

Competitiveness Analysis and Factors Affecting Indonesian Rubber Exports in BRICS Plus Countries

Farrel Rizqi Sambhoro*, Budi Setiawan, and Rachman Hartono

Agribusiness Study Program, Faculty of Agriculture, Universitas Brawijaya, Malang, Indonesia

*Corresponding author email: farrelrizqis@gmail.com

Article history: submitted: February 5, 2025; accepted: November 13, 2025; available online: November 20, 2025

Abstract. By leveraging its potential as a new member of BRICS, Indonesia can enhance its international trade through increased economic and trade cooperation within the group. BRICS integration can help improve Indonesia's trade balance and reduce its dependence on traditional markets, as it provides Indonesia with access to new markets and opportunities to diversify its export partners. This is the first study to analyze Indonesian rubber competitiveness and key determinants specifically across BRICS-Plus countries following official 2025 accession, providing one of the first empirical assessments in the context of Indonesia's prospective 2025 BRICS accession. Using Revealed Comparative Advantage (RCA) and multiple linear regression methods with annual data from 2001 to 2023, the study evaluates both comparative advantage and the factors influencing export performance. The independent variables include the GDP of BRICS countries, Indonesia's GDP, world rubber prices, exchange rate, inflation rate, population, and export restriction policy. The RCA results show that Indonesia holds a comparative advantage in most BRICS markets; however, competitiveness remains relatively weak in India and China, the two largest importers of Indonesian rubber. Regression analysis indicates that three variables significantly and positively affect Indonesia's rubber export value, namely the GDP of BRICS nations, international rubber prices, and the rupiah exchange rate. These findings imply that macroeconomic coordination, diversification of export destinations, and stabilization of the exchange rate are crucial to enhancing Indonesia's trade performance within BRICS. Strengthening competitiveness in key markets will be essential for Indonesia to optimize its economic gains and reinforce its position in the global rubber trade following full integration into the BRICS framework.

Keywords: brics; competitiveness; multiple linear regression; revealed comparative advantage; rubber export

INTRODUCTION

International trade is very important because it enables nations to capitalize on economies of scale and access a variety of goods through product differentiation ([Krugman et al., 2012](#)). The theory emphasizes that trade drives efficiency, specialization, and competition, which ultimately lead to economic growth and social welfare. By adopting this strategy, countries can strive to achieve sustainable economic growth and increase their income-generating capacity. One of the reasons for increasing national income can be the augmentation of goods and services production ([Putri & Siladjaja, 2021](#)). A country's export activities are influenced by the increase in the production of goods and services, and one of the main factors can occur due to the expansion of the domestic

production market, which occurs due to the opening of a country's trade market to the global economy. This is supported by the statement that the economic growth of a country, both developed and developing countries, can be achieved through a trade balance surplus or, in other words, profit from export and import activities ([Blavasciunaite et al., 2020](#); [Saragih & Aslami, 2022](#)). A trade surplus occurs when the export value exceeds the import value, whereas a trade deficit arises when the import value surpasses the export value. In early 2025, Indonesia officially became an official member of BRICS, which consists of Brazil, Russia, China, India, and South Africa. Indonesia was inaugurated by the Brazilian government as the chair of BRICS for the 2025 period, along with four other countries, namely the United Arab Emirates, Ethiopia, Iran, and



Egypt, thus becoming a BRICS Plus member. The BRICS countries collectively represent a significant portion of the global economy, accounting for nearly 30% of global GDP and approximately 40% of the world's population, positioning them as key players in the dynamics of international trade (UNComtrade, 2025). By utilizing its position in BRICS, Indonesia, as a developing country, can improve its trade relations not only with member countries but also with other emerging markets (Nayyar, 2020). Experience from other BRICS nations suggests that enhanced economic cooperation has led to increased trade volumes and a greater diversity of export markets (Bhat et al., 2022; Mishra et al., 2015). BRICS nations are reshaping global and domestic agriculture by leveraging economic growth, technology, and strategic investment to achieve food security and self-sufficiency, while facing complex challenges in reducing dependence on international markets (Bamidele, 2025). The BRICS countries are increasingly

integrated into the global trade network, which can provide Indonesia's rubber export with access to new markets and opportunities to diversify its export markets (Tonsakunthaweeteam, 2024). This integration can help stabilize Indonesia's export revenues and reduce its dependence on traditional markets.

According to data from Ditjenbun (2022), the value of rubber exports becomes the second largest after palm oil with an export value of 4.12 billion USD and contributing around 10.06% of the total exports of the Indonesian plantation subsector. Rubber has a significant influence in Indonesian economic growth (Husaini et al., 2023). Indonesia occupies a significant role in the global rubber market as one of the foremost producers and exporters. Indonesia is among the major exporters of rubber globally based on production volume, only below Thailand with a total production of 3 million tons in 2021 (Ministry of Agriculture, 2023).

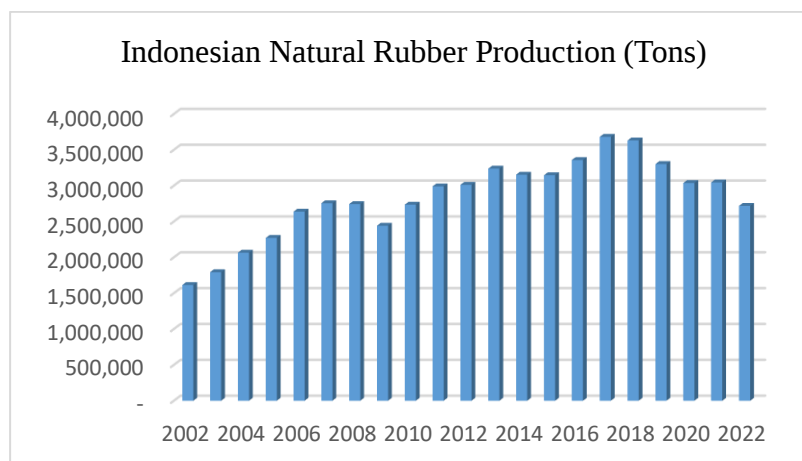


Figure 1. Indonesian natural rubber production
Source: Built by Authors based on (Ministry of Agriculture, 2023)

Prior research indicates that global demand for natural rubber has risen by around 61 million USD annually (Prasada & Dhamira, 2021). This is propelled by the annual expansion of the automotive sector, which is the predominant user of worldwide rubber as a primary material for tire manufacturing (Saputra et al., 2021). China's

dedication to advancing the electric vehicle sector exemplifies the significant potential for rubber consumption inside the country. The elevated demand for tires has led to considerable rubber consumption, with estimates indicating that China imported approximately 78.9% of its entire rubber consumption in 2015, totaling 3,803.2 tons

([Kajornkasirat et al., 2021](#)). The elevated demand presents potential for rubber-exporting nations globally to compete effectively in the BRICS market. China has achieved significant advancements in rubber tree agriculture, with over 1.12 million hectares allocated to this endeavor, yielding 856,000 tons ([Wang et al., 2024](#)). The intense rivalry in natural rubber commodities between Indonesia and other nations indicates that enhancing competitiveness is essential for maintaining the global market viability of Indonesian natural rubber ([Radityo et al., 2014](#)).

Competitiveness of a product can be assessed using many metrics as benchmarks. One measure of a product's competitive success is its substantial market demand or the rising volume of its exports in international trade ([Nurlaili, 2021](#)). To compete in the worldwide market, the product must possess advantages over those from rival countries ([Anggrasari et al., 2021](#)). If Indonesian rubber is competitive in the global market, the effect on farmers is that they will be more incentivized to produce higher-quality rubber at reduced production costs to enhance earnings and increase rubber output ([Daulika et al., 2020](#)). In conclusion, Indonesian rubber production must be competitive in the global market, both in comparative and competitive terms, to surpass other nations in the international market.

This study aims to analyze the competitiveness of Indonesian rubber exports, determinants of the values to BRICS countries, and to discuss the implications and recommendations to enhance economic growth through rubber export commerce and to fully leverage the advantages of BRICS membership. Numerous prior studies have examined the competitiveness of Indonesian natural rubber exports, particularly in traditional markets like the United States and other developed countries. However, few studies have investigated the prospects of Indonesian rubber exports to BRICS nations, particularly following Indonesia's official

accession to BRICS in 2025. Whereas, it is essential to do research on the competitiveness of Indonesian rubber exports to its primary trade partners ([Tiyastuti et al., 2022](#)). Understanding the potential of the BRICS market is essential for Indonesia to capitalize on trade synergies that drive economic growth while mitigating potential risks arising from the removal of existing barriers, as BRICS membership is expected to elevate Indonesia's global standing, strengthen its bargaining power, and provide a strategic platform to advance its national interests in international decision-making processes ([Kumar et al., 2023](#); [Nahak & Kalisang, 2025](#)). On the other hand, Indonesia needs to carefully manage potential challenges such as geopolitical frictions with Western countries, economic rivalry among BRICS members, and the evolving dynamics of global political realignments. To address these complexities, Indonesia should implement a flexible and strategically balanced foreign policy that maximizes the benefits of its participation in BRICS while safeguarding national interests ([Rachman & Info, 2025](#)). Therefore, this study seeks to provide a comprehensive understanding of Indonesia's position within the evolving BRICS framework by assessing the competitiveness and key determinants of its natural rubber exports. The findings are expected to provide policymakers and stakeholders with valuable insights for formulating strategies that enhance export performance, strengthen Indonesia's role in global trade, and ensure that its integration into BRICS translates into sustainable economic growth and greater resilience in the international market.

METHODS

This research employs a quantitative methodology to methodically examine a phenomenon by gathering numerical data ([Pandey et al., 2023](#)). This study utilizes secondary data comprising time series data (annual data) sourced from various reports, including the World Bank, United Nations

Commodity Trade Statistics Division (UN Comtrade), and Trademap, specifically focusing on the 4-digit HS code (HS 4001) for Natural Rubber over a 23-year period from 2001 to 2023. The rationale for selecting the timeframe is anchored in the inception of BRICS in 2001 up to the present day. The data pertains to rubber commodities, including the value and volume of Indonesian rubber exports, global rubber prices, inflation rates, Indonesian currency exchange rates, and additional factors. The data obtained via Microsoft Excel and subsequently analyzed using STATA 16.

Revealed Comparative Advantage

The Revealed Comparative Advantage (RCA) measurement or commonly called the Balassa Index created by Balassa in (1965) is employed to evaluate the export potential of Indonesian natural rubber goods in target countries, carefully articulated in [Long \(2021\)](#) as presented in Equation 1.

$$RCA_{ij} = \frac{X_{ij}/X_{tj}}{W_{ij}/W_{tj}} \dots\dots 1)$$

Description:

RCA_{ij}: Comparative competitiveness index of country i (Indonesia) to country j (BRICS Plus countries) in the period 2001-2023 (US\$); X_{ij}: Value of rubber exports from country i (Indonesia) to country j (BRICS Plus countries) in the period 2001-2023 (US\$); X_{tj}: Total export value from country i (Indonesia) to country j (BRICS Plus countries) in the period 2001-2023 (US\$); W_{ij}: Total export value of rubber commodities from all countries in the world to country j (BRICS Plus countries) in the period 2001-2023 (US\$); W_{tj}: Total export value of all commodities from all countries in the world to country j (BRICS Plus countries) in the period 2001-2023(US\$)

The competitiveness index value of a commodity in RCA has 2 possibilities, namely:

a. RCA value > 1, suggesting that Indonesia possesses a comparative advantage in competitiveness relative to total world exports of its rubber exports to BRICS Plus

countries. As a result of its comparative advantage, this indicates that the exporting country being analyzed is relatively more aware of problems related to the commodity group (strong competitiveness).

b. RCA value < 1, indicating that the total exports of Indonesian commodities by the country being studied are less than the average share of the commodity from around the world. This indicates that the exporting country (Indonesia) does not possess a comparative advantage in the BRICS Plus countries.

Multiple Linear Regression Analysis

Multiple regression analysis is a statistical method used to examine the relationship between a dependent variable and two or more independent variables. The independent variable in this research is the value of Indonesian rubber exports. Utilizing multiple regression, researchers can determine and measure the influence of each variable in this study, including the GDP of BRICS nations, international rubber prices, inflation rates, and exchange rates on the value of Indonesian rubber exports to BRICS countries. Analysis of factors affecting Indonesian rubber exports by multiple regression employing a natural logarithm model. The natural logarithm model was chosen because of discrepancies in units among the independent variables. ([Collischon & Eberl, 2020](#)). Consequently, the multiple regression analysis employed in this study is systematically articulated as stated in Equation 2.

$$\ln Y_{it} = \beta_0 + \ln \beta_1 PDB_{it} + \ln \beta_2 PRC_{it} + \ln \beta_3 INF + \ln \beta_4 EXC_{it} + e$$

Description:

Y : Total Value of Indonesian Rubber Exports to BRICS countries (US\$)

GDP : Combined GDP of all BRICS countries (US\$)

PRC : World rubber price (US\$)

INF : Inflation Rate of BRICS Countries (%)

EXC : Rupiah Exchange Rate to USD (Rupiah)

i : BRICS Plus Countries (Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Iran, UAE)

t : Period Year (2001-2023)

e : Standard Error

0 : Constant

This research utilizes statistical analyses, including the R-Squared Test, F-Test, and T-Test. The coefficient of determination (R^2) measures the degree to which the model explains the variations in the dependent variable. The F-test is a statistical method used to evaluate the influence of independent variables on dependent variables. The initial step in conducting a t-test is to formulate the test hypothesis. The t-test is a statistical procedure employed to evaluate the individual significance of parameters, also referred to as a partial significance test, as it assesses the importance of each variable within the model. Therefore, the t-test evaluates the influence of each explanatory variable on Indonesia's natural rubber exports.

1. The Determination Coefficient Test is used to assess how well the linear regression model can account for changes in the dependent variable using the independent variable. The R-Square or Adjusted R-Square figure approaching or above 0.5 or 50% indicates that the regression model sufficiently explains the dependent variable (Ghozali, 2018). In this case, the higher the R-Square or Adjusted R-Square value, the better the model's ability to explain the dependent variable. Conversely, if the R-Square or Adjusted R-Square value is low, then the regression model cannot properly explain the variation in the dependent variable, so it is necessary to make improvements or select more appropriate variables in order to improve the model's ability to explain the dependent variable. Therefore, the Determination Coefficient Test is important in evaluating the feasibility and reliability of the linear regression model.

2. Simultaneous regression test (F Test) is run to evaluate the combined impact of independent factors on the dependent variable in a linear regression model (Ghozali, 2018). This test is used to determine the statistical significance of whether the overall linear regression model has a significant effect on the dependent variable or not.

- a. Significance value > 0.05 or F count $< F$ table means there is no significant effect (H_0 is accepted)
- b. Significance value < 0.05 or F count $\geq F$ table means there is a significant effect. (H_1 is accepted),

3. Partial Regression Test (Partial t-Test) is run to determine the impact of each independent (neutral) variable separately. The t or sig value is the basis for decision-making.

- a. Sig value > 0.05 or t count $< t$ table means there is no significant effect (H_0 is accepted)
- b. Sig value < 0.05 or t count $> t$ table means there is a significant effect (H_1 is accepted)

RESULTS AND DISCUSSION

Based on **Figure 2**, Indonesian RCA rubber exports to BRICS nations offer significant insights on Indonesia's competitiveness in the global rubber market. RCA values exceeding 1 signify a competitive advantage, indicating that Indonesia exhibits superior rubber export performance in a certain market relative to its entire export framework. The findings indicate that Indonesia demonstrates a competitive advantage in the majority of these markets, but with differing degrees and temporal changes. In China, as one of the globe's foremost consumers of natural rubber Thomas et al. (2015), Indonesia exhibits RCA values oscillating near or exceeding 1 in numerous years, reaching a zenith of 15.6 in 2010 before diminishing to 2.5 in 2022. This indicates that Indonesia possesses a significant comparative advantage in the

Chinese market, particularly during its industrial expansion phase.

The recent drop in RCA values indicates heightened rivalry, evolving trade dynamics, or diversification of Chinese rubber sources, thereby undermining Indonesia's preeminent position. Brazil exhibits notably elevated RCA values, reaching a maximum of 98 in 2001 and 66 in 2018. These constantly elevated values underscore Brazil as a pivotal market in which Indonesia retains a significant comparative advantage. Brazil's reliance on Indonesian rubber seems to diminish post-2018, with the RCA value decreasing to 47 in 2023, indicating possible alterations in Brazilian domestic output, procurement strategies, or global trade dynamics. Substantial fluctuations in RCA levels in Russia were observed, with peak values of 136 in 2014 and 123 in 2013.

The elevated RCA values may be ascribed to geopolitical circumstances or trade agreements that favored Indonesian exporters during this timeframe. Nonetheless, the RCA value substantially declines in 2022 to 44, suggesting possible disruption or rivalry within the Russian market, which may be affected by overarching global political tensions and economic volatility. India, as a growing market for natural rubber, exhibits modest RCA values relative to other BRICS nations.

Beginning at 40 in 2001, India's comparative advantage saw fluctuations, culminating in a notable decrease to 4.7 in 2022. This significant decrease can be attributed to India's growing self-sufficiency in rubber production or heightened competition from other exporting nations ([Liu et al., 2019](#)). India's persistent need for rubber presents Indonesia with an opportunity to enhance its standing via strategic trade policies or value-added rubber products. The RCA values in South Africa have been largely steady, with a notable high of 85 in 2005 and 81 in 2018. These statistics indicate that Indonesia has a robust comparative advantage

in South Africa, likely due to its limited domestic manufacturing and significant reliance on imports ([Muzenda & Popa, 2015](#)).

The RCA value decreased to 43.7 in 2022, likely because of alterations in trade agreements or competition from other providers. Egypt exhibits persistently low RCA values, reaching a maximum of 28.5 in 2018, but experiencing a substantial decline following, falling to 5.9 in 2022 and merely 0.5 in 2023. This trend suggests that, although Indonesia has a comparative advantage in some years, Egypt is not a primary target market for Indonesian rubber exports, and its trade competitiveness may be overshadowed by other exporters or domestic production. The United Arab Emirates typically has low RCA values, indicating Indonesia's restricted comparative advantage in this market. Peaks like 40.1 in 2010 signify periods of robust export performance; nevertheless, RCA values often remain low, declining to 2.0 in 2022 and 1.3 in 2023. This suggests that the UAE is not a substantial market for Indonesian rubber, possibly due to limited competition or demand.

Competitiveness refers to a commodity's capacity to penetrate international markets. Commodities are deemed competitive if they can endure market shocks. The RCA index for Indonesian natural rubber commodities in BRICS plus nations exceeds 1, indicating that Indonesian natural rubber possesses a competitive advantage in these markets. However, some countries indicate that the RCA values are very low and near zero, emphasizing the necessity for diversification and adaptation to global trade dynamics ([Zuhdi et al., 2020](#)).

In countries such as Iran, Egypt, UAE, the values are so low that it indicates Indonesia is not focusing on rubber export to these countries and can focus more on BRICS countries that have high RCA values, such as India and China, where there is a vigorous advancement of their automotive industries ([Gao et al., 2024](#); [Kailashkumar, 2024](#)).

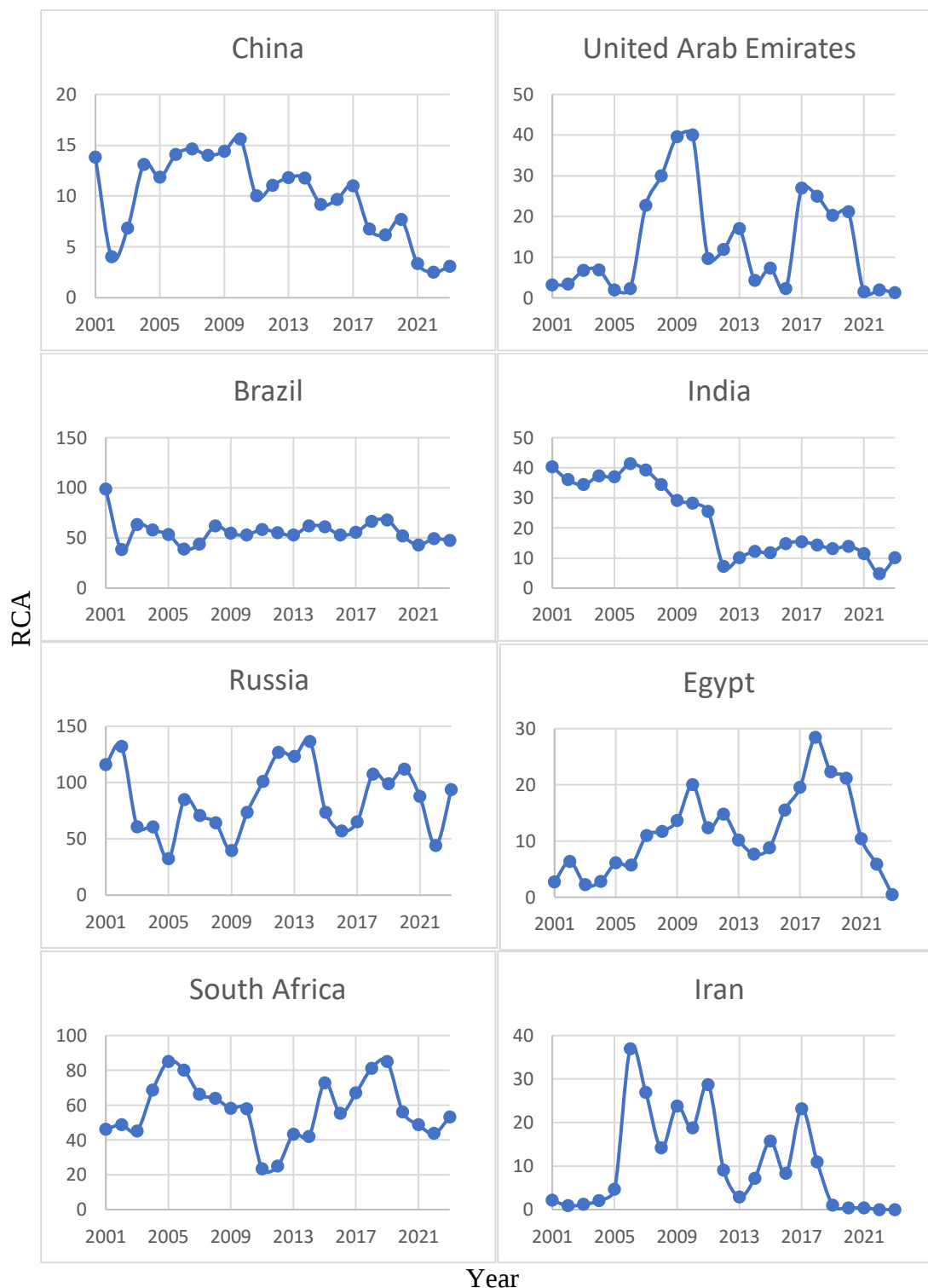


Figure 2. Indonesia natural rubber export RCA index to BRICS Plus countries (2001-2023)
Source: Built by authors based on ([United Nations Commodity Trade Statistics Division, 2025](https://doi.org/10.37637/ab.v8i3.2259))

Based on the findings in **Table 2**, it indicates that three of the four independent variables namely, the GDP of BRICS nations, global rubber prices, and exchange rate are

statistically significant predictors of Indonesia's total rubber exports, whereas the inflation rate is not statistically significant at the 5% significance level.

Table 1. Multiple Linear Regression Analysis

Rubber Export Values	Coefficient (β)	Standard Error	t	p-Value	95% Confidence Interval
GDP BRICS Countries	.8167939	.2060744	3.96	0.001*	[0.3838, 1.2497]
World Rubber Price	.6870229	.2202227	3.12	0.006*	[0.2244, 1.1497]
Inflation Rate	.3969466	.3393536	1.17	0,257	[-0.3160, 1.1099]
Exchange Rate	.5877863	.2125619	2.77	0.013*	[0.1412, 1.0344]
Constant	-1.274.046	5.825.612	-2.19	0.042*	[-24.9796, 0.5013]
R ²	0,7535				
F-Statistic	17.81				0.0000

Sources: Data processed using STATA 16. Notes: * Significant at α 5%

The coefficient for the GDP of BRICS nations is 0.8168 and is statistically significant, with a p-value of 0.001. This signifies that for each 1 unit rise in the aggregate GDP of BRICS nations, Indonesia's overall rubber exports are projected to increase by around 82% *ceteris paribus*, provided that all other variables remain the same. This relationship may occur because the economic growth of BRICS nations directly influences their industrial activity, consumer demand, and import capacity. When the GDP of BRICS countries rises, industries, particularly manufacturing and automotive sectors, experience higher production levels, which in turn increases their need for raw materials such as natural rubber. Rubber is a critical input for producing tires, footwear, industrial goods, and various consumer products; thus, economic expansion leads to a proportional increase in rubber demand. From a macroeconomic perspective, growing GDP also tends to stimulate investment and trade openness, as governments and private sectors within BRICS countries seek to meet the rising domestic and export demand. This can result in increased imports from key suppliers like Indonesia, which benefits from its established role as a major global rubber exporter. Additionally, economic expansion in partner countries often leads to more stable financial systems and stronger currencies, making imports relatively cheaper and more

attractive. Therefore, the observed positive relationship between BRICS GDP growth and Indonesia's rubber export value arises from interconnected factors such as increased industrial production, stronger consumer demand, improved purchasing capacity, and expanded trade integration, all of which contribute to higher import volumes of Indonesian rubber. Prior research has highlighted that GDP growth in trading partners might enhance domestic economic capabilities and production efficiency, hence augmenting exports of products and services (Haryati et al., 2024). This link indicates that as importing countries undergo economic expansion, their demand for exports from other nations rises, thereby enhancing the value of those commodities.

Global rubber prices significantly impact Indonesia's rubber exports. The correlation of 0.6870, accompanied by a p-value of 0.006, indicates that a 1-unit increase in world rubber prices (USD/kg) is associated with a 68% increase in total rubber exports, assuming all other variables are held constant. This highlights the price sensitivity of rubber exports, indicating that elevated global rubber prices would enhance profitability for Indonesia, allowing it to augment export volumes and demonstrate robust demand-side dynamics (Pakpahan et al., 2022). When global rubber prices increase, Indonesian producers and exporters are incentivized to expand production and

export volumes to capitalize on higher profit margins. The elevated prices make exports more attractive relative to domestic sales, as the international market offers greater returns. From a macroeconomic perspective, the positive price elasticity also illustrates Indonesia's competitive advantage as one of the world's largest natural rubber suppliers, enabling it to respond efficiently to global market shifts. However, such dependence on global price movements can also make export performance vulnerable to volatility in commodity markets, highlighting the need for policies that stabilize production costs and support value-added rubber processing industries. Overall, the strong positive correlation between world rubber prices and export performance demonstrates how international price dynamics play a pivotal role in shaping Indonesia's trade outcomes and foreign exchange earnings.

The exchange rate shows a statistically significant correlation of 0.5878 (p-value 0.013), indicating a moderately strong positive relationship between the depreciation of the Indonesian Rupiah and the increase in rubber exports. In numerical terms, this means that for every 1% depreciation in the Rupiah against the US dollar, Indonesia's total rubber exports are projected to rise by approximately 58.78%, assuming all other variables remain constant. This relationship reflects the export-boosting effect of currency depreciation, as a weaker Rupiah lowers the international price of Indonesian rubber when converted into foreign currencies. Consequently, buyers in global markets perceive Indonesian rubber as more cost-competitive compared to that of other exporting countries, leading to higher demand and export volumes. From an economic standpoint, this dynamic aligns with the Marshall-Lerner condition, which posits that a depreciation in the exchange rate improves a country's trade balance when demand for exports is price elastic. This finding aligns with prior studies indicating that currency depreciation enhances export performance ([Harjanto et al., 2021](#)).

The inflation rate coefficient of 0.3969, accompanied by a p-value of 0.257, indicates that inflation does not have a statistically significant influence on Indonesia's total rubber exports. This result suggests that fluctuations in domestic inflation are not directly or consistently correlated with changes in the country's export performance. Although inflation theoretically affects the overall cost structure of production, including inputs such as labor, fertilizer, energy, and transportation, its impact on export volumes appears minimal in this context. When inflation rises, producers may face higher operational costs, which could reduce their profit margins or limit their ability to expand exports. However, Indonesia's rubber industry may have developed adaptive mechanisms, such as efficiency improvements or government subsidies, that mitigate the short-term effects of inflation on production and trade. The insignificant statistical relationship also suggests that external variables, including global rubber prices, exchange rate fluctuations, and the GDP growth of BRICS trading partners, exert a more significant influence on export performance. These external factors tend to shape global demand and price competitiveness more directly than domestic inflation levels. Therefore, while inflation remains an important macroeconomic indicator, its role in determining Indonesia's rubber export dynamics is likely indirect, operating through broader economic stability and cost competitiveness rather than as a primary driver of export growth.

The regression analysis findings demonstrate that the model aligns closely with the data. The R-squared value of 0.7983 indicates that approximately 79.83% of the variance in the dependent variable is explained by the independent variables included in the model. This indicates that the model effectively elucidates the data, with a substantial percentage of the variance accounted for by the predictors. The adjusted R-squared value of 0.7535 somewhat modifies the R-squared to consider the

number of predictors, which is also notably high, affirming that the model's explanatory power remains robust despite the inclusion of several variables.

The F-statistic is 17.81, exceeding the critical F-value of 2.93 that has been established. Consequently, the null hypothesis (H0) at the 0.05 significance level is rejected, whereas the alternative hypothesis (H1) at the same significance level is accepted. This indicates robust evidence that at least one independent variable in the model is significantly associated with the dependent variable. The overall model is statistically significant, and the independent variables, collectively, account for the majority of the variation in the dependent variable.

The t-statistic for the Gross Domestic Product of the BRICS nations is 3.96, exceeding the designated t-table value of 2.101. Consequently, the null hypothesis (H0) is rejected at the 0.05 significance level, whereas the alternative hypothesis (H1) is accepted at the same level of significance. The GDP variable of the BRICS nations is statistically significant in elucidating the variation in Indonesia's rubber export value. The t-statistic for the worldwide rubber price variable is 3.12, exceeding the designated t-table value of 2.101. Consequently, the null hypothesis (H0) is rejected at the 0.05 significance level, whereas the alternative hypothesis (H1) is accepted at the same significance level. The international rubber price variable is statistically significant in elucidating the fluctuation in Indonesia's rubber export value. The t-statistic for the inflation variable is 1.17, which is less than the critical t-table value of 2.101. Consequently, the null hypothesis (H0) is accepted at a significance level of 0.05, whereas the alternative hypothesis (H1) is rejected at the same significance level. This indicates that the inflation variable is statistically unimportant and fails to account for the variation in the dependent variable of Indonesian rubber export values. The t-statistic for the Rupiah-to-Dollar exchange rate variable is 2.77, exceeding the critical t-

table value of 2.101. Consequently, the null hypothesis (H0) is rejected at a significance level of 0.05, whereas the alternative hypothesis (H1) is accepted at the same significance level. The exchange rate variable is statistically significant in elucidating the volatility of the dependent variable, specifically the value of Indonesian rubber exports.

CONCLUSION

The results of the RCA and multiple regression analyses confirm that Indonesia maintains a comparative advantage in exporting natural rubber to most BRICS Plus countries, particularly Brazil, which demonstrates consistently strong competitiveness. However, declining RCA values in major markets such as India and China, alongside volatility in Russia and South Africa, indicate the need for strategic efforts to sustain and strengthen competitiveness. Empirical findings reveal that the GDP of BRICS nations, international rubber prices, and the rupiah exchange rate have a significant and positive influence on Indonesia's export performance. These results underscore the importance of enhancing these macroeconomic factors and maintaining competitiveness in order to improve Indonesia's export value, support national economic growth, and optimize the potential benefits of its BRICS membership through expanded market access and trade diversification.

To maximize these benefits, Indonesia should pursue deeper economic collaboration with BRICS members by establishing more open trade agreements, reducing tariff barriers, and promoting stability in exchange rates and commodity prices. Strengthening bilateral partnerships could attract greater investment flows and facilitate infrastructure development within the rubber industry. Future studies could integrate models such as Export Product Dynamics, LA/AIDS, or the gravity model to provide a more comprehensive understanding of trade competitiveness. Additional variables,

including rubber substitute prices, domestic consumption, tariff policy, and technological innovation, should also be considered to refine the analysis and guide evidence-based policy formulation for sustainable export growth.

REFERENCES

- Anggrasari, H., Perdana, P., & Mulyo, J. H. (2021). Keunggulan Komparatif dan Kompetitif Rempah-Rempah Indonesia di Pasar Internasional. *JURNAL AGRICA*, 14(1), 9–19. <https://doi.org/10.31289/agrica.v14i1.4396>
- Bamidele, S. (2025). BRICS Revolution: The Global Agrarian Shift Sparked by Emerging Economies. *India Quarterly*, 81(1), 43–58. <https://doi.org/10.1177/09749284241307937>
- Bhat, M. A., Jamal, A., & Beg, M. N. (2022). Trade Integration and Export Aspiration: Evidence from India's Trade in Goods with BRICS Countries. *Organizations and Markets in Emerging Economies*, 13(2), 490–514. <https://doi.org/10.15388/omee.2022.13.90>
- Blavasciunaite, D., Garsviene, L., & Matuzeviciute, K. (2020). Trade balance effects on economic growth: Evidence from European Union Countries. *Economies*, 8(3). <https://doi.org/10.3390/ECONOMIES8030054>
- Center for Agricultural Data and Information System Ministry of Agriculture Republic of Indonesia. (2023). *Agricultural Statistics*.
- Collischon, M., & Eberl, A. (2020). Let's Talk About Fixed Effects: Let's Talk About All the Good Things and the Bad Things. *KZfSS Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, 72(2), 289–299. <https://doi.org/10.1007/s11577-020-00699-8>
- Daulika, P., Peng, K.-C., & Hanani, N. (2020). Analysis on Export Competitiveness and Factors Affecting of Natural Rubber Export Price In Indonesia. *Agricultural Social Economic Journal*, 20(1), 39–44. <https://doi.org/10.21776/ub.agrise.2020.020.1.6>
- Ditjenbun. (2022). Outlook Komoditas Perkebunan Karet. *Pusat Data Dan Sistem Informasi Pertanian*.
- Dwi Sinarni Putri, R., & Siladjaja, M. (2021). Published by LPMP Imperium Pengaruh Perdagangan Internasional (Ekspor-Impor) dan Investasi Terhadap Pertumbuhan Ekonomi di Indonesia Section: Financial Management. *Journal of Public Auditing and Financial Management*, 1(1), 13–26. <https://doi.org/10.36407/jpafm.v1i1.XXX>
- Gao, C., Wang, F., & Zhang, M. (2024). How Automotive 3D Interactive Display Marketing Affects Consumers' Intention to Buy Cars. *SAGE Open*, 14(2). <https://doi.org/10.1177/21582440241246429>
- Ghozali, I. (2018). *Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25* (9th ed.). Badan Penerbit Universitas Diponegoro.
- Harjanto, D. T., Ratnasih, C., & Yolanda, Y. (2021). Export Contribution of Micro, Small and Medium Enterprises to GDP Per capita in Indonesia. *International Journal of Applied Science*, 4(3), p11. <https://doi.org/10.30560/ijas.v4n3p11>
- Haryati, W., Novianti, T., & Hidayat, N. K. (2024). Daya Saing dan Determinan Ekspor Bawang Merah Indonesia: Sebuah Bukti di Kawasan ASEAN. *Agro Bali : Agricultural Journal*, 7(2), 641–653. <https://doi.org/10.37637/ab.v7i2.1732>
- Husaini, A., Fahrezi, D. D., Arbavella, M. A., & Sadewa, N. P. (2023). Analisis Ekspor Komoditi Karet Di Indonesia

- Terhadap Perdagangan Internasional 2016-2020. *Jurnal Economina*, 2(2).
- Kailashkumar, B., & Elanchezhian, M. (2024). Powering Ahead: Current Landscape of Electric Vehicles (EV) in India. *International Journal of Environment and Climate Change*, 14(1), 639–647. <https://doi.org/10.9734/ijecc/2024/v14i13879>
- Kajornkasirat, S., Muangprathub, J., Boonnam, N., & Sriklin, T. (2021). Information system supporting research on rubber in Thailand. *International Journal of Electrical and Computer Engineering*, 11(2), 1424–1430. <https://doi.org/10.11591/ijece.v11i2.pp1424-1430>
- Kementan. (2023). Analisis Kinerja Perdagangan Karet. *Pusdatin*.
- Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2012). *International Economics Theory and Policy Book 9th Edition*.
- Kumar, S., Kumar, A., Shaikh, G. M., Ali, K., & Azhar, M. (2023). The Long Run Impact of Exchange Rate and Inflation on GDP: A Panel Data Approach Consistent with Data from Brazil, Russia, India, China, And South Africa (BRICS). *Journal of Economic Impact*, 5(3), 317–326. <https://doi.org/10.52223/econimpact.2023.5318>
- Liu, L., Su, C. W., Tao, R., & Lobont, O. R. (2019). Do natural rubber price bubbles occur? *Agricultural Economics (Czech Republic)*, 65(2), 67–73. <https://doi.org/10.17221/151/2018-AGRICECON>
- Long, Y. (2021). Export competitiveness of agricultural products and agricultural sustainability in China. *Regional Sustainability*, 2(3), 203–210. <https://doi.org/10.1016/j.regsus.2021.09.001>
- Mishra, A. K., Gadhia, J. N., Kubendran, N., & Sahoo, M. (2015). Trade Flows between India and Other BRICS Countries: An Empirical Analysis Using Gravity Model. *Global Business Review*, 16(1), 107–122. <https://doi.org/10.1177/0972150914553523>
- Muzenda, E., & Popa, C. (2015). Waste Tyre Management in Gauteng, South Africa: Government, Industry and Community Perceptions. *International Journal of Environmental Science and Development*, 6(4), 311–315. <https://doi.org/10.7763/IJESD.2015.V6.609>
- Nahak, T. A., & Kalisang, R. J. (2025). Strategic Hedging Act: An Assessment of Indonesia's Decision to Join BRICS. *Andalas Journal of International Studies (AJIS)*, 14(1), 1. <https://doi.org/10.25077/ajis.14.1.1-14.2025>
- Nayyar, D. (2020). BRICS, emerging markets, and the world economy. In *Handbook of BRICS and Emerging Economies* (pp. 93–115). Oxford University Press. <https://doi.org/10.1093/oso/9780198827535.003.0003>
- Nurlaili. (2021). Analisis Daya Saing dan Faktor-Faktor yang Mempengaruhi Ekspor Produk Alas Kaki Indonesia ke Amerika Serikat Ditinjau dalam Perspektif Ekonomi Islam. *Jurnal Ilmiah Ekonomi Islam*, 7(2). <https://doi.org/10.29040/jiei.v7i2.2385>
- Pakpahan, E., Iskandarini, I., & Lindawati, L. (2022). Analisis Daya Saing dan Faktor-Faktor yang Mempengaruhi Ekspor Wortel dari Kabupaten Karo, Provinsi Sumatera Utara, Indonesia ke Malaysia. *Agro Bali : Agricultural Journal*, 5(1), 84–91. <https://doi.org/10.37637/ab.v5i1.873>
- Pandey, P., Madhusudhan, M., & Singh, B. P. (2023). Quantitative Research Approach and its Applications in Library and Information Science Research. *Access: An International Journal of Nepal Library Association*, 2(01), 77–90. <https://doi.org/10.3126/access.v2i01.58895>

- Prasada, I. Y., & Dhamira, A. (2021). The competitiveness of natural rubber by exporting countries in the global market. *E3S Web of Conferences*, 305. <https://doi.org/10.1051/e3sconf/202130502006>
- Rachman, V. H., & Info, A. (2025). Global Geopolitical Dynamics: BRICS' Collective Strategy in Facing Western Domination and Its Implications for Indonesia-Valhan Hamdiana Rachman Global Geopolitical Dynamics: BRICS' Collective Strategy in Facing Western Domination and Its Implications for Indonesia. *Jurnal Ilmiah Multidisiplin Indonesia (JIM-ID)*, 4. <https://doi.org/10.58471/esaprom.v4i04>
- Radityo, S. I., Dwiasuti, R., Muhaimin, A. W., Sosial, J., Fakultas, E., & Universitas Brawijaya, P. (2014). *Daya Saing Karet Alam Indonesia Di Pasar Dunia Competitiveness Of Indonesian Natural Rubber At World Market*. XXV(3).
- Saputra, R., Walvekar, R., Khalid, M., Mubarak, N. M., & Sillanpää, M. (2021). Current progress in waste tire rubber devulcanization. In *Chemosphere* (Vol. 265). Elsevier Ltd. <https://doi.org/10.1016/j.chemosphere.2020.129033>
- Saragih, H. S., & Aslami, N. (2022). Pengaruh Perdagangan Internasional Dan Investasi Terhadap Pertumbuhan Ekonomi Indonesia. *JOSR: Journal of Social Research*, 1(5), 377–383.
- Sohail, H. M., Zatullah, M., & Li, Z. (2021). Effect of Foreign Direct Investment on Bilateral Trade: Experience From Asian Emerging Economies. *SAGE Open*, 11(4). <https://doi.org/10.1177/21582440211054487>
- Syofya, H., Rahayu, S., Sakti, S., & Kerinci, A. (2018). Peran Sektor Pertanian Terhadap Perekonomian Indonesia (Analisis Input-Output). *Jurnal Manajemen Dan Kewirausahaan*, 9(3). <https://doi.org/10.31317>
- Tiyastuti, E., Marwanti, S., & Fajarningsih, R. U. (2022). Competitiveness and determinants of Indonesia's natural rubber exports in main partner countries. *Scientific Horizons*, 25(12), 80–89. [https://doi.org/10.48077/scihor.25\(12\).2022.80-89](https://doi.org/10.48077/scihor.25(12).2022.80-89)
- Tonsakunthaweeteam, S. (2024). “Trade creation and export diversion: Thailand's plastic and rubber under the ASEAN-China free trade agreement.” *Problems and Perspectives in Management*, 22(1), 619–633. [https://doi.org/10.21511/ppm.22\(1\).2024.49](https://doi.org/10.21511/ppm.22(1).2024.49)
- Tulush, L., Korchynska, O., Krushelnyskyi, M., Babicheva, O., & Pivtorak, A. (2022). Dynamics of Development of Production and Export of Agricultural Products in the Context of Foreign Trade in Australia. *Scientific Horizons*, 25(5), 125–133. [https://doi.org/10.48077/SCIHOR.25\(5\).2022.125-133](https://doi.org/10.48077/SCIHOR.25(5).2022.125-133)
- United Nations Commodity Trade Statistics Division. (2025). *UNComtrade*. <https://comtrade.un.org/>
- Wang, W., Wan, S., Zheng, L., Zhang, F., & Chen, J. (2024). Evaluation of the temperature adaptation of three rubber tree pest mites based on their two-sex life table. *Archives of Insect Biochemistry and Physiology*, 116(4). <https://doi.org/10.1002/arch.22138>
- Warren-Thomas, E., Dolman, P. M., & Edwards, D. P. (2015). Increasing Demand for Natural Rubber Necessitates a Robust Sustainability Initiative to Mitigate Impacts on Tropical Biodiversity. In *Conservation Letters* (Vol. 8, Issue 4, pp. 230–241). Wiley-Blackwell. <https://doi.org/10.1111/conl.12170>
- Zuhdi, F., Rahmadona, L., & Maulana, A. S. (2020). Export Competitiveness of Indonesian Spices to European Union-15. *AGRIC*, 32, 139–16