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Analysis the Offers of Indonesian Coffee Export "Gravity Model"

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Abstract
Nowadays, the development of exports is getting easier to do with the development of technology. The gravity model is one of the analytical techniques to compare the economic distance between the two countries that will exchange, and one of the indicators of the gravity model is the distance from the exporting country to the importing country. The advantage of Indonesia's exports is the non-oil and gas sector, where this sector blocks more than 90% of Indonesia's total exports and one of the sub-sectors of non-oil and gas is plantations, one of which is the coffee commodity. The study aims to analyze the effect of importers, distance, and population simultaneously and partially on the export value of Indonesian coffee commodities in 2019, and to analyze the variables that have a dominant influence on the export value of Indonesian coffee in 2019. Types and data sources use quantitative data with secondary data and using multiple linear analysis techniques. The results showed that simultaneously importer GDP, distance, and significant influence on the export value of Indonesian coffee in 2019. Partially, importer GDP has a positive and significant effect, while price and distance have a negative and significant effect. However, population variables have a negative and insignificant effect on the export value of Indonesian coffee in 2019. The variable that has the most dominant influence on the export value of Indonesian coffee commodities in 2019 is the price of goods.
Keywords: *Exports, Tea, Production, Exchange Rate, Land Area*

1. Introduction

International trade has an important role for Indonesia because exports are one of the main economic drivers of Indonesia. Exports can earn foreign exchange which will affect the welfare of the community. Specifically, export activities are aimed at earning foreign exchange, absorbing labor, spurring growth in the real sector, and improving people's welfare (Widyono, 2010). Towards the era of free trade, global competition is getting tougher and forces Indonesia to be competitive in maintaining the economy. Ricardo in Jhingan (1993) states one way to maintain a country's economic growth by increasing development in the primary sector (agriculture). The limitations that each country has, such as limited natural resource management, limited human resources and technology, require each country to conduct international trade in order to complement each other's needs. International trade is also considered as one of the main factors to increase Gross Domestic Product (GDP) (Ekananda, 2015). Plantation is one of the sub-sectors that has an important role in the agricultural sector, both in terms of the contribution of the national economy, exports and absorption of labor because the plantation sub-sector has the largest GDP contribution among other agricultural commodities. Research conducted by Masagus M. Ridhwan et al. (2015) states that the agribusiness sector is important to be developed so that it can increase exports which can be seen from 4 things such as (extensive, intensive, quality and sustainability). With the majority of people's life patterns being agrarian, building industrial linkages for strategic commodities has a greater opportunity for agro-industrial growth by utilizing these commodities. Based on data from the Ministry of Agriculture, one of the leading sectors for plantation commodities is coffee, which has an average export value of coffee from 2010-2019 of US $ 971,365,590. Therefore, the coffee commodity has become a promising commodity for the coming years. Even though Indonesia is one of the 10 largest coffee exporters in the world, from year to year the quantity of coffee export commodities has decreased. There are many reasons that may occur, for example, increasing domestic consumption, decreasing coffee bean prices or decreasing coffee bean production.

Based on data from UNCOMTRADE, in 2019 Indonesia became the 9th country as a world coffee commodity exporter, amounting to $ 883,123,380. With this amount, Indonesia is the second country as an exporter of coffee commodities in ASEAN after Vietnam, which is number one in ASEAN at $ 2,218,821,270. The largest export of Indonesia's coffee commodity is focused on the USA, where this is interesting because the distance between Indonesia and the United States is very far, not to mention that the population of the United States is not as much as China and India, where India is number nine as the country with the largest coffee importer of Indonesia. In this study, a gravity model will be used to determine whether the proximity in the similarity concept will affect Indonesia's coffee exports. Another variable that is part of the gravity model is distance. Distance is a factor that shows the cost of transportation in trade. If the distance between the country of origin and the country of import destination is further away, the volume of exports will decrease. This is due to the transportation costs imposed, if the distance between countries is farther away, the higher the cost required and this will cause the price of the desired commodity to be expensive. Therefore, the farther the distance will reduce the export volume.

Ekananda (2015) states that the price of the commodity to be traded is one of the factors that need to be considered because the price will determine the size of the number of goods to be traded. The lower the price of an item, the more demand for that good, conversely the higher the price of an item, the lower the demand for that good. Another factor that will be discussed is the population. According to Lipsey et al. (1995), population has a strong and positive relationship with the number of commodities demanded. This shows that increasing the population of a country will increase the number of commodities purchased at each price level. Meanwhile, according to Salvatore (2013), increasing the population will increase the domestic consumption of a country, which means increasing the amount of domestic demand in the country for a commodity.

2. Literature Review

Salvatore (2014)
In the theory of Heckscher and Ohlin (H-O) states that a country will export commodities whose production requires intensive use of the country's production factors which are relatively abundant and cheap, and import commodities whose production requires intensive use of the country's production factors which are relatively scarce and expensive.

Alonso in Fitzsimons and Hogan (1999:386)
Revealed that a strong relationship is found using the gravity function by replacing mass with population and the strength of gravity by some measure of the interaction between two locations. After that the gravity equation was widely used for issues in regional and local economies, with empirical success.

Annisa Humaira (2007)
The results of research conducted by J H Eita and A C Jordaan which examined the effect of GDP on exports stated that the GDP of exporters and importers had a positive and significant effect on exports, and the distance variable had a significant negative relationship. The higher the importer's GDP, it is certain that the purchasing power of the country can increase and will have an effect on the quantity of its exports.

Sukirno (2005)
Which states that a negative relationship between price and demand occurs when an increase in the price of a commodity will cause consumers to look for substitutes for goods whose price increases. In addition, an increase in prices results in a decrease in the real income of consumers. Reduced real income forces consumers to reduce purchases of various types of goods, especially goods with rising prices.

3. Problem Formulation

The problem formulation of this study is:

a) The GDP of the destination country (importer) has a positive effect on the export volume of Indonesian Coffee Commodities in 2019
b) The export price of Indonesian Coffee Commodities to export destination countries has a positive effect on the export volume of Indonesian Coffee Commodities 2019.
c) Distance has a negative effect on the export volume of Indonesian Coffee Commodities to destination countries in 2019.

d) The population of the importing country has a negative effect on the export of Indonesian Coffee Commodities in 2019.

4. Research Methodology

This research is an associative quantitative research. In this study, the variables used are the influence of the GDP of the destination country, the distance between the export destination country and Indonesia, the export price of coffee commodities, and the population of the export destination country. Secondary data used in this study were obtained from the International Coffee Organization (ICO), the Ministry of Agriculture, Comtrade.un.org, and the Central Bureau of Statistics. The data collection method used in this study is to use non-behavioral observation methods taken from various references. The data analysis technique used is multiple linear regression analysis.

5. Analysis Result

1) Descriptive Statistical Analysis

Table 1. Descriptive Statistical Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ekspor	64	844.00	58671883.00	5546033.4219	11044470.71633
PDB	64	1264348739.00	18300400000000.00	1200582468604.5623	2785404056899.28860
Jarak	64	1269.00	18964.00	8885.5938	3997.21623
Harga	64	1.23	13.18	3.3687	2.27557
Populasi	64	167294.00	1397715000.00	85698713.6094	242228129.41957
Valid N (listwise)	64				

Source: Processed Data, 2021

Based on the results of descriptive statistical analysis, it can be described as follows:

1. Exports, export data are the number of export offers for coffee from 64 countries, where in this study the country with the smallest number of export offers was 844 kg while the largest was 58671883 kg.

2. In the GDP data, it can be seen that the country with the lowest GDP offering coffee was 1264348739 while the highest was 18.300.4 billion.

3. In the distance data, the distance between the lowest and the highest is not too far.

4. Price, price data is the data that has the smallest number, so that it can indicate the imbalance of the data used.

5. The country that offered coffee with the lowest population was 167294 while the highest was 1397715000.

2) Multiple Linear Regression Analysis

After the analysis is carried out using the SPSS program, the results of the analysis are obtained as described in the regression results report:

$\hat{Y}$ = 2,703 + 0,722X_1 - 0,959X_2 – 0,306X_3 – 0,074X_4
S(β) = (2,073) (0,221) (0,446) (0,051) (0,233)
t = (1,304) (3,272) (-2,149) (-6,028) (-0,318)
Sig = (0,197) (0,002) (0,036) (0,000) (0.752)
R^2 = 0,559
F = 18,707 (sig = 0,000)

3) Classic assumption test

- The normality test aims to test whether the residual value resulting from the regression is normally distributed or not. To detect the normality of the data, Kolmogorov-Smirnov was used with the criteria that if Asymp.Sig (2-tailed) was greater than the 0.05 level of significance, it could be concluded that the residuals were normally distributed. Based on the test results, it can be seen that the Kolmogorov-Smirnov statistical value is 0.11 with Asymp. Sig (2-tailed) of 0.200 is greater than 0.05. This means that the residual data is normally distributed.

- Multicollinearity test aims to test whether the regression model found a correlation between the independent variables. The presence or absence of multicollinearity in the regression model can be detected by looking at the tolerance value and the variance inflation factor (VIF) value. The test results show that the tolerance value of each variable GDP, Distance, Price and Population is greater than 10 percent (0.10) and the VIF of each of these variables is less than 10, so it can be concluded that the regression equation model in this study free from multicollinearity.

- This heteroscedasticity test aims to determine whether in the regression model there is an inequality of variance from the residuals of one observation to another using the Park test. The test results show that the Sig. of each variable used in this study the value is greater than 0.05, so it can be concluded that the regression equation model used in this study does not contain symptoms of heteroscedasticity.

4) Simultaneous Significance Test of Regression Coefficient (Test F)

Based on the test results, it was obtained that the value of Fcount (18.707)> Ftable (2.53) and a significance value of 0.000 <0.05, this means that GDP, Distance, Price, and Population simultaneously have a significant effect on the value of Indonesian coffee exports in 2019.

With R2 = 0.559, this means that 55.9 percent of the variation in the value of Indonesian coffee exports is influenced by GDP, Distance, Price, and Population, while 44.1 percent is influenced by other variables that are not included in the model.

5). T test

1. Testing the Effect of GDP on the Export Value of Coffee Commodities

Based on the calculation, the t-count is 3.272, which is greater than the t-table, which is 1.6710, with a significance value of 0.002 <0.05. This means that GDP has a positive effect on the export value of coffee. The results of this study are in line with research conducted by Muh. Mulyadi (2017) and Marlina Banne Lembang (2013) in this study used the importer GDP variable, the result was that importer's GDP had a positive and significant effect on Indonesia's export volume. This research is in accordance with the theory which states that the greater the GDP of a country, the greater the demand and purchasing power in that country, so that imports in that country will increase. In this research, it means that the greater the GDP of a country, the greater the export of Indonesia's coffee commodity. In addition to Kurniawan and Wiwin Setyari (2018) in their research, GDP is an important indicator in monitoring the production capacity of a country, such as Indonesia's GDP has a positive effect on export capacity. This means that GDP itself is a reflection of a country's ability to export and import.

2. Testing the Effect of Distance on the Export Value of Coffee Commodities

Based on the calculation, t-count of -2.149 is greater than t-table of -1.67109 and a significance value of 0.036 <0.05. This means that distance has a significant negative effect on the export value of the coffee commodity. This result is in accordance with the theory because distance is an obstacle in conducting trade between countries and has an impact on the cost of transporting goods to the destination country (Head dalam Ragil Khoiru Rizal 2018). In the estimation results in the export equation, it can be seen that distance has a negative relationship, this is in accordance with the theory of gravity. This means that the farther the distance between the trading countries, the less the volume of exports between these countries.

3. Testing the Effect of Price on the Export Value of Coffee Commodities

Based on the calculation, t-count of -6.028 is greater than t-table of -1.67109 with a significance value of 0.000 <0.05. This means that the price has a significant negative effect on the export value of Indonesia's coffee commodity. This means that the cheaper the price of the Indonesian coffee commodity, the more exports will be made. According to Ekananda (2015) if a commodity export goods are getting cheaper, the quantity demand for these goods will also increase. This result is supported by the theory of Micro Economics (Sadono Sukirno: 2005) where several factors of demand are one of them because of the goods.

4. Testing the Influence of Population on the Export Value of Coffee Commodities

Based on the calculation, t-count of -0.318 is smaller than t-table -1.67109 with a significance value of 0.752 <0.05. This means that the population is insignificant negative towards the export value of Indonesia's coffee commodity. This means that the less population in a country, the less coffee exports to that country, the results of this study contradict the theory, which states that the more population in a country, the greater the demand for a commodity. However, according to research conducted by Muh Mulyadi (2017), population variables have a significant and negative effect on Indonesian exports. This shows that the large population of a country does not necessarily make the country the main target for exports of certain commodities. It can be seen that the 2 countries with the largest population in the world such as China and India have very small coffee imports compared to countries with similar populations. There is an interesting thing where the largest export of Indonesia's coffee commodity is focused on the United States. This indicates that culture is an important factor. This is also in line with the demand factors in Micro Economics (Sadono Sukirno: 2005) which states that one of the factors of demand is taste or reference, this appetite factor causes the population in the results of the study to have a negative effect. Not all countries have the same taste for coffee commodities as Asian countries tend not to consume large amounts of coffee, in contrast to countries in Europe and the United States, these countries have a very large demand for coffee because the cultures and tastes of these countries.

6) Dominant Variables Influence the Export Value of Coffee Commodities

The independent variable that has a dominant effect on the dependent variable can be seen from the Standardized Coefficients Beta. Based on the test results, it is found that the inflation variable has a sig.0,000 value closer to zero, with Beta Coefficients of -0.557 which is further away from zero. This shows that the variable that has a dominant influence on the export value of Indonesian coffee commodities in 2019 is the price of the coffee commodity.

6. Conclusion

Based on the research results that have been described, it can be concluded as follows: The simultaneous test results show that GDP, distance, price and population have a significant effect on the export value of Indonesian coffee commodities in 2019. GDP (X1) partially has a positive and significant effect on the export value of Indonesian coffee commodities in 2019. This shows that, the greater the GDP food importing countries will also have greater exports of Indonesian coffee commodities. Price (X2) has a negative and significant effect on the export value of Indonesian coffee commodities in 2019. This shows that the cheaper the price of the Indonesian coffee commodity, the higher the demand for Indonesian coffee commodities in the importer country so that the greater the quantity of Indonesian exports to the importer country. Distance (X3) partially has a negative and significant effect on the export value of Indonesian coffee commodities in 2019. This shows that, the farther the distance traveled by the importer country, the less exports will be made by Indonesia to that country. And the variable that has the most dominant influence on the export value of Indonesian coffee commodities in 2019 is the price of the goods themselves.

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