Analysis of Factors Affecting Indonesia's Cinnamon Exports to the United States

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Abstract

This study analyzes the influence of United States GDP, cinnamon export prices, cinnamon production, and the exchange rate on Indonesia's cinnamon exports to the United States, both partially and simultaneously. The data used in this study are time series data from 1989-2018. The data obtained were analyzed by using multiple regression techniques. The results of this study are 1) there is a significant and positive influence of the United States GDP on Indonesia's cinnamon exports, 2) there is a significant and positive influence on the price of cinnamon exports on Indonesia's cinnamon exports, 3) there is no significant effect of cinnamon production on Indonesia's cinnamon exports, 4) there is a significant and positive exchange rate effect on Indonesia's cinnamon exports. Simultaneously, there is a significant influence on United State GDP, cinnamon export prices, cinnamon production, and the exchange rate on Indonesia's cinnamon exports to the United States.

Keywords: cinnamon export, GDP, production, price, exchange rate

Introduction

Exports are important activities for a country's economy. Export activities can contribute to the acceleration of economic development. One of Indonesia's agricultural products for export is cinnamon. According to Pribadi (2016: 10), Cinnamon *(Lauraceae)* is a plant native to South and Southeast Asia that has high economic value, although it takes a long time to produce. Cinnamon is one of Indonesia's agricultural products which is exported abroad. One of the main export destinations of Indonesian cinnamon is to the United States. This can be seen from the volume of cinnamon exports in Indonesia as shown in Figure 1

Figure 1 explains the development of Indonesian cinnamon exports to the United States in 1989-2018. From this table it can be seen that Indonesia's cinnamon exports to the United States show fluctuating developments. From 1994-1996 there was a decline in Indonesia's cinnamon exports to the United States. Then this situation happened again from 1999-2000. During 2012-2018, Indonesia's cinnamon exports experienced increases and decreases.

The fluctuation in Indonesia's cinnamon exports to the United States is thought to have been caused by the influence of United State GDP, the price of cinnamon exports, cinnamon production and the exchange rate. The figure 1 shows that the lowest growth of Indonesian cinnamon exports to the United States occurred in 2012 of -27.53 percent. The decline in Indonesian cinnamon exports to the United States is thought to have been caused by a decline in United State GDP, rising prices for cinnamon exports, falling cinnamon production and an appreciating exchange rate.

The meaning of exports according to the Karya (2016: 150) is foreign trade activities that carry out the delivery and sale of goods and services to foreign markets. This export activity causes the flow of goods abroad, while the reward is the flow of income in the form of foreign exchange into the country.

According to Sasono (2013: xii) export is the activity of selling products from one country to another over the outer boundaries of a country's customs territory, with the aim of earning foreign exchange that is urgently needed by the country, seeking employment for the labor market, obtaining import duty and other taxes, as well as balancing the flow of goods and money flowing in the country.
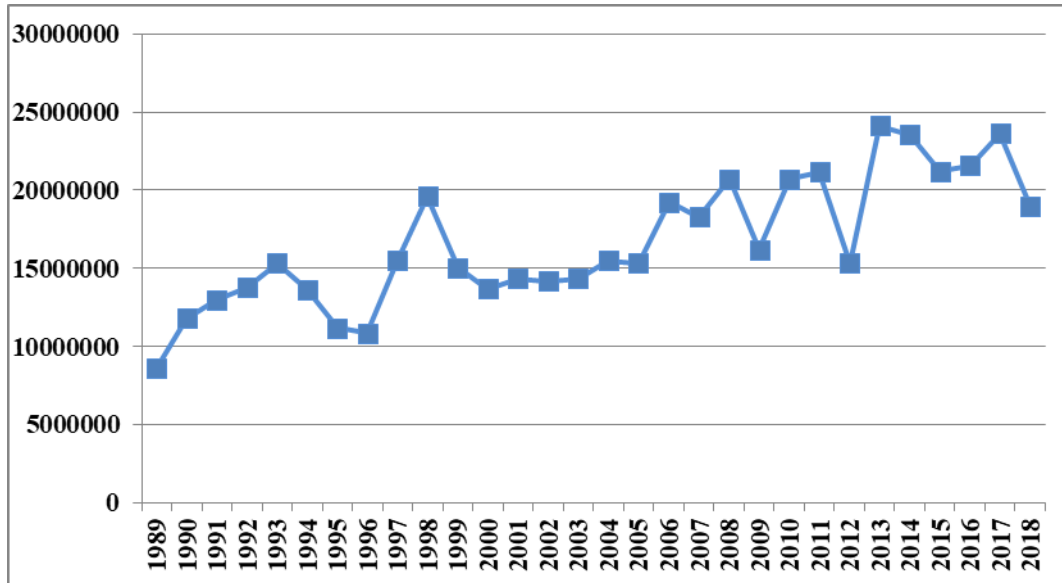
Figure 1 Development of Indonesian Cinnamon Exports to the United States from 1989 – 2018
Source: UN Comtrade, 2019

In international trade theory it is mentioned that the factors that influence exports can be seen from the demand and supply side (Krugman, 1988 in Tan, 2000). From the demand side, exports are influenced by export prices, exchange rates, income of destination countries, foreign trade policies of importing countries and devaluation in exporting countries. From the supply side, exports are influenced by export prices, domestic prices, exchange rates, product quality, technology, production capacity, capital interest, labor costs, input prices, capital and deregulation policies (exporting countries) (Ekananda, 2014:p. 92-93).

There are several factors that have caused fluctuations in Indonesia's cinnamon exports to the United States during this period. According to (Blanchard, 2017: p. 411), exports are determined by:

$$X = X\,(Y\,^*,\,\epsilon)\,\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (1)$$
$$(+,\,-)$$

Where: $Y\,^*$ represents foreign income and ϵ is the real exchange rate.

Exports depend on foreign income, i.e. higher foreign income means higher foreign demand for all goods, both foreign and domestic. Higher foreign income leads to higher exports. Exports also depend on the real exchange rate, i.e. the higher the price of domestic goods in the form of foreign goods, the lower the foreign demand for domestic goods. In other words, the higher the real exchange rate, the lower the export (Blanchard, 2017: 411).

According to Pindyck (2014: 25-26), the higher the price, the more companies will be willing to be produced and sold. Higher prices will add companies to increase production by recruiting additional workers or increasing work hours of existing workers (at higher costs for the company). Higher prices will also be able to attract new producers into the market. Consumers will be able to buy more goods if the price is lower.

The production of goods and services involves the transformation of resources such as labor, raw materials and facilities and machinery into finished products. Productive resources such as labor and capital equipment used by companies to produce goods and services are called inputs or factors of production and the amount of goods and services produced is the company's output (Besanko, 2011: 202).

According to Purnamawati (2013: 18), if the price of the rupiah against the US dollar increases or the rupiah strengthens, the rupiah can buy more goods sold in dollars. Thus, when the exchange rate falls or the

rupiah strengthens then Indonesian imports may increase, while exports fall. Conversely, when the rupiah price decreases or the exchange rate rises, the United Stated dollar can buy more goods that are sold in Rupiah. so that Indonesian exports may rise while imports fall.

Based on the explanation above, it can be concluded that when the income, price of commodity, production and exchange rate change it will affect the change in exports. If income increases, demand for exports will also increase. If the price of exports decreases, commodity exports will increase. If production increases, exports will also increase. If the exchange rate depreciates, exports will increase and vice versa. This study analyzes the extent of the influence of the United States GDP, cinnamon export prices, cinnamon production, and the exchange rate of Indonesian cinnamon exports to the United States.

Methods

Based on the data source, the data used in this study is using secondary data from 1989-2000. The data used in this study were obtained from World Bank, UN Comtrade and the Ministry of Agriculture by using the time series analysis. Testing conducted in this study using the classic assumption test, namely multicollinearity test, heteroscedasticity test and autocorrelation test. To see the effect of the independent variables on the dependent variable simultaneously an F test was conducted, while to see the effect of each independent variable partially on the dependent variable a t test was performed.

The method used is multiple regression analysis to examine the effect of US GDP (X_1), cinnamon export prices (X_2), cinnamon production (X_3), and exchange rates (X_4) on Indonesian cinnamon exports to the United States (Y). (Y). The equation from the analysis can be seen in the equation below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu \quad \dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

where :

Y	=	Indonesia's Cinnamon Export
X_1	=	GDP of United States
X_2	=	Cinnamon Export Price
X_3	=	Cinnamon Production
X_4	=	Exchange Rate

The operational descriptions in this study as Cinnamon Export (Y) is the volume of Indonesian cinnamon export with code HS 0906 (Cinnamon and cinnamon-tree flowers) which was exported to the United States from 1989-2018 in units of kg. United States GDP (X_1) is the amount of production of goods and services at the basis of United States Constant Prices from 1989-2018 expressed in units of Trillions of USD per year. Cinnamon Export Price (X_2) is the export price of cinnamon from 1989-2018 expressed in units of USD / kg per year. Cinnamon Production (X_3) is the total Indonesian cinnamon production from 1989-2018 expressed in tons. Exchange Rate (X_4) is the average exchange rate of Rupiah to USD from 1989-2018 expressed in units of Rupiah / USD per year.

Results and Discussion

Based on data processing with the help of Eviews 9 program, the results of data processed for various tests and analysis models are obtained as follows:

Descriptive Analysis Results

Descriptive analysis results can be described as follows:

Cinnamon Export

During the observation period, the lowest growth rate of cinnamon exports occurred in 2012 of -27.53% while the highest growth rate in 2013 was 57.39%. The average growth is 4.54%.

United States GDP

The lowest United State GDP growth rate occurred in 2009 of -2.54% while the highest growth rate occurred in 1999 of 4.75%. The average growth is 2.47%.

Export Price Of Cinnamon

During 1998-2018, the lowest cinnamon export price growth occurred in 1998 of -35.61% while the highest growth rate occurred in 2017 of 51,43%. The average growth is 2.82%.

Cinnamon Production

Indonesia's lowest cinnamon production growth occurred in 2015 of -49.45% while the highest growth rate occurred in 2016 of 73.77%. The average growth is 5.96%.

Exchange Rate

The lowest exchange rate growth occurred in 1999 amounted to -21.56% while the highest growth rate occurred in 1998 amounted to 244.18%. The average growth was 11.81%.

Classic Assumption Test

Multicollinearity Test

From the Multicollinearity test results with the Variance Inflation Factor (VIF) method in Table 1, obtained VIF values for all variables X1 (8.746467), X2 (1.104779), X3 (5.099087), and X4 (8.736528) < 10. Therefore, it can be concluded that in this model there were no multicollinearity problems. With the meaning of the words in this study there is no correlation between fellow independent variables (independent).

Heteroscedasticity Test

From the results of the Heteroscedasticity test with the Breusch-Pagan-Godfrey Test in Table 2, it can be seen the F-statistic probability in this study has a value (0.4770) > 0.05. Because the F-statistic probability in this study has a probability value > 0.05, it can be concluded that in this study there was no heterokedasticity problem. Thus all variables in this study have a linear relationship with residuals (variables outside the model).

Autocorrelation Test

Autocorrelation test in this study was carried out with the Breusch-Godfrey Serial Correlation LM Test. An estimation model is said to have no autocorrelation problems if the LM F-statistic test probability > 0.05. Conversely, an estimation model is said to have autocorrelation problems if the F-statistic LM test probability < 0.05. The F-statistic probability value of 0.6884. Because the F-statistic probability value > 0.05, it can be concluded that the estimation model in this study does not have an autocorrelation problem.

This autocorrelation test can also be seen from the Durbin Watson test. Based on the Durbin Watson test, the dW value in this study was 1.842618. While from the DW Table with a significance of 0.05 and the amount of data (n) = 20, the number of independent variables (k) = 30, the value of dL = 1.143 and the value of dU = 1.739 were obtained. Because the value of dW lies between the value of dU and 4-dU then (1.739 <1.842618 <2.261), it can be concluded that there is no autocorrelation problem. With the meaning of the word, in this study there is no correlation between residuals in one observation with another observation.

Results of Multiple Regression Estimates

Table 1 shows the estimated results of the influence of US GDP, cinnamon prices, cinnamon production and the exchange rate on Indonesian cinnamon exports to the United States. From the estimation results obtained, the Indonesian cinnamon export equation model to the United States is as follows:

$$Y = 1017779 + 1124.159\ X_1 + 268514.7\ X_2 + 11.65147\ X_3 + 52.46898\ X_4 \quad \dots\dots (3)$$

Based on the estimation results in Table 1, it can be seen that the United States GDP, cinnamon prices, cinnamon production and the exchange value is zero, the value of Indonesian cinnamon exports to the United States is 1,017,779 kg. The R-squared value of the Indonesian cinnamon export equation to the United States is 0.660739. This shows that the contribution of United State GDP, cinnamon export price, cinnamon production and the exchange rate of Indonesian cinnamon exports to the United States is 66.07 percent while the remaining 33.93 percent is influenced by other variables not included in the export equation Indonesia's cinnamon to the United States.

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Table 1 Estimation Results of the Effects of United States GDP, Cinnamon Export Prices, Cinnamon Production, Exchange Rates Against Indonesia's Cinnamon Exports to the United States

Dependent Variable: Y
Method: Least Squares
Date: 10/20/19   Time: 06:45
Sample: 1989 2018
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1017779	99293.98	10.250159	0.0000
X1	1124.159	499.7802	2.249306	0.0332
X2	268514.7	31929.69	8.409562	0.0000
X3	11.65147	37.37716	0.311727	0.7578
X4	52.46898	8.525869	6.154092	0.0000
R-squared	0.660739	Mean dependent var		16690093
Adjusted R-squared	0.621594	S.D. dependent var		4121270.
S.E. of regression	2535188.	Akaike info criterion		32.45300
Sum squared resid	1.67E+14	Schwarz criterion		32.63983
Log likelihood	-482.7950	Hannan-Quinn criter.		32.51277
F-statistic	26.87907	Durbin-Watson stat		1.726313
Prob(F-statistic)	0.000000			

Source: Eviews 9 data processing results, n = 30 α = 0.05

The F-Statistics probability value (0.0000) which is small than $\alpha = 0.05$. Thus, it can be concluded that together the United State GDP variables, the price of cinnamon export wood, cinnamon production, and the exchange rate have a significant effect on Indonesian cinnamon exports to the United States.

The first hypothesis in this study states that United States GDP has a significant effect on Indonesian cinnamon exports to the United States. Based on the estimation results in Table 1, the probability value of United State GDP (0.0332) on Indonesian cinnamon exports to the United States is small from $\alpha = 0.05$. Therefore, it can be said partially that the GDP of the United States has a significant effect on the export of Indonesian cinnamon to the United States. This is because an increase in foreign output in this case is the American economy will increase Indonesian exports because the increased United State economy indicates that the United States economy is growing so that demand for imported goods that become exports for Indonesia will increase. An increase in the United States GDP will increase demand for Indonesian cinnamon exports because of the purchasing power of the United States people for cinnamon.

Conversely, if the economy of the United States experiences a decline, it means that the economy of the United States is experiencing a decline, so that demand for imported goods that become exports for Indonesia will decline. Thus Indonesia's cinnamon exports to the United States will also decline.

The results of this study are consistent with the theory seen in Blanchard (2017:411), Pyndick (2014:16), which states that foreign incomes has an impact on increasing exports of a country. The results of this study are in line with the findings of Riyani (2018) dan Nurhayati (2018) suggesting in their research that the GDP of trading partners affects Indonesian exports.

The second hypothesis in this study also proved to be accepted. Thus there is a significant effect between the price of cinnamon on Indonesia's cinnamon exports to the United States. The significant influence between the price of cinnamon on the export of Indonesian cinnamon to the United States indicates that the export of Indonesian cinnamon to America is influenced by the price of cinnamon. This is because when there is an increase in prices, producers especially exporters, will increase their supply abroad because there is an increased profit potential. The rising price is accompanied by an increasing number of offers, in this case an increase in exports, which will have an impact on producers profits. This phenomenon also occurs in cinnamon. Increasing the price of cinnamon abroad will increase exports of cinnamon.

The results of this study are in accordance with Pindyck (2014:25), which states that the higher the price, the more goods the company is willing to produce and sell. A higher price increase will allow the company to expand production. Therefore, increase in prices will have an impact on shifting the supply curve so that exports increased

The results of this study are also in line with the findings of Sarwedi (2010), Iskandar (2012), Riyani (2018), and Nurhayati (2018) who find that prices determine the amount of goods to be exported.

The third hypothesis in this study was not proven to be accepted. Thus there is no significant effect between cinnamon production on Indonesian cinnamon exports to the United States. The absence of a significant effect between cinnamon production on Indonesian cinnamon exports to the United States indicates that Indonesian cinnamon exports to United State were not affected by cinnamon production. In other word, the ups and downs of cinnamon production does not affect Indonesia's cinnamon exports to the United States. The results of this study are not in line with the findings of Ayuningsih dan Setiawina (2014) who found that production determines the amount of goods to be exported.

The fourth hypothesis in this study also proved to be accepted. Thus there is a significant positive effect between the exchange rate on Indonesia's cinnamon exports to the United States. There is a significant influence between the exchange rate on Indonesian cinnamon exports to the United States indicating that the export of Indonesian cinnamon to America is influenced by the exchange rate. This is because the exchange rate depreciation will cause the price of Indonesian export goods is decrease so that demand for Indonesian products will rise. The increasing demand for export products will certainly push up the export capacity of Indonesian commodities, one of which is cinnamon. Conversely, if the exchange rate appreciates, it will cause the price of Indonesian export goods to become more expensive abroad so that demand for Indonesian products will fall. The decline in demand for these export products will bring about a decline in Indonesia's export performance, one of which is the decline in cinnamon exports.

The results of this study are in accordance with the theory which states Blanchard (2017:411). The depreciation of the exchange rate will cause an increase in exports. Conversely, appreciation of exchange rate will cause a decline in exports. The results of this study are also in line with the findings of Sarwedi (2010), Yee et al (2016), Ebadi (2015), Iskandar (2012), Ginting (2013), Riyani (2018), and Purba and Annaria (2017), who find that exchange rates determine the amount of goods to be exported.

Conclusions

The results of the study concluded that 1) there was a significant positive effect between United State GDP on Indonesia's cinnamon exports to the United States. This means that an increase in United State GDP will increase Indonesia's cinnamon exports to the United States. 2) there is a significant positive effect between the price of cinnamon on Indonesian cinnamon exports to the United States. This means an increase in the price of cinnamon will increase Indonesia's cinnamon exports to the United States. 3) there is no significant effect between cinnamon production on Indonesian cinnamon exports to the United States. In other words the ups and downs of cinnamon production do not determine Indonesia's cinnamon exports to the United States. 4) there is a significant positive effect between the exchange rate on Indonesia's cinnamon exports to the United States. With the meaning of the word if the exchange rate depreciates it will have an impact on increasing exports of Indonesian cinnamon to the United States.

Based on the results of the research, some suggestions that can be put forward are 1) The government is expected to maintain the stability of the exchange rate so that it can encourage the export of cinnamon, 2) The government is expected to continue to improve the quality of cinnamon commodities so that it can encourage an increase in cinnamon exports, 3) the government is expected continue to establish and enhance cooperation with trade partner countries, especially the United States as one of Indonesia's cinnamon export destinations.

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