

Competitiveness of Indonesia and Thailand's TSNR (Technically Specified Natural Rubber) Exports in the International Market

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Abstract Indonesia, as the world's first TSNR exporter, is not necessarily able to compete with Thailand in the international market. Indonesia's natural rubber productivity is relatively low compared to Thailand, which has caused several TSNR factories to stop operating. The existence of global competition requires TSNR Indonesia to be able to compete with Thailand. The aim of this research is to analyze the competitiveness, market position and export development potential of TSNR Indonesia and Thailand. This research uses quantitative analytical methods. The data analysis used is RCA (Revealed Comparative Advantage), EPD (Export Product Dynamic) and X-Model Potential Export Products. The research results show that Indonesia and Thailand's TSNR exports have a high comparative advantage in the five export markets. Indonesia's TSNR exports do not have a competitive advantage in the five export destination countries, while Thailand's TSNR exports have a competitive advantage in the United States, India and South Korea. Indonesia's TSNR export markets are the United States, Japan, China and India as potential markets and South Korea as a less potential market. Thailand's TSNR export markets in the United States, India and South Korea are optimistic markets, while Japan and China are potential markets.

Keywords TSNR, Competitiveness, RCA, EPD, X-

Model, Indonesia, Thailand

1. Introduction

One of Indonesia's plantation commodities with high export value is rubber, the mainstay commodity after palm oil. Rubber is a plantation commodity that plays an important role as a source of income, employment opportunities and a source of foreign exchange for the country [1]. Indonesia is one of the world's natural rubber producers joining in the ITRC (International Tripartite Rubber Council) with members Thailand, Indonesia and Malaysia. The ITRC country's contribution to total world natural rubber exports reaches 65-75% [2]. Thailand and Indonesia compete with each other to win the world market with an average contribution of (34.50 percent) and (25.81 percent) respectively in the 2018-2022 period to world natural rubber exports. However, when compared, Indonesia's natural rubber productivity is relatively lower than Thailand even though it has a larger area of land. Indonesia's natural rubber productivity in 2022 will only be 0.819 ton/ha while Thailand's productivity will reach 1.375 ton/ha [3]. This condition is inversely proportional to Thailand as Indonesia's main competitor which is trying to

increase the production and quality of natural rubber through the Rubber Replanting Financial program [4].

Indonesia's natural rubber exports are dominated by processed rubber with a market share reaching 60.05% [5]. TSNR (Technically Specified Natural Rubber) is a processed rubber that dominates exports with a contribution reaching 97.32% of the total volume of Indonesian natural rubber exports in 2022 on the international market [6]. Technically Specified Natural Rubber or technical specification rubber is processed rubber that has a quality guarantee by including information on the technical properties and features of each type of quality [7]. This type of TSNR processed rubber is widely used in the tire industry, especially in the world's largest automotive industrial countries.

World TSNR exports are also occupied by Indonesia and Thailand with average volumes for the 2018-2022 period of (2,331,012 Kg) and (1,482,455 Kg) [8]. Indonesia is able to provide up to 37.44% of the world's TSNR supply. This is because TSNR or Indonesian crumb rubber exports average 95% of total production [9]. Even though Indonesia is the first TSNR exporter in the world, the average growth in export value is negative compared to Thailand and other exporting countries which have positive growth [8]. Thailand, which is ranked second as the world's TSNR exporter, is the main competitor.

The export markets for Indonesia's TSNR exports are dominated by the world's largest industrial countries covering the United States, Japan, China, India and South Korea by export volume [8]. The export markets for Indonesia's TSNR and Thailand as the main competitor tend to be the same [10]. Indonesia, as the world's first TSNR exporter, is not necessarily able to compete with Thailand in the international market [11]. Even though Indonesia has larger land areas, natural rubber productivity is relatively low compared to Thailand. Low productivity has caused 45 TSNR factories to stop operating during the 2017-May 2023 period [12]. In addition, global competition demands that TSNR Indonesia be able to compete with Thailand, especially to excel competitively. Therefore, it is important to see how competitive Indonesia's TSNR exports are in facing Thailand as the main competitor. The importance of natural rubber as a contributor to the country's economy means that Indonesia's TSNR exports must be competitive.

2. Materials and Methods

This research uses quantitative analytical methods to analyze the competitiveness, market position and development potential of Indonesia and Thailand's TSNR export markets in the five largest importing countries including the United States, Japan, China, India and South Korea. The type of data used is secondary data obtained from the UN Comtrade and ITC Trade Map for 15 years from 2008 to 2022. The data analysis methods used are RCA, EPD and X-Model Potential Export.

RCA (Revealed Comparative Advantage)

RCA analysis is a performance measure to compare domestic production and trade activities to world trade. RCA is used to analyze the comparative competitiveness of TSNR Indonesia and Thailand. The RCA calculation is [13]:

$$RCA = \frac{X_{ij}/X_{it}}{W_i/W_t}$$

Where X_{ij} is the value of Indonesia and Thailand's TSNR exports to the export markets and X_{it} represents the total value of Indonesia and Thailand's exports to the export markets, while W_i is the value of world TSNR exports to the export markets and W_t represents the total value of world exports to the export markets. If the RCA result is ≥ 1 , then it has a strong comparative advantage, whereas if the RCA result is < 1 , then it has weak comparative competitiveness.

EPD (Export Product Dynamics)

EPD (Export Product Dynamic) analysis aims to analyze the competitiveness of TSNR Indonesia and Thailand. EPD can also determine market position by looking at export growth through the X axis (export market share growth) and the Y axis (product share growth). The EPD calculation is [14]:

The formula X axis is

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

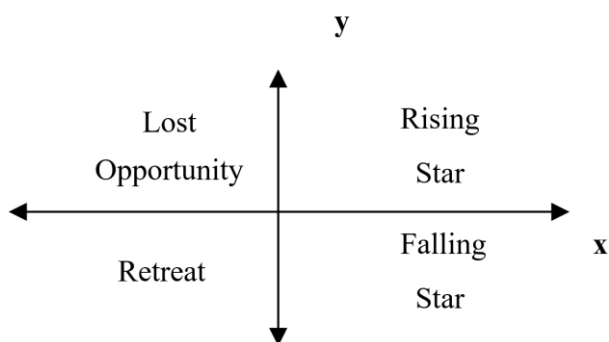
The formula Y axis is

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

Where X_{ij} is the value of TSNR exports from Indonesia and Thailand to the export markets, W_{ij} is the value of world TSNR exports to the export markets, X_t is the total value of exports from Indonesia and Thailand to the export markets, W_t is the total value of world exports to the export markets and T is the number of years.

The EPD matrix Figure 1 shows the market position of the exporting country in the destination country.

1. The Rising Star position indicates market share with product demand that is growing and developing rapidly.
2. The Lost Opportunity position shows that exporting countries experience a loss of opportunities for world market share due to a decrease in product market share.
3. The Falling Star position shows that market share conditions continue to increase despite a decrease in product movement in the market.
4. The Retreat position shows product movements that are not dynamic or competitive in the market, so that the product experiences setbacks and is not wanted by the market.



Source: Esterhuizen [14]

Figure 1. EPD (Export Product Dynamic) Matrix

X-Model Potential Export

X-Model analysis is to show whether Indonesian and Thailand TSNR products have high potential or not in export markets [15]. X-Model clustering combines RCA and EPD analyses as follows:

Table 1. X-Model Clustering

Bilateral RCA (Competitiveness)	EPD (Market Position)	X-Model (Market Development Potential)
>1	Rising Star	Optimistic Market
	Lost Opportunity	Potential Market
	Falling Star	Potential Market
	Retreat	Less Potential
<1	Rising Star	Less Potential
	Lost Opportunity	Less Potential
	Falling Star	Less Potential
	Retreat	Not Potential

Source: Ministry of Trade [15]

Market development potential in analysis X-Model:

1. The market is optimistic, indicating that the exported commodities have ideal market development potential in the export destination countries.
2. Potential market, shows that the exported commodity still has potential in the export destination country.
3. The market lacks potential, indicating that the commodity exported by the exporter in the destination country is not suitable as an export destination country.
4. The market is not potential, indicating that the commodity exported in the destination country has

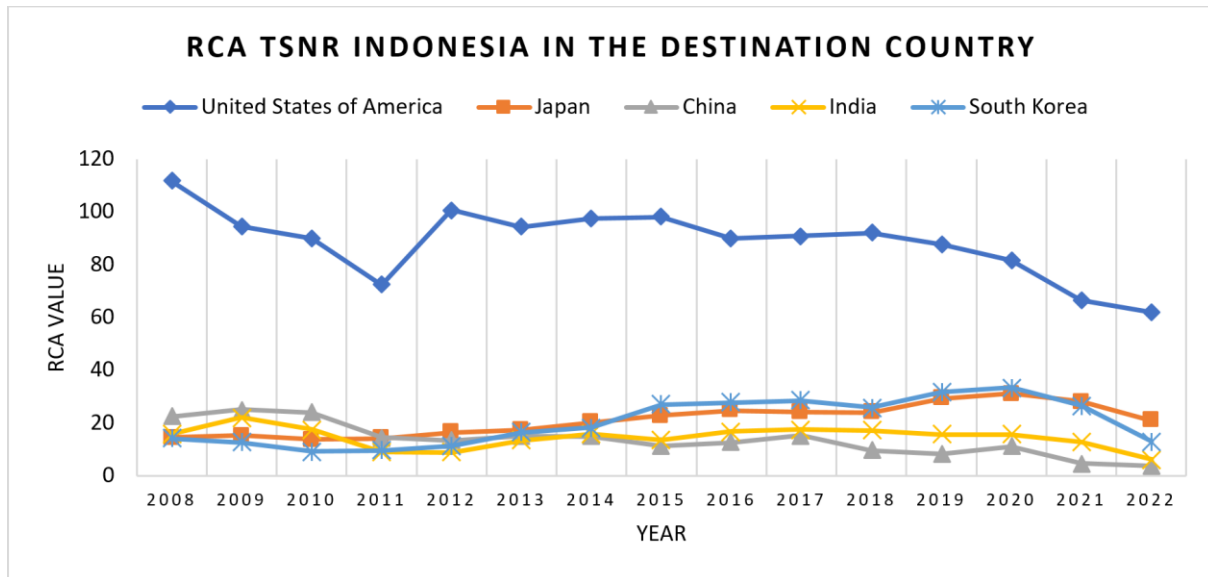
little potential to be used as an export destination country because it is not ideal for market development.

3. Results and Discussion

Competitiveness of TSNR Indonesia and Thailand in the International Market

Competitiveness of TSNR Indonesia and Thailand in export markets is explored using RCA analysis. This method is to determine the comparative advantages of Indonesia and Thailand's TSNR in the world's five largest export markets. The development of Indonesia's RCA index against the market exports is presented in Figure 2:

Based on Figure 2, Indonesia's RCA value in export destination countries is (≥ 1), so it can be said that Indonesia is strongly competitive and has a comparative advantage in five export markets. Indonesia's RCA value in the United States has negative growth even though it has increased several times with an average over 15 years of 88.603. In 2009, it experienced a decline due to the global financial crisis which had an impact on demand for Indonesian natural rubber exports to the United States [16]. Cote d'Ivoire reform efforts in 2012 resulted in the emergence of a new strength in the country's economy which can be seen from the increase in Cote d'Ivoire natural rubber exports to the United States [17]. Another thing that threatens Indonesian exports is the fiscal gap in 2013, which caused a recession in the United States [18]. The existence of non-tariff barriers imposed by the United States regarding products that must be environmentally friendly has caused the market position of natural rubber, one of which is Indonesia's TSNR (Technically Specified Natural Rubber), to decline every year [19]. In 2014 and 2015, it increased again, but in 2016 it decreased in line with the decline in export value due to the trade war between the United States and China. In 2017 and 2018, it increased again because the impact of the trade war made natural rubber exporting countries reduce export volumes, so Indonesia took advantage of this situation [20]. However, from 2019 to 2022, there will continue to be a decline, starting with the occurrence of Covid-19, which caused world economic conditions to slow down. The strategy used to maintain the natural rubber market share in the United States is by establishing bilateral relations in the economic sector through the support of an FTA (Free Trade Agreement) [21].



Source: Research Results (2023)

Figure 2. Development of the Indonesian RCA Index in Five Export Destination Countries

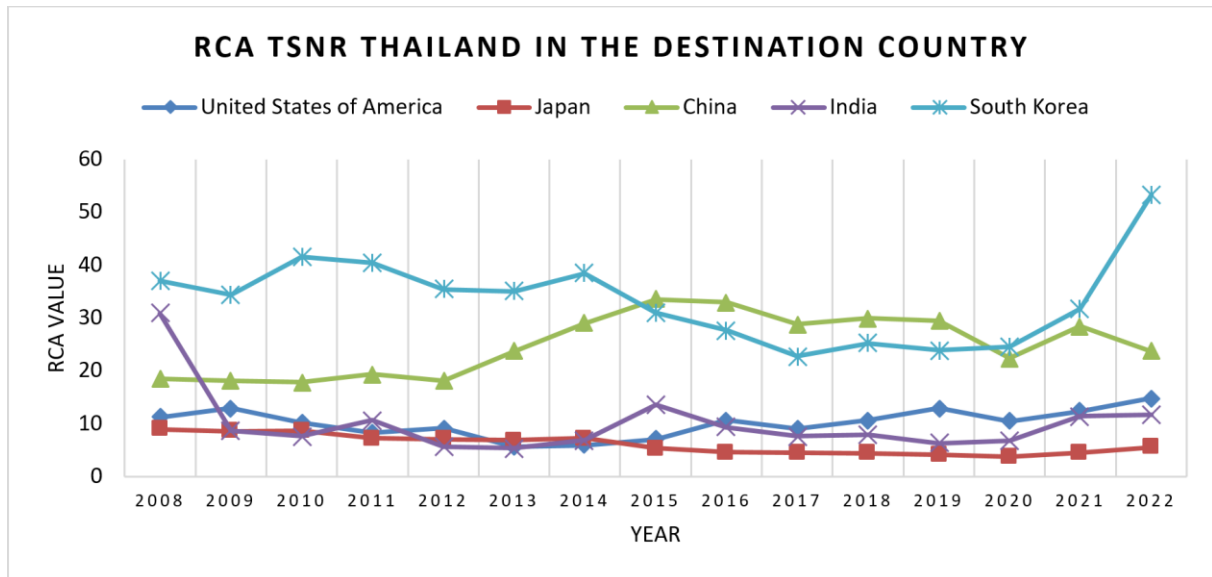
RCA Indonesia value at Japan has had positive growth even though it has experienced several declines with a 15-year average of 21,072. The amount of demand for Indonesian natural rubber exports from Japan tends to increase, followed by positive export value growth. Indonesia has established a partnership with Japan in the economic sector through bilateral cooperation IJEPA (Indonesia-Japan Economic Partnership Agreement). The IJEPA agreement is used to reduce barriers in export-import activities to increase trade and investment between the two countries. These obstacles are in the form of regulations set by the government to limit free trade. Apart from the economic ties between Indonesia and Japan, the need for Japan natural rubber is also increasing because it is one of the largest automotive producers in the world [22]. Japan is known as a country that has economic efficiency and export competitiveness, so that this country has become a trading partner that is able to make a positive contribution to the Indonesian economy, especially export-import activities [23]. Apart from that, Indonesia continues to maintain natural rubber trade cooperation with Japan due to the elimination of import duties to 0% which was given to Indonesia because Indonesia did not get this opportunity from other trading partner countries [24].

The value of RCA Indonesia in China tends to decrease, but has increased several times with an average for 15 years of 13,694. In 2015, China's demand for natural rubber decreased quite significantly due to implementing a policy of increasing standards in importing rubber sheets [25]. Meanwhile, in 2018, the RCA value decreased drastically due to the decline in rubber prices and demand for China's natural rubber exports. The decline in demand was caused by the expansion of China's plantation land which invested in rubber planting in three countries, namely Myanmar, Laos and Cambodia. This condition has certainly resulted

in China focusing more on exports from Myanmar, Laos and Cambodia [11]. Even though Indonesia is active in the Asean-China Free Trade Agreement (ACFTA) cooperation, the type of Indonesian processed rubber exported to China shows a decreasing value, especially for RSS 1, SIR 20 and RSS 3 products [26].

Indonesia's RCA value in India has negative growth with an average RCA value over 15 years of 14,469. This is because the decline in the volume of Indonesian TSNR exports in India is smaller than the increase, so even though it is experiencing fluctuations, it tends to increase. Although India has started planting rubber trees to reduce dependence on imports [27]. However, planting rubber trees is not easy, especially for India, which has been dependent on imports. Apart from that, rubber trees can be tapped when they are 5 to 6 years old. Research by Kafrawi [28] states that there is a positive correlation between plant age and latex production. This condition indicates that the older the rubber plant, the higher the latex production produced. Therefore, India will not immediately reduce the quantity of imports due to the high demand for natural rubber.

The value of RCA Indonesia in South Korea has positive growth with the highest value reaching 33,534 in 2020 and an average for 15 years of 20,315. The growth in RCA Indonesia's value in South Korea is in line with positive export volume and value. Even though in 2021 and 2022, there will be quite a drastic decline, the average growth in the Indonesian RCA value in South Korea is not below that of China and India. Indonesia and South Korea have collaborated in trade, investment and industry [29]. The Ministry of Trade [30] stated that South Korea was ranked sixth as a source of imports and Indonesia even received cheaper import duties due to trade agreements.



Source: Research Results (2023)

Figure 3. Development of Thailand's RCA Index in Five Export Destination Countries

Based on Figure 3, Thailand's RCA value in export destination countries is (≥ 1), so it can be said that Thailand has strong competitiveness and has a comparative advantage in five export destination countries. Thailand's RCA value in the United States experiences fluctuations which tend to increase with an average RCA value over 15 years of 10.071. From 2013 to 2015, the value of Thailand's RCA in the United States decreased drastically, but from 2016 to 2022, it increased even though it decreased several times. Thailand's RCA value in the United States is smaller from Indonesian RCA values, each of which is the same as 10,071 and 88,603. This condition is in line with research by Meliany [17] which states that Indonesian and Cote d'Ivoire natural rubber is relatively superior in the American market. However, there are indications of Thailand's non-compliance in implementing the country's ITRC export restriction scheme because Thailand's export volume continues to increase, while Indonesia and Malaysia's exports show a decline [31].

The value of RCA Thailand in the Japan market experienced growth that tended to decrease from 2008 to 2022, although it increased several times but was not too high with a 15-year average of 6,077. RCA Thailand's value in Japan is lower than RCA Indonesia value. Indonesia has a comparative advantage than Thailand, which indicates that Japan is not the main market for TNSR Thailand products. Thailand's RCA value in China tends to increase even though it has decreased several times with an average RCA value over 15 years of 24,916. From 2008 to 2019, Thailand's RCA value in China tended to increase, in 2020, it decreased, then in 2021, it increased and decreased again in 2022. The RCA value Thailand in the China market has an average of 24,916 higher than Indonesia. In line with research by Zikriansyah [32] which states that the development of Indonesian natural rubber exports in the

China market is greater than Thailand in terms of export volume and value. This is proven by Indonesia's comparatively greater competitiveness in the China market lower than Thailand. In addition, Thailand trade tends to focus on the China market because of the high demand for natural rubber, so that China is the first importer of natural rubber in Thailand [17].

Value of RCA Thailand in India tends to decrease starting in 2008, amounting to 30,827 until 2022, and it will decrease to 11,619 with a 15-year average of 10,006. A drastic decline occurred in 2012 and 2013 amounting to 5,572 and 5,310 respectively. Even though it has experienced a decline for several years, the growth in RCA Thailand's value tends to increase. Although India has started planting rubber trees to reduce dependence on imports [27]. However, planting rubber trees is not easy, especially for India, which has been dependent on imports. Apart from that, young rubber trees around 5 to 6 years old cannot produce high latex production because there is a positive correlation between plant age and latex production. These conditions indicate that the older the rubber plant, the higher the latex production produced [28]. Therefore, India will not immediately reduce the quantity of imports due to the high demand for natural rubber.

RCA Thailand's value in South Korea experienced fluctuations which tended to increase with an average RCA value over 15 years of 33.386. Thailand is comparatively superior in controlling the South Korean market compared to Indonesia as evidenced by the average RCA values for Indonesia and Thailand of 20,315 and 33,463 respectively. This condition is because since 2008 Indonesia's RCA value was only 12,649 while Thailand's RCA value reached 37,044. Even though in 2020 it had a value of 33,534, Indonesia could not maintain it in 2022 which was only 13,084. In contrast to Thailand, although it experienced

fluctuations, the decline in value was not too high.

Based on the results of RCA TSNR calculations for Indonesia and Thailand in five export destination countries, it is known that these two countries have strong comparative competitiveness. Indonesia's TSNR has the highest RCA value in the United States and Japan markets, while Thailand's TSNR is the highest in the South Korea and China markets. This condition is in line with the higher supply of TSNR from Indonesia and Thailand in these destination countries. Apart from that, the price factor also influences the comparative advantages of TSNR Indonesia and Thailand. Thailand's TSNR has a higher export price than Indonesia's TSNR price, so export destination countries can consider prices. However, there are destination countries that do not pay attention to the price factor but rather consider quality even though the price is higher [33].

Market Position of TSNR Indonesia and Thailand in the International Market

EPD analysis aims to show the market position of TSNR Indonesia in trading in export markets. TSNR Indonesia and Thailand have a competitive advantage if their market share grows faster than the world average. The results of EPD can be found in Table 3.

Based on Table 2, the results obtained show that the growth of market share and product share of TSNR Indonesia in the markets of the United States, China and India is in a Lost Opportunity position because there has been a decline in market share which has resulted in lost opportunities for TSNR Indonesia. In line with the comparative decline in competitiveness through Indonesia's RCA TSNR value in the United States, China and India. The Lost Opportunity position shows a decrease in TSNR's domestic market share, while the market share in destination countries has increased. This is because the world supply of TSNR products is greater than the supply of Indonesian TSNR in the destination country, so that the

weaknesses of Indonesian TSNR products and their main competitors can be identified [34].

The growth of market share and product share of TSNR Indonesia in the Japan market is in the Falling Star position. The Falling Star position shows that market share conditions continue to increase, but there is a decline in product movement in the market. This condition indicates that Indonesia's TSNR in the Japan market has positive export market share growth, but product demand has decreased in the global market by 0.0000359% as shown in Table 2. Meanwhile, the growth of market share and product share of TSNR Indonesia in the South Korean market is in the Retreat position. The growth of market share and product share of TSNR Indonesia in South Korea has a negative value. This indicates that there is a decline in the Indonesian TSNR market share in South Korea which is followed by a decline in demand, thus indicating that Indonesian TSNR is no longer desired by the South Korean market [35].

Based on Table 3, the growth in market share and product share of TSNR Thailand in the United States has a positive value, so it is in the Rising Star position. Demand for Thailand TSNR from the United States is increasing with market share growing, so it has a strong competitive advantage. Meanwhile, Indonesia's TSNR position in the United States is at Lost Opportunity even though it is considered superior. This is because the large value of Indonesia's RCA in the United States is not balanced by positive growth, while the value of Thailand's RCA in the United States has positive growth. The growth of market share and product share of TSNR Thailand in the Japan market is in a Lost Opportunity position because there is a decline in market share which results in the loss of opportunities for TSNR Thailand. This is in line with the competitiveness of Thailand's TSNR exports in Japan which tends to decline with negative growth. The Lost Opportunity position shows that TSNR products are still suitable for trading, but market share has decreased or fluctuated.

Table 2. EPD value of Indonesia TSNR

Country of destination	Export Market Share Growth (X-Axis)	Product Share Growth (Y- Axis)	Market Position
United States of America	-0.0010551	0.0000127	Lost Opportunity
Japan	0.0006092	-0.0000359	Falling Star
China	-0.0006037	0.0000983	Lost Opportunity
India	-0.0016309	0.0000975	Lost Opportunity
South Korea	-0.0001639	-0.0000165	Retreat

Source: Research Results (2023)

Table 3. EPD value of Thailand TSNR

Country of destination	Export Market Share Growth (X-Axis)	Product Share Growth (Y- Axis)	Market Position
United States of America	0,0007150	0,0000214	Rising Star
Japan	-0,0005476	0,0000088	Lost Opportunity
China	0,0004843	-0,0000031	Falling Star
India	0,0000461	0,0000283	Rising Star
South Korea	0,0011902	0,0000034	Rising Star

Source: Research Results (2023)

Meanwhile, the growth of market share and product share of TSNR Thailand in the China market is in the Falling Star position. Market share conditions continue to increase, despite a decrease in product movement in the market, in contrast to Indonesia in the China market which is in a Lost Opportunity position. This condition is in line with research by Syaffendi [36] that the competitiveness of Indonesian natural rubber with Thailand has a substitution relationship which states that Indonesia cannot compete through price but must pay attention to the quality of its products to compete for the China market. This is a challenge for Indonesia to improve the quality of exported products through the quality of rubber materials. The low quality of Standard Indonesian Rubber is caused by the raw material being low quality coagulum, so improving the quality of Indonesian natural rubber starts with farmers [37]. The growth of market share and product share of TSNR Thailand in Indian and South Korean markets is in the Rising Star position because the growth of market share and product share has a positive value. Even though India is starting to plant rubber trees to reduce dependence on imports, the position of Thailand TSNR products in India is still ideal.

Based on the results of EPD for TSNR Indonesia and Thailand in five export destination countries, it is known that TSNR Indonesia is unable to compete competitively in the five destination countries, while TSNR Thailand has competitiveness in the markets of the United States, India and South Korea. According to Porter in Widodoatmodjo [38], even though a product has a comparative advantage, it does not guarantee that it will win competition in the world market or have a competitive advantage. This condition is due to increasingly tight global market competition. Apart from paying attention to the price factor, destination countries are also more interested in product quality. Research Meliany [17] states that the Indonesian natural rubber industry has weaknesses, namely the quality of human resources is still low because rubber plantations are dominated by community rubber plantations, the infrastructure to support export activities is inadequate and

the weakness of Indonesia's downstream natural rubber industry. In contrast to Indonesia, Thailand focuses on the development of rubber plants [39]. This can be shown that the Thailand government provides support by continuing to innovate through the Thailand Rubber Research Institute [40].

Potential for TSNR Market Development in Indonesia and Thailand in the International Market

X-Model analysis can show the potential for market development of a commodity through product clustering. The following is a market clustering of Indonesian and Thailand TSNR (Technically Specified Natural Rubber) in export markets.

Based on Table 4, Indonesia's TSNR in the United States, China and India markets has an average RCA value of more than one with the market position being at Lost Opportunity, so the X-Model results show potential market development. This means that TSNR Indonesia products have the potential to be developed because they have high competitiveness in the markets of the United States, China and India. TSNR Indonesia in the South Korean market has an average RCA value of more than one with a market position in Retreat, resulting in less potential market development.

Based on Table 5, Thailand's TSNR in the United States, India and South Korea markets has an average RCA value of more than one with a position in Rising Star, so the X-Model results show optimistic market development. This is because TSNR Thailand has comparative advantages and high competitive advantages in the markets of the United States, India and South Korea. TSNR Thailand in the Japan and China markets has an RCA value of more than one and a position in Lost Opportunity and Falling Star, so that the X-Model obtains potential market development results. This condition indicates that TSNR Thailand products in the Japan and China markets still have potential for development.

Table 4. Results of the Indonesian TSNR X-Model

Country	Bilateral RCA (Competitiveness)	EPD (Market Position)	X-Model (Market Development Potential)
United States of America	88,603	Lost Opportunity	Potential Market
Japan	21,072	Falling Star	Potential Market
China	13,694	Lost Opportunity	Potential Market
India	14,469	Lost Opportunity	Potential Market
South Korea	20,315	Retreat	Less Potential Market

Source: Research Results (2023)

Table 5. Results of the Thailand's TSNR X-Model

Country	Bilateral RCA (Competitiveness)	EPD (Market Position)	X-Model (Market Development Potential)
United States of America	10,071	Rising Star	Optimistic Market
Japan	6,077	Lost Opportunity	Potential Market
China	24,916	Falling Star	Potential Market
India	10,006	Rising Star	Optimistic Market
South Korea	33,463	Rising Star	Optimistic Market

Source: Research Results (2023)

X-Model analysis results show that Indonesia's TSNR exports show that the United States, Japan, China and India are in potential market share, which means that these export markets still have the potential to become the main export destination countries. Meanwhile, South Korea has a less potential market share, so it is necessary to diversify the export destination country market. Thailand's TSNR exports show that the United States is in an optimistic market share, which means that it is the most ideal export markets, while the United States, Japan, China and India are in potential market share, meaning that the four destination countries still have a large enough market share to be the main export markets.

Based on the research results, the government must focus on export destination countries that have market development potential, so that export demand can increase and be more competitive [16]. TSNR Indonesia's exports can focus on the markets of the United States, Japan, China and India as the main export destination countries. Temporarily, South Korea has less potential focused as an export destination country. Apart from that, the government needs diversification of the Indonesian TSNR market, especially in countries that have the largest automotive industries. This is an alternative if TSNR Indonesia's main market is bored.

A strategy that is no less important for applied is increasing the production and quality of natural rubber Indonesia. Increased production does not support with quality according to request importer, so TSNR Indonesia will have a competitive advantage. The government needs it to support the rubber tree rejuvenation program for increased natural rubber productivity so that TSNR or SIR factory operations do not stop due to shortage of raw

material supply. Efforts to rejuvenate plants carried out by farmers need to be supported with providing incentives, superior seeds, fertilizer, technical guidance and soft loans to ensure the continuity of rubber farming.

4. Conclusions

Indonesia and Thailand's TSNR exports have a strong comparative advantage in five export markets. Indonesia's TSNR exports do not have a competitive advantage in the five export destination countries, while Thailand's TSNR exports have a competitive advantage in the United States, India and South Korea. TSNR Indonesia's export markets are the United States, Japan, China and India as potential markets and South Korea as a less potential market. Thailand's TSNR export markets in the United States, India and South Korea are optimistic markets, while Japan and China are potential markets. The Indonesian government expected to focus on increasing market share in export destination countries that have potential market development. A-part from that, the government needs to support the rubber tree rejuvenation program to increase the productivity and quality of natural rubber as a raw material for TSNR, so as to increase the superiority of the competitive TSNR Indonesia.

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