Exports In Indonesia

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Abstract. *Cocoa is one of the plantation commodities that plays an important role in economic activities in Indonesia. Cocoa commodities have export market opportunities, so they can increase foreign exchange. This study aims to analyze the amount of production, international prices and land area that affect the volume of cocoa bean exports in Indonesia. The data used in this study are time series data from 1990 to 2022. The data analysis techniques used in the study are multiple linear regression analysis, classical assumption test, F test and T test. The results of the study found that simultaneously the variables of production, international prices, and land area have a significant effect on the volume of cocoa bean exports in Indonesia. Partially, the variables of production and international prices have a positive and significant effect on the volume of cocoa bean exports in Indonesia, while the partial variable of land area has a negative effect on the volume of cocoa bean exports in Indonesia. The results of this study can provide a basis for designing policies and strategies that support increasing the volume of cocoa exports in Indonesia for stakeholders, including the government, farmers, and exporters. The government needs to formulate policies that support increasing the area of land and productivity of cocoa.*

Keywords: Export, Production, International Price, Land Area.

INTRODUCTION

International trade is one type of trade activity, namely the business of buying and selling goods or services that are carried out continuously in order to gain profit by crossing customs areas based on applicable provisions (Heliati, 2013). The occurrence of international trade cannot be avoided by any country, because each country has advantages and disadvantages in one of the natural resources such as geographical conditions, climate, technology, economic structure, labor specifications, social, and politics. Because of the differences, each country will produce different goods, so that the country will trade to meet its needs. International trade is often associated with export and import trade. Export volume can be considered as one of the important macroeconomic measures of a country's development (Azadeh and Ashkan, 2015).

Economic development that occurs in the economic sector is a process of export-import of goods and services produced by a country exported to other countries so that by doing so it can increase the rate of economic growth for exporting countries, this happens because each country needs cooperation to show its economy (Batubara and Saskara, 2015). Exports are goods and services sold to foreign countries to be exchanged for other goods (products or money). Until now, exports have played a role in expanding market share and generating foreign exchange to increase

a country's income. Indonesia always strives to increase exports so that Indonesia's economic growth remains stable, so that Indonesia's export value is now increasing due to the large demand from other countries (Safitri, et al., 2014). Exports in Indonesia are divided into two parts, namely oil and gas exports and non-oil and gas exports.

Indonesia is an agricultural country with natural conditions that are potential for developing crops in the agricultural sector that produce various types of commodities, one of which is a plantation commodity, namely the Cocoa plant. The cocoa plant is one of the plantation commodities that is very suitable for the climate and soil types of Indonesia, so that Indonesia can produce and produce cocoa (Puspita et al., 2015). Cocoa is one of the plantation commodities that has a fairly important role in economic activities in Indonesia. Cocoa commodities are one of the many plants that have quite large opportunities for trade, both domestically and abroad. Cocoa commodities have export market opportunities, so they can increase the country's foreign exchange. Cocoa commodities consistently play a role as a source of foreign exchange for the country which makes a very important contribution to the structure of the Indonesian economy (Arsyad et al., 2011).

Based on the publication of the Directorate General of Plantations, cocoa contributed foreign exchange of US$ 1.24 billion, which is the third largest after palm oil and rubber or 4.41% of total plantation commodity exports. Indonesia is the third largest cocoa producing country in the world after Ghana and Ivory Coast. Cocoa is a major commodity for central African countries such as Ivory Coast and Ghana (Aikpokpodion, 2010). The government together with national cocoa stakeholders continue to strive to make improvements from upstream to downstream to improve the quality and productivity of Indonesian cocoa. According to the Decree of the Minister of Agriculture Number 3470/Kpts/PD.320/10/2012, which stipulates September 16 as Indonesian Cocoa Day, this annual commemoration aims to improve the welfare of plantations and improve the reputation of Indonesian cocoa from upstream to downstream (Directorate General of Plantations, 2019).

Cocoa is a plantation crop that is famous for its processed fruit. Chocolate paste, chocolate bars, and chocolate powder are some of the popular processed cocoa beans. In addition to chocolate, there are other types of processed products. In efforts to develop regions and agro-industry in Indonesia, cocoa commodities are recorded as participating in it (Puspita et al., 2015). Processed cocoa beans or cocoa powder are processed products from cocoa beans that are widely

used in the food and beverage industry. This product has a fairly high economic value and its demand continues to increase in the international market. Indonesia is one of the largest cocoa bean producers in the world, but is still relatively minimal in the production of processed cocoa beans. In fact, the export market for processed cocoa beans has great potential to be developed and become one of the country's significant sources of foreign exchange. In addition, cocoa also has a strategic role in the global economy because it is used as the main raw material in the chocolate industry which has great economic value.

Based on data from the International Cocoa Organization (ICCO) in 2021/2022, Indonesia is ranked 6th as the largest cocoa exporting country in the world (Ministry of Industry, 2022). In addition to increasingly open export opportunities, the domestic cocoa bean market is still quite large. Cocoa beans will be processed into products commonly known as chocolate. Indonesia, which has a very large area of land that is capable of exporting cocoa beans to many countries, is the sixth largest producer of chocolate raw materials in the world, but Indonesia cannot produce the best chocolate like Switzerland and none of this country's chocolate products are famous in the world. Switzerland, which does not have land to produce cocoa beans, can produce the best and highest quality chocolate in the world. There are many famous brands that we can find all over the world and their factory headquarters are in this country, namely Nestle, Delfi, Toblerone, Lindt, Sprungli or Suchard (Kabaremagz, 2014:13). In terms of quality, Indonesian cocoa is not inferior to other cocoa in the world if fermented properly, it can have the same taste as Ghanaian cocoa. Indonesian cocoa is very much needed in the chocolate processing industry, especially for the cosmetics and pharmaceutical industries. Because of its advantages, although it tastes a bit sour due to the low content of free fatty acids (FFA), this cocoa is very much needed. In line with these advantages, the Indonesian cocoa market has quite a large opportunity for export and domestic needs. In other words, there is a great possibility to use the cocoa industry as one of the drivers of economic growth and income distribution (Ministry of Industry, 2007).

Table 1. Development of Volume and Value of Indonesian Cocoa Bean Exports 2013-2022

Year	Volume (Tons)	Value (1,000 US$)
2013	414,092	1,151,481
2014	333,679	1,244,530
2015	355,321	1,307,771

2016	330,029	1,239,581
2017	354,880	1,120,765
2018	380,827	1,245,794
2019	358,481	1,198,734
2020	377,849	1,244,184
2021	382,712	1,206,775
2022	385,421	1,259,655

Source: Central Bureau of Statistics, 2023

Cocoa exports in terms of volume and value have fluctuated over the past five years. In 2018, the volume of cocoa exports reached 380,827 tons with a total value of around US$1.25 billion. Then in 2019 it decreased to 358,481 tons with a total value of around US$1.20 billion. Furthermore, the volume of cocoa exports continued to increase until in 2022 it reached 385,421 tons with a total value of around US$1.26 billion. However, in 2021, the increase in the volume of cocoa exports was not followed by the export value, where the value of cocoa exports actually decreased by 3.01 percent from 2020 (Central Statistics Agency, 2023). When Indonesia's cocoa exports increase in both volume and value every year, this shows that there is great potential in the international market. Indonesia can take advantage of this potential to increase cocoa exports, so it is necessary to know the factors that drive Indonesia's cocoa exports in the international market.

The increase in the value of Indonesian cocoa exports is driven by many factors. Some of them are land area, production volume, international prices, exchange rates, foreign demand, and climate differences. This study will focus on examining the amount of production, international prices, and land area. The reason researchers chose the Production Amount variable is because the amount of Indonesian Cocoa Production fluctuates up and down due to the increasing area of land or the increase in pests and diseases in cocoa trees which results in a decrease in the amount of Indonesian Cocoa production. The reason researchers chose the International Price variable is because the Price is determined by the amount of supply and demand for the Cocoa. The more foreign supply of the amount of cocoa, the price of cocoa on the international market will increase.

Most of Indonesia's cocoa production is exported abroad and the rest is marketed domestically. Indonesia's cocoa exports reach five continents, namely Asia, Africa, Australia, America, and Europe with the main share in Asia. In 2022, the top five destination countries for Indonesia's cocoa exports are India, the United States, Malaysia, China, and Australia. Total cocoa

exports to these five countries reached 56.68 percent of Indonesia's total cocoa exports (Central Statistics Agency, 2023).

Table 2. Comparison of Cocoa Export Volume by Destination Country, 2022

No	Country of destination	Weight (tons)	%
1.	India	68.21	17.7
2.	United States of America	48.16	12.5
3.	Malaysia	47.03	12.2
4.	China	36.74	9.5
5.	Australia	18.32	4.8

Source: Central Bureau of Statistics, 2023

Table 2 shows that the largest cocoa export destination country in 2022 is India with an export volume of 68.21 thousand tons or around 17.70 percent of Indonesia's total cocoa export volume with a value of US$210.91 million. Furthermore, cocoa is mostly exported to the United States and Malaysia with export contributions of 12.49 percent and 12.20 percent respectively to Indonesia's total cocoa export volume.

High chocolate consumption in the European Union attracts world cocoa producing countries, including Indonesia. This may provide an opportunity for Indonesian cocoa products to be sold in Europe. The Ministry of Agriculture continues to carry out diplomatic cooperation and trade efforts through the Indonesia-European United Comprehensive Economic Partnership Agreement (IEU-CEPA) diplomatic forum. This will reduce cocoa tariffs in Europe while increasing consumption of processed Indonesian cocoa in European countries. According to the Directorate General of Plantations (2019), countries in the African continent such as Egypt, which are interested in cocoa powder from Indonesia, are another potential market share for market penetration of processed cocoa commodities. In terms of quality, Indonesian cocoa is not inferior to world cocoa where if fermented properly it can achieve a taste that is equivalent to cocoa from Ghana because Indonesian cocoa has the advantage of not melting easily. The market opportunities for Indonesian cocoa are quite open for both exports and domestic needs. In other words, the potential to use the cocoa industry as one of the drivers of needs and income distribution is quite open. The development of Indonesian cocoa bean production is shown in Table 3

Table 3. Indonesian Cocoa Bean Production 2013-2022

Year	Production (Tons)	Growth (%)
2013	720,862	
2014	728,414	1.05
2015	593,331	-18.54
2016	658,399	10.97
2017	585,246	-10.28
2018	767,280	29.90
2019	734,795	-4.23
2020	720,660	-1.92
2021	688.210	-7.05
2022	650,612	-5.46

Source: Central Bureau of Statistics, 2023

Cocoa bean production in Indonesia has continued to decline in the last five years. Based on the report of the Central Statistics Agency (BPS). The development of cocoa bean production in Indonesia in the period 2013-2022 fluctuated with an average growth of slightly increasing by 0.96% per year. In 2022, Indonesia's cocoa bean production was 650,612. This volume decreased by 5.46% compared to the previous year. The decline in cocoa bean production has also occurred five times in a row since 2018, as seen in the table. Indonesia's largest cocoa bean production was recorded in 2018, reaching 767,280 tons. Meanwhile, the lowest cocoa bean production was recorded in 2022. The fluctuation of cocoa exports can be influenced by the amount of production. When production increases, exports also increase (Ariningsih, 2014). Production is a factor that can affect the amount of exports. An increase in production will increase export volume, likewise a decrease in production will decrease export volume (Zakariya et al., 2016).

In addition to production factors, there are other factors that can affect Indonesian cocoa exports, namely international cocoa prices. Increasing exports is closely related to prices, as with the law of supply, namely if the price of a commodity increases, the goods offered will increase. This means that the higher the price of a commodity, the more the amount offered by the seller.

Table 4. World Cocoa Prices 2013-2022

No	Year	Price (US$/Ton)
1	2013	2,441.6
2	2014	3,065.2
3	2015	3,138.1
4	2016	2,893.1
5	2017	2,030.3
6	2018	2,292.9
7	2019	2,341.2
8	2020	2,367.0
9	2021	2,427.2
10	2022	2,368.4

Source: International Cocoa Organization (2022)

Based on ICCO 2022 data, the world cocoa price in the last five years 2018-2022 has been relatively volatile. Judging from the highest cocoa price in 2022 at $2,455.80. However, there was a decline in 2021, previously in 2020 the cocoa price reached $2,407.20 before finally decreasing to $2,384.98 in 2021. In 2018 the world cocoa price was at its lowest price, namely $2,208.41.

In addition to the price, land area also affects exports. Production will increase with land expansion, if local needs are no longer met, then there will be exports. As stated by Suresmiathi et al (2015), the more land used in the plantation industry, the higher the production results produced. Therefore, along with increased production, export volume will also increase.

Table 5. Development of Cocoa Plantation Area 2013-2022

Year	Land Area (Ha)	Growth (%)
2013	1,740,612	
2014	1,727,437	-0.76
2015	1,709,284	-1.05
2016	1,720,773	0.67
2017	1,653,116	-3.62
2018	1,611,014	-2.86
2019	1,560,945	-3.11
2020	1,508,955	-3.33
2021	1,460,396	-2.00
2022	1,421,009	-2.17

Source: Central Bureau of Statistics, 2023

The area of cocoa in Indonesia has decreased by -1.80% per year between 2013 and 2022. In 2013, the area of cocoa reached 1.74 million ha, but in 2022, the area of cocoa fell to 1.42 million ha, or decreased by 319 thousand ha, compared to the area of Plantation in 2021. The highest area expansion was only recorded in 2016, with a growth of 0.67% compared to the previous year, but the lowest growth occurred in 2017 at -3.62%. This decline was partly due to the conversion of land to other commodities which were considered to provide greater profits (Central Statistics Agency, 2022).

Cocoa plantations are spread across all provinces in Indonesia, except for DKI Jakarta Province. Of the 33 provinces, Central Sulawesi Province is still the province with the largest cocoa plantation area in Indonesia, reaching 274,003 hectares in 2022 or around 19.28% of the total cocoa plantation area in Indonesia. Southeast Sulawesi Province follows with a total area of 227,029 hectares (15.98%), followed by South Sulawesi Province with 179,564 hectares (12.64%), West Sulawesi Province with 142,319 hectares (10.02%), and Aceh Province with 94,631 hectares (6.66%). The area of cocoa plantations according to business status in 2022 did not show any significant changes compared to the previous year. Like in 2021, control of the area of cocoa plantations was dominated by Smallholder Plantations, which was 1.42 million hectares or 99.63%. Furthermore, Large Private Plantations control around 4,995 hectares or 0.35% of cocoa plantations. The remaining 264 hectares or 0.02% of cocoa plantations are controlled by Large State Plantations (Central Statistics Agency, 2022).

Based on the background and problems that have been explained, it is deemed necessary to conduct a study related to "Analysis of Factors Affecting the Volume of Cocoa Bean Exports in Indonesia for the Period 1990-2022"

RESEARCH METHODS

This study uses qualitative and quantitative approaches. To explain the development of cocoa bean exports in several export destination countries using a qualitative approach while to explain the factors that influence the demand for cocoa bean exports using a quantitative approach based on statistical information. According to (Sugiyono, 2016:8) quantitative research methods are methods based on the philosophy of positivism, used to research certain populations and samples, sampling techniques are generally carried out randomly, data collection using research instruments, data analysis is quantitative or statistical in nature with the aim of testing the

hypothesis that has been applied. This study analyzes variables using multiple linear regression techniques. In this study, Production (X1), Price (X2), and Land area (X3) are used as measuring tools to determine how much influence they have on the Volume of Cocoa Bean Exports in Indonesia (Y) in 1993-2022.

This research was conducted in the Republic of Indonesia using data issued and published by the Central Statistics Agency, the Directorate General of Plantations, the International Cocoa Organization (ICCO), and from other sources related to the research object. Where the location of this research was chosen because Indonesia is one of the largest cocoa bean producing and exporting countries in the world. This study uses time series data. Time series data is data obtained from observation data of an object from several time periods. The number of observations in this study uses data from the years in Indonesia with a time span of 1990-2022, so the number of observations in this study is 33 years of observation.

The data collection technique used in this study is non-participatory observation. The data collected in this study is non-participatory observation, namely the researcher is not directly involved as an independent observer. Data is accessed from the Central Statistics Agency, Directorate General of Plantations, International Cocoa Organization (ICCO), literature books, journals and other research results in the period 1990-2022. The analysis method used in this study is the multiple linear regression analysis method to measure the effect of independent variables on the dependent variable. The data used are analyzed quantitatively with a statistical analysis model, namely the multiple linear regression equation.

RESULTS AND DISCUSSION
Inferential Analysis of Research Data
Classical Assumption Test Results
Normality Test

Table 6. Normality Test Results

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		33
Normal Parametersa,b	Mean	.0000000
	Std. Deviation	57462.853079
Most Extreme Differences	Absolute	.091
	Positive	.091
	Negative	-.072
Test Statistics		.091
Asymp. Sig. (2-tailed)c		.200d
Monte Carlo Sig. (2-tailed)eSig.		.691
99% Confidence IntervalLower Bound		.679
Upper Bound		.703

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Source: Appendix 2 (processed data)

Multicollinearity Test

Table 7. Multicollinearity Test Results

Coefficientsa

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	119319.849	5170.483		23,077	<.001		
	Production	.681	.017	1.276	39.111	<.001	.239	4.192
	Price	.029	.008	.158	3,567	.001	.129	7,760
	Land area	-.121	.008	-.847	-16,054	.342	.140	7.129

a. Dependent Variable: Export

Source: Appendix 2 (processed data)

Table 7 shows that the VIF value for the production variable (X1), international price (X2), and land area (X3) is less than 10 and the tolerance value is greater than 0.1. So, it can be concluded that this study does not experience multicollinearity symptoms.

Autocorrelation Test

Table 8. Autocorrelation Test Results

Model	R	R Square	djusted R Square	. Error of the Estimate	Durbin-Watson
1	.796a	.793	.792	10224.984	1,810

a. Predictors: (Constant), Land Area, Production, Price

b. Dependent Variable: Export

Source: Appendix 2 (processed data)

Based on Table 8, the variables studied have a DW value of 1.310, this value when compared with a significance value of 0.05 (5%), the number of samples 33 (n) and the number of independent variables (K = 3), then the numbers obtained dL = 1.268, dU = 1.739 and 4-du = 2.261. By using the Durbin-Watson value analysis, the results obtained dU <dw <4-dU, 1.739 <1.810 <2.261, so it can be concluded that there are no symptoms of autocorrelation in the model.

Heteroscedasticity Test

Table 9. Heteroscedasticity Test Results

Model		Unstandardized'oefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4025.174	2321.769		1,734	.094
	Production	.008	.008	.342	1,070	.293
	Price	-.003	.004	-.382	-.877	.388
	Land area	-.001	.003	-.091	-.175	.862

a. Dependent Variable: ABS_RES

Source: Appendix 2 (processed data)

Table 9 shows the probability value of significance of independent variables of production (X1), international price (X2), and land area (X3) greater than 0.05, which means that there is no symptom of heteroscedasticity. Thus, it can be concluded that in the regression model of this study there is no symptom of heteroscedasticity.

Multiple Linear Analysis Test Results

Table 10. Results of Multiple Linear Analysis

Coefficientsa

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1(Constant)	119319.849	5170.483		23,077	<.001
Production	.681	.017	1.276	39.111	<.001
Price	.029	.008	.158	3,567	.001
Land area	-.121	.008	-.847	-16,054	.342

a. Dependent Variable: Export

Source: Appendix 3 (processed data)

Table 10 shows the results of multiple linear regression analysis, which can be used to create the following equation:

$\hat{Y} = 119319.849 + 0.681$ ....(4.1)

Se = (5170.483)(0.017)(0.008)(0.008)

t = (23.077)(39.111)(3.567)(-16.054)

F = 13.614

$R^2 = 0.793$

From this equation, we can see the magnitude of the influence of each independent variable that has a significant effect on the volume of Indonesian cocoa bean exports for the period 1990-2022:

1) Production (X1)

The regression coefficient of cocoa bean production (X1) of 0.681 means that every 1 ton increase in cocoa bean production will cause an increase in the volume of Indonesian cocoa bean exports of 0.681 tons assuming constant international prices (X2) and land area (X3).

2) International Price (X2)

The regression coefficient of international prices (X2) of 0.029 means that every 1 US$ increase in price will cause an increase in the volume of Indonesian cocoa bean exports of 0.029 tons assuming constant production (X1) and land area (X3).

3) Land Area (X3)

The regression coefficient of land area (X3) of -0.121 means that every 1 Ha increase in land area will cause a decrease in the volume of Indonesian cocoa bean exports of 0.121 tons assuming constant production (X1) and international prices (X2).

Hypothesis Testing

Simultaneous Regression Coefficient Test (F Test)

Table 11. Simultaneous Test Results (F Test)

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.086E+11	3	1.362E+11	13,614	<.001b
	Residual	3031958768.3	29	104550302.36		
	Total	4.116E+11	32			

a. Dependent Variable: Export

b. Predictors: (Constant), Land Area, Production, Price

Source: Appendix 4 (processed data)

a) The influence of production (X1), international prices (X2), and land area (X3) on the volume of cocoa bean exports in Indonesia (Y).

1) Hypothesis Formulation

H0: $\beta1 = \beta2 = \beta3 = 0$, meaning that Production (X1), International Prices (X2), and Land Area (X3) do not have a significant simultaneous effect on the Volume of Indonesian Cocoa Bean Exports.

H1: one of $\beta i \neq 0$ (i=1,2,3), Production (X1), International Price (X2), and Land Area (X3) have a simultaneous and significant effect on the Volume of Indonesian Cocoa Bean Exports.

2) Real Level

The real level used in this study is $\alpha = 5\%$ with the degrees of freedom of the numerator df = (k-1) = (3-1) and the degrees of freedom of the denominator (nk) = (33-4), therefore $=F_{tabel}F_{(0,05)(2)(29)}= 3.33$

3) Determining the size of the F-count

F_{hitung} obtained from the SPSS program regression results of 13.614.

4) Testing Criteria

If > , then H0 is rejected. $F_{hitung} F_{tabel}$

H1 is accepted If ≤ , then H0 is accepted and H1 is rejected. $F_{hitung} F_{tabel}$

5) Conclusion

Based on the SPSS output results of 13.614 more than 3.33, then H0 is rejected and H1 is accepted. This means that the variables Production (X1), International Price (X2), and Land Area (X3) simultaneously have a significant effect on the Volume of Cocoa Bean Exports in Indonesia in 1990-2022. With R^2 0.793, this means that 79 percent of fluctuations in the volume of Indonesian cocoa bean exports are influenced together by the rise and fall of production variables, international prices, and the area of cocoa plantations, while 21 percent is influenced by other variables not included in the research model. $F_{hitung} F_{tabel}$

Partial Regression Coefficient Test (T-Test)

Hypothesis testing or t-test is carried out to determine whether the independent variable has a partial influence on the dependent variable.

a) **The Effect of Production (X1) on the Volume of Cocoa Bean Exports in Indonesia 1990-2022 (Y).**

1) Hypothesis Formulation

H0: β1 = 0 means that cocoa production does not have a positive and significant partial effect on the volume of Indonesian cocoa bean exports.

H1: β1 > 0 means that cocoa production has a positive and significant partial effect on the volume of Indonesian cocoa bean exports.

2) Real Level

The real level is α = 5% = 0.05 with freedom df = (33-3-1) then

F_{tabel} = 1,699.

3) Determining the magnitude of t-count

t_{hitung} obtained from the SPSS program regression results of 39.111.

4) Testing Criteria

H0 is accepted if: ≤ or significant value ≥ α (0.05) $t_{hitung} t_{table}$

H0 is rejected if: $\geq$ or significant $\leq \alpha$ (0.05)t_{hitung} t_{table}

5) Conclusion

The probability value of production < alpha 0.05 is 0.01 < 0.05 and > is 39.11 > 1.699, so H0 is rejected and H1 is accepted, this means that production has a positive and significant partial effect on the volume of cocoa bean exports in Indonesia in 1990-2022.$t_{hitung}t_{table}$

b) **The Influence of International Prices (X2) on the Volume of Cocoa Bean Exports in Indonesia 1990-2022 (Y).**

1) Hypothesis Formulation

H0: $\beta 1 = 0$ means that world cocoa prices do not have a positive and significant partial effect on the volume of Indonesian cocoa bean exports.

H1: $\beta 1 > 0$ means that world cocoa prices have a positive and significant partial effect on the volume of Indonesian cocoa bean exports.

2) Real Level

The real level is $\alpha = 5\% = 0.05$ with freedom df = (31-3-1) then

$t_{tabel}= 1,699$.

3) Determining the magnitude of t-count

T obtained from the SPSS program regression results was 3.567.t_{hitung}

4) Testing Criteria

H0 is accepted if: $\leq$ or significant value $\geq \alpha$ (0.05)t_{hitung} t_{table}

H0 is rejected if: $\geq$ or significant $\leq \alpha$ (0.05).$t_{hitung}t_{table}$

5) Conclusion

The probability value of international prices < alpha 0.05 is 0.01 < 0.05 and > is 3.567 > 1.699, so H0 is rejected and H1 is accepted, this means that international cocoa prices have a positive and significant partial effect on the volume of cocoa bean exports in Indonesia in 1990-2022.$t_{hitung}t_{table}$

c) **The Influence of Land Area (X3) on the Volume of Cocoa Bean Exports in Indonesia 1990-2022 (Y)**

1) Hypothesis Formulation

H0: $\beta 1 = 0$ means that land area does not have a positive and significant partial effect on the volume of Indonesian cocoa bean exports.

H1: $\beta 1 > 0$ means that land area has a positive and significant partial effect on the volume of Indonesian cocoa bean exports.

2) Real Rate

The real level is $\alpha = 5\% = 0.05$ with freedom df = (31-3-1) then = $1.699.t_{table}$

3) Determining the Size t_{hitung}

t_{hitung} obtained from the SPSS program regression results of -16.054.

4) Testing Criteria

H0 is accepted if: $\leq$ or significant value $\geq \alpha$ (0.05) $t_{hitung} t_{table}$

H0 is rejected if: $\geq$ or significant $\leq \alpha$ (0.05). $t_{hitung} t_{table}$

5) Conclusion

The probability value of Land Area > alpha 0.05 is 0.342 > 0.05 and < which is -16.054 < 1.699 then H0 is accepted and H1 is rejected, this means that international cocoa prices do not have a positive and significant partial effect on the volume of cocoa bean exports in Indonesia in 1990-2022. $t_{hitung} t_{tabel}$

Discussion of Research Results

The Influence of Production, International Prices, and Land Area (X) on the Volume of Cocoa Bean Exports in Indonesia 1990-2022 (Y)

The hypothesis states that Production, International Prices, and Land Area simultaneously have a significant effect on the volume of cocoa bean exports in Indonesia in 1990-2022. Based on the results of the F count of 13.614, with a probability value of 0.01, it can be concluded that H0 is rejected and H1 is accepted, which means that the variables Production, International Prices, and Land Area simultaneously have a significant effect on the Volume of Cocoa Bean Exports in Indonesia in 1990-2022. This is in line with previous research conducted by Sani (2022) which stated that Land Area, Rubber Production Amount, Exchange Rate, and International Value simultaneously and significantly affect Indonesian Rubber Exports to Japan. These results mean that Production, International Prices, and Land Area can affect the Volume of Cocoa Bean Exports in Indonesia in 1990-2022.

The Effect of Production (X1) on the Volume of Cocoa Bean Exports in Indonesia 1990-2023 (Y)

The results of the study indicate that production has a positive effect on the volume of cocoa bean exports in Indonesia. The results of the production coefficient of 39.111 and the probability value of 0.01 mean that if there is a one percent increase in production, the volume of cocoa bean exports during 1993-2022 will increase by 39.111 tons assuming other independent variables are constant.

The research hypothesis states that the volume of cocoa bean exports in Indonesia in 1990-2022 has a positive effect in line with previous research conducted by Zakiah (2022) based on the results of the study, it shows that the amount of production has a positive and significant effect on the value of cocoa exports in 2001-2020. In addition, research conducted by Moisseva (2009) states that the amount of production has a direct relationship with exports. This is inseparable from the availability of abundant natural resources and land in Indonesia, as well as the increasing demand for cocoa production. This study shows that the level of cocoa production has a positive impact on the value of cocoa exports from 1990-2022. In other words, if the amount of cocoa production can be increased consistently, the value of cocoa exports can continue to increase. In the context of this study, it shows that the size of the amount of cocoa production in Indonesia will affect the volume of Indonesian cocoa bean exports. Because, if the cocoa production produced is large, the volume of cocoa exports will increase and vice versa, if the cocoa production decreases, the volume of Indonesian cocoa bean exports will decrease.

The Influence of International Prices (X2) on the Volume of Cocoa Bean Exports in Indonesia 1990-2022 (Y)

The results show that international prices have a positive and significant effect on the volume of cocoa bean exports in Indonesia. The results of the international price coefficient of 3.567 and a prob value of 0.01 mean that if there is an increase in international prices by one percent, the volume of Indonesian cocoa bean exports in 1990-2022 will increase by 3.567 tons assuming other independent variables are constant.

In the research hypothesis, it states that the international price of cocoa in 1990-2022 has a positive and significant effect in line with previous research conducted by Hanif (2023) based on the results of the study, it shows that world oil prices partially have a positive and significant effect on the value of Indonesian coal exports. International prices are one of the factors that producers consider to export and make a profit. When prices rise, profits will rise and when international cocoa prices fall, profits will fall. Kotler and Armstrong argue that pricing a

commodity does not always determine the price; there are several underlying strategies, one of which is that setting a high price for a commodity or product will correlate with its quality if the commodity is of high quality, the price will rise, and if the commodity is of low quality, the price will fall. Based on this study, Indonesian cocoa commodities are undoubtedly of high quality; it is ranked third largest in the world, behind Ivory Coast, Ghana, and Indonesia.

The Influence of Land Area (X3) on the Volume of Cocoa Bean Exports in Indonesia 1990-2023 (Y)

The results show that Land Area has a negative effect on the volume of cocoa bean exports in Indonesia in 1990-2022. The results of the coefficient of -16.054 and the probability value of 0.01 mean that if there is an increase in land area by one percent, the volume of cocoa bean exports during 1990-2022 will decrease by -16.054 tons assuming other independent variables are constant.

The research hypothesis states that the area of Indonesian cocoa plantations in 1990-2022 has a negative effect in line with previous research conducted by Nisa (2023) which stated that in the long term the area of land has a negative and significant effect on cocoa exports in Indonesia. Where this is not in accordance with the existing hypothesis. The increasing area of cocoa plantations is not in line with the growth in cocoa bean production, which decreased drastically during the same period in 2017. If examined in more detail, BPS data (2021) shows that during this period, there was an increase in the area of productive plants (TM), an increase in the area of old/damaged plants (TT/TR), and a decrease in cocoa productivity. Between 2008 and 2017, the area of cocoa plantations jumped sharply from 162 thousand ha to 514 thousand ha. On the other hand, the area of old and damaged plants jumped sharply from 162 thousand ha to 514 thousand ha. Another factor that plays a role in the decline in cocoa production is the decline in cocoa productivity. Efforts to increase cocoa production are also faced with the problem of converting cocoa land into other commodity land, such as oil palm and food crops.

CONCLUSION

Based on the research results with data analysis that has been described in the previous chapter regarding the analysis of the influence of production, international prices, and land area on the volume of cocoa bean exports in Indonesia, the following conclusions were obtained:

1) The results of this study indicate that Production Amount, International Price, and Land Area simultaneously have a significant effect on the Export Volume of Cocoa Beans in Indonesia in 1990-2022.

2) The results of this study indicate that the Production Amount (X1) and International Price (X2) partially have a significant effect on the Export Volume of Cocoa Beans in Indonesia in 1990-2022. Meanwhile, the Land Area (X3) partially does not have a significant effect on the Export Volume of Cocoa Beans in Indonesia in 1990-2022.

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