

INDONESIAN COFFEE EXPORT ANALYSIS TO GERMANY FROM 1990 TO 2019

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Abstract

Export is the activity of selling goods abroad, one of Indonesia's main export commodities is coffee. Germany is the highest coffee consuming country in the European region, this makes Germany a potential market for Indonesian exports. This study was conducted to determine the factors that affect the volume of Indonesian coffee exports to Germany using quantitative methods and secondary data types in the form of time series from 1990 to 2019. The data sources were obtained from the Directorate General of Plantation (Ditjebun), the Central Statistics Agency (BPS), World Bank, International Coffee Organization (ICO). Multiple regression model with ECM approach was used to analyze the data. The results of this study indicate that in the long term and short term coffee production, German GDP and world coffee prices have an insignificant effect on coffee export activities, but in the short term the coffee production variable has insignificant effect.

Keywords: coffee exports, coffee production, world coffee prices

1. INTRODUCTION

In international trade activities, Indonesia is country that until now the products of agricultural, fishery and forestry sectors are still being used and used as the main export commodities to the international market. This happens because Indonesia has the potential and ability to utilize natural wealth and human resources. Data from Badan Pusat Statistik shows that the main commodities from agricultural sector, processing, non-tsimber forest products, plantations to mining products are the result of the export sector which experined the highest increase during the period 2020.

One of the primary sector commodities that are Indonesia's leading export commodities, one of which comes from the plantation sector, is coffee. Coffee is one type of raw material from plantations in Indonesia that plays a role in the economy, which can contribute in the form of foreign exchange and state revenues, creating new jobs, as a source of income for farmers, growth of the agribusiness industry, to regional development and environmental protection, (Directorate General of Estate Crops, 2019). In the international market, the consumption of coffee basic products is increasing every year.

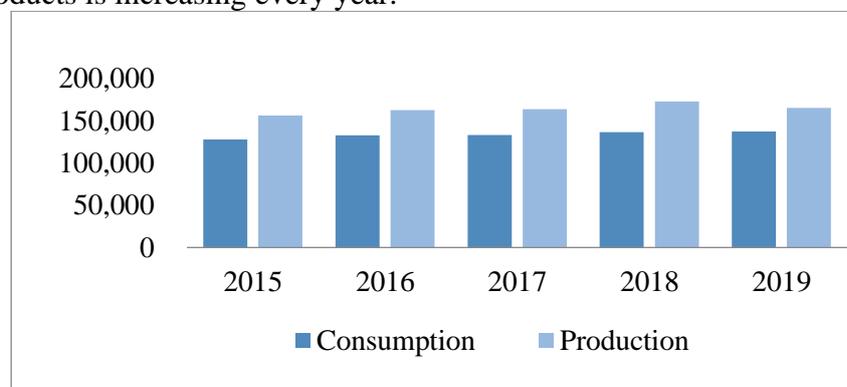


Figure 1. Coffee consumption and production in the world 2015-2019 in 60 kg per bags

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Figure 1 shows that world coffee consumption has increased from year to year. The increase in world coffee consumption is due to the trend of coffee connoisseurs spreading to almost all countries in the world, so that with this number of consumers has also increased, (Rafensca Merry Christa, 2017). In 2019, coffee production tends to decline due to the coffee plant in Brazil being out of its biennial cycle. In this biennial cycle, the first coffee production is usually higher, while the following year is lower.

In the conditional of many coffee lovers from all countries in the world, only a few countries are able to produce coffee, including several countries from Asia, Latin Amerika, Central Amerika Mexico and Africa. This happens because these countries have tropical and subtropical climates which are suitable areas for coffee cultivation. In the world, Indonesia plays a role as the largest coffee producer and exporter. This is evidenced by the table below.

Table 1. Coffee exporting countries in the world 2016-2019 (60 kg per bags)

No	County	Year			
		2016	2017	2018	2019
1	Brazil	34,269,000	30,925,000	35,637,000	40,698,000
2	Vietnam	29,721,000	25,092,000	31,385,000	27,400,000
3	Kolombia	12,831,000	12,985,000	12,808,000	13,672,000
4	Indonesia	6,545,000	8,198,000	4,539,000	6,334,000
5	India	6,086,000	6,542,000	5,967,000	6,028,000

Source : International Coffee Organization, 2021

It can be seen in table 1 that Brazil, Vietnam, Colombia, Indonesia and India are in the order of five countries as the largest to the smallest coffee producing and exporting countries, seen from the amount of coffee produced. From 2016 to 2019, Indonesia became the fourth largest coffee exporter in the world, with the volume of coffee exports fluctuating every year. In 2017, coffee exports from Indonesia experienced the highest increase in the 2016-2019, which in 2016 reached 6,54 million (60 kg per bag) to 8,19 million (60 kg per bag). Then in the following year it decreased to 4,53 million in 2018.

In international trade activities, basically every country producing and exporting certain commodities has a market that is used as a trading destination, especially in the trade of coffee commodities. One of the countries that is the destination for Indonesian coffee exports is Germany because Germany is a country that occupies the third largest position in the world besides Japan and the United States which imports coffee from Indonesia. In addition, Germany is also the largest importer of Indonesian coffee in the European region. This is expected to be a potential and open opportunity for Indonesia to expand its coffee export market to the European Union. However, before increasing exports, exporters must first understand the demand for coffee in the German market based on the volume of their exports, because it is hoped that there will be a balance of supply and demand in international trade, so that there is no excess supply in the export destination country. According to the Kementrian Indonesia, Indonesia's coffee exports to Germany are highly volatile. This can be seen in the following figure.

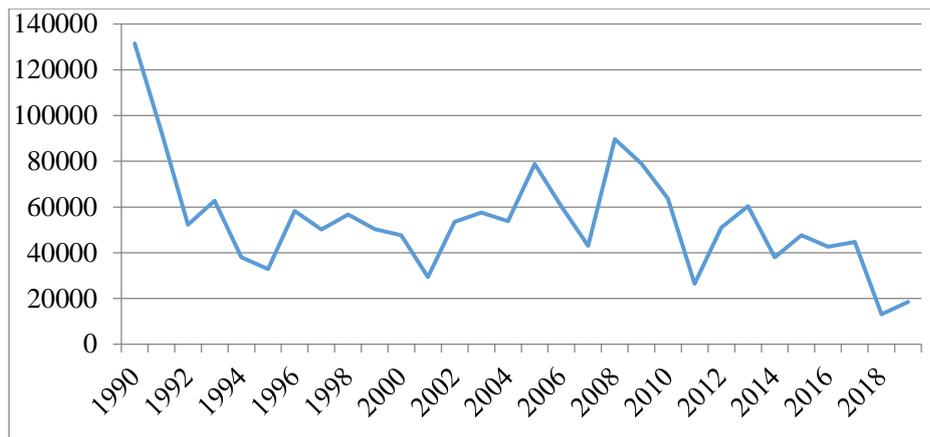


Figure 2. Development of Indonesian coffee export volume to Germany 1990-2019 (tons)

Figure 2 shows that from 1990 to 2019, coffee exports from Indonesia to Germany experienced development and fluctuated every year. The factors that influence the increase or decrease in coffee exports can be seen from the economic aspect, such as the amount of coffee produced by Indonesia, the world coffee price, and the GDP per capita of Germany. Apart from the economic aspect, other factors come from health and the environment.

These factors serve as guidelines for coffee exporters and producers in Indonesia to consider the amount of coffee to be exported to Germany. Among the existing factors, economic factors are considered the easiest to calculate, so this study aims to determine what economic factors affect the volume of coffee exports from Indonesia to Germany.

2. LITERATURE STUDY

International trade is defined as trade activities across or between countries consisting of exports and imports, with the categories of trade in goods and trade in services. Trade in goods will be included in the balance of payments, while trade in services will be included in the balance of services (Tambunan, 2001). Export is defined as the process of legally transferring goods from one country to another, usually as an aspect of trading activity. In export activities there will be a balance between supply and demand that forms the relative price described in the Terms of Trade (TOT). Terms of Trade (TOT) is the ratio of export prices and import prices multiplied by 100%, which occurs when trade between the two countries is in balance or when there is an equilibrium in the international market. The equilibrium in question is that the quantity demanded from the importing country is equal to the quantity supplied by the exporting country (Tambunan, 2001).

The demand for a good is defined as the probable condition of the quantity of the good demanded at a certain price level. The law of demand explains that if the price increases, the quantity of the good will decrease because the quantity depends on the price of the good. According to (Raharja & Manurug, 2008) in addition to the prices of commodity goods, the prices of other goods, both substitutes and complements, GDP, people's tastes, people's habits, price ranges in the future, producer businesses and income distribution are also some of the factors that can affect the magnitude of the request

International Trade and Income Relations

Export and import activities in international trade activities are influenced by income factors. On the import side, an increase in the amount of income will also increase the amount of imports, and a decrease in the amount of income will reduce the amount of imports in a country. Meanwhile, on the export side, when there is an increase in income, it will also have

an impact on increasing the cost of producing export goods. In general, export prices and costs increased but export volumes decreased.

Effect of Price on Consumer Behavior

Price is the amount of money charged by consumers as a form of reward for using or owning a product or service (Kloter, 2001). The formation of international prices in the international market adjusts to movements in the domestic market. Theoretically, the total demand and supply curves can be used in trade to determine the equilibrium relative price (Christa, 2017). In the domestic market, the selling price and the purchase price are the equilibrium prices formed as a result of market mechanisms. Equilibrium price is a price condition when producers and consumers do not wish to increase or decrease the quantity of goods sold or consumed (Raharja & Manurug, 2008). In consumption activities, consumers do not only consider taste but also consider price (Pyndick & Rubinfeld, 2012).

A previous study that discussed coffee exports was conducted by Indah Sri Wulandari (2010) with the aim of research to determine the differences between Indonesian coffee exports and Brazilian coffee, identify the role of variables that influence coffee exports from Indonesia and Brazil in destination countries and compare the results of research that affect the amount of coffee exported to Indonesia and Brazil. This study uses panel data analysis. The results show that the tastes of coffee connoisseurs in the destination country and the price of Brazilian coffee have a positive and significant effect on the amount of coffee export demand, but have a negative correlation with the price of Indonesian coffee, the income of the destination country and distance.

Manalu, et al (2020) conducted a study to observe the things that affect the demand for Indonesian coffee in foreign markets. This study uses time series data from 1995 – 2017 with a data analysis method in the form of a Linear Approximate Almost Ideal Demand System (LA/AIDS) model. As a result, it is known that the price of raw coffee and Carea NTM affects the demand for Indonesian coffee beans in the United States market. The population of Japan, the price of Vietnamese coffee, and Japan's NTR against the dollar have an effect on the Japanese market. Meanwhile, what drives the demand for Indonesian coffee beans in the German market are raw prices and Carea NTM. Judging from the cross-elasticity value, Indonesian coffee is a substitute in the Japanese and German markets, while in the United States it is complementary to Vietnamese coffee.

Sitanini, Sutanto and Wijayanti's research (2020) aims to study and analyze aspects that affect the number of coffee exports from Indonesia to Japan. Through the Error Correction Model (ECM) method, the results show that the increase in population in Japan, world tea prices and the Indonesia Japan Economics Partnership (IJEPA) policy will also increase the volume of coffee exports from Indonesia to Japan, while the variables that reduce the volume of coffee exports from Indonesia to Japan is coffee consumption in Japan, world coffee prices and inflation. The increase in coffee production, Japan's GDP and the exchange rate did not increase or decrease the volume of coffee exports to Japan.

Richie Jeff Komaling (2013) conducted a study to find out the things that affect coffee exports from Indonesia to Germany, using the multiple regression model as the method of data analysis. The result is that Indonesia's coffee export capacity to Germany is significantly influenced by world coffee prices, Germany's per capita income, and coffee consumption in Germany.

Benedicta Rafensca Merry Chista's research (2017) to identify economic aspects that affect the export capacity of Indonesian robusta coffee in the German market. The multiple linear regression model with STATA was chosen to analyze the data, and the results show that the amount of Indonesian coffee exported to the German market is significantly influenced by the total production of robusta coffee in Indonesia, international prices of robusta coffee and GDP

per capita of Germany, while the exchange rate of the rupiah against the US dollar and international cocoa prices have no significant effect. From this research, it is shown that the international price of robusta coffee is the research variable that has the greatest influence on the export of robusta coffee.

Setiawan and Sugiarti's research (2016) aims to examine the competitiveness and determinants of Indonesian coffee exported to the Malaysian market through the CEPT-AFTA scheme. The multiple regression method was chosen by the researchers to see the variables that have an influence on the amount of Indonesian coffee exported in the Malaysian market and the Revealed Comparative Advantage (RCA) method is used for export competitiveness analysis. As a result, it is shown in multiple linear regression analysis that the amount of coffee production in Indonesia, coffee export prices and the rupiah exchange rate against the US dollar are variables that affect the amount of Indonesian coffee exported in the Malaysian market and from the RCA review it is known that coffee from Indonesia is able to compete in the Malaysian market. However, its competitiveness has declined since CEPT-AFTA was enacted. Meanwhile, the variables that have no effect are the CEPT-AFTA dummy and the RCA.

3. METHODOLOGY

The use of quantitative methods used in this study. Quantitative method is defined as a method in research that is based on the principle of positivism, with a quantitative/statistical population or sample as research material in order to test the specified hypothesis (Sugiyono, 2008).

The data sources in this study are secondary data in the form of time series from 1990 to 2019. The data used are sourced from the Direktorat Jenderal Perkebunan (Ditjenbun), Badan Pusat Statistik (BPS), World Bank, International Coffee Organization (ICO), and the use of other literature such as books, journals and articles.

Multiple regression model with Error Correction Model (ECM) method is used in this study to analyze the data. The formation of the ECM model begins with the formation of a long-term equation model based on the applicable theory. In this study, the regression equations we tested were:

$$EKSPOR_t = \beta_0 + \beta_1 PROD_t + \beta_2 GDP_t + \beta_3 HKD_t + et.....(1)$$

Description :

- EKSPOR_t = Indonesian coffee export volume to Germany (tonnes)
- PROD_t = Total Indonesian coffee production (tonnes)
- GDP_t = Germany's GDP (USD)
- HKD_t = World coffee price (USD)
- et = standar error year –t
- β₀ = constant
- β₁- β₄ = estimated coefficient of independent variable

From the above equation, the short run is made. The characteristic of ECM is that the model contains an Error Correction Term (ECT) element. The use of stationary ECT in the long-term equation, not only to identify the presence or absence of cointegration but also to be used as one of the variables in the short-term equation. Statistically, if the ECT coefficient is significant or if the probability value is less than 5%, it can be said that the model is valid, so the short-term equation in this study can be formulated as follows:

$$DEKSPOR_t = \beta_0 + \beta_1 DPROD_t + \beta_2 DGDP_t + \beta_3 DHKD_t + ECT + et(2)$$

Description :

- DEKSPOR_t =Export Volume_t –Export Volume_{t-1}
- DPROD_t =Product_t – Product_{t-1}

- DGDP_t = Germany's GDP_t – Germany's GDP_{t-1}
 DHKD_t = Wrold coffee price_t – World coffee price_{t-1}
 ECT = Res_{t-1}
 et = standar error year –t
 β₀ = Constant
 β₁- β₄ = estimated coefficient of independent variable

4. RESULT AND DISCUSSION

Stationarity Test

Identification of data stationarity is very necessary in analyzing data in the form of time series. It is very likely that the data will be pseudo if the stationarity test is not carried out. This study conducted a stationarity test using Augmented Dickey-Fuller (ADF). The data is said to be stationary if the ADF value is greater than the critical value, but if the ADF value is less than the critical value, the data is said to be non-stationary (Widarjono, 2018). After processing the E-views 10 data, the stationarity test results are shown in Table 2.

Table 2. Unit Root Test Results with the ADF Method at Level Level

Variable	Probability at Level Level	Description
EKSPOR	0.0019	Stationary
PROD	0.7006	Not stationary
GDP	0.6519	Not stationary
HKD	0.1211	Not stationary
Critical Value α = 5%	-2.967767	

Source : Data processed with E-Views 10

Based on the results of the stationarity test in table 2, there is only one significant variable at = 5%, while the other three variables are not stationary at the level level.

Degree of Integration Test

The next step as a consequence of the non-fulfillment of the assumption of stationarity at zero degrees is to perform a degree of integration test. The purpose of this test is to detect at the level of differentiation to what extent the variables are already stationary.

The degree of integration test was carried out through the Augmented Dickey-Fuller (ADF) test at the first difference level. If the ADF value is greater than the critical value, then the data can be said to be stationary. And if the ADF value is less than the critical value, the data is said to be non-stationary. Table 3 is the result of the degree of integration test.

Table 3. Unit Test Results with the ADF Method at the First Difference Level

Variable	Probability at <i>First Difference level</i>	Description
EKSPOR	0.0000	Stationary
PROD	0.0000	Stationary
GDP	0.0004	Stationary
HKD	0.0000	Stationary
Critical Value $\alpha = 5\%$	-2.971853	

Source: Data processed with E-Views 10

The results obtained after testing the degree of integration with the degree of integration of 5% indicate that the ADF value of the overall variables studied is higher than the critical value, so it can be concluded that all variables are stationary.

Cointegration Test

Cointegration test is a tool to ensure the existence of a long-term equilibrium relationship between the independent and dependent variables. The prerequisites needed to know that the variables studied are cointegrated by looking at the behavior of the residuals from the regression carried out. By unit root test, it is stated that ECT is stationary at the level level. With this, the stationary test on the residuals confirms that there is cointegration between the variables used.

The cointegration test is mutually cointegrated which means that there is a long-term equilibrium.

Error Correction Model (ECM)

Based on the results of cointegration analysis (long term), changes in coffee export volume, coffee production, German GDP and world coffee prices have a cointegration relationship. So for the next short-term estimation with the ECM model.

The use of the Error Correction Model is to estimate the model in the short term. Error correction modeling is a method used to identify the relationship between non-stationary variables. The regression results are as follows.

Table 4. Short-term Regression Estimation Results

Variable	Coef	t-statistic	Prob
D(PROD)	0.007371	0.078110	0.9384
D(GDP)	-0.012937	-0.907781	0.3730
D(HKD)	-9100.285	-0.889454	0.3826
ECT	-0.542131	-3.423560	0.0022
C	-2453.945	-0.696060	0.4931
R-Squared		0.433130	

Adjusted R-Squared 0.338652

Source: Data processed with E-Views 10

Based on the short-term estimation results, coffee production does not have a significant impact on the amount of coffee exported by Indonesia to Germany, with a coefficient value of -0.012937 and a probability value of 0.3730, meaning that any increase or decrease in Indonesian coffee production does not affect the increase or decrease of Indonesian coffee export capacities to Germany. Research (Sitanini et al., 2020), states that Indonesian coffee production does not increase or decrease the volume of Indonesian coffee exports to Japan.

Germany's GDP also does not have a big influence on the volume of Indonesian coffee exports to Germany. It can be seen from the coefficient value of -0.012937 with a probability value of 0.3730, meaning that it can be said that every 1% increase in German GDP occurs, the effect will reduce Indonesian coffee exports by 0.013% (*ceteris paribus*). Research (Marpaung, 2016), states that the GDP of the destination country has a but not substantial effect on the volume of Arabica coffee exports in North Sumatra, the income that has increased is thought to be not only related to the demand for coffee because some residents in the importing country have realized the importance of food safety in the future.

World coffee prices have a negative and insignificant effect on Indonesian coffee exports to Germany. The coefficient value is -9100.285 with a probability value of 0.3826, every time the world coffee price increases by 1 dollar, the effect will decrease coffee exports by 5436,196 kg. In the period 1990-2019, world coffee prices experienced developments and tended to increase in recent years. This certainly affects the volume of coffee exports from Indonesia to Germany. The world coffee price has a big impact on Indonesian coffee exports because in the trading activities of coffee products in the international market, the coffee price benchmark in the world market is used. This result is in accordance with research (Sitanini et al., 2020) where the movement of coffee demand in destination countries to the increase in world coffee prices has a high negative response.

5. CONCLUSION

In the long term, all of the independent variables, namely coffee production, German GDP and world coffee prices, did not have a significant impact on the volume of Indonesian coffee exports to Germany for the period 1990-2019. In the short term, Germany's GDP and world coffee prices negatively and insignificantly affected coffee exports, while coffee production had a positive but not significant effect and the error correction term (ECT) negatively significantly affected the volume of Indonesian coffee exports to Germany.

Suggestions that can be given from this research. Coffee producers need to improve the quality and quantity of coffee produced in Indonesia in order to compete in the international market share and to gain added value and make it a leading commodity now and in the future. By knowing several aspects that affect the demand for Indonesian coffee to Germany, it is hoped that the management and related authorities can maintain trade relations with the European continent, especially in Germany by maintaining and safeguarding the existing market. In addition, the promotion of coffee commodities in the international market needs to be carried out with the support of government policies that can mutually benefit all parties in the coffee industry.

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