Analysis of determinants of coffee exports in Indonesia

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Abstract

Coffee is one of the plantation commodities that has an important role in economic activities in Indonesia. Coffee is also one of Indonesia's export commodities which is quite important as a foreign exchange earner in addition to the oil and gas sector. During 2005-2018 Indonesia's coffee exports always fluctuated every year. Therefore, there is a need for research on the factors that affect coffee exports. This study aims to analyze the effect of coffee production, plantation area and exchange rate on Indonesian coffee exports. The results show that: 1) During 2005-2018 the value of coffee exports increased by an average of 6% per year, Indonesian coffee production increased by an average of 1.2% annually, the area of coffee plantations decreased by an average of 0.1% annually and the price of the US Dollar increased by 3.1% annually; 2) Partially the variable of coffee production has a significant positive effect on coffee exports, the area of coffee plantations has a significant positive effect on coffee exports, and the exchange rate has a significant positive effect on coffee exports, while simultaneously the variables of the amount of production, the area of the plantation, and the exchange rate have an effect on coffee exports.

Key words: Coffee export; coffee production; land area; exchange rate

INTRODUCTION

Indonesia is an agricultural country that has great potential from the agricultural and plantation sectors, including coffee plantations. Coffee is one of the plantation commodities that has an important role in economic activities in Indonesia. Coffee is also one of Indonesia's export commodities which is quite important as a foreign exchange earner in addition to the oil and gas sector (Ningsih & Dian Dwi Laksani, 2020).

The world's largest coffee producer and coffee contributor is still dominated by Brazil with a total production in 2018 of 3.05 million tons or around 35% of total world production. Then Vietnam supplied 1.76 million tons or about 14% of total world production. Below that, Indonesia and Colombia each account for 6.8% and 6.4% of the world's coffee production. In terms of production and exports of Indonesian coffee, it always fluctuates every year, the following is data on the development of coffee production and exports of Indonesian coffee during 2010-2018 (Badan Pusat Statistika, 2019).

Table 1.

Data on the Development of Indonesian Coffee Production and Exports in 2010-2018

YEAR	TOTAL PRODUCTION (TON)	EXPORT VALUE (000 USD)
2010	686.921	814.311
2011	638.646	1.036.671
2012	691.163	1.249.520
2013	675.881	1.174.029
2014	643.857	1.039.341
2015	639.355	1.197.735
2016	663.871	1.008.549
2017	716.089	1.187.157
2018	756.051	815.993

Source: Badan Pusat Statistika (2019)

Based on table 1, Indonesian coffee production in 2010-2018 experienced an average growth of 1% annually, in 2010 the total production of Indonesian coffee was 687 thousand tons and increased in 2018 to 756 thousand tons. In terms of export value also fluctuated from year to year, the highest export value occurred in 2012 at 1.25 billion USD and the lowest was in 2010 at 814 thousand USD.

In international trade, especially in export activities, one of the factors that affects the high and low of coffee exports is the price. International prices have an influence on the purchasing power of the world's population in consuming coffee. In addition, the exchange rate is also very influential on international trade, because basically international trade transactions use a foreign currency, namely the US Dollar (USD).

Based on the description above, the researcher is interested in studying the analysis of the factors that affect Indonesian coffee exports. The purpose of this study is to analyze the effect of the amount of coffee production, coffee plantation area, world coffee prices, and the exchange rate on Indonesian coffee exports.

METHOD

The type of data used in this study is secondary data for the time series (time series) for the period 2005-2018 including: 1) Indonesian coffee production, 2) Coffee plantation area, 3) International coffee prices, 4) Rupiah exchange rate (exchange rate) against the US Dollar, 5) Indonesian coffee export volume. The data was obtained from the publication of the Indonesian Central Statistics Agency under the title Statistics Indonesia Coffee 2019.

This research is a type of quantitative research using descriptive analysis in presenting an overview of the various variables studied. The analytical tool used to determine the research variables uses multiple linear regression analysis with the application of e-views 10. The multiple linear regression model in this study is as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Information:

Y	= Coffe Export
α	= Constant
X_1	= Total Coffe Production
X_2	= Coffee Plantation
X_3	= Exchange Rate
$β_1$, $β_2$, $β_3$	= Regression Coefficient
e	= Error

RESULTS AND DISCUSSION

Indonesian Coffee Export

Based on data published by BPS, coffee production in Indonesia is used to meet the needs of the domestic and international markets. In international trade activities, coffee is a source of foreign exchange for the country and is a driving force in economic growth with its upstream and downstream industries. The following table shows the development of Indonesian coffee exports from 2005-2018.

Table 2.
Value of Indonesian Coffee Exports in 2005-2018

Year	Export Value (000 Usd)
2005	503.836
2006	586.877
2007	636.319
2008	991.458
2009	814.300
2010	814.311
2011	1.036.671
2012	1.249.520
2013	1.174.029
2014	1.039.341
2015	1.197.735
2016	1.008.549
2017	1.187.157
2018	815.993

Source: BPS, 2019

Based on table 2, it can be seen that during 2005-2018 the value of Indonesian coffee exports always fluctuated. In 2018 the value of coffee exports was 816 thousand USD, in 2017 the export value reached 1.19 billion USD or decreased by 31% from the previous year. For 14 years from 2005-2018 the value of coffee exports increased by an average of 6% per year. The highest export value occurred in 2012 and the lowest was in 2005 with each export value of 1.25 billion USD and 504 thousand USD.

Coffee Production

As one of the world's largest coffee exporters, Indonesia's coffee production always fluctuates every year. This is caused by several factors, including the area of coffee land that always fluctuates, changes in weather, the presence of pests, types of fertilizers, and coffee cultivation techniques applied. The productive age of coffee trees is also considered to affect the productivity of the coffee produced. The development of Indonesian coffee production can be seen in the following table.

Table 3.
Development of Coffee Production in Indonesia for 2005-2018

Year	Total Production (Ton)
2005	640.365
2006	682.158
2007	676.476
2008	698.016
2009	682.690
2010	686.921
2011	638.646
2012	691.163
2013	675.881
2014	643.857
2015	639.355
2016	663.871
2017	716.089
2018	756.051

Sourcer: BPS, 2019

Based on table 3, the amount of coffee production in Indonesia shows an increasing trend every year in 2005, coffee production was 640 thousand tons and increased in 2018 to 756 thousand tons. In a period of 14 years from 2005 to 2018 Indonesian coffee production increased by an average of 1.2% annually. Indonesian coffee production experienced a decline in the period 2013-2015, then in 2016 coffee production again showed an increase of 664 thousand tons although it was still lower than the total production in 2012 which reached 691 thousand tons.

Coffee Plantation Area

According to the status of exploitation, coffee plantations in Indonesia are divided into Large Plantations (PB) and People's Plantations (PR). Large plantations consist of Large State Plantations (PBN) and Large Private Plantations (PBS) spread across various provinces in Indonesia. Based on BPS data in 2018, South Sumatra Province is the largest contributor to coffee plantations in Indonesia with an area of 251 thousand hectares or about 20.3% of the total area of coffee plantations in Indonesia. As with coffee production, the area of coffee plantations in Indonesia also fluctuates every year. The following is data on the development of coffee plantation area in Indonesia.

Table 4.
Data on the Development of Coffee Plantation Area in 2005-2018

Year	Coffe Plantation (HA)
2005	1.255.272
2006	1.308.732
2007	1.295.912
2008	1.295.110
2009	1.266.235
2010	1.210.365
2011	1.233.698
2012	1.235.289
2013	1.241.712
2014	1.230.495
2015	1.230.001
2016	1.251.703
2017	1.238.466
2018	1.252.826

Sumber: BPS, 2019

Based on table 4, the area of coffee plantations in Indonesia shows a decreasing trend every year. In 2006 the coffee plantation area reached 1.30 million hectares, in 2018 it decreased to 1.25 hectares or experienced an average decrease of 0.1% annually.

Exchange Rate

The rupiah exchange rate or exchange rate is the price of one country's currency against another country's currency. The United States Dollar is the currency used in international trade. Along with economic changes in Indonesia and the world, the exchange rate of the United States Dollar has also changed from time to time. Changes in the price of a currency affect international trade activities. When the price of the US Dollar increases, the country will tend to reduce imports of a product and increase exports.

During the period 2005-2018 the US Dollar exchange rate always fluctuated from year to year. When the price of the US dollar has strengthened, it means that the rupiah has decreased and vice versa when the US dollar has decreased, it means that the rupiah has strengthened. Changes in the US Dollar currency exchange rate can be seen in the following table.

Table 5.
Data on US Dollar Exchange Rates against Rupiah

Year	Exchange Rate
2005	9.830
2006	9.020
2007	9.419
2008	10.950
2009	9.400
2010	8.991
2011	9.068
2012	9.670
2013	12.189
2014	12.440
2015	13.795
2016	13.436
2017	13.548
2018	14.481

Sumber: BPS, 2019

Based on table 5 the price of the US Dollar shows an increase every year, in 2005 the US Dollar price reached Rp. 9,830 in 2018 increased to Rp. 14,481. During the period 2005-2018, the price of the US Dollar increased by 3.1% annually. In other words, during 2005-2018 the value of the rupiah currency has always weakened.

Statistic test
t Test

The t-test in multiple linear regression is intended to test how much influence the independent variables partially have on the dependent variable. The way in the t test is to compare if the probability with is 5% and also t count with t table. The decision-making criteria in the t-test are if the probability (significance) > 0.05 (α) or t count < t table, it means that the independent variable has no effect on the dependent variable. Meanwhile, if the probability (significance) < 0.05 (α) or t count > t table, it means that the independent variable has an effect on the dependent variable.

Table 6.
t Test Results

Variable	t-Statistic	t-tabel	Prob.	Kesimpulan
X1	3.065243	2.00665	0.00949	Significant Positive Effect
X2	2.717469	2.00665	0.01166	Significant Positive Effect
X3	2.330769	2.00665	0.02128	Significant Positive Effect

F Test

The F test was conducted to determine whether the independent variables together had an effect or not on the dependent variable. The criteria for making decisions are if F count < F table or probability F statistic > 5%, meaning that the independent variables together have no effect on the dependent

variable. Meanwhile, if F count > F table or probability F statistic < 5%, it means that the independent variables together have an effect on the dependent variable. The results of the F test in this study can be seen in the following table.

Table 7.
F. Test Results

F-statistic	F-tabel	Prob.
13.67589	3.18	0.000271

Based on the results of the F-test, the F-statistical value of 13.68 > F-table of 3.18 and the value of Prob were obtained. F-statistic of 0.000271 < alpha 0.05, it can be concluded that the variables of coffee production, plantation area, and exchange rate simultaneously affect the coffee export variable.

Coefficient of Determination Test

Test of determination to explain how big the proportion of changes in the dependent variable can be explained by the effect of changes in the independent variables. If R^2 is getting closer to 1 (one), then it shows a stronger influence. Vice versa, if it is close to the value of 0 (zero) then the influence caused by the independent variable on the dependent variable is getting weaker. The results of the coefficient of determination test can be seen in the following table.

Table 8.
Results of the Coefficient of Determination

R-squared	0.415299
Adjusted R-squared	0.739889

Based on the results of the coefficient of determination test, the R-squared value is 0.739889 or 73.99%, which means that the variables of coffee production (X1), plantation area (X2), and exchange rate (X3) have a proportion of influence on the coffee export variable (Y) of 73.99%, while the remaining 26.01% is influenced by other variables not included in the regression model.

RESULT AND DISCUSSION

Effect of Total Coffee Production on Coffee Exports

Based on regression analysis, it shows that the amount of coffee production has a significant positive effect on coffee exports in Indonesia. It can be seen from the t-count value of 3.065243 > t-table of 2.00665 and the probability value of t-count of 0.00949 < 0.05 significance level. The estimation results show that the regression coefficient value of the coffee production variable is 1.3, meaning that when there is an increase in the number of coffee production variables by 1%, there will be an increase in coffee exports by 1.3%, assuming the other variables are fixed (ceteris paribus).

The Effect of Plantation Area on Coffee Exports

Based on regression analysis, it shows that the area of coffee plantations has a significant positive effect on coffee exports in Indonesia. It can be seen from the t-count value of 2.717469 > t-table of 2.00665 and the t-count probability value of 0.01166 < 0.05 significance level. The estimation results show that the regression coefficient value of the coffee production variable is 3.8 meaning that when there is an increase in the variable area of the plantation by 1%, there will be an increase in coffee exports by 3.8%, assuming the other variables are fixed (ceteris paribus).

The Effect of Exchange Rates on Coffee Exports

Based on regression analysis, it shows that the exchange rate has a significant positive effect on coffee exports in Indonesia. It can be seen from the t-count value of 2.330769 > t-table of 2.00665 and the t-count probability value of 0.02128 < 0.05 significance level. The estimation results show that the regression coefficient of the exchange rate variable is 4.2, meaning that when there is an increase in the exchange rate of 1%, there will be an increase in coffee exports of 4.2%, assuming the other variables are fixed (ceteris paribus).

Effect of Total Coffee Production, Real Estate Area, and Exchange Rate on Coffee Exports

Based on the results of the F-test, the F-statistical value of 13.68 > F-table of 3.18 and the value of Prob were obtained. F-statistic of 0.000271 < alpha 0.05 which means that the variables of coffee production, plantation area, and the exchange rate simultaneously affect the Indonesian coffee export variables.

CONCLUSION

During 2005-2018 the value of coffee exports increased by an average of 6% per year, Indonesian coffee production increased by an average of 1.2% annually, the area of coffee plantations decreased by an average of 0.1% annually and The price of the US Dollar increased by 3.1% every year.

Partially, the variable amount of coffee production has a significant positive effect on coffee exports, the area of coffee plantations has a significant positive effect on coffee exports, and the exchange rate has a significant positive effect on coffee exports. Meanwhile, simultaneously, the variables of the amount of production, the area of the plantation, and the exchange rate have an effect on coffee exports.

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