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Export Competitiveness Analysis of Indonesian Natural Rubber (HS 400122) Commodity in The Chinese Market

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Abstract:

Natural rubber is a major industrial commodities of tropical crops that supports the national economy, espescially Indonesia. TSNR (Technically Specified Natural Rubber) is one of dominant products in the rubber exports market. This study is purposes to determine Indonesia's level of competitiveness regarding TSNR exports and export performances of TSNR commodities in the Chinese market. Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), and Constant Market Share (CMS) are three methods of analyzing the competitiveness and market share of TSNR. Results indicated that Indonesia's RCA is 13.99 where RCA is >1 and Indonesia's RSCA is 0.84 where RSCA > 0, meaning Indonesian exports are competitive in the Chinese market. But despite that fact, Indonesia's natural rubber market share tends to be weak with the export growth value of -0.08, commodity composition effect of -0.003048, market distribution effect of -0.000282 and competitiveness effect of -703,959.

Keywords: *Natural Rubber, TSNR, Competitiveness, Export, RCA, RSCA, CMS*

1. Introduction

Economic growth is a fundamental macroeconomic indicator, especially for developing countries and the basis for economic development (Alade et al. , 2021). Economic growth refers to macroeconomic growth, national economy, per capita income (GDP), which had a positive impact on the socio-economic sector and improves living standards (Basil, Nwokoye and Biedomo, 2021). A positive economic growth rate is one of the priorities for governments of various countries, especially developing countries to improve and strengthen their economies (Al-Kasasbeh, 2023). A country's economic situation can be judged from two perspective, internal and external, with the internal factors are referred to real sector developments, and the external factors are referred to the development of Balance of Payments (Harahap, Imsar and Bi Rahmani, 2023)

International trade is a trade involving residents or government of one country with another accordingly to their agreement in order to achieve national development goals that are supported by resources, technology, and accessibility of more advanced transportation. There are two neccessity in International trade, competitive advantage or comparative advantage. Participant countries in international trade can oftenly have one of these advantages or both. Comparative advantage is a country ability to specialize production and export of commodities that have smaller absolute losses and imports commodities that have larger absolute losses. Meanwhile, competitive advantage is the ability of a commodity to enter foreign markets and being able to survive in it (Destiningsih *et al.*, 2020). International trade also encourage foreign investments that plays an important role of improving a country due to the association with new ideas, advanced technology, improved management, skill development, capital gain, new work

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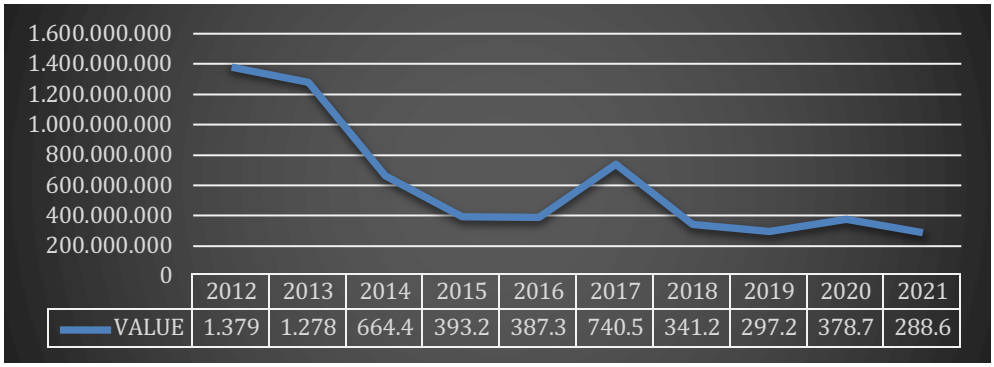
opportunities, and development in the sector of industry (Rochdiani and Wulandari, 2023).

Natural rubber is considered to be one of the crucial exports commodities in Indonesia. The Directorate General of Indonesian Plantations (2020) stated that in 2017, Indonesia have approximately USD 5.1 billion of rubber export, increasing 51.3% compared to 2016 (Zuhdi and Anggraini, 2020). Rubber commodities role in Indonesia's exports cannot be underestimated, considering that rubber commodity exports are crucial after palm oil. Besides from being a source of GDP, job opportunities, it is also known that rubber commodity encourages the growth in plantation areas. Rubber commodities also known to be one of the factors that preserve the environment and resources (Daulika, Peng and Hanani, 2020).

China is considered to be one of the major countries for Indonesia's rubber export. China's own rubber consumption is very high, thus opening up considerable opportunities for Indonesia to expand its market share in China. In addition to Indonesia, Thailand and Malaysia are also countries that export rubber to China. (Muslika and Tamami, 2019).



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
VALUE	1.379	1.278	664.4	393.2	387.3	740.5	341.2	297.2	378.7	288.6

Figure 1. Export Value of Indonesian TSNR (HS 400122) to Chinese Market (2012-2021)
Source *:* UN COMTRADE (2023)

Indonesia, Malaysia, and Thailand are one of the few countries that participated in International Tripartite Rubber Council (ITRC) which is a large rubber producing country and is a major rubber exporter in the international market. Indonesia itself is a natural rubber producing and exporting country with a massive land area in the world. However, at present most of Indonesia's natural rubber exports are still primary products while processed rubber products are still very few. This is because the natural rubber processing industry is still small. In the period 1994 to 2018 most Indonesian products experienced a decline in growth in export share. Meanwhile, Thailand's government is focusing on the development of rubber plants and is trying to amplify the expansion of rubber plantations in Thailand. Malaysia is also considered to be one of the major producer and exporter of natural rubber. However, their productivity of natural rubber has decreased due to limited land (Ardanari and Mukiwihando, 2020)

Vietnam had a massive USD 3.43 billion added to their rubber exports value in 2021. Their volume of exports is ranked third in the world. China is one of the major markets for Vietnam's rubber exports which recorded an export value of around 1.52 million tons, which is 71 percent of total exports. (ResearchAndMarkets.com, 2022).

Singapore is also one of the major export destinations for Indonesia's rubber products with an estimated share of 50.73% from 2001 to 2018, followed by Thailand with estimated share of 16.07%, Malaysia with estimated share of 13.41%, Vietnam with estimated share of 10.24% and the Philippines with estimated share of 5.55% (UN Comtrade, 2023). Singapore market have a relatively complete types of rubber products demand such as product group codes HS 4008, 4009, 4010, 4014, 4015 to 4016. (Zainuddin, 2020).

2. Theoretical Background

International Trade

According to Nopirin (1995: 7) International trade is trade between a country and another country on the basis of mutual agreement. This trade is a form of economic cooperation. Some of the benefits of international trade are as a source of foreign exchange and are able to maintain market price stability. International trade is also able to expand employment and allow a country to acquire goods or services that cannot be produced on its own.

Export
Export is an activity of removing products and goods from within a country to abroad by following regulatory standards and applicable regulations. Export activities are generally carried out by a country that is able to produce goods in large quantities and the amount has been fulfilled domestically (Ramadhan, Wahyuningtyas and Mustaqim, 2023).

Competitiveness
The ability of a country to add, maintain, and master market positions by increasing the scale and benefits of production where the high and low competitiveness of the country will also affect the success of a country in international trade is competitiveness (Fatimah, Hendrati and Asmara, 2021).

Rubber
Rubber is a necessary raw material in daily human activities. Rubber is the basic material of equipment needed by the community, such as cosmetic tools, fashion and medical devices. Natural rubber is also used as a main material in the manufacture of transportation wheels and tyres. (Husaini et al. , 2023). There are sorts types of natural rubber such as; processed rubber materials, conventional natural rubber, concentrated latex, chunk rubber, technical specification rubber, tire rubber and reclaim rubber. The dominant nature in the international market is *Technically Specified Natural Rubber* (TSNR) (Mandasari, 2022).

3. Methodology

This research is categorized as a Quantitative research that analyzes level of competitiveness and export performance of Technically Specified Natural Rubber (TSNR). Export of TSNR with Harmonized Code HS 400122 with the *Purposive Sampling* of five countries which are Thailand, Indonesia, Malaysia, Vietnam, and Singapore is used as the object of this research. This study also used the form of secondary data with time series starting from 2013 to 2022. The data comes from official sources or institutions such as *Central Bureau of Statistics*, Trademap (ITC), and UN COMTRADE.

Data Analysis Methods

***Revealed Comparative Advantage* (RCA)**
Data processing and analysis techniques are carried out quantitatively and descriptively. Quantitative analysis is performed with RCA analysis to measure competitveness. The calculation results from the RCA analysis will be described according to the theory of the analysis tool.

$$RCA = \frac{Xi/Xt}{Wi/Wt}$$

Revealed Symmetric Comparative Advantge (RSCA)
RSCA is a refinement of the analysis tool*, namely Revealed Comparative Advantage (RCA)* where the RCA index is not equal to both neutral sides, namely 1 so that the RCA indicator is made symmetrical known *as* Revealed Symmetric Comparative Advantage *(RSCA)* (Fatimah, Hendrati and Asmara, 2021). It is known that if the RSCA value > 0, indicating that a certain export product have a high value in comparative advantage, and vice-versa if the RSCA value is < 0.

$$RSCA = \frac{RCA-1}{RCA+1}$$

***Constant Market Share* (CMS)**

CMS used as a way of analyzing causes of fluctuations in a country's commodity exports where there are changes in the competitiveness of the product commodity or due to shrinkage of the total import market. Three effects such as composition of commmodity, distribution of its markets, and the competitive level of that commodity where it is described as a form of comparison between the export growth rate of a country with the standard export movement rate (world) The combination of these three effects is able to describe the export growth of a country as follows (Fatimah, Hendrati and Asmara, 2021).

$$\text{Standard Growth} = \frac{Et-E(t-1)}{E(t-1)}$$

$$\text{Effects of Commodity Composition} = \frac{\sum i\,(ri-r)\,Ei(t-1)}{E(t-1)}$$

$$\text{Market Distribution Effects} = \frac{\sum i \sum j\,(rij-ri)\,eij(t-1)}{E(t-1)}$$

$$\text{Competitiveness Effects} = \frac{\sum I \sum j\,Eij(t) - Eij(t-1) - rij\,Eij(t-1)}{E(t-1)}$$

Information:

$$r = \frac{Wt-W(t-1)}{W(t-1)}$$

$$Ri = \frac{Wi(t) - Wi(t-1)}{Wi(t-1)}$$

$$Rij = \frac{Wij(t)-Wij(t-1)}{Wij(t-1)}$$

Where:

Et	= Total export values of country (a) in year (t)
E(t –1)	= Total export values of country (a) in the previous year (t-1)
Ei	= Export values of commodities (i) of country (a)
Ei(t –1)	= Export values of commodities (i) of country (a) in the previous year (t-1)
Eij	= Commodities (i) export values of country (a) to country (j)
Eij(t –1)	= Commodities (i) export values of country (a) to country (j) in the previous year (t1)
W(t)	= Total Export value (world standard) in the year (t)
W(t –1)	= Total Export value (world standard) in the previous year (t-1)
Wi(t)	= Export value of commodities (i) (world standard) in year (t)
Wi(t –1)	= Export value of commodities (i) (world standard) in the previous year (t-1)
Wij(t)	= Export value of commodities (i) to country (j) in year (t)
Wij(t –1)	= Export value of commodities (i) to country (j) in the previous year (t-1)

In CMS analysis there are four parameters, namely:

Standard Export Growth	If the world standard export growth measure commodity (i) to country (j) is lower than the export growth of commodity (i) from country (a) to country (j), it can be interpreted that the export performance of Country (a) is superior to the export performance of other countries, and vice versa.
Commodity Composition	If composition of commodities showing positive effect, it means that the series of commodities (i) is sufficient to fill the market's demands and rules in country j and vice versa.

Market Distribution	If the effect of market distribution is showing positive values, it can be conclude that a country has sufficient abilities to distribute its market, and vice versa.
Competitiveness	When this effect shows a positive result, meaning country (a) is stronger than other competing countries, and vice versa.

4. Empirical Findings/Result

Revealed Comparative Advantage

Table 1. RCA Calculation Results of TSNR Natural Rubber Commodity Exporters (HS 400122) in the Chinese Market in 2013-2022.

YEAR	Thailand	Indonesian	Malaysia	Vietnam	Singapore
2013	36,37	23,08	12,61	32,56	0,52
2014	39,10	20,08	11,27	24,55	0,23
2015	45,57	15,31	10,86	11,29	0,24
2016	43,44	16,42	11,47	5,39	0,39
2017	37,42	19,50	10,14	1,77	0,53
2018	36,72	11,62	11,55	4,14	0,57
2019	34,96	10,04	11,85	3,99	0,68
2020	27,11	13,41	11,27	2,19	0,93
2021	34,49	5,80	11,52	1,87	0,83
2022	30,46	4,65	11,46	0,00	1,12
AVERAGE	36,56	13,99	11,40	8,78	0,60

Source: Secondary Data, processed 2023

Table 1. shows that Indonesia's RCA value is in second position among other competing countries. Thailand's RCA value from 2013 to 2022 is in first place surpassing competing countries annually despite its fluctuating RCA value. In 2013 and 2014, RCA Indonesia was below Thailand and Vietnam, but superior to other competing countries such as Malaysia and Singapore. From 2015 to 2017 RCA Indonesia experienced an increase in TSNR natural rubber exports surpassing its competitors namely Malaysia, Vietnam and Singapore. However, in 2018, RCA Indonesia experienced a decrease with a value of 11.62 almost equivalent to Malaysia with a value of 11.55. However, in 2019 Indonesia's RCA experienced a slight decline above Thailand and Malaysia. In 2020, RCA Indonesia increased again beyond its competitors with RCA of 13.41. However, in 2021 and 2022, Indonesia again experienced a decline above Malaysia and Thailand.

Revealed Symmetric Comparative Advantage

Table 2. RSCA Calculation Results of TSNR Natural Rubber Commodity Exporters (HS 400122) in the Chinese Market in 2013-2022.

YEAR	Thailand	Indonesian	Malaysia	Vietnamese	Singapore
2013	0,95	0,92	0,85	0,94	-0,31
2014	0,95	0,91	0,84	0,92	-0,63
2015	0,96	0,88	0,83	0,84	-0,62
2016	0,95	0,89	0,84	0,69	-0,44
2017	0,95	0,90	0,82	0,28	-0,31
2018	0,95	0,84	0,84	0,61	-0,27
2019	0,94	0,82	0,84	0,60	-0,19
2020	0,93	0,86	0,84	0,37	-0,03
2021	0,94	0,71	0,84	0,30	-0,09
2022	0,94	0,65	0,84	-1,00	0,06
AVERAGE	0,95	0,84	0,84	0,46	-0,28

Source : *Secondary Data*, 2023 (data processed)

Table 2 above shows Indonesia's RSCA value in 2013 to 2014 Indonesia is above Malaysia and Singapore but Indonesia is below Thailand and Vietnam. From 2015 to 2018, Indonesia's RSCA position surpassed Malaysia, Vietnam and Singapore but Indonesia was below Thailand. In 2019, Indonesia and Malaysia has the same RSCA value of 0.84. In 2020, Indonesia's RSCA value is in the top 2 position surpassing its competitors. In 2021 and 2022, Indonesia's RSCA value decreased and was below Thailand and Malaysia.

***Constant Market Share* (*CMS*)**

Table 3. Standard Export Growth

YEAR	Thailand	Indonesian	Malaysia	Vietnamese	Singapore	Standard Growth
2013-2014	0,00	-0,04	0,03	0,14	-0,01	-0,23
2014-2015	-0,07	-0,15	-0,14	0,08	-0,17	-0,22
2015-2016	0,01	-0,04	-0,05	0,09	-0,05	-0,22
2016-2017	0,10	0,17	0,15	0,22	0,13	0,36
2017-2018	0,06	0,07	0,14	0,13	0,10	-0,24
2018-2019	-0,02	-0,07	-0,04	0,09	-0,05	-0,05
2019-2020	-0,07	-0,03	-0,02	0,06	-0,04	-0,16
2020-2021	0,17	0,42	0,28	0,19	0,22	0,35
2021-2022	0,06	0,26	0,18	0,40	0,13	-0,08
AVERAGE	0,03	0,07	0,06	0,16	0,03	-0,05

Source : *Secondary Data*, 2023 (data processed)

Based on the table above, Indonesia's export growth has an average value is 0.07. This value is still higher than Malaysia, Singapore and Thailand which has average values of 0.06, 0.03 and 0.03 respectively. Meanwhile, Vietnam is in first place with an average value of 0.16.

Table 4. Effects of Commodity Composition

YEAR	Thailand	Indonesian	Malaysia	Vietnamese	Singapore
2013-2014	-0,01088	-0,01346	-0,00332	-0,00593	-0,00017
2014-2015	-0,00152	-0,00204	-0,00043	-0,00076	-0,00003
2015-2016	-0,00142	-0,00204	-0,00041	-0,00047	-0,00003
2016-2017	0,00328	0,00554	0,00105	0,00097	0,00008
2017-2018	-0,00388	-0,00844	-0,00134	-0,00093	-0,00012
2018-2019	-0,00006	-0,00014	-0,00002	-0,00002	0,00000
2019-2020	-0,00096	-0,00240	-0,00042	-0,00032	-0,00005
2020-2021	0,00152	0,00496	0,00088	0,00047	0,00011
2021-2022	-0,00116	-0,00232	-0,00048	-0,00033	-0,00007
AVERAGE	-0,00168	-0,00226	-0,00050	-0,00081	-0,00003

Source : *Secondary Data*, 2023 (data processed)

Based on the table above, the average commodity composition effect of Thailand, Indonesia, Malaysia, Vietnam and Singapore shows negative values. Indonesia has an average value of -0.00226. This value is still lower than Singapore, Malaysia and Vietnam and Thailand which has values of -0.00003, -0.00050, -0.00081, and -0.00168, respectively.

Table 5. Market Distribution Effects

YEAR	Thailand	Indonesian	Malaysia	Vietnamese	Singapore
2013-2014	0,00250	0,00095	0,00057	0,00108	0,00004
2014-2015	-0,00015	-0,00005	-0,00003	-0,00005	0,00000
2015-2016	-0,00119	-0,00028	-0,00026	-0,00021	-0,00001
2016-2017	0,00008	0,00002	0,00002	0,00001	0,00000
2017-2018	-0,00044	-0,00023	-0,00012	-0,00003	-0,00001

2018-2019	-0,00008	-0,00003	-0,00003	-0,00001	0,00000
2019-2020	0,00008	0,00003	0,00003	0,00001	0,00000
2020-2021	-0,00048	-0,00044	-0,00031	-0,00006	-0,00004
2021-2022	-0,00018	-0,00006	-0,00008	-0,00001	-0,00001
AVERAGE	0,00002	-0,00001	-0,00002	0,00008	0,00000

Source : *Secondary Data*, 2023 (data processed)

According to the data above, Indonesia has an average market distribution of -0.00001. This value is still lower than Vietnam which has an average value of 0.00008, then Thailand which has an average value of 0.00002 and Singapore which has an average value of 0.00000. Meanwhile, the average value of commodity composition in Malaysia is -0.00002.

Table 6. Competitiveness Effects

YEAR	Thailand	Indonesian	Malaysia	Vietnamese	Singapore
2013-2014	-0,00020	-0,00175	-0,00059	-0,00092	-0,00004
2014-2015	0,00253	-0,00071	0,00008	-0,00145	-0,00001
2015-2016	0,00015	0,00054	0,00003	-0,00051	0,00003
2016-2017	-0,00083	0,00148	-0,00016	-0,00070	0,00005
2017-2018	-0,00092	-0,00132	0,00026	0,00050	-0,00001
2018-2019	-0,00018	-0,00014	0,00006	0,00000	0,00002
2019-2020	-0,00070	0,00078	0,00010	-0,00019	0,00003
2020-2021	0,00073	-0,00137	-0,00008	-0,00011	-0,00002
2021-2022	-0,00062	-0,00004	0,00002	-0,00027	0,00003
AVERAGE	0,00000	-0,00028	-0,00003	-0,00041	0,00001

Source : *Secondary Data*, 2023 (data processed)

The data above is showing Indonesia competitiveness has an average value of -0.00028. This value is still lower than Singapore which has an average value of 0.00001, then Thailand which has an average value of 0.00000, and Malaysia which has an average value of -0.0003. Meanwhile, the average value of Vietnam's competitiveness has an average value of -0.00041.

5. Discussion

***Revealed Comparative Advantage* (RCA)**

From 2013 to 2022, the RCA value of Thailand, Indonesia, and Malaysia is always above 1, indicates that every year TSNR exports of these three countries are always competitive in the Chinese market. Meanwhile, Vietnam's RCA value from 2013 to 2021 is above 1 and competitive, except in 2022 because Vietnam did not export TSNR to the Chinese market at all that year. Singapore's RCA value is below 1 from 2013 to 2021, which means that the country is unable to compete. However, in 2022 Singapore's RCA is above 1, which means that in 2022 Singapore can be said to be competitive.

***Revealed Symmetric Comparative Advantage* (RSCA)**

From 2013 to 2022, the RSCA value of Thailand, Indonesia, and Malaysia is always above 0, indicates that every year their TSNR exports always have a comparative advantage in the Chinese market. Meanwhile, Vietnam's RSCA value from 2013 to 2021 is above 0 and have a comparative advantage, except in 2022 because Vietnam did not export TSNR to the Chinese market at all that year. Singapore's RCA value is below 0 from 2013 to 2021, which means that the country is unable to compete. However, in 2022 Singapore's RCA is above 0, which means that in 2022 Singapore can be said to be competitive.

Standard Growth

From 2013 to 2022, the average growth of TSNR commodity exports of five countries, namely Thailand, Indonesia, Malaysia, Vietnam, and Singapore is above the average growth value of the world's TSNR commodity exports to China so that it can be said that the growth of value in the export of TSNR commodities of the five countries in the Chinese market has a higher value than the growth

of the export value of world TSNR natural rubber commodities to the market China.

Effects of Commodity Composition

From 2013 to 2022, TSNR of Thailand, Indonesia, Malaysia, Vietnam and Singapore has a negative average value of effect commodity composition, stating that composition of natural rubber commodities TSNR of the five countries is not enough to meet market demand. According to research conducted stated that the decline in demand for natural rubber TSNR was caused by smallholder plantations domination over rubber plantations in Indonesia that were not well maintained so that the productivity and composition of Indonesian natural rubber commodities were still low when compared to Thailand and also the influence of climate anomaly that occurred in that year, besides that the price of rubber on the world market was also declining so that Indonesia took Efforts to limit export quotas which have an impact on the amount of rubber exports (Muslika and Tamami, 2019).

Market Distribution Effects

From 2013 to 2022, TSNR of Thailand, Indonesia, Malaysia, Vietnam and Singapore has a negative average value of market distribution effects, concluding that there is a decrease in demand for TSNR in these five countries to the Chinese market. This statement is similar to a research by Zuhdi and Anggraini (2020), which states that negative values in periods II and III illustrate a decreasing quality and price which also causes a decreasing demand for Indonesian Natural Rubber.

Competitiveness Effects

From 2013 to 2022, the average value of the competitiveness effect of Thailand and Singapore TSNR has a positive value, which means that these countries are competitive in China's TSNR natural rubber export market. Meanwhile, Indonesia, Malaysia and Vietnam has a negative value, indicating a lesser competitiveness in China's TSNR natural rubber export market. In the study, Indonesia has a higher level of competitiveness in the exports for natural rubber compared to that of Thailand's, especially in the third period (2014-2019). This fact stated that Indonesia's export of natural rubber products has a low level of competitiveness (Zuhdi &; Anggraini, 2020)

6. Conclusion

According to the results of research above and distribution that has been done, the author concludes that Indonesia is competitive and has a comparative advantage for TSNR exports in the Chinese market, but has a negative effect on the Commodity Composition, Market Distribution, and Competitiveness with each being in fifth, second, and fourth place. The Indonesian government, which acts as an exporter, must often improve the composition of its TSNR Natural Rubber commodity due to its elastic nature to income which can also have an impact on the competitiveness of the commodity.

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