



Analysis of factors affecting the competitiveness of Indonesian tea

Fauzan Adnan Sumekar dan Eddy Renaldi

Department of Agriculture, Universitas Padjadjaran, Jatinangor, West Java, Indonesia

Abstract

This study aims to analyze the factors influencing the competitiveness of Indonesian tea in the international market. Using data from 2003 to 2022, the research focuses on the five main export destinations for Indonesian tea: Malaysia, Russia, Australia, the United States, and Pakistan. The methods used include the Export Intensity Index (EII) to measure competitiveness and panel data regression to identify the factors affecting this competitiveness. The results indicate that tea production, GDP of exporting countries, exchange rates, inflation, and export prices significantly influence the competitiveness of Indonesian tea. Panel data regression analysis shows that increased tea production and GDP of the exporting countries can enhance Indonesian tea's competitiveness. However, high inflation and exchange rate fluctuations can reduce competitiveness. The study provides recommendations for policymakers to focus on increasing tea production, ensuring economic stability, and controlling inflation to enhance the competitiveness of Indonesian tea in the international market.

Keywords: Indonesian tea competitiveness, export intensity index, tea production, export price

Introduction

According to data from the Central Statistics Agency (BPS, 2024), Indonesia's agricultural sector ranked third as the main contributor to GDP growth in 2024, with a contribution of 12.53%, equivalent to IDR 262 quadrillion. This agricultural sector consists of several subsectors including food crops, livestock, horticulture, and plantations. Since the enactment of Law No. 18 of 2004 on Plantations, the plantation subsector has become very important. This decision reflects the government's commitment to supporting and advancing the plantation subsector, given its strategic role in national development.

The importance of the plantation subsector for the economy of a country has been recognized by international research. According to the International Labour Organization (2016), the plantation subsector plays a significant role in the economies of developing and emerging countries. Millions of people gain employment from this sector, which also generates significant export revenue and contributes to economic growth.

Data from the Badan Pusat Statistik (2023) ^[5] shows the export value of several strategic plantation commodities in 2022. One such export commodity is cloves, which experienced a decline of 41.05%; coconut, which declined by 8.09%; palm oil, which declined by 47.92%; coffee, which declined by 2.41%; and tea, which experienced an increase of 0.83%. Among the various commodities discussed, tea is the only one that showed an increase in export value. With an export value of USD 89,902,350 and a growth of 0.83%, this phenomenon demonstrates the potential for growth in the plantation sector, particularly tea. Tea (*Camellia sinensis*) plays an important role in Indonesia's economic structure, not only as a source of foreign exchange but also as a source of income for farmers, a labor absorber, a driver of the tourism industry, and an environmental conservation supporter. Tea is considered a national flagship commodity of Indonesia and is an important component of agricultural products. This is emphasized in the Minister of Agriculture of the Republic of Indonesia Decree No. 317/Kpts/KB.020/10/2015 concerning

Guidelines for Production, Certification, Distribution, and Supervision of Tea Plant Seeds, which states that tea is not only a plantation commodity but also one of the most popular spice and refreshment plants.

Based on Trademap (2024), Indonesia's tea exports to the five main importing countries in 2023 include Malaysia, Russia, Australia, the United States, and Pakistan. The largest export value of Indonesian tea is to Malaysia at USD 13,955,000, followed by Russia (USD 6,740,000), Australia (USD 4,903,000), the USA (USD 3,987,000), and Pakistan (USD 2,954,000). From this data, it can be seen that Malaysia is the main market for Indonesian tea exports, followed by Russia and Australia.

However, compared to other exporters, Indonesia faces intense competition. In Malaysia, the largest exporter is China with an export value of USD 208,793,000, which is 1396% higher than Indonesia's exports. Sri Lanka also shows significant export performance to Malaysia with an export value 28% higher than Indonesia. In Russia, India dominates with an export value of USD 69,778,000, which is 935% larger than Indonesia's exports. In Australia, Sri Lanka has an export value of USD 17,830,000, which is 264% higher than Indonesia's exports. In the USA, India dominates with an export value of USD 51,759,000, which is 1198% larger than Indonesia's exports. In Pakistan, Kenya is the largest exporter with an export value reaching USD 560,013,000, which is 18860% larger than Indonesia's exports, and Vietnam also has an export value 3382% higher than Indonesia.

Overall, the condition of Indonesian tea exports to the five main destination countries shows that Indonesia faces very tight competition from other tea-exporting countries. China, India, Sri Lanka, and Kenya are the main competitors dominating these important markets. Although Indonesia has a presence in these markets, its export value is still relatively small compared to its competitors. From the explanation in tables 1.3 and 1.4, it can be seen that Indonesian tea exports in the global market and in the five largest export destination countries are still quite difficult to compete. In this context, a deep analysis of the factors

causing the decline in the export value of Indonesian tea needs to be conducted to assess the competitiveness of Indonesian tea in the global market.

According to research conducted by Fadhilah Ramadhani (2013)^[8], it appears that the competitiveness of Indonesian tea in the global market still shows significant strength, as reflected in the average Revealed Comparative Advantage (RCA) value of 6.790. This study provides important insights into the position and potential competitiveness of Indonesian tea in the context of the international market. Although many previous studies have examined the competitiveness of tea in the global market, most of these studies differ in data timeliness, variable variations, research methods, and analysis tools, which affects the variation in research results.

V From the background explanation above, it is clear that although the government has formulated strategies and directed efforts to increase the competitiveness of Indonesian tea as a national flagship commodity in the global market, this target has not been achieved. The trend or value of Indonesian tea exports has fluctuated from year to year, creating research gaps that need to be filled. Considering the urgency to increase the export value of Indonesian tea, related research becomes important. Therefore, researchers conducted a study on "Analysis of Factors Affecting the Competitiveness of Indonesian Tea" as a foundation to deepen the understanding of the factors influencing the competitiveness of Indonesian tea. This study uses the latest data to provide more up-to-date and relevant results with current conditions.

Research methodology

This study utilizes secondary data in the form of time series data covering a period of 20 years from 2003 to 2022. The main focus of this research is on Indonesia's main tea importing countries, namely Malaysia, Russia, Australia, the United States (USA), and Pakistan. In addition, this study also highlights major tea exporting countries such as Indonesia, China, Sri Lanka, Kenya, Vietnam, and India. Data sources used include official websites such as Trademap, World Bank, UNCTAD, OECD, FAO, Our World in Data, and other sources that provide the necessary information for analysis.

The data analysis method applied is a quantitative method consisting of several structured approaches. First, the Export Intensity Index (EII) method is used to measure the level of competitiveness. Next, the factors affecting tea competitiveness are examined through a static panel data regression approach. The collected data is then processed using E-Views 12 and Microsoft Excel 2019 software.

Pengukuran Daya Saing

1. Export Intensity Index (EII)

EII is used to analyze the competitive position of Indonesian tea compared to other tea-exporting countries in the international market.

$$EII = \frac{X_{ij}/X_i}{M_j/M_w}$$

Keterangan:

X_{ij} = The export value of Indonesian tea to country-j (USD 000)

X_i = Total export value of Indonesia to the world (USD 000)

M_j = Import value of tea by country-j from the world (USD 000)

M_w = Total world import value of tea (USD 000)

When the EII value exceeds 1, it indicates that the country has strong competitiveness as its value is above the world average. Conversely, if the value is less than 1, it indicates that the country has low competitiveness as its value is below the world average.

Static panel data regression analysis

This study aims to analyze the influence of certain independent variables on the competitiveness of Indonesian tea exports measured by the Export Intensity Index (EII). The independent variables to be evaluated include tea production (X1), GDP of the exporting country (X2), Exchange Rate (X3), Inflation (X4), and Export Price (X5). The model used in this study is:

$$EII_{ict} = \alpha_0 + \alpha_1 PT_{c,t} + GDP_{c,t} + ER_{c,t} + IF_{c,t} + HE_{c,t} + u_{c,t}$$

Keterangan:

EII_{ict} = Export competitiveness index of tea in country-c in year-t

α₀ = Constant

α₁ = Regression coefficient for each variable

PT_{c,t} = Tea production in country-c in year-t

GDP_{c,t} = GDP of country-c in year-t

ER_{c,t} = Exchange rate of each country against USD in year-t

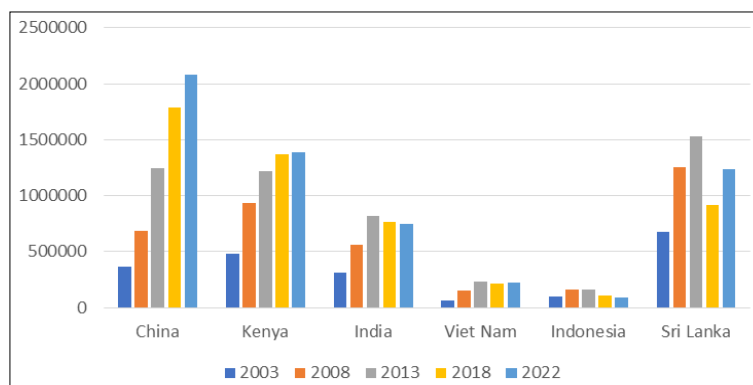
IF_{c,t} = Inflation in country-c in year-t

HE_{c,t} = Export price of tea in country-c in year-t

u_{c,t} = error term

Result and discussion

Development of world tea export values



Source: Trademap, 2024

Fig 1: World Tea Export Values (USD 000)

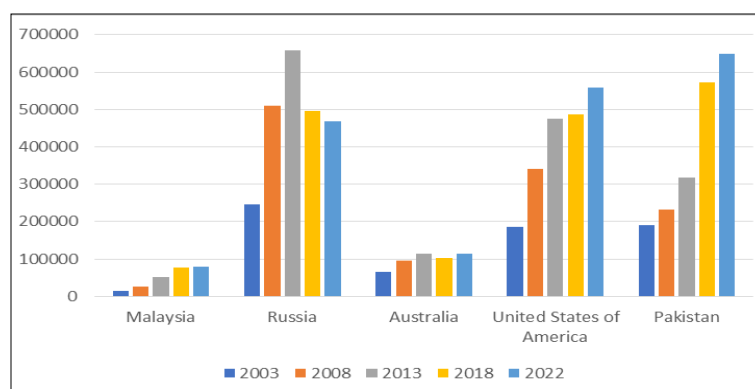
Based on Figure 4, China and Kenya show positive trends in tea export values from 2003 to 2022. The export value of Chinese and Kenyan tea increased by 468% and 188%, respectively, during this period. Although the export value of Chinese tea is higher, Kenya has a larger production volume, reaching 2,326,000 tons in 2022 compared to China, which produced 14,542,600 tons. This indicates that China is able to sell its tea at higher prices in the international market compared to Kenya. The increase in Chinese tea export value is not independent of the significant increase in production during the analyzed period. Chinese tea production increased from 3,360,675 tons in 2003 to 14,542,600 tons in 2022.

Indonesia experienced a decline in both production and export value. Indonesian tea production decreased from 738,000 tons in 2003 to 595,000 tons in 2022. The export value of Indonesian tea decreased by 43%. The volume of Indonesian tea exports also declined from 96,210 tons in

2008 to 44,632 tons in 2022. According to Edward (2016), the factors causing this decline include a reduction in land area, increased production costs, low quality, and unmet standardization targets both at the national and international levels. Additionally, outdated production equipment, undertrained human resources, and low tea prices at the farmer level contributed to this decline.

The export value of Indian tea appears quite fluctuative, although still better than Indonesia. Although fluctuative in value, Indian tea production increased consistently from 3,678,000 tons in 2003 to 5,969,000 tons in 2022. This indicates that although the export value tends to fluctuate, increased production can meet high domestic consumption demand. Similarly to India, Vietnam and Sri Lanka also show fluctuative trends in export values.

Development of world tea import values



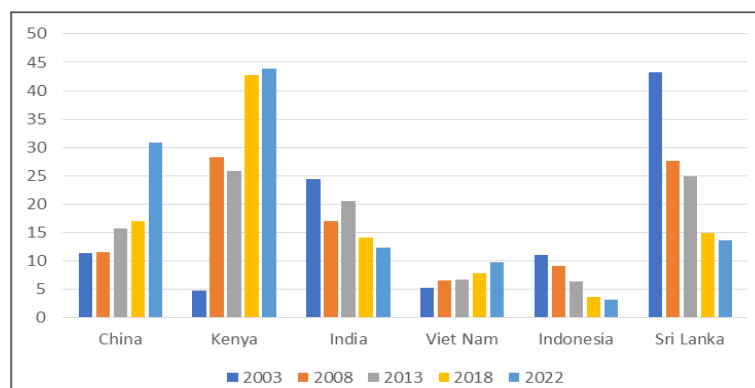
Source: Trademap, 2024

Fig 2: World Tea Import Valuer (USD 000)

The selection of the top five largest importing countries, namely Malaysia, Russia, Australia, the United States, and Pakistan, is based on their significant contribution to absorbing 24.3% of world tea. Additionally, these five countries are the largest export destinations for Indonesia. An analysis of import values from these five countries shows variations in import trends during the period 2003 to 2022. Some countries like Malaysia and Australia show relatively consistent increasing import trends. Meanwhile, Russia and the United States experience fluctuations in their import values. Pakistan, on the other hand, shows a significant increase in import values from 2003 to 2022.

An analysis of the importers' trade balance shows that all analyzed countries experience a deficit. Specifically, Pakistan has the largest trade balance deficit with a value of USD -572,512,000 in 2023, followed by the United States with USD -421,274,000 and Russia with USD -269,641,000. Australia and Malaysia also show deficits of USD -100,201,000 and USD -77,804,000, respectively. The trade balance deficits experienced by these five countries indicate that their domestic tea consumption heavily relies on imports from other countries.

Export Proportion of Tea

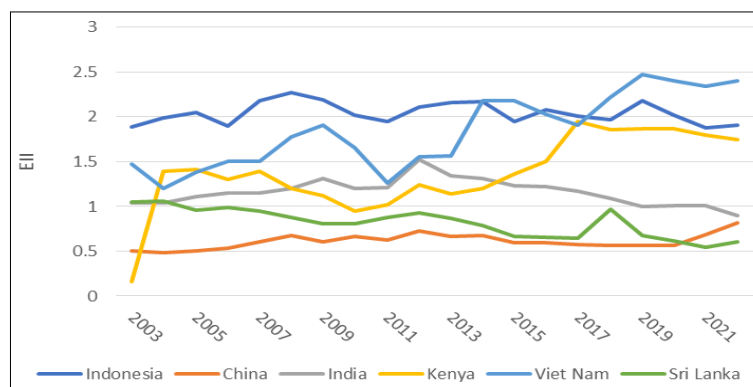


Source: Trademap, 2024

Fig 3: Export Prices of Tea (USD 000)

China shows a consistent increase in market share for tea prices from 2003 to 2022, with an increase of 170.8%. On the other hand, Kenya and Vietnam experience fluctuations but continue to show an overall upward trend, with Kenya experiencing an increase of 828.5% and Vietnam increasing moderately. India, despite experiencing fluctuations, shows an overall decline of 49.5%. Meanwhile, Sri Lanka and Indonesia face a continuous decline in market share with decreases of 68.5% and 71.8%, respectively.

According to Muflihah *et al.* (2023), the decline in Indonesian tea market share is due to the decrease in tea quality that does not meet international market standards and unstable production quantities. In China itself, the increase in market share is in line with the increase in production and the country's GDP, indicating the relationship between economic growth and the success of tea exports.



Source: Processed data, 2024

Fig 4: EII 2003-2022

Based on the analysis results using the EII method in Figure 4.7, it can be seen that during the period 2003-2022, Indonesia and the five largest tea-exporting countries had quite fluctuating EII values each year. Exporters consistently having EII values above 1 are Indonesia and Vietnam, indicating these two countries have good competitiveness compared to their competitors. Meanwhile, Kenya has had EII values above 1 since 2004. The other two countries, Sri Lanka and China, have EII values below 1, indicating these two countries are less competitive in destination countries.

China has the smallest EII value trend compared to other competitors, even though China's export value and proportion are very large compared to the other four competitors, at 419,387 thousand USD and around 30% in 2022. This is because China's tea export value to the world is very large, resulting in a small export ratio.

The highest EII value in 2022 is held by Vietnam with a value of 2.40. Vietnam experienced an EII value increase of 633% from 2003 to 2022. This is in line with a positive trend in tea export values and proportions. Vietnam recorded an increase in tea export values of 582.9% and an increase in proportions of 86.3%

Indonesia is the most consistent country with EII values above 1.5 each year. Indonesia's EII value once reached above 2 in several years but dropped again as Indonesian tea export values declined. According to Septino Adi Surya (2023), Indonesian tea producers are expected to increase production both in quantity and quality so that abundant tea production can increase Indonesian tea exports and affect

Analysis of Indonesian tea export competitiveness (EII)

The competitiveness of tea exports is analyzed using the Export Intensity Index (EII) method. If the EII calculation result is < 1 , it means the tea-exporting country exports less to the five selected importers compared to the world average (low competitiveness). If the EII calculation result is > 1 , it means the tea-exporting country exports more to the five selected importers compared to the world average (high competitiveness). If the EII calculation result is $= 1$, it means the tea-exporting country exports tea to the five selected importers equal to the world average tea exports to the same importers. The EII ratio values from the largest tea-exporting countries to destination countries for the period 2003-2022 are used to observe the condition and development of tea export competitiveness in the destination countries.

Indonesian tea competitiveness in the international market. He argues that improving tea production quality and quantity will strengthen Indonesia's position in the global market and increase EII values.

Regression analysis of best model for tea export competitiveness

Panel data regression analysis includes the coefficient of determination (R-square), model feasibility test (F-test), and significance test of independent variables (T-Statistic test).

$$EII_{i,c,t} = -0,217 + 0,07 * (PT)_{c,t} + 0,015 * \log(GDP)_{c,t} + 0,120 * \log(ER)_{c,t} - 0,002IF_{c,t} + 0,0000168 * HE_{c,t} + \mu_{1,et}$$

a. Coefficient of Determination (R-Square)

The regression results using the FEM method show that the R-squared value is 0.971. The independent variables, including Production (PT), Gross Domestic Product (GDP), Exchange Rate (ER), Inflation (IF), and Export Price (HE), can explain 97.1% of the variations in the dependent variable Export Competitiveness (EII). The remaining 2.9% variation is explained by other variables not included in this model.

b. F - Test

The F-test is used to assess the simultaneous influence of independent variables on the dependent variable. The regression results show an F-statistic value of 312.880 with an F-statistic probability value of 0.0000, which is less than 0.05. This indicates that all independent variables (PT, GDP, ER, IF, and HE) collectively have a significant influence on Tea Export Competitiveness (EII). These

results align with the study by Wardhany and Adzim (2018)^[34], which states that production, international prices, and exchange rates significantly influence the volume of Indonesian cocoa bean exports. Similar research by Nolla *et al.* (2020)^[35] states that inflation, exchange rates, and production significantly influence Indonesian tobacco export volumes.

c. T – Test

▪ **Influence of Tea Production (PT) on Tea Export Competitiveness**

The probability value of the PT variable is $0.2752 > \alpha$ (0.05) and the t-test value is 1.097, which is less than the t-table value at the 5% significance level with df 114, which is 1.657. This indicates that the PT variable does not significantly influence Tea Export Competitiveness during the study period. These results align with the study by Surya (2023), which states that tea production does not significantly influence the competitiveness of Indonesian tea exports. Mejaya *et al.* (2016)^[37] state that tea produced for export purposes must be of high quality to compete in the international market. However, not all domestically produced tea meets the quality standards required by importing countries.

▪ **Influence of Gross Domestic Product (GDP) on Tea Export Competitiveness**

The probability value of the GDP variable is $0.0205 < \alpha$ (0.05) and the t-test value is 2.353, which is greater than the t-table value. This indicates that GDP significantly influences Tea Export Competitiveness with a positive relationship during the study period. These results align with the study by Aulia (2020)^[38], which states that the higher the GDP of a country, the greater its ability to engage in trade. This indicates that the higher the GDP of trading partner countries, the larger the available market. Increased demand and supply impact the increase in import demand and export supply. On the other hand, GDP growth also has the potential to increase production diversity. Increased production will increase the need for inputs and drive higher imports, thereby increasing Indonesia's export value.

▪ **Influence of Exchange Rate (ER) on Tea Export Competitiveness**

The probability value of the ER variable is $0.0490 < \alpha$ (0.05) and the t-test value is 1.992, which is greater than the t-table value. This indicates that the ER variable significantly influences Tea Export Competitiveness during the study period. These results align with the study by Wardhany and Adzim (2018)^[34], which states that the exchange rate of the rupiah against USD significantly influences the volume of cocoa bean exports.

▪ **Influence of Inflation (IF) on Tea Export Competitiveness**

The probability value of the IF variable is $0.1626 > \alpha$ (0.05) and the t-test value is -1.406, which is less than the t-table value. This indicates that the IF variable does not significantly influence Tea Export Competitiveness during the study period. These results align with the study by Putri and Jayadi (2023)^[39], which states that inflation does not significantly influence non-oil and gas exports.

▪ **Influence of Export Price (HE) on Tea Export Competitiveness**

The probability value of the HE variable is $0.4135 > \alpha$ (0.05) and the t-test value is -0.822, which is less than the t-table value. This indicates that the HE variable does not significantly influence Tea Export Competitiveness during the study period. These results align with the study by Wahyuni *et al.* (2021)^[40] that international palm oil prices do not significantly influence Indonesian palm oil exports.

Conclusion

1. The Export Competitiveness (EII) of Indonesian tea from 2003 to 2022 has an average value of 2.04, with the EII value in 2022 being 1.90. Although the export competitiveness of Indonesian tea is consistently high compared to other countries, its export value and global market proportion still need to be increased to maintain competitive advantage. Increasing export values and improving product quality are key to maintaining and enhancing this competitiveness.
2. Based on the export competitiveness (EII) model analysis for tea, it was found that simultaneously, the variables Tea Production, GDP, Exchange Rate, Inflation, and Export Price significantly influence export competitiveness. Partially, the GDP and Exchange Rate variables significantly influence EII. Meanwhile, Inflation, Export Price, and Tea Production do not show significant influence. This indicates that increasing GDP and exchange rate stability are crucial for enhancing the competitiveness of Indonesian tea in the global market.

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