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Competitiveness Analysis and Factors Affecting Indonesian Cinnamon Exports

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Abstract: Cinnamon is one of the plantation spice commodities that contributes to the Indonesian economy. Indonesia is the largest exporter country in the world regarding the total export volume of cinnamon, but regarding the total value of exports, Indonesia comes in second after Sri Lanka. This study aims to analyze the comparative competitiveness of Indonesian cinnamon among major competitors in the United States' market and to analyze the factors that influence the competitiveness of Indonesian cinnamon exports in the United States. The data used in this study comprise secondary data from 2007 to 2021 obtained from various data sources. The revealed comparative advantage method was used in a comparative competitiveness analysis. Moreover, the factors that affect the competitiveness of Indonesian cinnamon exports in the United States were analyzed using the ordinary least squares method. The results of the analysis show that Indonesian cinnamon is competitive in the United States' market, but Sri Lanka's cinnamon exports have stronger competitiveness than Indonesia's in the United States' market. The results of the ordinary least squares method show that the exchange rate of the IDR (rupiah) against the USD, the volume of Indonesian cinnamon exports, the GDP per capita of the USA and the value of cinnamon exports to the USA have a significant effect on the competitiveness of Indonesian cinnamon exports to the United States.

Keywords: competitiveness; cinnamon; Indonesia; revealed comparative advantage

1. Introduction

International trade has a role in economic growth and in driving the economy of a country, including Indonesia. International trade can be beneficial for a country by producing products that have a comparative advantage and also encouraging the entry of foreign investment into the country. Foreign investment plays an important role in increasing the welfare of recipient countries because of the benefits associated with new innovations, new technologies, managerial techniques, skills development, increasing capital, job creation, and industrial sector development (Kurniasih 2020).

The plantation sub-sector provides the largest contribution compared to other agricultural sub-sectors, with a contribution of 37.83 percent to the gross domestic product (GDP) of the agricultural sector (Central Bureau of Statistics 2019). The performance of the plantation sub-sector needs to be improved to boost productivity, leading to an increase in plantation commodity export performance (Pratinda and Harta 2021). One of Indonesia's plantation export commodities, which has high potential and creates hope for the country's foreign exchange earnings, is cinnamon. Cinnamon is not Indonesia's main export commodity, but it is Indonesia's mainstay plantation commodity and has great potential for exports. There is significant demand for cinnamon from Indonesia by consumers abroad because of its distinctive aroma. Cinnamon has an export share of 12.4 percent of Indonesia's total spice exports (Sa'diyah and Darwanto 2020).

Cinnamon is a native plant from Indonesia, which in the world of trade is better known as cassiavera. The main production centers of cinnamon are in the Kerinci Regency

of Jambi Province and the Tanah Datar and Agam Regencies of West Sumatra Province (Research Institute for Spices and Various Industrial Plants 2010). The main product of the cinnamon plant is in the form of dried cinnamon bark, which can be used as a spice for food flavoring. In addition, cinnamon bark can also produce several other products such as cinnamon powder, cinnamon essential oil and cinnamon oleoresin, which are widely used in the food, beverage, pharmaceutical and cosmetics industries (Senevirathne et al. 2022; Cardoso-Ugarte et al. 2016; Nabavi et al. 2015). Cinnamon plant development is a means to improve and develop the quality of export crops in order to survive in the existing international market and penetrate new markets.

Indonesia's large cinnamon production is expected to increase exports to destination countries via international trade. Cinnamon exports from Indonesia still mostly come in the form of raw cinnamon bark rolls, while the export of cinnamon in the form of processed products is still relatively small. This results in lower cinnamon export prices for Indonesia compared to several other exporting countries. This could be due to the low post-harvest handling operations of cinnamon plants.

This condition has an impact on the competitiveness of Indonesia's cinnamon exports, especially with major competitor countries such as Sri Lanka. Regarding the total volume of cinnamon exports to the global market, Indonesia ranks first as the largest exporter country. Meanwhile, regarding the total value of cinnamon exports relative to the global market, Indonesia comes in second after Sri Lanka (Piyasiri and Wijeratne 2016). This shows that there are differences in the price and quality of cinnamon produced by each country. The average price of Indonesian cinnamon is USD 1653.8 per ton, while the average price of Sri Lankan cinnamon is USD 8969.2 per ton (Astuti 2018). Meanwhile, the average price of Sri Lanka cinnamon is USD 8969.2 per ton (Supriana et al. 2022; Putri et al. 2020; Nur et al. 2021). The results of this study provide insights, which are important to maintain and improve the competitiveness of Indonesian cinnamon exports; thus, it is necessary to know the market position of Indonesian cinnamon in the main importing country (United States of America) and what factors affect Indonesian cinnamon exports to the United States. This research aims to analyze the comparative competitiveness of Indonesian cinnamon among the main competitor countries (Sri Lanka) in the main importing countries (United States of America) and to investigate the factors that affect the competitiveness of Indonesian cinnamon exports in the main importing country (United States of America).

The structure of this paper is as follows. The next section describes the methods of the research. The results and discussion are described in Section 3 and the final section concludes by discussing the results and recommendations.

2. Methods

The data used in this study comprise secondary data in the form of a time series from 2007 to 2021 obtained from various data sources. The object of this research is cinnamon with HS code 0906 (cinnamon and cinnamon-tree flowers). The data sources are the United Nations Commodity and Trade (UN COMTRADE), the Central Statistics Agency (BPS), the Food and Agriculture Organization (FAO) and various other literature related to this research.

The data analysis technique used is the revealed comparative advantage (RCA) method, which is used to analyze the level of competitiveness of Indonesian cinnamon exports in the main importing country (United States). In addition, classical assumption test analyses were also used, including multiple linear regression analysis using the ordinary least squares (OLS) method, and statistical test analyses were used to investigate factors that affect the competitiveness of Indonesian cinnamon exports in major importing countries (United States of America). The data were analyzed using Stata 14 software and Microsoft Excel.

In this study, the RCA method was used to determine the comparative position or competitiveness of Indonesian cinnamon with its competitor (Sri Lanka) in the main importing country (United States). The RCA formula used is as follows:

$$RCA = \frac{X_{ij}/X_j}{X_{iw}/X_w}$$

where

X_{ij}: cinnamon export value of Indonesia or its competitors to major importing countries;
X_j: total export value of Indonesia or its competitors to the main importing country;
X_{iw}: value of world cinnamon exports to major importing countries;
X_w: total value of world exports to major importing countries.

The results of the RCA calculation show the competitiveness of a commodity in international trade. The interpretation of the results of the RCA calculation is as follows:

RCA < 1, meaning that a country has a comparative advantage below the world average so that the commodity is not competitive;
RCA = 1, meaning that a country has a comparative advantage equal to the world average;
RCA > 1, meaning that a country has a comparative advantage over the world average so that the commodity has high competitiveness.

The classical assumption test was carried out to check the existence of deviations in the data or model to be used in the regression equation. Some of the basic assumptions (Das 2019; Riyanto and Hatmawan 2020) include the following:

(1) Normality Test A model can be identified to be normally distributed if it has a Prob > z value of more than 0.05. The normality test used is the Shapiro–Wilk test.
(2) Multicollinearity Test A good regression model should be free from multicollinearity problems indicated by the value of variance inflation factor (VIF) of each independent variable. The VIF value is less than 10, meaning that the model is free from multicollinearity symptoms.
(3) Heteroscedasticity Test Heteroscedasticity test aims to check the inequality of variance error from one observation to another observation. If the Prob > Chi^2 value is more than 0.05, then the model is free from heteroscedasticity symptoms.
(4) Autocorrelation Test Autocorrelation test aims to check correlation between variables that have an effect on time. A good regression model requires no autocorrelation, which is indicated by the Prob > Chi^2 value of more than 0.05.

Riduwan (2011) states that multiple linear regression is an analysis tool for forecasting the value of the influence of two independent variables (independent) or more on the dependent variable to prove whether there is a functional relationship or causal relationship between two or more independent variables with the dependent variable. The variables used in this study were the rupiah exchange rate, the volume of Indonesian cinnamon exports, the amount of Indonesian cinnamon produced, the GDP per capita of Indonesia, the GDP per capita of the USA and the value of cinnamon exports to the USA.

The exchange rate system applies a relationship in which the depreciation or appreciation of the currency will result in upward changes in exports and imports. If the exchange rate depreciates—that is, the value of the domestic currency decreases, resulting in an increase in the value of foreign currency—its exchange rate (price) will cause exports to increase and imports tend to decrease. Exchange rate variables have a significant effect on the competitiveness of Indonesian cinnamon exports (Supriana et al. 2022; Putri et al. 2020).

The cinnamon export volume is the number of goods exported to countries that need it. Export volume has an influence on the competitiveness of Indonesian cinnamon exports (Sari and Divinagracia 2021; Wiranthi and Mubarok 2017). Production is one of the factors that influence cinnamon exports (Sa'diyah and Darwanto 2020; Santoso et al. 2022). Production is a factor that affects supply. The level of production will be directly

proportional to the level of supply. An increase in production will increase export volume, and a decrease in production will reduce export volume.

The GDP per capita is the average income of the population in a country at a certain time, and it can be used as an indicator to measure the level of consumption or purchasing power of a country for goods and services. A high GDP per capita indicates that the country can be used as an opportunity to reach markets for export activities. Research (Darhyati et al. 2017) shows that there is an effect of GDP on exports in Indonesia. In this study, it was expected that Indonesia's GDP and United States' GDP affected the competitiveness of cinnamon export.

The export value is the amount of state revenue that carries out export activities. If the international price is higher than the domestic price, then a country will tend to become an exporter. Domestic producers will prefer to sell their products to buyers from other countries, whereas if the international price is lower than the domestic price, then a country will tend to become an importer. This international price will then directly or indirectly affect the export value of Indonesian cinnamon, which will then affect export competitiveness in the international market (Malau et al. 2022; Hadi et al. 2019; Darmawan et al. 2021).

The following is the equation model used in this multiple linear regression analysis:

$$Y = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + \beta_6 X6 + e$$

where

Y: the competitiveness of Indonesian cinnamon;
β_0: constant;
$\beta_{1,2,3}$: regression coefficient;
X1: the exchange rate of the rupiah against the US dollar in the previous year (Rp);
X2: Indonesian cinnamon export volume (tons);
X3: total Indonesian cinnamon production (tons);
X4: Indonesia GDP per capita (USD);
X5: USA GDP per capita (USD);
X6: cinnamon export value to USA (USD);
e: standard error.

To identify the influence of the independent variable on the dependent variable, the coefficient of determination ($R2$), F-test, and *t*-test can be used.

(1) Coefficient of Determination ($R2$) The coefficient of determination was used to measure the extent to which the independent variable is able to explain the diversity of the dependent variable (Riyanto and Hatmawan 2020). The value of $R2$ ranges from 0 to 1 (the closer to 1, the better).
(2) F-Statistics Test The significance test of the model or the F-test was conducted to check the effect of independent variables on the dependent variable (Riyanto and Hatmawan 2020).
(3) T-Statistic Test T-test was used to determine whether the regression coefficient of each independent variable had a significant effect on the independent variable (Riyanto and Hatmawan 2020).

3. Results and Discussion

3.1. Comparative Competitiveness Analysis

The competitiveness or comparative advantage of Indonesian cinnamon among the main competitor countries (Sri Lanka) relative to the main importing countries (United States of America) can be determined by using revealed comparative advantage (RCA) analysis. The results of RCA estimations for Indonesian cinnamon and competing countries in the United States can be observed in Table 1.

Table 1. RCA value of Indonesia and its competitors relative to the United States.

Year	RCA Indonesia	RCA Sri Lanka
2007	9.36	75.09
2008	9.91	77.73
2009	7.33	64.15
2010	9.09	76.60
2011	8.43	86.28
2012	6.15	92.97
2013	9.95	84.18
2014	10.48	76.35
2015	10.40	61.93
2016	9.57	78.77
2017	11.79	64.81
2018	10.60	n.a.
2019	11.01	53.58
2020	9.79	58.84
2021	9.25	67.59
Average	9.54	67.93

Regarding the results of Indonesia's RCA calculations, it shows that Indonesia's cinnamon commodity for export to the United States has a comparative advantage or competitiveness. This can be observed from the RCA value of Indonesian cinnamon relative to the United States, which has a value of more than one. Likewise, the RCA value of Sri Lankan cinnamon for export to the United States has a comparative advantage or strong competitiveness, which can be observed in the RCA value that is greater than one. The average value of the Sri Lankan RCA (67.93) is much higher than the Indonesian RCA average (9.54), which means that Sri Lankan cinnamon has a comparative advantage or higher competitiveness compared to Indonesian cinnamon in the United States' market.

According to Hettiarachchi et al. (2020), cinnamon originating from Sri Lanka has good product quality and high production levels. Thus, it can meet the market share of countries that need it. When viewed from the value of Sri Lankan cinnamon exports, it is smaller than the value of Indonesian cinnamon exports to the United States. This is because the exchange rate of Sri Lanka against the US dollar increased so that the exports of Sri Lankan cinnamon have a cheaper value due to currency devaluation countries compared to foreign currencies (Hayat and Khatoon 2021; Wattanakul et al. 2021).

Even though the value of Sri Lanka's cinnamon exports is smaller than the value of Indonesian cinnamon exports to the United States, the average value of Sri Lanka's cinnamon RCA is greater than the average value of Indonesian cinnamon RCA in the United States market. This can happen because the export structure of Sri Lanka's cinnamon is dominated by good quality cinnamon, which is reflected in the high export prices prevailing in the United States market compared to Indonesia.

The development of the RCA value of Indonesian cinnamon relative to the United States tends to fluctuate. In 2008–2009, there was a drastic decline in the RCA value of Indonesian cinnamon by 18.19 percent. The decline was due to the financial crisis in the United States, which then affected the world's cinnamon consumption. The RCA value of Indonesian cinnamon increased again in 2010 (Nezky 2013). This increase was due to the improving global economy and the recovery of the industrial sector. Although the value of Indonesian cinnamon fluctuates, its value is still greater than one, which means that Indonesia is still highly competitive in the United States' market (Soh et al. 2021). Regarding the RCA value, Indonesia has a comparative or competitive advantage, so efforts that can be made include increasing the quantity and considering the quality of domestic cinnamon.

Classical Assumption Test Analysis

(1) Normality Test

To find out whether the confounding variables or residual values generated by the regression model are normally distributed or not, a normality test was performed using the Shapiro–Wilk test method. The residual is normally distributed if the significance value obtained is greater than 0.05. The results of the normality test can be observed in Table 2.

Table 2. Normality test results.

Variable	Obs	z	Prob < z
Res	15	0.358	0.36009

Regarding the results in Table 2, it was found that the Prob > z value was 0.36009. When the value of Prob > z is greater than 0.05, the variable is normally distributed. Therefore, it can be concluded that the residuals generated by the regression model are normally distributed.

In addition, the normality test can also be known using the normal p-plot graph by looking at the distribution of the points on the plot graph. The residual will be normally distributed if the distribution of the points is close to or along the diagonal line. Furthermore, the normal plot graph can be observed in Figure 1.
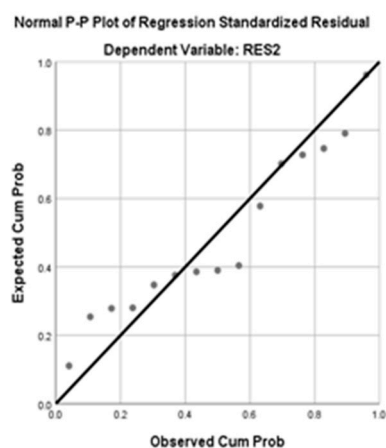

Figure 1. Normality graph.

(2) Multicollinearity Test

A multicollinearity test was conducted to determine whether there is a linear relationship between the independent variables used in the regression model. A deviation in multicollinearity will make it difficult to separate the effect of each independent variable on the dependent variable. The multicollinearity test used in this study was to look at the value of the variable inflation factor (VIF). The regression model is free from multicollinearity deviations if the VIF value obtained is less than 10. The results of the multicollinearity test can be observed in Table 3.

Table 3. Multicollinearity test results.

Variable	VIF	1/VIF
X1	7.63	0.131122
X2	5.56	0.179991
X3	4.39	0.227886
X4	3.97	0.251875
X5	3.09	0.323560
X6	2.04	0.489669
Average	4.45	

Regarding Table 3, it can be observed that the equation model of the factors that affect the competitiveness of Indonesian cinnamon exports does not have multicollinearity deviations. This is indicated by the absence of an independent variable that has a VIF value of more than 10.

(3)　Heteroscedasticity Test

Heteroscedasticity deviation is indicated by the presence of variance inequality from the residuals in the regression model. In this Indonesian cinnamon export competitiveness equation model, the method used in the heteroscedasticity test is the White test method. The results of the heteroscedasticity test are as follows.

Regarding the estimation results presented in Table 4, it was found that the value of $Prob > chi^2$ was 0.3666. If the value of $Prob > chi^2$ is greater than 0.05, then the regression model used is free from heteroscedasticity deviations. Therefore, it can be concluded that there is no heteroscedasticity problem in the regression model.

Table 4. Heteroscedasticity test results.

Variable	Chi^2	Prob > Chi^2
Nilai	0.82	0.3666

(4)　Autocorrelation Test

An autocorrelation test was conducted to determine whether there was a relationship or correlation between residuals in a regression equation. The method used in the auto-correlation test on the Indonesian cinnamon export competitiveness equation model is the Durbin alternative or Durbin-h method. The results of the autocorrelation test can be observed in Table 5.

Table 5. Autocorrelation test results.

Lags (p)	Chi^2	df	Prob > Chi^2
Value	1.386	1	0.2515

Regarding the estimation results, it was found that the value of $Prob > chi^2$ was 0.2515. If the value of $Prob > chi^2$ is greater than 0.05, then the regression model used is free from autocorrelation deviations. Therefore, it can be concluded that there is no autocorrelation problem in the regression model.

3.2. Multiple Linear Regression Analysis

A multiple linear regression model was used to determine how much influence the independent variables can have the rupiah exchange rate against the USD (X1), the volume of cinnamon exports (X2), the amount of cinnamon produced (X3), Indonesia's GDP per capita (X4), the USA's GDP per capita (X5) and the value of cinnamon exports to the USA (X6) on the dependent variable of the competitiveness of Indonesian cinnamon (Y).

Regarding Table 6, the results of multiple linear regression are obtained as follows.

$$Y = 219.4511 + 5.526115\ X1 + 68.97417\ X2 + 9.715536\ X3$$

$$- 65.84175\ X4 - 149.597\ X5 + 104.2006\ X6$$

The equation can be interpreted as follows:

(a)　The exchange rate of the rupiah against the USD (X1) has a positive relationship relative to the competitiveness of Indonesian cinnamon exports. This means that if the rupiah exchange rate increases by one unit, the competitiveness of Indonesian cinnamon exports will increase by 5.526115 units, assuming that other variables are constant.

(b)   Cinnamon export volume (X2) has a positive relationship with the competitiveness of Indonesian cinnamon exports. This means that if the volume of cinnamon exports increases by one unit, the competitiveness of Indonesian cinnamon exports will increase by 68.97417 units, assuming that other variables are constant.

(c)   The amount of cinnamon produced (X3) has a positive relationship with the competitiveness of Indonesian cinnamon exports. This means that if the amount of cinnamon produced increases by one unit, the competitiveness of Indonesian cinnamon exports will increase by 9.715536 units, assuming that other variables are constant.

(d)   Indonesian GDP per capita (X4) has a negative relationship relative to the competitiveness of Indonesia's cinnamon exports. This means that if Indonesian GDP per capita increases by one unit, the competitiveness of Indonesia's cinnamon exports will decrease by 65.84175 units, assuming that other variables are constant.

(e)   USA per capita GDP (X5) has a negative relationship relative to the competitiveness of Indonesian cinnamon exports. This means that if the GDP per capita of the USA increases by one unit, the competitiveness of Indonesia's cinnamon exports will decrease by 149,597 units, assuming that other variables are constant.

(f)   The value of cinnamon exports to the USA (X6) has a positive relationship with the competitiveness of Indonesian cinnamon exports. This means that if the value of cinnamon exports to the USA increases by one unit, the competitiveness of Indonesian cinnamon exports will increase by 104,2006 units, assuming that other variables are constant.

Table 6. The factors affecting Indonesian cinnamon competitiveness.

Variable	Coefficient	Prob.
X1	5.526115	0.022 **
X2	68.97417	0.015 **
X3	9.715536	0.544
X4	−65.84175	0.335
X5	−149.597	0.026 **
X6	104.2006	0.023 **
Constanta	219.4511	0.1195
R-Squared	0.9040	-
F-test	12.55	0.0011

Note: (**) Significant at the 5% level of significance.

Statistical Test Analysis

(1)   Coefficient of Determination (R2) The value of the coefficient of determination serves to show how much the independent variable contributes to the dependent variable. Regarding the results in Table 6, the coefficient of determination (R2) is 0.9040. This shows that 90.40% of the competitiveness of Indonesian cinnamon exports can be explained by the independent variables used in the equation, namely, the exchange rate of the rupiah against the USD, the volume of cinnamon exports and the amount of cinnamon produced. The remaining 9.6% is explained by other variables excluded from the equation model.

(2)   Statistical F-Test The F-test was used to determine whether the independent variables studied simultaneously (simultaneously) had a significant effect on the competitiveness of Indonesian cinnamon exports. Regarding the results in Table 6, it can be observed that the calculated F value is 12.55 with a significance value of 0.0000, which is smaller than the 5% level (less than 0.05). This means that H0 is rejected and H1 is accepted, so it can be concluded that the independent variables studied, namely, the exchange rate of the rupiah against the USD, the volume of cinnamon exports and the amount of cinnamon produced together or simultaneously have a significant effect on the competitiveness of Indonesia's cinnamon exports.

(3) Statistical T-Test The *t*-test was used to determine the effect of each partially studied independent variable on the competitiveness of Indonesian cinnamon exports. The results of the *t*-test analysis can be observed in Table 6. Regarding the results, the following test results were obtained:

a. The variable exchange rate of the rupiah against the USD (X1) with the competitiveness of Indonesian cinnamon exports (Y) shows a significance value of 0.022, which is smaller than the 5% level of significance (less than 0.05). This means that H0 is rejected and H1 is accepted; thus, it can be concluded that the rupiah exchange rate against the USD partially has a significant influence on the competitiveness of Indonesian cinnamon exports.

b. The cinnamon export volume variable (X2) with Indonesian cinnamon export competitiveness (Y) shows that the volume of cinnamon exports partially has a significant influence on the competitiveness of Indonesian cinnamon exports.

c. The variable amount of cinnamon produced (X3) with the competitiveness of Indonesian cinnamon exports (Y) shows that the amount of cinnamon produced partially has no significant effect on the competitiveness of Indonesian cinnamon exports.

d. Indonesia's GDP per capita variable (X4) with Indonesia's cinnamon export competitiveness (Y) shows that Indonesia's GDP per capita has no significant effect on the competitiveness of Indonesian cinnamon exports.

e. The variable of USA GDP per capita (X5) with Indonesian cinnamon export competitiveness (Y) shows that the USA GDP per capita has a significant effect on the competitiveness of Indonesian cinnamon exports.

f. The variable value of cinnamon exports to the USA (X6) with the competitiveness of Indonesian cinnamon exports (Y) shows that the value of cinnamon exports to the USA partially has a significant effect on the competitiveness of Indonesian cinnamon exports.

3.3. Discussion

(1) Exchange Rate of Rupiah to USD

Regarding the results of the data analysis, the coefficient of the rupiah exchange rate against the USD (X1) produces a negative effect of 5.526115 with a significance level of 0.022, which is smaller than the 5% significance level ($\alpha = 0.05$). This shows that the variable exchange rate of the rupiah against the USD has a negative effect and partially has a significant influence on the competitiveness of Indonesian cinnamon exports. The hypothesis that states that there is a significant negative effect between the rupiah exchange rate and the competitiveness of Indonesian cinnamon exports is acceptable.

The results of this study support the results of previous research from Sugiharti et al. (2020), Astuti (2018) and Supriana et al. (2022), which showed that the rupiah exchange rate had a significant negative effect on the competitiveness of Indonesian cinnamon exports to the largest export destination countries. With a negative value in the rupiah exchange rate variable, it states that the relationship between the rupiah exchange rate and export competitiveness is in the opposite direction or inversely proportional. If the value of the domestic currency decreases against the currencies of other countries (depreciation), it will increase export competitiveness. Conversely, if the value of the domestic currency increases against foreign currencies, it will tend to reduce the competitiveness of exports.

A higher exchange rate in terms of the rupiah against the USD or depreciation in the exchange rate will cause the price of goods from Indonesia to become relatively more expensive. Ginting (2013) states that when the exchange rate increases, the price of domestic goods becomes relatively more expensive than foreign goods. This condition will encourage domestic residents to buy more imported goods and foreign residents to buy fewer imported goods from the country.

(2)   Cinnamon Export Volume

Regarding the results of the data analysis, the coefficient of the export volume of cinnamon (X2) produces a positive effect of 68.97417 with a significance level of 0.015, which is smaller than the 5% significant level (α = 0.05). This shows that the variable volume of cinnamon exports has a positive effect and partially has a significant influence on the competitiveness of Indonesian cinnamon exports. The hypothesis that states that there is a significant positive effect between the volume of cinnamon exports and the competitiveness of Indonesian cinnamon exports is acceptable.

The results of this study support the results of previous research studies by Rosyadi et al. (2021), Maulana and Kartiasih (2017) and Supriana et al. (2022), all of which determine the effect of export competitiveness on Indonesia's export volume, proving that there is a positive and significant influence between export competitiveness and export volume. If there is an increase in the volume of cinnamon exports to the United States, it will increase the competitiveness of cinnamon exports relative to export destination countries. Conversely, if the volume of cinnamon exports decreases, the competitiveness of cinnamon exports to export destination countries will also decrease.

If the volume of Indonesian cinnamon exports to the United States increases, this indicates that there is an increase in the purchasing power of Indonesian cinnamon in the United States market; thus, the competitiveness of Indonesian cinnamon exports will also increase.

(3)   Amount of Cinnamon Produced

Regarding the results of the data analysis, the coefficient value of the amount of cinnamon produced (X3) brings about a positive effect of 9.715536 with a significance level of 0.544, which is greater than the 5% significance level (α = 0.05). This shows that the variable amount of cinnamon produced has a positive but insignificant effect on the competitiveness of Indonesian cinnamon exports. The hypothesis that states that there is a significant positive effect between cinnamon export volume and the competitiveness of Indonesian cinnamon exports cannot be accepted.

The positive value of the regression results is in accordance with the absolute advantage theory proposed by Adam Smith, which states that a country will produce and export certain commodities if the country has an absolute advantage over other countries. According to Wulansari et al. (2016), if the production of a commodity is optimal, effective and efficient, it will affect the competitiveness of the export of the commodity. If a country has high-quality production factors, the amount of produce will also increase; thus, the country can specialize in these products, and this will affect the competitiveness of exports in the international market. The results of research studies from Oktavian and Maulana (2019) and Sa'diyah and Darwanto (2020), which determined the effect of the amount of produce on competitiveness, exert a positive influence on the amount of production and export competitiveness. If there is an increase in the amount of produce, it will increase export competitiveness. Conversely, if there is a decrease in the amount of produce, the competitiveness of exports will also decrease.

The insignificant effect between the amount of produce and export competitiveness in this study explains that an increase in the amount of cinnamon produced is not always followed by an increase in export competitiveness, but it can also experience a decrease. Although the amount of Indonesian cinnamon products increases, not all products will be exported to the global market, but they may be marketed in the domestic market to meet domestic needs.

The resulting product must have good quality in order to meet export standards relative to the destination country so that the product has competitiveness in the global market. Products that are eligible for export are products that have domestic potential and are highly competitive in the international market (Hamdani 2012). Not all of Indonesia's cinnamon is good quality, so some products cannot meet the standards for export relative to the global market (Menggala 2021; Izhar and Hendri 2022).

(4)   Indonesia GDP per Capita

The results show that Indonesia's GDP per capita (X4) produces a negative effect of -67.84175 with a significance level of 0.335, which is greater than the 5% significant level ($\alpha = 0.05$). This shows that Indonesia's GDP has a negative and partially insignificant effect on the competitiveness of Indonesian cinnamon exports. The hypothesis that states that there is a significant positive influence between Indonesia's GDP per capita and the competitiveness of Indonesia's cinnamon exports cannot be accepted. That is, even though there is a change in GDP, the value of Indonesia's rubber exports changes in the same direction, but the change is not significant. The previous description is in line with the research of Yazid et al. (2020), Suryanto (2016), and Farida and Yuliana (2022) stating that Indonesia's GDP does not affect exports.

(5)   USA GDP per Capita

The results of the USA GDP per capita (X5) produce a negative effect of $-149,597$ with a significance level of 0.029, which is smaller than the 5% significance level ($\alpha = 0.05$). This shows that the USA's GDP per capita has a negative effect and partially has a significant influence on the competitiveness of Indonesian cinnamon exports. The hypothesis that states that there is a significant negative effect between cinnamon export volume and the competitiveness of Indonesian cinnamon exports is acceptable.

According to Mahadika et al. (2017) and Cora and Wen (2020), the amount of GDP can indicate the size of a country's economy, both with respect to exporting and importing countries. A large exporting country's GDP shows the country's greater ability to produce and export to other countries. Likewise, a large importing country's GDP indicates greater importing public incomes, and large incomes can have an impact on the demand for imported commodities so that the importing country's GDP can also increase exports in exporting countries.

Negative GDP growth indicates a decrease in people's purchasing power. The decline in the value of goods and services produced by the community certainly has an impact on decreasing income and welfare. Meanwhile, the ability to buy imported products will receive a positive response from exporters in terms of sending their products to destination countries.

(6)   Export Value of Cinnamon to the USA

The cinnamon exports to the USA (X6) produce a positive effect of 104.2006 with a significance level of 0.023, which is smaller than the 5% significance level ($\alpha = 0.05$). This shows that the variable value of cinnamon exports to the USA has a positive effect and partially has a significant influence on the competitiveness of Indonesian cinnamon exports. The hypothesis that states that there is a significant positive influence between the value of cinnamon exports to the USA and the competitiveness of Indonesian cinnamon exports is acceptable.

The results of this study support the results of previous research by Rosyadi et al. (2021) and Haryadi and Amril (2020) stating that the factor that has a positive and significant effect on competitiveness is the value of commodity exports. If there is an increase in the value of cinnamon exports to the United States, it will increase the competitiveness of cinnamon exports in destination countries. Conversely, if the export value of cinnamon decreases, the competitiveness of cinnamon exports in destination countries will also decrease.

The results of this study cannot be directly compared to other countries, except countries that have a similar farm and institutional environment as Indonesia. For instance, countries in South, Southeast and East Asia, and sub-Saharan Africa have comparable farm characteristics, and this study's results may apply to these countries (Eastwood et al. 2009).

4. Conclusions

By examining comparative competitiveness via the revealed comparative advantage calculation, it is shown that Indonesia has a comparative advantage or competitiveness with respect to cinnamon commodities exported to the United States. This can be identified

from the RCA value of Indonesian cinnamon exported to the United States, which is greater than one. Sri Lankan cinnamon exports are more competitive than Indonesia's in terms of market share relative to the United States.

The factors that affect the competitiveness of Indonesian cinnamon exports relative to the United States were found for the variable of the exchange rate of the rupiah against the USD, the volume of cinnamon exports, the USA's GDP per capita and the value of cinnamon exports to the USA. Meanwhile, the amount of cinnamon produced and Indonesia's GDP per capita have no significant effect on the competitiveness of cinnamon exports to the United States.

A suggestion provided here is to increase exports via better and stricter quality control on Indonesian cinnamon; thus, Indonesian cinnamon commodities can be more competitive. Furthermore, the suggestion is also extended to conducting the post-harvest processing of cinnamon in order to transform cinnamon into processed products so that the dominant types of cinnamon products exported are no longer in the form of raw cinnamon bark rolls because they have a lower export value compared to processed cinnamon products. Via the comprehensive study that has been conducted, study limitations still exist, motivating potential future research to include the companies that are involved in exporting cinnamon during a particular period of study and including government regulations on export policy.

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