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Potential Competitiveness of Indonesian Rubber Export in International Trade

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ABSTRACT

Abstract

Keywords:

*Competitive,
Export,
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The demand for rubber continues to rise in countries with established automotive industries. However, the potential of Indonesia's rubber as an export commodity, along with its domestic absorption, has not yet matched the opportunities available in the international rubber market. This discrepancy, reflected in the decline in both value and volume of Indonesian rubber exports over recent years, poses a threat if left unaddressed. This study aims to analyze the competitiveness of Indonesian rubber exports to destination countries and to examine Indonesia's market position and export potential in those countries. The data utilized in this research consist of Indonesia's rubber export values, which are analyzed using the Revealed Comparative Advantage (RCA), Export Product Dynamics (EPD), and the X-Model of Product Export Potential. The findings indicate that rubber is a commodity with a strong comparative advantage, supported by Indonesia's natural endowments, affirming its role as a key rubber-exporting country in the global market. Furthermore, the development of rubber export markets in importing countries demonstrates promising potential.

INTRODUCTION

International trade refers to activities involving the exchange of goods and services between countries (Rangkuty and Efendi 2022). Indonesia's abundant natural resources represent one of its key competitive advantages. Within the agricultural sector, the plantation subsector stands out as having significant export potential. According to data from Statistics Indonesia (BPS), in 2022, the export value of plantation commodities reached IDR 577 trillion, accounting for 92.34% of the total agricultural export value. Given the substantial contribution of agricultural exports to national revenue, the development of the agricultural sector is expected to drive national economic growth. The performance of Indonesia's agricultural exports has shown considerable improvement, consistent with the findings of prior studies (Mulyasari et al. 2023; Arrazy and Pramadini 2020; Ross et al. 2023), which identify plantation commodities as Indonesia's leading export products. These plantation commodities make a tangible contribution to national income (Sugiharti *et al.* 2020; Malian 2004; Amiruddin *et al.* 2022; Adi 2017). Data from the Ministry of Trade also highlights rubber as a plantation commodity with high economic value and strong development potential. Rubber is among Indonesia's leading export commodities. As the world's second-largest producer of natural rubber, Indonesia's main competitor in rubber exports is Thailand (Sitepu & McKay, 2020; Asmara & Artdiyasa, 2008).

Rubber plays a significant role in the Indonesian economy, particularly in agriculture and exports. According to data from UN Comtrade, Indonesia's rubber export volume fluctuated between 2017 and 2021. In 2017, rubber exports stood at 2,991,909 tons. This figure rose significantly in 2018 to 2,812,105 tons. However, in 2019, the volume declined to 2,503,671 tons, continuing to fall to 2,279,915 tons in 2020. In 2021, export volume increased slightly to 2,334,734 tons. These fluctuations may be influenced by global market conditions, price competitiveness, or related government policies (You et al. 2024). Nevertheless, rubber has consistently remained one of Indonesia's flagship plantation export commodities, despite its varying performance in recent years.

As a major rubber producer, Indonesia's natural rubber supply plays a crucial role in meeting global demand. According to data from the International Trade Center, in 2022, Indonesia ranked as the world's second-largest rubber producer after Thailand. That year, Thailand produced over 4.6 million tons of rubber, significantly higher than Indonesia's 3.2 million tons. Vietnam followed in third place with approximately 1.1 million tons, then India with around 800,000 tons. Other significant producers include China, Malaysia, Vietnam, and several other countries, although their production volumes remain considerably lower than those of Thailand and Indonesia. This data clearly illustrates the dominance of Thailand and Indonesia as the world's top rubber producers. Despite Indonesia having a larger plantation area than Thailand, the latter's rubber production is higher (Apriansyah et al. 2019). This disparity affects Indonesia's competitiveness in the global rubber export market. Thailand holds the largest share of global rubber production, contributing 31% with an average output of 4.83 million tons, followed by Indonesia with 23% or an average of 3.44 million tons. Other producers include Vietnam, India, China, Côte d'Ivoire, Malaysia, the Philippines, and Guatemala.

Global demand for rubber continues to grow, and Indonesia's production capacity presents an opportunity to expand its presence in international markets. However, despite rubber's significant role in foreign exchange earnings and its strategic position in key export

destinations, Indonesia's rubber exports have not consistently performed well. As noted by previous research (Sugiharti et al. 2020), Indonesia's rubber exports have begun to lose market share, as reflected in declining competitiveness. In recent years, the value of Indonesia's rubber exports to destination countries has decreased. This is concerning given that 80% of Indonesia's rubber production is allocated for export, while only 20% is consumed domestically, indicating that rubber absorption is highly dependent on export markets.

The gap between Indonesia's export potential and actual domestic utilization of rubber highlights a pressing concern. Continued decline in the value and volume of rubber exports poses a threat to the sector if not addressed. Rubber remains a promising export commodity with substantial development potential. Enhancing productivity and improving product quality are critical challenges that must be addressed. Therefore, it is necessary to thoroughly examine the dynamics of Indonesia's rubber export performance in various destination countries. An in-depth analysis of natural rubber export performance is essential to assess Indonesia's position in the international rubber trade. Indonesian rubber exports are distributed across several continents, each with distinct market characteristics. Based on this background, the study raises the following research questions: 1) What is the competitiveness of Indonesian rubber in the top ten rubber-importing countries? 2) What are the market positions and export potential of Indonesian rubber in those ten importing countries??

RESEARCH METHODS

This study utilizes secondary data in the form of time series and cross-sectional data. The time series data cover 15 years (2008–2022), focusing on natural rubber classified under HS code 400122, namely *Technically Specified Natural Rubber*. The data analyzed includes the export value of Indonesian rubber, the total export value of all Indonesian commodities, the global export value of rubber, and the total global export value of all commodities. Data were collected from multiple sources, including Statistics Indonesia (Badan Pusat Statistik), the Directorate General of Plantations at the Ministry of Agriculture, UN Comtrade, the World Trade Organization (WTO), the Food and Agriculture Organization (FAO), and relevant academic literature. The specific types and sources of data used in this research are summarized in the table below.

Table 1. Types and Sources of Data

No.	Data Type	Data Source
1	Export volume of Indonesian rubber (HS code 400122) in international markets	Statistics Indonesia, UN Comtrade, FAOSTAT, Trade Map.
2	Export value of Indonesian rubber (HS code 400122) in international markets	Statistics Indonesia, UN Comtrade, FAOSTAT, Trade Map.
3	Total export value of all Indonesian commodities	Statistics Indonesia, UN Comtrade, FAOSTAT, Trade Map.
4	Global export volume of rubber (HS code 400122)	UN Comtrade or Trade Map.
5	Total global export value of all commodities	UN Comtrade or Trade Map.

6 Global rubber prices

Directorate General of Plantations, Trade Map

This research applies a quantitative descriptive approach, whereby relevant data are collected and systematically described to portray the conditions, situations, and variables involved. The descriptive method is used to interpret data related to the growth and competitiveness of rubber exports. Quantitative methods employed include Revealed Symmetric Comparative Advantage (RSCA), Export Product Dynamics (EPD), and the X-Model of Potential Export Products.

Revealed Comparative Advantage (RCA) is a tool used to measure the competitiveness of a commodity by analyzing its comparative advantage in a given country. It is intended to compare the market share of a specific sector of one country against that of other producers. The RCA index, introduced by Bela Balassa, is based on the notion that a country's export performance is largely determined by its relative competitiveness, assuming other export-related factors remain constant (*ceteris paribus*) (Bustami dan Hidayat 2013). The RCA formula is as follows:

$$RCA = (X_{ij}/X_j) / (X_{iw}/X_w)$$

Where:

X_{ij} = Export value of Indonesian rubber to a specific destination country

X_j = Total export value of all Indonesian commodities to the destination country

X_{iw} = Global export value of rubber to the destination country

X_w = Total global export value of all commodities to the destination country

The provision of RCA is that the value of 1 is the dividing line between comparative advantage and disadvantage. Therefore, if the RCA index value is greater than 1, the competitiveness of a particular product in a country is fairly strong against the product measured on average. While an RCA index less than 1 shows the absence of competitiveness of a particular product in a country.

The RCA index is classified into four categories. First, an RCA value within the range of $0 < RCA \leq 1$ indicates the absence of comparative advantage. Second, a value between $1 < RCA \leq 2$ denotes a weak comparative advantage. Third, a value in the range of $2 < RCA \leq 4$ indicates a moderate comparative advantage, while a value greater than 4 reflects a strong comparative advantage. The RCA analysis offers several advantages, including its ability to minimize the influence of government intervention, thereby providing a consistent measure of a product's comparative advantage. However, it also has certain limitations. Notably, the RCA method is unable to identify actual trade patterns and may yield biased results, particularly because the RCA index has no upper limit. To address these limitations, the RCA method can be refined through the use of the Revealed Symmetric Comparative Advantage (RSCA), as introduced by Laursen (1998) and Dalum et al. (1998). The RSCA is calculated using the following formula:

$$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1)$$

The RSCA calculation yields values ranging from -1 to 1. A positive RSCA value indicates that the commodity or industry of a country possesses a comparative advantage, whereas a negative RSCA value suggests that the commodity lacks comparative advantage.

Export Product Dynamics (EPD) is a method used to describe and assess the market position and competitiveness of a country's product or commodity in a specific export destination. The EPD method is employed to determine the competitive advantage of a particular commodity

from a country. Moreover, EPD functions as an indicator to determine whether a commodity is experiencing dynamic growth or not. These changes can specifically identify the export growth rate of a commodity. If the growth rate exceeds the average over a relatively long period, the commodity may become a significant contributor to a country's export earnings.

The EPD equation is structured as follows:

X-axis (growth of a country's export share in a target market):

$$\frac{\sum_{t-1}^t \left(\frac{X_{ij}}{W_{ij}} \right) t \times 100\% - \sum_{t-1}^t \left(\frac{X_{ij}}{W_{ij}} \right) t - 1 \times 100\%}{T}$$

Y-axis (growth of product market share in the target market):

$$\frac{\sum_{t-1}^t \left(\frac{X_t}{W_t} \right) t \times 100\% - \sum_{t-1}^t \left(\frac{X_t}{W_t} \right) t - 1 \times 100\%}{T}$$

Where:

X_{ij} = Export value of Indonesian rubber to the destination country

X_t = Total export value of all Indonesian commodities

W_{ij} = Global export value of rubber to the destination country

W_t = Total global export value of all commodities

T = Number of years in the analysis

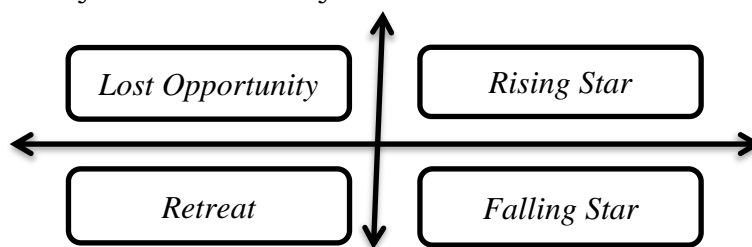


Figure 1 EPD Matrix (Esterhuizen, 2006)

Description:

- The X-axis illustrates the growth in export share (business strength) of a country in a specific market.
- The Y-axis reflects the attractiveness (market share growth) of a particular product in the destination market.

The X-Model is an analytical tool that integrates both RCA and EPD methods. Its purpose is to classify export products based on their potential development in target markets, considering both competitiveness (RCA) and market position (EPD) (Destiarni, Triyasari, and Jamil 2021). Clustering of the X-Model Potential Export Product analysis can be seen in the following table:

Table 2. X-Model Potential Export Product Clustering

RCA	EPD	X-Model
>1	Rising Star	Optimistic Market Development
	Lost Opportunity	Potential Market Development
	Falling Star	Potential Market Development
	Retreat	Less Potential Market Development
<1	Rising Star	Potential Market Development
	Lost Opportunity	Less Potential Market Development

	Falling Star	Less Potential Market Development
	Retreat	Non-Potential Market Development

RESULTS AND DISCUSSION

According to data from UN Comtrade, Indonesia—one of the world’s leading rubber exporters—ships rubber to a variety of destination countries. The ten largest export destinations for Indonesian rubber include Japan, the United States, China, India, South Korea, Turkey, Canada, Brazil, Mexico, and Germany. The following graph illustrates Indonesia’s rubber export values to these top ten countries from 2008 to 2022.

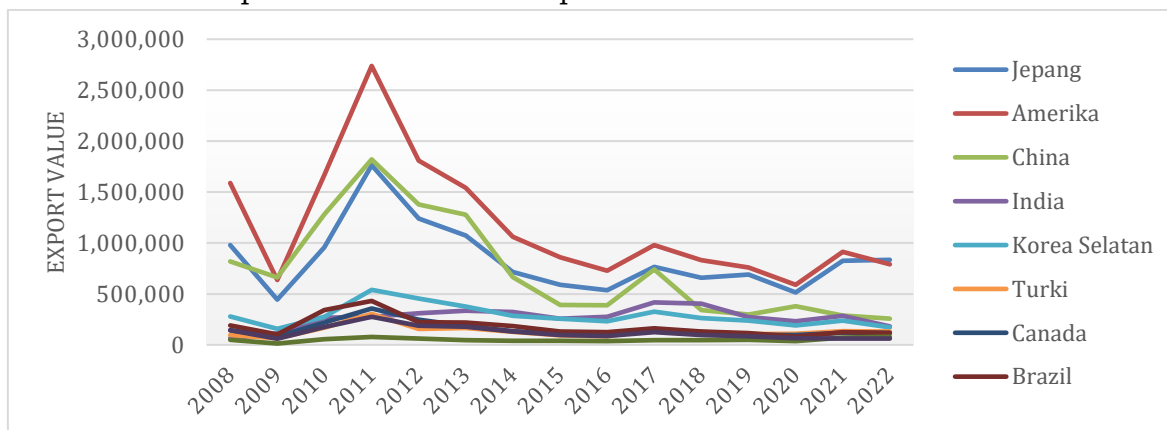


Figure 2 Indonesia’s Main Export Destinations for Rubber (ITC, 2024)

The United States stands out as the largest importer of Indonesian rubber, with an export value reaching 1.6 million USD in 2011 (Figure 2). This reflects a significant increase in U.S. demand for Indonesian rubber during that year and confirms the United States as the top importer of Indonesian rubber throughout the 2008–2022 period. After peaking in 2011, the export value of Indonesian rubber generally declined, hitting a low in 2016, before experiencing further fluctuations up to 2022. Over the last 15 years, the export patterns of Indonesian rubber across destination countries show similar trends, which appear to be aligned with global rubber demand and individual country needs. Export performance to Japan and China has remained relatively stable, while other countries such as India have demonstrated more substantial growth in recent years.

Indonesia is not the sole major exporter in the international rubber market. Although there are several natural rubber-producing countries, not all of them are significant exporters. The largest export volumes primarily originate from Southeast Asian nations—namely Indonesia, Thailand, Vietnam, and Malaysia. In Africa, Côte d’Ivoire (Ivory Coast) is a key player with considerable export volume. Despite being a relatively new entrant in the global rubber trade, Côte d’Ivoire’s rubber exports have shown a rising trend during the 2015–2022 period (Figure 3).

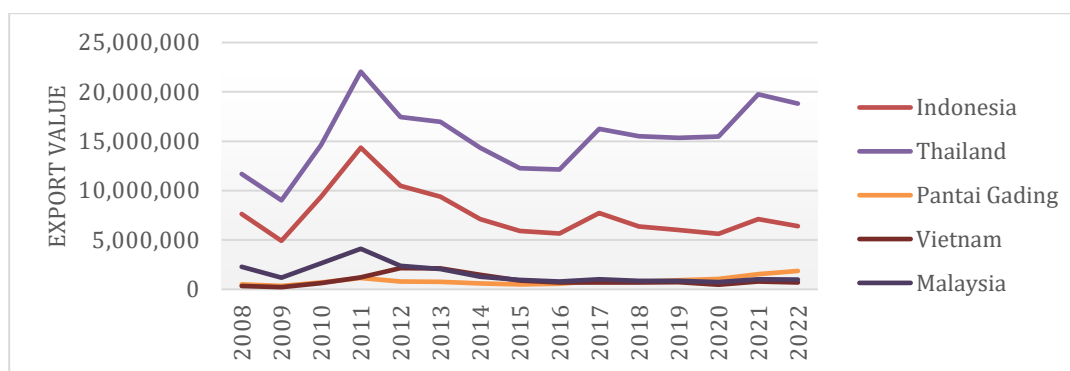


Figure 3 Leading Natural Rubber Exporting Countries (ITC, 2024)

Indonesia's Rubber Competitive Advantage

Rubber plays a crucial role in Indonesia's economy, particularly as a leading plantation commodity for export markets. To assess Indonesia's rubber competitive position in international markets, the study employs the Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), Export Product Dynamics (EPD), and the X-Model of Potential Export Products for HS code 400122 (Technically Specified Natural Rubber).

RCA values for Indonesian rubber exports under HS 400122 to key importing countries—namely Japan, the United States, China, India, South Korea, Canada, Brazil, Mexico, and Germany—over the period 2008 to 2022 were further analyzed using the RSCA method. The RCA index shows that Indonesia's rubber exports to these destinations have demonstrated varying levels of competitiveness across years. With RCA values consistently well above 1, these results strongly suggest that Indonesian rubber enjoys a high degree of comparative advantage in each of these countries. However, due to extremely high RCA values—reaching the hundreds in some cases—further refinement using the RSCA method was applied. The RSCA values for Indonesian rubber exports to the destination countries are presented in the following table. Consistently positive RSCA values indicate that during the 2008–2022 period, Indonesian rubber maintained a comparative advantage in its key export markets.

Table 3 RSCA Values for Indonesian Rubber Exports to Major Destination Countries

Year	RSCA Values									
	JPG	USA	CHN	IND	KOR	TRK	CND	BRZ	MXC	GRN
2008	0.896	0.982	0.924	0.909	0.952	0.988	0.996	0.998	0.991	0.993
2009	0.883	0.976	0.934	0.946	0.951	0.991	0.99	0.997	0.979	0.984
2010	0.875	0.978	0.926	0.939	0.936	0.991	0.996	0.995	0.983	0.977
2011	0.882	0.978	0.897	0.932	0.943	0.990	0.995	0.990	0.987	0.978
2012	0.902	0.979	0.911	0.923	0.957	0.989	0.996	0.980	0.987	0.981
2013	0.914	0.980	0.917	0.916	0.971	0.989	0.996	0.982	0.987	0.986
2014	0.921	0.977	0.905	0.924	0.973	0.990	0.996	0.984	0.987	0.981
2015	0.926	0.977	0.877	0.894	0.982	0.989	0.995	0.979	0.989	0.973
2016	0.933	0.976	0.885	0.903	0.983	0.990	0.994	0.975	0.988	0.978
2017	0.932	0.975	0.902	0.912	0.983	0.992	0.99	0.976	0.988	0.981
2018	0.934	0.975	0.841	0.907	0.983	0.991	0.994	0.979	0.991	0.982

2019	0.944	0.973	0.818	0.897	0.986	0.98	0.993	0.978	0.990	0.984
2020	0.947	0.970	0.861	0.894	0.987	0.990	0.995	0.975	0.989	0.981
2021	0.944	0.966	0.706	0.869	0.984	0.983	0.993	0.972	0.990	0.969
2022	0.924	0.958	0.645	0.722	0.964	0.977	0.992	0.972	0.991	0.968
Average	0.917	0.975	0.863	0.899	0.969	0.989	0.995	0.982	0.988	0.980

Source: Processed Secondary Data (2025)

A positive RSCA value indicates that Indonesia's rubber commodity demonstrates a comparative advantage in the importing country. The RSCA values of Indonesian rubber in its ten main export destinations all show positive results, suggesting that Indonesian rubber possesses a sufficient competitive advantage in the international rubber market. Indonesia's rubber industry is highly dependent on the fluctuations of the global natural rubber market, as only a small portion of domestic rubber production is absorbed by the domestic rubber goods manufacturing industry. When compared to other rubber-exporting countries—such as Thailand, Côte d'Ivoire, Vietnam, and Malaysia—Indonesia's RSCA values are relatively similar.

Table 4 RSCA Values of Indonesian Rubber Compared to Other Exporting Countries

Year	RSCA Value				
	Indonesia	Thailand	Pantai Gading	Vietnam	Malaysia
2008	0.959	0.971	0.952	0.636	0.984
2009	0.963	0.975	0.944	0.604	0.990
2010	0.954	0.965	0.952	0.691	0.987
2011	0.939	0.954	0.952	0.662	0.983
2012	0.930	0.958	0.948	0.810	0.957
2013	0.947	0.971	0.952	0.844	0.974
2014	0.956	0.978	0.964	0.831	0.984
2015	0.962	0.981	0.961	0.744	0.983
2016	0.959	0.971	0.952	0.636	0.984
2017	0.963	0.975	0.944	0.604	0.990
2018	0.954	0.965	0.952	0.691	0.987
2019	0.939	0.954	0.952	0.662	0.983
2020	0.930	0.958	0.948	0.810	0.957
2021	0.947	0.971	0.952	0.844	0.974
2022	0.956	0.978	0.964	0.831	0.984
Rata-rata	0.956	0.976	0.966	0.649	0.981

Source: Processed Secondary Data (2025)

Several studies, including those by Haikal Sitepu and McKay 2020; Isventina, Nuryartono, and Hutagaol 2018 show that the United States, Japan, and China have consistently dominated as Indonesia's top rubber export destinations. However, during the 2008–2022 period, the average RCA value for Canada exceeded that of these countries, with Indonesia's RCA and RSCA values for rubber exports to Canada being among the highest. This suggests that Canada is a highly potential market. During the same period, Indonesia accounted for an average of 82% of Canada's rubber imports, highlighting Canada as a significant trading partner. This aligns with findings by Choirulina and Paryadi 2022, who noted that a trade agreement between Indonesia and Canada has made Canada an increasingly promising export market.

Brazil is another country that imports Indonesian rubber with a high RCA value and a positive RSCA growth trend. Since 2008, Brazil has consistently imported rubber from Indonesia. Although Brazil is also a rubber-producing country, it remains a major importer of natural rubber, including from Indonesia. This finding is consistent with Mawardi *et al.* 2021, who stated that Indonesia's rubber exports to Brazil are driven by high domestic demand that cannot be met by local production. The combination of a high RCA value and positively trending RSCA further confirms that Brazil represents a potential export market for Indonesian rubber. Turkey recorded an average RCA value of 193.7, indicating a strong comparative advantage for Indonesian rubber exports in the Turkish market. Oktaviani and Novianti 2008 observed that trade volumes between Indonesia and Turkey have steadily increased over the years, with natural rubber being one of Indonesia's main export commodities to Turkey.

From 2008 to 2022, the average volume of Indonesian rubber exports to Mexico was approximately 50,240 tons, making it the lowest among the main importing countries. However, the relatively high average RCA value implies that Indonesian rubber still holds a comparative advantage in the Mexican market. Rubber imports by Mexico increased significantly between 2017 and 2019. Although a decline occurred in 2020 due to the COVID-19 pandemic, imports recovered in 2021 and 2022. To expand its market share in Mexico, the Indonesian Ministry of Trade organized a trade exhibition at the World Trade Center area, signaling efforts to strengthen Indonesia's export presence in Mexico. Although the RSCA values of Indonesian rubber exports to Germany have not increased over time and have shown a declining trend, they remain positive, indicating that Indonesian rubber still possesses comparative advantage in the German market. This is supported by findings from Dhamira and Prasada 2021, which confirmed that Indonesian natural rubber has potential for development in the European market.

Research by Welatama 2017; Wahyudy, Khairizal, and Heriyanto 2018, indicates that the United States, Japan, South Korea, China, and India are the largest importers of Indonesian rubber. This study further confirms that from 2008 to 2022, these countries consistently ranked as Indonesia's main rubber export destinations, positioning them as strategic and vital markets. Similar findings were reported by Tajulfitri dan Widyaishwara (2019), who emphasized that these countries have highly developed manufacturing and automotive industries, which require rubber as a primary raw material. One of the largest tire companies in the world, Goodyear Tire and Rubber Company, headquartered in Akron, Ohio, United States, relies on Indonesian rubber for its raw material supply. Japan and South Korea, with their well-established automotive sectors, also generate strong demand for natural rubber. Meanwhile, China, the world's largest producer of rubber-based finished goods, requires a substantial supply of natural rubber. Additionally, India, with its rapid economic growth, has also increased its demand for natural rubber to support various industrial needs.

Market Position and Development Potential of Indonesian Rubber in the International Market

To analyze the market position of Indonesia's natural rubber commodity, particularly in terms of market share growth and product share in the international market, the Export Product Dynamics (EPD) analysis is employed. Based on the EPD calculations, Indonesia's

rubber export is categorized as a Rising Star in the Mexican market. However, in other major destination countries, the position ranges from Falling Star to Lost Opportunity and Retreat. Table 4 EPD Calculation Results for Indonesian Rubber in Major Importing Countries

Country	X-Axis	Y-Axis	Market Position
Japan	0.000175	-0.000043	<i>Falling Star</i>
USA	-0.001320	0.000011	<i>Lost opportunity</i>
China	-0.000702	0.000067	<i>Lost opportunity</i>
India	-0.001348	0.000044	<i>Lost opportunity</i>
Korea	-0.000353	-0.000016	<i>Retreat</i>
Turkey	-0.000508	0.000004	<i>Lost opportunity</i>
Canada	-0.000776	0.000003	<i>Lost opportunity</i>
Brazil	-0.031109	0.000000	<i>Lost opportunity</i>
Mexico	0.001476	0.000007	<i>Rising Star</i>
Germany	-0.002355	0.000000	<i>Lost opportunity</i>

Source: Processed secondary data (2025)

The research findings indicate that from 2008 to 2022, Japan occupied the Falling Star position. This suggests that while the growth in Indonesia's market share in Japan was positive, the growth in product share of rubber was negative, resulting in a declining market position. This decline indicates that Indonesia's rubber commodity in the Japanese market has experienced a significant downturn during the 2008–2022 period, mainly due to increasing competition from other exporting countries. Major natural rubber producers such as Thailand, Vietnam, and Malaysia have increased their rubber exports to Japan, thereby reducing Indonesia's market share.

The United States, China, India, Turkey, Canada, Brazil, and Germany, countries that are significant importers of Indonesian rubber, are categorized under the Lost Opportunity position (Table 2). This classification implies that although these countries import rubber from Indonesia, the country has not been able to dominate these markets due to intense competition from other producers. Notably, China and India also import rubber from countries such as Vietnam and Thailand. The increasing domestic rubber production in China and India reduces their dependence on Indonesian rubber. Additionally, the lower quality of Indonesian rubber, attributed primarily to the dominance of smallholder production, has been cited in research by Zuhdi and Anggraini 2020 as a key factor in its limited competitiveness. Therefore, to address these challenges, it is imperative to enhance Indonesia's domestic rubber industry structure and downstream integration.

In the South Korean market, Indonesian rubber holds a *Retreat* position. This classification signifies a decline in both market share and product share, with negative values on both the X and Y axes, indicating that Indonesian rubber is not favored in this market. Despite the generally favorable trade relationship between Indonesia and South Korea, only 2.8% of Indonesia's rubber exports are destined for South Korea, resulting in the *Retreat* position. South Korea imports a significant volume of rubber from countries such as Vietnam and Thailand. In 2022, Thailand's rubber exports to South Korea amounted to USD 300,000, whereas Indonesia's reached only USD 172,000. This disparity is largely due to the superior quality of Thai rubber compared to that of Indonesia.

Among the countries studied, Mexico is the only market where Indonesian rubber is categorized as a Rising Star (Table 4). This classification indicates positive growth in both

market and product share. Despite fluctuations, Indonesia's rubber exports to Mexico have demonstrated a growth trend in recent years. This development is attributed to the strengthening trade relations between Indonesia and Mexico, which enhances the market potential for Indonesian rubber. To further assess the market development potential, the X Model of Potential Export is applied, which is based on the clustering results derived from the RCA (Revealed Comparative Advantage) values and EPD market positions.

Table 5 Clustering Results of RCA and EPD Values

Country	RCA	EPD	Market Development Potential
Japan	25.2	<i>Falling Star</i>	Potential Market
USA	82.7	<i>Lost opportunity</i>	Potential Market
China	17.4	<i>Lost opportunity</i>	Potential Market
India	21.9	<i>Lost opportunity</i>	Potential Market
Korea	85.7	<i>Retreat</i>	Less Potential Market
Turkey	193.7	<i>Lost opportunity</i>	Potential Market
Canada	448.2	<i>Lost opportunity</i>	Potential Market
Brazil	203.4	<i>Lost opportunity</i>	Potential Market
Mexico	179.9	<i>Rising Star</i>	Optimistic Market
Germany	114.3	<i>Lost opportunity</i>	Potential Market

Source: Processed secondary data (2025)

The majority of Indonesia's natural rubber importing countries demonstrate substantial potential for market development. However, the South Korean market is identified as less promising in this regard. This finding contrasts with research by Kurniawaty *et al.* (2022) which highlights South Korea as a prospective trading partner for Indonesia. The decline in Indonesia's rubber exports to South Korea in 2015 and 2016 has contributed to its current Retreat position in market development potential. Despite being categorized as a less promising market, Indonesia's relatively high average RCA (Revealed Comparative Advantage) value in South Korea indicates that Indonesian rubber still holds a comparative advantage in that market.

Optimistic market development potential is found in Mexico, aligning with the findings of Hutabarat (2018), who states that Mexico represents a promising market for Indonesia due to its openness to imported goods, particularly from Southeast Asia. This study confirms that Indonesian natural rubber possesses a strong comparative advantage in the Mexican market, supported by a high average RCA score and a Rising Star EPD position.

Indonesia's rubber export market also holds development potential in Japan, the United States, China, India, Turkey, Canada, Brazil, and Germany. Although these countries currently fall under the Lost Opportunity category in EPD analysis, their high RCA scores suggest that market expansion is still feasible. Studies by Muna and Hendrati 2023; (Lembang and Pratomo 2013), emphasize that Indonesian rubber has both comparative and competitive advantages in the Chinese market. It is therefore recommended that Indonesia prioritize the quality and standardization of its rubber exports to maintain and grow its market share.

CONCLUSION

Based on the RCA analysis of Indonesian rubber in major importing countries, it can be concluded that the commodity possesses a comparative advantage due to Indonesia's

favorable natural conditions, supporting its role as a key rubber exporter in the international market. The market position of Indonesian rubber in Japan is categorized as Falling Star. In the United States, China, India, Turkey, Canada, and Brazil, it is classified as Lost Opportunity. South Korea represents a Retreat position, while Mexico is identified as a Rising Star. Indonesia's rubber market development potential is optimistic in Mexico. Market development is considered potential in Japan, the United States, China, India, Turkey, Canada, Brazil, and Germany, while it is less promising in South Korea.

RECOMMENDATIONS

1. Expansion of Indonesia's rubber export markets should be pursued to reduce reliance on major importing countries. Initiatives such as trade exhibitions—similar to those conducted in Mexico—should be promoted as a strategic effort to market Indonesian rubber products globally.
2. Future researchers are encouraged to examine the impact of the EU Deforestation Regulation (EUDR) on the demand for Indonesian natural rubber exports.

REFERENCES

- Adi, Lumadya. 2017. "Pengaruh Exchange Rate Dan GDP Terhadap Ekspor Dan Impor Indonesia." *Develop* 1(1). doi: 10.25139/dev.v1i1.69.
- Amiruddin, Achmad, Heliawaty, and Alfirah Fadhilah. 2022. "Posisi Keunggulan Kompetitif Daya Saing Karet Indonesia." *Jurnal Agrisept* 23 (2)(2021):1–14.
- Arrazy, Masquri, and RIndy Pramadini. 2020. "PROYEKSI EKSPOR TEH INDONESIA DENGAN METODE ARIMA INDONESIAN TEA EXPORT PROJECTION USING ARIMA METHOD." *MEDIAN Jurnal Ilmiah Populer* 04(01):50–56.
- Asmara, Rosihan, and Nesia Artdiyasa. 2008. "ANALISIS TINGKAT DAYA SAING EKSPOR KOMODITI PERKEBUNAN INDONESIA (THE EXPORT COMPETITIVENESS LEVEL ANALYSIS OF INDONESIAN ESTATE COMMODITY)." *AGRISE* Volume VII(2).
- Choirulina, Eka, and Deky Paryadi. 2022. "Strategi Akses Pasar Kerjasama Perdagangan Indonesia Kanada Dalam Kerangka Comprehensive Economic Partnership Agreement (Cepa)." *Cendekia Niaga* 6(2):110–28. doi: 10.52391/jcn.v6i2.745.
- Destiarni, Resti Prastika, Sri Ratna Triyasari, and Ahmad Syariful Jamil. 2021. "The Determinants of Indonesia's CPO Export in Non - Traditional Market." *E3S Web of Conferences* 232:1–12. doi: 10.1051/e3sconf/202123202017.
- Dhamira, Aura, and Imade Yoga Prasada. 2021. "Indonesian Natural Rubber Export Potential in European Market." *E3S Web of Conferences* 305:1–8. doi: 10.1051/e3sconf/202130502003.
- Haikal Sitepu, Muhammad, and Alison McKay. 2020. "Socio-Technical Analysis of Natural Rubber Plantation in North Sumatera: Possibilities for Sustaining Supply." *IOP Conference Series: Materials Science and Engineering* 801(1):0–9. doi: 10.1088/1757-899X/801/1/012114.
- Hutabarat, Leonard. 2018. "Diplomasi Ekonomi Indonesia Dan Pasar Prospektif Di Kawasan Pacific Alliance: Studi Kasus Meksiko Dan Chile." *Jurnal Asia Pacific Studies* 2(2):161. doi: 10.33541/japs.v2i2.806.
- Isventina, Isventina, Nunung Nuryartono, and Manuntun Parulian Hutagaol. 2018. "Analisis Daya Saing Sektor Industri Prioritas Indonesia Dalam Menghadapi Pasar Asean."

Jurnal Ekonomi Dan Kebijakan Pembangunan 4(1):71–93. doi: 10.29244/jekp.4.1.71-93.

Kurniawaty, Kurniawaty, Zamzami Zamzami, and Nurhayani Nurhayani. 2022. “Pengaruh Produksi, PDB, Dan Nilai Tukar Terhadap Ekspor Karet Indonesia Ke Korea Selatan.” *Jurnal Ekonomi Aktual* 2(2):65–72. doi: 10.53867/jea.v2i2.63.

Lembang, Marlina Banne, and Yulius Pratomo. 2013. “Ekspor Karet Indonesia Ke-15 Negara Tujuan Utama Setelah Pemberlakuan Kebijakan ACFTA.” *Trikonomika* 12(1):20. doi: 10.23969/trikonmika.v12i1.454.

Malian, A. Husni. 2004. “Kebijakan Perdagangan Internasional Komoditas Pertanian Indonesia.” *Akp* 2(2):135–56.

Mawardi, Ahmad Nasyid, Tri Endar Suswatiningsih, and Arum Ambarsari. 2021. “Analisis Faktor-Faktor Yang Mempengaruhi Ekspor Karet Alam Indonesia Ke Brazil.” *Journal Agrifitia* 1(1):80–89.

Mulyasari, Gita, Ira Nurhayati Djarot, Nugroho Adi Sasongko, and Agusta Samodra Putra. 2023. “Social-Life Cycle Assessment of Oil Palm Plantation Smallholders in Bengkulu Province, Indonesia.” *Heliyon* 9(8):e19123. doi: 10.1016/j.heliyon.2023.e19123.

Muna, Kamala Nailil, and Ignatia Martha Hendrati. 2023. “Export Competitiveness Analysis of Indonesian Natural Rubber (HS 400122) Commodity in The Chinese Market.” *4(4):167–75.*

Oktaviani, Rina, and Dan Tanti Novianti. 2008. “INTEGRASI PERDAGANGAN DAN DINAMIKA EKSPOR INDONESIA KE TIMUR TENGAH (Studi Kasus : Turki, Tunisia, Dan Maroko) (Case Study: Turkey, Tunisia, and Marocco).” *Agro EKonomi* 26(2):167–89.

Rangkuty, Dewi Mahrani, and Bakhtiar Efendi. 2022. *TEORI EKSPOR (Studi Kasus: Ekspor Indonesia Ke Negara ASEAN)*. Vol. 19. LPPM UNDIKMA.

Ross, Finnley W. R., Philip W. Boyd, Karen Filbee-Dexter, Kenta Watanabe, Alejandra Ortega, Dorte Krause-Jensen, Catherine Lovelock, Calvyn F. A. Sondak, Lennart T. Bach, Carlos M. Duarte, Oscar Serrano, John Beardall, Patrick Tarbuck, and Peter I. Macreadie. 2023. “Potential Role of Seaweeds in Climate Change Mitigation.” *Science of the Total Environment* 885(December 2022):163699. doi: 10.1016/j.scitotenv.2023.163699.

Sugiharti, Lilik, Miguel Angel Esquivias, and Bakti Setyorani. 2020. “The Impact of Exchange Rate Volatility on Indonesia’s Top Exports to the Five Main Export Markets.” *Heliyon* 6(1):e03141. doi: 10.1016/j.heliyon.2019.e03141.

Tajulfitri, Sang Saniaka, and Widyaiswara. 2019. “POSISI PERDAGANGAN KARET INDONESIA DALAM MENGHADAPI PASAR GLOBAL.” *Jurnal Cendekia Niaga* 3(2):5–10.

Wahyudy, Hajry Arief, Khairizal, and Heriyanto. 2018. “PERKEMBANGAN EKSPOR KARET ALAM INDONESIA.” *Jurnal Dinamika Pertanian* XXXIV(2):88.

Welatama, Andresta. 2017. “DAMPAK KEBIJAKAN INTERNATIONAL TRIPARTITE RUBBER COUNCIL DALAM MEMBATASI KUOTA EKSPOR KARET ALAM TERHADAP INDONESIA.” *JOM FISIP* 4(2):1–8.

Zuhdi, Fadhlan, and Rizqi Sari Anggraini. 2020. “The Indonesian Natural Rubber Export Competitiveness in Global Market.” *International Journal of Agriculture System (JAS)* 8(2):130–39. doi: 10.20956/ijas.v8i2.2518.