



THE INFLUENCE OF COFFE PLANTATIONS AREA, COFFE PRODUCTION, AND RUPIAH EXCHANGE RATE TOWARDS THE GROWTH OF INDONESIA COFFE EXPORT TO THE UNITED STATES 2000-2021

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ABSTRACT

This study aims to determine the effect of the variable area of coffee plantations, coffee production and the rupiah exchange rate on the growth of Indonesian coffee export to the United States from 2000-2021. This research uses a quantitative approach. By using purposive sampling technique. The analysis method used is multiple linear regression. The results of this study indicate that three of independent variables have a simultaneous effect with dependent variables. The significant negative partial effect of the land area (LA), non significant negative partial effect of the exchange rate (ER) and partial positive significant of the coffee production (CP). Coffee production is dominant variable that affects the dependent variable.

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INTRODUCTION

Coffee is an important economic commodity, many developing countries depend on coffee production. In Tanzania, coffee employs more than 400,000 underprivileged households and contributes more than \$100 million in export earnings (Baffes, 2005). In (Murindahabi, 2019) a 1% increase in coffee

exports can result in GDP growth of 0.0217%. 2016 /2017 ICO (International Coffee Organization) published data explaining that Indonesia ranks fourth as the largest coffee exporting country in the world (Supriyadi, 2018). Meanwhile, in 2021 Indonesia will be in ninth place (Librianty, 2021). This shows a decrease in the growth of Indonesia's coffee exports compared to 4 years ago. Coffee exports have a relatively large long-term impact on economic growth.

America is the largest importing country of raw coffee beans to Indonesia. Indonesia is still more supportive of the export of raw coffee bean products because the structure of the Indonesian coffee processing industry is still not able to stand in a balanced way. Only 20% is processed into preparations such as ground coffee, instant coffee, and mixed coffee. While the other 80% goes into dry coffee beans (Ministry of Industry, 2009). The Indonesian coffee processing industry is still underdeveloped, this is due to economic, technical, and social factors. There are still limitations in information, capital, business management, and most importantly limitations in terms of technology. These factors are the reasons why Indonesia still prioritizes the export of raw coffee beans. America has better coffee processing capabilities than Indonesia. This is of course supported by technological excellence, quality human resources, and the availability of sufficient capital.

From the description above, this is in line with the Heckscher-Ohlin theory of international trade which says that the main determinant in international trade activities is the difference in the prices of various factors of production which include technology, human resource capabilities, costs required in the production process and other. The implementation of international trade is due to differences in comparative advantage between countries. The basis of comparative advantage is the Endowment factor and Intensity factor. Endowment factors are various factors of production owned by a country, while factors that involve technology to support the production process are Intensity factors (Salvatore, 2012).

Research conducted by (Slavova & Georgieva, 2019) explains that coffee production and trade have a significant economic and social contribution to the livelihoods of local farmers. Meanwhile, the European Union is the largest coffee importer in global trade, followed by the United States. Uganda is a country that can reduce its poverty rate through coffee production and the coffee production sector is a promising sector in Uganda (Nugroho, 2022). Besides that, land degradation or damage is a problem that has been felt globally, especially in the 21st century in tropical and subtropical regions. The occurrence of this land damage was accelerated by human intervention which affected 500 million hectares of land in the tropics (Hafif, 2021).

The exchange rate is one of the instruments in international trade whose effect on exports has always been a concern (Dang et al., 2020). The exchange rate is the price of one country's currency against another country's currency

(Krugman et al., 2017). In research (Alegwu, 2018), the exchange rate has a negative long-term effect on all exports of agricultural products and has the strongest influence on coffee and rubber agricultural products. This research has a renewal value, namely using 2000-2021, which in previous studies only reached 2011. In the previous study the variable used was export volume but in this study it used export value. It is hoped that this will provide better insights and results to explain the factors influencing the growth of Indonesian coffee exports to the United States.

Based on some of the phenomena that the author has described, the purpose of this study is the influence of the variable area of coffee plantations, coffee production and the rupiah exchange rate on the growth of Indonesian coffee exports to the United States.

Based on the theory and the phenomena that occur, a theoretical framework can be developed regarding the influence of coffee plantation areas, coffee production, and rupiah exchange rate on the growth of Indonesian coffee exports to the United States in 2000-2021 as follows:

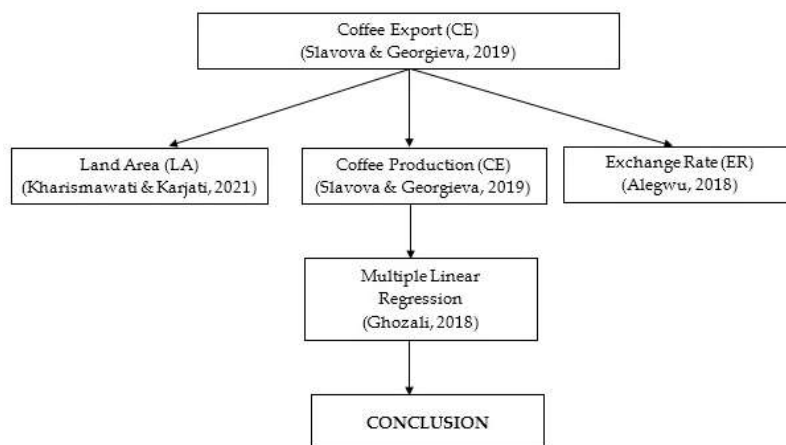


Figure 1

Theoretical Framework

Hypothesis

H1: Land Area (LA) has a significant effect on Coffee Export (CE).

H2 : Coffee Production (CP) has a significant effect on Coffee Export (CE).

H3 : Exchange Rate (ER) has no significant effect on Coffee Export (CE).

H4 : Land Area (LA), Coffee Production (CE), and Exchange Rate (ER) significantly affect Coffee Export (CE).

H5 : Coffee Production is the most dominant variable in influencing Coffee Export.

RESEARCH METHODS

Type and Source of Data

This research use annual data on the growth of Indonesia's coffee exports to the United States in 2000-2021, the area of coffee plantations by large plantations in 2000-2021, coffee production by large plantations in 2000-2021 and the rupiah exchange rate in 2000- 2021. The secondary data used was obtained from the official website of the Central Bureau of Statistics and the website of the Ministry of Trade

Analysis Technique

The analysis technique that will be used is multiple linear regression with an analysis tool in the form of Eviews 10. There are several testing techniques as follows: Classical Assumptions Test (Normality Test, Heteroscedasticity Test, Autocorrelation Test, Multicollinearity Test, and Linearity Test). The method to be used is the least squares method or the method of Ordinary Least Square (OLS). Then to determine the simultaneous effect of the author using the simultaneous F test and to determine the partial effect of each variable, the author used the partial T test. In general, the regression equation in this research is:

$$CE_t = B_0 - B_1 LA_t + B_2 CP_t - B_3 ER_t + \epsilon_t$$

Information:

CE : Coffee Export

LA : Land Area

CP : Coffee Production

ER : Exchange Rate

€ : Error Correction Model

The regression equation above explains that the growth of Indonesia's coffee exports to the United States is influenced by the area of coffee plantations, coffee production and the rupiah exchange rate, and the assumption of other variables outside of the constant research variable (*ceteris paribus*).

RESULTS AND DISCUSSION

Statistical Data Description

procedures that must be carried out to determine the effect of the independent variable on the dependent variable, the classical assumption test must be carried out. the results can be seen in table 1. The table 1 explains that there are a total of 22 data observations in the period studied, namely 2000-2021. The mean value of the variable land area (LA) is 47.79 with a standard deviation of 11.41. The maximum land area value was 63.20 Ha which occurred in 2000 and the lowest land area value was 21.9 in 2020 and the last median value was 48.25.

Table 1. Descriptive Statistical Test Results

	LA	CP	ER	CE
Means	47.79545	25.85182	11007.11	184947.7
Median	48.25000	28.47000	10018.67	185564.9
Maximum	63.20000	37.00000	14625.25	330815.0
Minimum	21.90000	5.600000	8571170	41980.60
std. Dev.	11.41008	7.825804	2180607	87949.47
Probability	0.070577	0.004140	0.234912	0.545464
Observations	22	22	22	22

Source: Results of Data Processing, EViews 10, 2022

The mean value of the coffee production (CP) variable is 25.85 with a standard deviation of 7.82. The highest production value was 37 tons which occurred in 2015 while the lowest production value was 5.6 tons in 2021. The coffee production value has a median value of 28.47. The mean value of the variable exchange rate (ER) is 11007.11 with a standard deviation of 2180.60. The most depreciated exchange rate was at 14625.25 which occurred in 2020 while it strengthened at 8571.17 in 2003. The exchange rate has a median value of 10018.67. The mean value of the variable coffee exports (CE) is 184947.7 with a standard deviation of 87949.47. The highest coffee export value was \$330815 in 2012, while the lowest value was \$41980.6 in 2001. The median value of the coffee export variable was 185564.9

Table 2. Classical Assumption Test Results

Test Requirements Analysis	Test Result
Normality Test	Prob : 0.62 > 0.05
Heteroscedasticity Test	Prob. Chi-Square : 0.17 > 0.05
Multicollinearity Test	Centered VIF LA: 5.46 < 10 CP: 2.78 < 10 ER: 2.77 < 10
Autocorrelation Test	Prob. Chi-Square: 0.39 > 0.05 Durbin-Watson: 1.53 (In between +/-2)
Linearity Test	Prob. F-Statistic: 0.73 > 0.05

Source: Results of Data Processing, EViews 10, 2022

Classical assumption test results based on test results of the normality test, the heteroscedasticity test, multicollinearity test, autocorrelation test, and linearity test have all passed the test.

Table 3. Regression Analysis Results

Variables	coefficient	std. Error	t-Statistics	Prob.
C	425395.5	186853.2	2.276630	0.0353
LA	-9864.404	2675.133	-3.687444	0.0017
CP	10361.51	2787124	3.717633	0.0016
ER	-3.346728	9.987442	-0.335094	0.7414
R-squared	0.602930	Mean dependent var		184947.7
Adjusted R-squared	0.536752	SD dependent var		87949.47
SE of regression	59860.45	Akaike info criterion		25.00039
Sum squared residue	6.45E+10	Schwarz criterion		25.19876
Likelihood logs	-271.0042	Hannan-Quinn criter.		25.04712
F-statistics	9.110696	Durbin-Watson stat		1.539392
Prob(F-statistic)	0.000693			

Source: Results of Data Processing, EViews 10, 2022

From the test results above, we can see that the magnitude of the coefficient of determination (Adj.R²) is 0.536752 (53.67%). This illustrates that the independent variables are jointly able to explain the dependent variable of 53.67%. The other 46.33% is explained by other variables that are not included in the model or explained in terms of error. Based on the results of the F-test analysis in this research, the probability value of the F-Stat was 0.000693 < 0.05 which shows the simultaneous effect of the independent variables on the dependent variable.

Table 3 above can be explained in the equation written as follows:

$$\text{Ekspor Kopi} = 425395.5 - 9864.4 \cdot \text{LA} + 10361.51 \cdot \text{CP} - 3.34 \cdot \text{ER} + e$$

The constant β_0 of 425395.5 illustrates the size of coffee exports if it does not receive the impact of land area (LA), coffee production (CP), and exchange rate (ER). The coefficient of the free variable land area (LA) is - 9864.4 illustrating that when the land area expands by one unit, coffee exports can decrease by 9864.4 assuming the other independent variables remain constant. The regression coefficient of the independent variable coffee production (CP) of 10361.51 illustrates that when coffee production increases by one unit, coffee exports can increase by 10361.51 assuming the other independent variables remain constant. The coefficient of the independent variable exchange rate is - 3.34 illustrating that when the exchange rate increases by one unit, coffee exports can decrease by 3.34 assuming the other independent variables remain constant.

Discussion

Effect of Land Area On Coffee Exports

From the research results, it was found that the variable land area (LA) has a probability value of 0.0017 which is smaller than alpha 0.05, which means

that H₀ is rejected and H_a is accepted. The results of this research indicated that the LA variable (Land Area) had a significant and negative effect on the growth of Indonesian and United States coffee exports. These results are in line with the findings (Kharismawati & Karjati, 2021) which obtained results in the form of paddy land area which has a negative effect on rice production. These results were also supported again by (Juliansyah, 2018) who found similar results, namely the variable land area owned by Indonesia from 1990-2015 showed that land area had a negative effect. With an increase of 1, it can reduce exports. This negative effect of the land area was also found in research results (Putra, 2013) which showed that in the short term land area has an insignificant negative effect. However, if viewed in the long term, the area of land shows a significant negative result on changes in Indonesian tobacco exports to Germany. The same results were also found in research (Yusli, 2019) land area has a significant negative effect on the growth in export volume of cocoa plantation commodities in Indonesia.

This finding is in line with the theory of international trade put forward by Heckscher-Ohlin in which there are differences in the proportions of production factors between countries. When compared to the United States, which incidentally is a developed country, Indonesia will be less competitive in several respects. One of them is in terms of optimizing and using technology to support their production activities. In addition, the results of this research indicate that endowment factors such as production factors such as land, labor, capital, and natural resources owned by Indonesia are still not optimal. So in this research, it is proven that the wider the land owned by Indonesia will result in a decrease in coffee exports. Vice versa, the decreasing area of land will increase coffee exports. The wider the land area, the more precise processing and qualified human resources are needed. With the area of plantation land owned, it does not always increase plantation yields where the wider the land, the more attention, patience, and application of appropriate technology is needed that can balance the processing process so that crop failure does not occur.

The factor of the level of productivity of the soil needs to be considered as well, where the level of productivity of the soil decreases, the results of plants that grow in the land will not be maximized. In (Hafif, 2021) it is stated that land degradation or damage is a problem that has been felt globally, especially in the 21st century in tropical and subtropical regions. The occurrence of this land degradation has been accelerated by a human intervention which has affected 500 million hectares of land in the tropics. Maintaining soil quality is not an easy task. Any activity that causes changes in land use will lead to a decrease in soil quality. This is very difficult to avoid. Several factors play an active role in land conditions such as environmental and natural conditions.

Effect Of Coffee Production On Coffee Exports

the Coffee Production (CP) variable has a probability value of 0.0016 which is smaller than alpha 0.05, which means accepting H_a and rejecting H_0 . These results indicate that the variable CP (Coffee Production) has a significant and positive influence on the growth of Indonesian coffee exports to the United States. The results obtained from this research are in line with the results of research (Puspa Galih, 2011) in this research it was stated that there was a partial influence of the coffee production variable which had a positive and significant effect on the dependent variable, namely Indonesian coffee exports in the 2001-2011 period. The results of this research were also supported by research (Pribadi, 2020) which obtained similar results, where the variable amount of coffee production had a significant effect on Indonesian coffee exports to the United States. In the results obtained in the research (Irmawati & Indrawati, 2022) it was found that the coffee production variable had a significant influence when viewed in the long term.

The research results obtained indicate that increasing production will increase exports. If a country can produce coffee in large quantities, then that country can specialize in this product so that it can help increase Indonesian coffee exports in the international market. This is in line with the Hecksher-Ohlin theory, which states that when a country has relatively large or inexpensive factors of production to encourage its production process, the country will specialize in the production and then export these goods or services. Indonesia is a labor-intensive developing country, which can be proven by the relatively low cost of labor (farmers). The average nominal daily wage received by farm workers in November 2020 increased by 0.15% compared to October 2020, namely from IDR 55,766 to IDR. 55,848. This is of course proof that Indonesia has a low production cost factor so that it can produce a commodity in large quantities and then export it.

In terms of wages, this is inversely proportional to the United States where the income of farmers there is around USD 64,000 or if converted to Rp832 million per year. The United States is a capital-intensive and technology-intensive country. The costs that need to be incurred in producing coffee are very expensive when compared to Indonesia. The United States tends to prefer importing similar goods or commodities from other countries to get cheaper prices compared to producing them themselves (Pribadi, 2020).

Effect of The Rupiah Exchange Rate On Coffee Exports

The Exchange Rate variable has a probability value of 0.7414 which is greater than 0.05 so that it accepts H_0 and rejects H_a . This shows that the variable ER (Exchange Rate) has no significant effect on the growth of Indonesian coffee exports to the United States. These results are supported by the findings obtained in research (Putra, 2021) which show that the short-term estimation of the exchange rate does not significantly affect the model of the

exported coffee commodity. Research that has been conducted (Listiani, 2010) explains the effect of exchange rate volatility on exports in the long run which has different results for all destination markets. A negative effect was obtained for the total volume of exports to the USA, Hong Kong, and Malaysia but had a positive effect on the total volume of exports to Japan and Singapore. This is in line with findings (Alegwu, 2018) which say the exchange rate has a negative long-term effect on all agricultural exports with the strongest effect being on coffee and rubber commodities. In research (Ginting, 2013) exchange rate variables in the short term have a negative effect on Indonesian exports.

The results of this research are in line with what was stated by (Krugman et al., 2017) which defines the exchange rate as the price of a currency from a country expressed in another currency. Exchange rate movements are not only influenced by fundamental factors such as economic growth, the inflation rate, developments in domestic exports, and imports but are also influenced by non-fundamental factors such as the volatility of the US dollar which is still influenced by economic factors and market conditions in the country. The influence caused by the movement of the euro and yuan as well as the movement of regional currencies also took part in the domination of the rupiah movement factor. This research proves that the stronger the condition of the rupiah exchange rate does not always increase exports. The Exchange Rate (ER) variable was less successful in proving a relationship with the coffee exports variable. This is due to the Exchange Rate (ER) variable, there are still other factors that become determining factors for the strengthening or weakening of the rupiah exchange rate.

The Simultaneous Effect of Land Area, Coffee Production, And Exchange Rates On Coffee Exports

Based on the results of the F test in this research, the statistical probability value of F is less than 0.05 which indicates that the variables Land Area (LA), Coffee Production (CP), and Exchange Rate (ER) together affect Coffee Export (CE). From the results that have been obtained, it can be interpreted that with the existence of land area, production, and depreciation of the exchange rate, Indonesian coffee exports to the United States can proceed.

The Most Dominant Independent Variable Influencing The Dependent Variable

The independent variable that is most dominant in influencing Indonesian coffee exports to the United States in this research is the variable that has the largest absolute value of standardized coefficients beta. Based on the results obtained through data analysis, the CP (Coffee Production) variable has the most dominant influence on Indonesian coffee exports to the United States in the 2000-2021 period. This is because production is a determining factor in the emergence of demand from abroad, where when the quality of the

production results is poor or not in accordance with market standards, this will have an impact on the confidence of importers in the coffee production produced by Indonesia.

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

The conclusions that can be drawn by the author based on some of the research results obtained:

1. Land Area (LA) has a negative effect on Coffee Export.
2. Coffee Production (CP) has a positive effect on Coffee Export.
3. Exchange Rate does not affect Coffee Export.
4. Land Area (LA), Coffee Production (CP), and Exchange Rate (ER) jointly influence Coffee Exports.
5. Coffee Production (CP) is the most dominant variable in influencing coffee exports.

Suggestion

By Based on the results that have been described in the discussion above, there are several suggestions that can be made by the government regarding export sector policies for Indonesian coffee commodities. The government and the community can maintain stability in the availability of the area of coffee plantation land with the quantity of production. The government can establish good cooperation with the private sector to encourage the realization of the quality of plantation land in Indonesia. The need for attention and cooperation between the government and coffee farmers to continue evaluating the results of coffee plantations so that they can be used as a basis for renewal ideas that will be implemented in the future and for the realization of coffee standards that are in accordance with the international market. Optimizing the application of post-harvest technology so that coffee production can increase and the quality of production is maintained. In terms of balancing the rupiah exchange rate, the government must be more agile in determining and balancing the economic policies that will be implemented due to the application of the right economic policies.

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