

Analysis of the Competitiveness of Indonesian Rubber Exports in International Markets

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ABSTRACT

Indonesia's position as one of the largest rubber producing countries in the world does not make Indonesia a major rubber exporter on the international market. This research aims to analyze comparative competitiveness, competitive competitiveness and specialization of Indonesian rubber trade in the international market. The research methods used are Revealed Comparative Trade Advantage (RTCA), Export Competitiveness Index (XCI), and Trade Specialization Index (ISP). This research uses secondary data for the 2012-2021 period obtained from the Food and Agriculture Organization (FAO) and processed using Microsoft Excel tools. The research results show that Indonesian rubber commodities do not have comparative competitiveness, competitive competitiveness and trade specialization as a rubber importer in the international market. RCTA analysis shows an average value of -1.187 placing Indonesia in fourth position among other competing countries. XCI analysis shows an average value of 0.817 making Indonesia the country with the lowest competitiveness compared to other competing countries. ISP analysis shows that Indonesia tends to be a rubber importer with an average value of -0.573 and is at the import substitution stage.

Keywords: Competitiveness, Export, Rubber, Trading Specialization

1. INTRODUCTION

International trade greatly influences a country's economic growth which occurs because the country cannot meet domestic needs independently or if a country has an advantage in producing excess of a product [1]. Exports and imports are the core components of international trade. In this case, export activities tend to aim to increase state income and import activities to meet economic needs consumed by the domestic population [2].

Based on data from the Ministry of Trade (2022), the export value of the agricultural sector in 2022 will contribute US\$ 4,689.2 million, placing the agricultural sector in third position after the processing and mining industries in Indonesia's non-oil and gas exports. The agricultural sector has a strategic role for an agrarian country like Indonesia where the plantation subsector is one of the leading agricultural subsectors and supports national and international economic activities in Indonesia because of its good quality and very abundant production quantity so that it has a fairly high contribution to the agricultural sector [3].

The plantation subsector plays the most important role in generating the largest foreign exchange for Indonesia, where the contribution of the plantation subsector in 2021 accounts for 3.94 percent of total GDP and 29.67 percent of the Agriculture, Forestry and Fisheries sectors, which places it in first place in this sector (Central Statistics Agency, 2022). The plantation commodity that is most widely developed in Indonesia and is superior in the international market which is a development target because it has quite broad market potential is rubber.

Rubber (*Hevea brasiliensis*) is one of the plantation commodities ranked second after palm oil which makes a large contribution to Indonesia's foreign exchange earnings [4]. Where from 2017 to 2021 rubber has the highest average production, namely 3,338,970.4 tons/year after palm oil

commodities. Rubber is also one of Indonesia's main export commodities. Based on data from the Central Statistics Agency (2023), the value of rubber exports in Indonesia in 2021 reached a value of US\$ 4,015.93 million. Where in 2021 the value of rubber exports increased by 1,005.84 million US\$ compared to 2020.

Based on export volume, the comparison of rubber export volumes from countries in the Asian region, namely Indonesia, Thailand, India, Malaysia, Vietnam and China in the period 2017 to 2021 experienced fluctuations. In this period, Indonesia was in first position with an average export volume of 2,649,475.4 tons/year, which was able to shift Thailand to second position with an average export volume of 2,115,508 tons/year. Where previously Thailand was Indonesia's largest rubber competitor in the Asian region as the largest rubber exporter in the world and controlled rubber exports. And followed by Malaysia, Vietnam, China and India respectively with an average export volume of 596,035.6 tons/year; 502,040.6 tons/year; 18,698.4 tons/year; and 6,461 tons/year.

Competitiveness is the ability or superiority of a commodity in penetrating the market [5]. The competitiveness of a product can be seen through several indicators as benchmarks. One indicator that can describe the success of a product in competition is the increasing demand for the product in the market or the increasing export of the product in international trade [6]. In order for a product to survive in the international market, the product must be able to compete with similar products from competing countries. Therefore, the export share of a product needs to be increased by having unique product advantages compared to other competing countries [7].

The level of competitiveness of a country in international trade can be seen through two factors, namely the comparative advantage factor and also the competitive advantage factor. Comparative advantage factors are advantages that naturally exist in a country. Meanwhile, competitive advantage factors are advantages that a country can create or develop. Furthermore, rubber export competition in Indonesia with its competitor countries can provide an insight into the extent of trade specialization and the competitive position of Indonesian rubber commodities in the international market.

Several studies regarding the competitiveness of Indonesian rubber have been carried out before. Research by [8] using the Revealed Comparative Advantage (RCA) method reveals that Indonesian rubber commodities have strong competitiveness in the international market. [9] research uses the RCA method and shows that rubber commodities in the 2012-2021 period have comparative competitiveness with an average RCA value of 30.37. [10] research using the RCA method shows that rubber commodities in Indonesia have comparative competitiveness but Indonesian rubber commodities do not have competitive competitiveness based on the Export Product Dynamic (EPD) value. This research will examine the position of Indonesian rubber commodities compared to its competitor countries in the international market by considering the export value and import value. The stages of Indonesian rubber in trade specialization are also interesting to analyze because it has never been done in previous research.

This research aims to analyze comparative competitiveness, competitive competitiveness and specialization of Indonesian rubber trade in the international market. The research results obtained show the position of Indonesian rubber commodities in the international market, compared to competing countries, namely Thailand, Malaysia, China, Vietnam and India.

2. METHODS

This research refers to a type of quantitative research that uses secondary data in the form of annual data (time series) over a 10 year period, namely from 2012 to 2021. The data was mostly obtained from the Food and Agriculture Organization (FAO) as well as other sources such as journals, articles, books, and the internet. The rubber in question is rubber that is still raw (unprocessed). The countries used as comparisons in this research are countries from the Asian region, namely Thailand, Malaysia, China, Vietnam and India, considering that these countries are also among the largest rubber producers and exporters in the world. The analysis techniques used are Revealed Comparative Trade Advantage (RCTA), Export Competitiveness Index (XCI), and Trade Specialization Index (ISP). Data processing was carried out with the help of Microsoft Excel software.

2.1 Comparative Competitiveness Analysis

The comparative competitiveness analysis in this research uses the Revealed Comparative Trade Advantage (RCTA) method. The RCTA method is formulated as follows (Huda et al., 2021):

$$RCTA = RXA - RMP$$

$$RXA = (X_{in}/X_i(wn)) / [X_{(oi)n}/X_{(oi)}(wn)]$$

$$RMP = (M_{in}/M_i(wn)) / [M_{(oi)n}/M_{(oi)}(wn)]$$

Information: RXA = Revealed Export Competitiveness (export competitiveness); RMP = Revealed Import Penetration (import penetration); i = rubber; n = Country concerned (Indonesia, Thailand, India, Malaysia, Vietnam, or China; o = All types of goods including I; w = World; X_{in} = Value of rubber exports from country n; M_{in} = Value of rubber imports from country n; X_i(wn) = Total value of rubber exports from all countries other than n in the world; M_i(wn) = Total value of rubber imports from all countries other than n in the world; ; M_{(oi)n} = Total value of imports of all goods other than rubber in country n; one country n; M_(oi)(wn) = Total value of imports of goods other than rubber from countries other than n (total value of imports of all goods minus the value of rubber imports from one of country n).

The criteria in the RCTA analysis are that if the RCTA value is positive (RCTA > 0), then the country has comparative competitiveness in rubber exports (advantage). Meanwhile, if the RCTA value is negative (RCTA < 0) then the country does not have comparative competitiveness in rubber exports (disadvantage).

2.2 Competitive Competitiveness Analysis

The competitive competitiveness of Indonesian rubber can be analyzed using the Export Competitiveness Index (XCI) method. The XCI value will describe the trend of competitive competitiveness, with the criteria that if XCI is greater than or equal to one (XCI ≥ 1) then the country has the ability to increase the competitive competitiveness of rubber exports. On the other hand, if XCI is less than one (XCI < 1) then the country is in a decline in the competitiveness of rubber exports in the international market. XCI analysis is carried out using the following formula:

$$XCI = \frac{(X_{in}/X_{iw})_t}{(X_{in}/X_{iw})_{t-1}}$$

Note: X_{in} = Value of rubber exports from country n; X_{iw} = World rubber export value; t = Current year; t-1 = Previous year

2.3 Trading Specialization

Trade specialization in this research uses Trade Specialization Index (ISP) analysis. ISP analysis was carried out to determine the position of Indonesian rubber in the international market, whether it tends to become an exporter or importer of rubber. ISP has a value between -1 and +1. An ISP with a positive value indicates that Indonesian rubber has strong competitiveness or that Indonesia tends to act as a rubber exporter. On the other hand, if the ISP is negative, it indicates that

Indonesian rubber has weak competitiveness or that Indonesia tends to act as an importer. There are five stages in the ISP value, namely the introduction stage (-1 < ISP < -0.50), the import substitution stage (-0.50 < ISP < 0.00), the growth stage (0.01 < ISP < 0.80), maturity stage (0.81 < ISP < 1.00), and return to import stage (1.00 < ISP < 0.00). The following is the formula for ISP analysis:

$$ISP_s = \frac{(X_{in} - M_{in})}{(X_{in} + M_{in})}$$

Note: X_{in} = Value of rubber exports from country n; M_{in} = Value of rubber imports from country n

3. RESULTS AND DISCUSSION

3.1 Comparative Competitiveness

The results of the RCTA analysis calculation show that the six countries, including Indonesia, Thailand, Malaysia, China, Vietnam and India, in the 2012-2021 period respectively had an average RCTA value of -1.187; 203,750; -44,658; -2,271; 5,019; and 0.047. An RCTA value that is greater than zero or positive indicates that rubber products from these six countries have a comparative advantage in the international market.

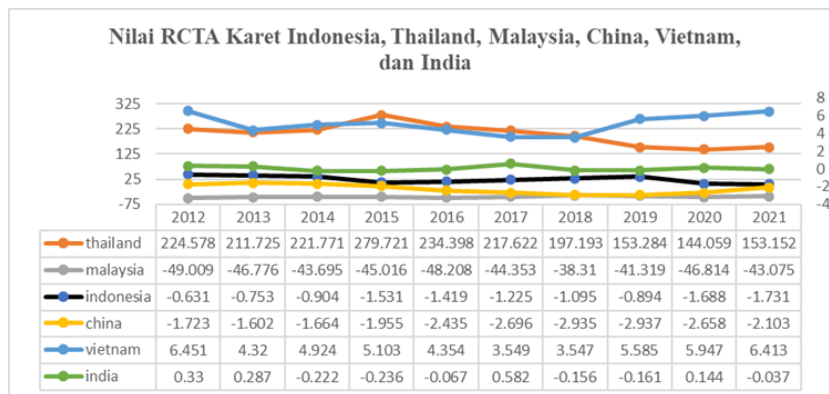


Figure 1. Comparison of rubber RCTA values for Indonesia, Thailand, Malaysia, China, Vietnam and India in 2012-2021

Thailand occupies first place with an average RCTA value of 203,750. This value shows that Thailand has the greatest comparative advantage compared to the other five competing countries. The RCTA value of rubber in Thailand tends to decrease every year. Despite this, the RCTA value of Thai rubber remains the highest every year. The high value of Thailand's RCTA in the period 2012 to 2021 is influenced by the high value of rubber exports. Apart from that, in research (Perdana, 2019) it is said that although Thailand has a shortage of rubber plantation land, Thailand has a fairly high level of rubber productivity, reaching 1.8 tons/ha.

Vietnam is in second place, with an average RCTA value of 5.019. Vietnam is able to compete as one of the countries that is the largest rubber exporter on the international market. Vietnam always has a positive RCTA value in the period 2012 to 2021. This is influenced by the value of rubber exports which is higher than the value of imports. Therefore, Vietnam has positive comparative competitiveness. This was confirmed by Faisal et al (2022) who stated that the value of rubber exports in Vietnam experienced fluctuations which tended to increase. This increase was influenced by several factors such as the price and quality of rubber, as well as the volume of rubber exported. Vietnam's rubber production has also increased because Vietnam has begun to develop its rubber plantations so that it has become the third largest country in the world (Sari & Darsana, 2021).

India occupies third position with an average RCTA value of 0.047. India is able to compete as one of the countries that is a rubber exporter on the international market. Compared to other

countries, Indian rubber in the period 2012 to 2021 has a very low average RCTA value. However, because the average RCTA value of Indian rubber is positive or greater than zero, India still has a comparative advantage in rubber competitiveness. Based on FAO data, it is known that India has an average rubber export value that is lower than its import value in 2012-2021. The low value of rubber exports in India is caused by low rubber prices. Therefore, policies or efforts that can be made by rubber farmers to survive amidst low prices are to reduce production input costs, as well as reduce the use of other production inputs even though this will have an impact on reducing their rubber production.

Indonesia is in fourth place with an average RCTA value of -1.187. Indonesia's overall RCTA value is negative. Compared to other countries, Indonesian rubber has a very low average RCTA value. Because the average RCTA value of Indonesian rubber is negative and less than zero, Indonesia does not have a comparative advantage in rubber competitiveness. This illustrates that Indonesia's role as the second-ranked rubber producing country does not yet have a comparative advantage compared to the 3 countries above. The large amount of land owned by Indonesia does not rule out the possibility that Indonesia does not have a comparative advantage which can be caused by several factors, one of which is the low productivity of rubber which occurs especially in smallholder plantations which only have an average productivity of more than 1,000 kg/ha/year (Junaidi, 2020). Therefore, one of the actions that can be taken to increase the comparative competitiveness of Indonesian rubber in the international market is increasing the productivity of Indonesian rubber by utilizing owned rubber land. Apart from that, it can also be done by treating rubber plants from pests and diseases, ensuring the availability of superior seeds, using effective and efficient technology, improving the quality of human resources such as rubber farmers, and Indonesia needs to improve and maintain the quality of rubber every year.

China occupies fifth position with an average RCTA value of -2.271. China's RCTA value from 2012 to 2021 is negative. Compared with other countries, Chinese rubber is also one of the countries that has a very low average RCTA value. Because the average RCTA value of Chinese rubber is negative and less than zero, it can be said that China does not have a comparative advantage in rubber competitiveness.

Malaysia occupies the last position among five other countries with an average RCTA value of -44.658. Compared to other countries, Malaysian rubber has the lowest average RCTA value. In this period, Malaysia's overall RCTA value was negative. Because the average RCTA value for Malaysian rubber is negative and less than zero, which means that Malaysia does not have a comparative advantage in rubber competitiveness.

3.2 Competitive Competitiveness

Figure 2 shows the X_{Ci} values for Indonesia, Thailand, Malaysia, China, Vietnam and India in the 2012-2021 period. The value of the value of world rubber exports in the previous year, in this case 2011. This research only uses data from 2012-2021 so the X_{Ci} value in 2012 cannot be obtained.

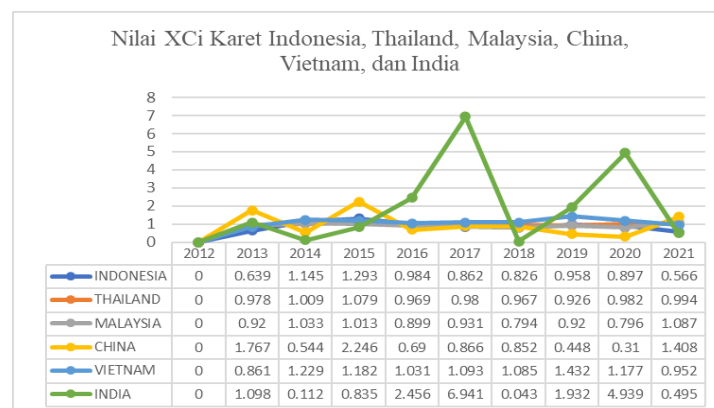


Figure 2. Comparison of the X_{Ci} values of rubber from Indonesia, Thailand, Malaysia, China, Vietnam, and India in 2012-2021

Based on average results over a 10 year period, India is in first place because it has the highest average X_{Ci} value compared to five other countries (Indonesia, Thailand, Malaysia, China and Vietnam). India has an average X_{Ci} value of 1.885. So, India can be said to have a competitive advantage because the average X_{Ci} value for India shows a positive value and is more than one. Even though India has the highest average X_{Ci} value, the X_{Ci} value of Indian rubber also fluctuates over a 10 year period. So, the competitiveness of Indian rubber still needs to be improved, especially in terms of quality and quantity of rubber.

Vietnam is ranked second with an average X_{Ci} value of 1.004. Similar to India, overall Vietnamese rubber in the period 2012 to 2021 experienced an increase in competitive competitiveness as indicated by an average X_{Ci} value of greater than one.

China occupies third place with an average rubber X_{Ci} value of 0.913. This value means that the competitiveness of Chinese rubber in the period 2012 to 2021 has decreased ($X_{Ci} < 1$). This is directly proportional to the value of China's rubber exports, which fluctuates but tends to decline. The low X_{Ci} value of Chinese rubber is caused by the analysis method calculations carried out being influenced by the export value, so that the X_{Ci} value of Chinese rubber tends to decrease.

Thailand is in fourth position with an average X_{Ci} rubber value of 0.889. This value shows that the competitiveness of Thai rubber in the period 2012 to 2021 has decreased. The low X_{Ci} value of Thai rubber is due to the fact that the growth of Thai rubber exports is still below the growth of world rubber exports, so the value obtained is smaller. However, based on comparative advantages, Thai rubber still dominates the world rubber export market.

Malaysia occupies fifth position with an average rubber X_{Ci} value of 0.839. This value means that the competitiveness of Malaysian rubber in the period 2012 to 2021 has decreased because it has an average X_{Ci} value of less than one. The low X_{Ci} value of Malaysian rubber is caused by the value of Malaysian rubber exports which decreases every year. Therefore, this affects the calculation of the X_{Ci} value of Malaysian rubber which has an average X_{Ci} value of less than one.

Indonesia is in sixth place with an average rubber X_{Ci} value of 0.817. This value shows that the competitiveness of Indonesian rubber in the period 2012 to 2021 has decreased because it has an average X_{Ci} value of less than one. This decrease was caused by the fluctuating value of Indonesian rubber exports and tended to decrease every year and had an average rubber export value of US\$ 8,489.

The high level of competition in the international market requires the Indonesian state to improve the quality of rubber plants, rubber quality, rubber productivity, as well as strategies for increasing rubber prices in the international market in order to survive and increase competitiveness. Indonesia already has advantages in terms of production factors, such as good climatic conditions for rubber plants, and is able to specialize in rubber commodities because its production is quite large. In improving the quality of Indonesian rubber, actions that can be taken include improving much more modern technology, namely by applying replanting techniques for old rubber trees through cultivating seed technology and post-harvest technology so as to obtain good superior rubber seeds as well as strategies for expanding the market [11].

3.4 Trading Specialization

Figure 3 shows a comparison of ISP values from six countries (Indonesia, Thailand, Malaysia, China, Vietnam and India). All countries have a negative average ISP so they tend to be rubber importing countries in the 2012 to 2021 period, except for Thailand and Vietnam which have a positive average ISP value so they tend to be rubber exporting countries in the 2012-2021 period

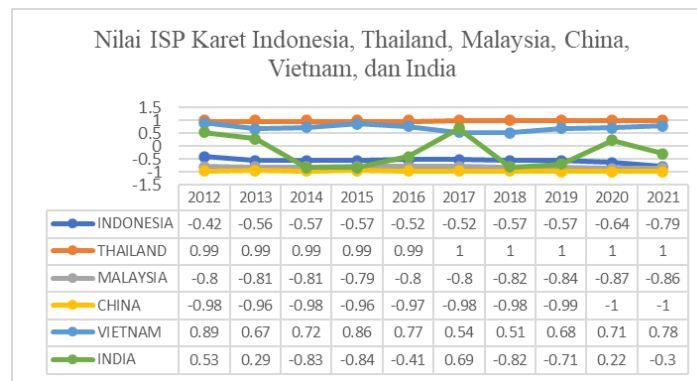


Figure 3. Comparison of rubber ISP values for Indonesia, Thailand, Malaysia, China, Vietnam, and India in 2012-2021

Thailand is in first position and has the highest average ISP value compared to the other five competing countries, namely 0.995. Where the average ISP value is positive ($0.81 < ISP < 1.00$) so it can be said that Thai rubber is at the maturity stage. The values obtained indicate that Thailand tends to be a natural rubber exporting country. The maturity stage means that Thailand has carried out a standardization process regarding innovations to improve rubber quality, such as using storage technology to control temperature and humidity which can help maintain rubber quality during distribution and delivery.

Vietnam is in second place with an average ISP value of 0.713. It is known that the average ISP value for Vietnam is positive ($0.01 < ISP < 0.80$) which indicates that Vietnam is at a growth stage. At this stage of growth, it means that Vietnam has a much higher volume of rubber exports compared to the volume of natural rubber imports. This is in accordance with FAO data which shows that the average volume of Vietnam's rubber exports is 108,086 tons. Meanwhile, Vietnam's average rubber import volume is 14,819,667 tons.

India is in third position with an average ISP value of -0.218. Where this value is negative ($-1 < ISP < -0.50$), which means that India is at the introduction stage. Vietnam is at the stage of introducing rubber exports because it has a much higher import volume compared to the export volume of natural rubber. This is in accordance with FAO data which shows that Vietnam has an average rubber import volume of 6,115,836 tons. Meanwhile, Vietnam's average rubber export volume is 3,982,994 tons.

Indonesia is in fourth position with an average ISP value of -0.573. Based on this, it is known that Indonesia has a negative average ISP value ($-0.50 < ISP < 0.00$). This value shows that Indonesia is at the rubber import substitution stage in the period 2012 to 2021. At this stage, it means that Indonesian rubber has very low competitiveness because the production level is not high enough. The quality of Indonesian rubber production is still relatively low. In fact, rubber is a strategic commodity that can bring in foreign exchange for the country. Apart from that, the low value of Indonesia's ISP is caused by the volume of rubber exports being lower than the volume of rubber imports. The average value of Indonesian rubber export volume is 5,524,734 tons, while the average value of Indonesian rubber import volume is 22,892,632 tons. In this case, Indonesia is also making efforts by implementing a policy of setting minimum prices (Cost of Production) carried out by the Ministry of Trade to increase domestic rubber prices. As is known, government policy has a big influence on strategies to increase the comparative advantage of natural rubber latex.

Malaysia is in fifth position with an average ISP value of -0.820. Based on the average ISP value, it is known that Malaysia has a negative value ($-0.50 < ISP < 0.00$) so it can be said that Malaysian rubber is at the import substitution stage. Apart from that, the low value of Malaysia's ISP is due to the volume of rubber exports being lower than the volume of natural rubber imports. The average value of Malaysia's rubber export volume is 28,381 tons, while the average value of Malaysia's rubber import volume is 328,204,066 tons.

China is in the last position among the five other competing countries with an average ISP value of -0.980. It is known that the average ISP value for China is negative ($-0.50 < \text{ISP} < 0.00$), which means that China is at the import substitution stage. Apart from that, China's low ISP value is caused by the volume of rubber exports being lower than the volume of natural rubber imports. The average value of China's rubber export volume is 2,220,142 tons, while the average value of China's rubber import volume is 465,804,055 tons.

CONCLUSION

Based on research analyzing the competitiveness of Indonesian rubber exports in the international market, it is known that rubber commodities in Indonesia do not have comparative competitiveness or competitive competitiveness. Indonesia's rubber trading specialty is known as an importing country in the international market.

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