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Analysis of Indonesian Palm Oil Competitiveness in the Main Export Destination Countries

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Abstract. Indonesia is the largest palm oil producing country in the world with a production volume of nearly 43 million tons/year. The high production of Indonesian palm oil is a new opportunity that needs to be developed in this globalization era to compete with its main competitors. Therefore, an analysis is needed in order to discover the competitiveness of Indonesian palm oil commodity in the main export destination countries. Export is an activity conducted by a country by selling its products abroad using the payment system, quality, quantity, and other sales terms that have been agreed upon by the exporting and importing countries. This study aims to analyze the level of competitiveness of Indonesian palm oil exports in the Asian and European markets represented by six countries: India, Malaysia, Singapore, the Netherlands, Italy, and Spain. The analytical method used is Revealed Competitive Advantage (RCA) to see the comparative advantage and to determine whether the performance of Indonesian palm oil products in the main export destination countries increases or decreases by using the Revealed Comparative Advantage Index (RCA Index) calculation. The data used are secondary data in the form of time series during the period of 2014 to 2020 and cross sections of the main export destination countries of Indonesian palm oil. The results of the calculation of the RCA value show that in the period 2014 to 2020 the RCA value of Indonesian palm oil products in the main export destination countries is higher than one (> 1). Thus, Indonesian palm oil products have a comparative advantage in the main exports of destination countries from year to year. In contrast to the RCA index calculation results in this study, Indonesian palm oil products are still able to show a positive trend every year. This is proven by certain years' RCA index of the main export destination countries: India, Malaysia, Singapore, the Netherlands, Italy, and Spain is still less than one (<1) even though the average RCA index value for each country is higher than one (>1). Hence, it can be said that the performance of Indonesian palm oil products increases or decreases frequently every year in each of the main export destination countries.

Keywords: competitiveness, export, palm oil, RCA index

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1. Introduction

Indonesia is one of the countries which economy depends on the role of exports. Export is an important component being a concern in a country's economy. The higher the export performance of a country, the greater the positive impact for that country [1]. To increase exports, Indonesia basically has many potential product choices to be developed. There has been

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a shift in Indonesian exports from the oil and gas as the dominant sector to non-oil and non-gas sector. The three major non-oil and non-gas sectors are the industrial sector, the mining sector, and the agricultural sector. The agricultural sector plays an essential role because agricultural products could positively impact the economy growth of a country [2]. As a tropical country, agriculture is an abundant source of wealth for Indonesia. There are various types of agricultural commodities in Indonesia and one of them is palm oil [3].

Palm oil is one of the plantation commodities that is crucial in economic activities in Indonesia due to its role in producing vegetable oil needed by the industrial sector [4][5]. Indonesia as the largest palm oil producing country in the world in 1980 had around 295 thousand hectares area of oil palm plantations. The area then expanded in 2019 to 14.68 million hectares or increased almost 50 times. This expansion has placed Indonesia as the largest producing country in the world after Malaysia and Thailand. The area of land and the volume of Indonesian palm oil production keep increasing every year. The volume of palm oil production (tons/year) in the main producing countries during 2015 - 2019 is presented in Figure 1.

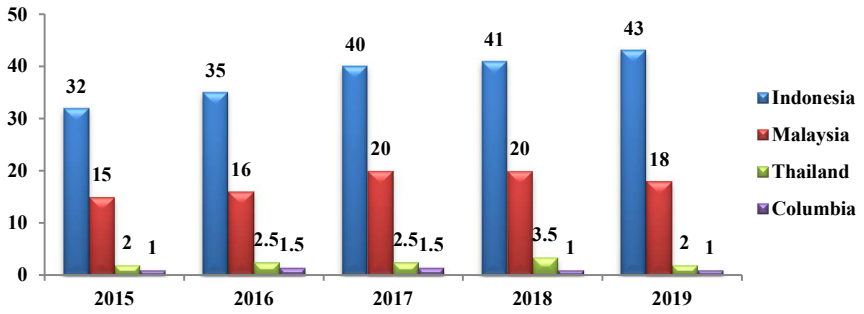

Figure 1. Oil Palm Production Volume (tons/year) 2019

Figure 1 shows that Indonesia's palm oil production from 2015-2019 increased every year. In 2015, it was 32 million tons and increased to 43 million tons in 2019. In other words, the volume of Indonesian palm oil increased by 25.5% [7].

As an agricultural and maritime country, Indonesia has a comparative advantage. Comparative advantage is an economy basis that needs to be utilized through economic development to become a competitive advantage. Malaysia has been the main competitor of Indonesian palm oil. The production and quality of palm oil produced by Malaysia is better than the one produced by Indonesia [9]. However, the development of Malaysia's palm oil exports is expected to be hindered by limited labor resources and high labor wages. Meanwhile, Indonesia has the potential to develop because of the available prospective area and the opportunities to increase productivity [10].

Indonesia's palm oil export market includes these five main countries: India, China, the European Union, Africa and Pakistan. Their demand for palm oil is the largest which covers

62% of the total demand of the export destination countries [11]. The distribution of Indonesian palm oil trade in 2019 is presented in Figure 2 [12].

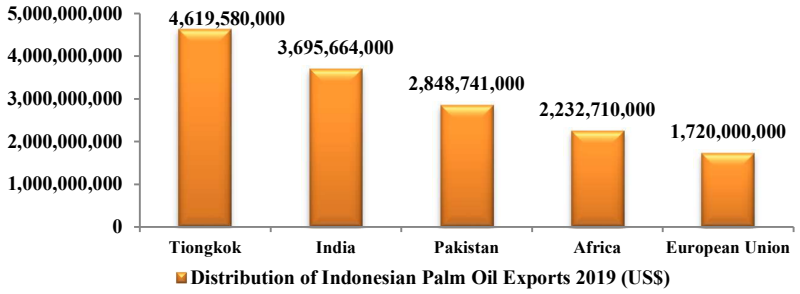

Figure 2. Export Trade of Indonesian Palm Oil According to Destination Countries in 2019

In 2019, the total distribution of palm oil exports in the five main export destination countries was 15.1 billion (US$). The largest distribution of exports according to the destination country was China with 4.61 billion (US$). India was at second place with 3.69 billion (US$). Meanwhile, Pakistan was the third with 2.84 billion (US$) followed by Africa with 2.23 billion (US$) and the European Union with 1.72 billion (US$).

Competitiveness is one of the determining criteria for the success of one country in international trade. Theoretically, the problem of competitiveness is explained by various theories, one of which is the ability of a commodity to enter foreign market and to survive in this market [13]. The definition of Power Competitiveness also refers to the ability of a country to promote its products against the capabilities of other countries [14].

In international trade, the competitiveness of a commodity could be indicated by comparative and competitive advantage. The comparative advantage of a product could be seen from the Revealed Comparative Advantage (RCA). The country's competitiveness is categorized as good if the resulting RCA value is > 1 [14].

International trade requires each country to have specialization and the ability to compete in the existing market. Market domination by a country can be an indicator of its ability to compete for certain commodities. Based on the presented data and information, it is very important to study the dominance of the Indonesian market in the export destination countries. Therefore, the author is interested in conducting a study related to the problem above with the title "Analysis of Indonesian Palm Oil Competitiveness in the Main Export Destination Countries for the 2014-2020 Period. This study is necessary because Indonesia is the largest palm oil producing country in the world with a production volume of nearly 43 million tons/year [14].

The high production of Indonesian palm oil is a new opportunity that needs to be developed in this globalization era so that Indonesia is able to compete with its main competitors. An analysis to discover the competitiveness of Indonesian palm oil commodities in the main export destination countries, which in this case are India, Malaysia, Singapore, the Netherlands, Italy,

and Spain, is necessary to conduct. While there have been many similar studies to this research, there are differences in the year of analysis, the country being the research object, and the method of analysis. In general, previous studies only calculated RCA values while this research also calculated the RCA index. The purpose of the calculation is to see whether the performance of Indonesian palm oil products increases or decreases every year in each of the main export destination countries.

2. Methods

The method used in this research is a quantitative descriptive research method. The importing countries for this study include India, Malaysia, Singapore, the Netherlands, Italy and Spain. The data used in this study is secondary data in the form of time series accessed for the 2014-2020 period from various sources related to the topic of the study including the Statistics Indonesia (*Badan Pusat Statistik*-BPS), Ministry of Trade, IndexMundi, and other related literature.

2.1. Data Analysis Method

The data and information obtained in this study were analyzed with a quantitative descriptive method. The quantitative model in this study used several modeling approaches including Revealed Comparative Advantage (RCA) analysis and Revealed Comparative Advantage Index (RCA Index). Data processing was conducted through the Microsoft Excel program.

RCA is an analytical method used to measure the comparative advantage of a country's product in the international market [15]. RCA will show the conclusion that the share of the export market for Indonesian palm oil commodities to the total exports of all Indonesian commodities is greater than the share of the export market for palm oil commodities to the total exports of commodities from importing countries in Indonesia and the world [16]. The Comparative Advantage (RCA) value of Indonesian palm oil to the main export destination countries: India, Malaysia, Singapore, the Netherlands, Italy, and Spain can be calculated using the following formula [17].

$$RCA = \frac{(Xij/Xj)}{(Wiw/Xw)} \quad (1)$$

Description: Xij: the value of “i” palm oil exports (US$); Xj: the total value of “i” exports (US$); Wiw: the value of the world CPO exports (US$); Xw: the total value of world exports (US$); i: India, Malaysia, Singapore, the Netherlands, Italy, and Spain.

The value of the competitiveness of a commodity can be concluded with two possibilities:

1. If the RCA value is > 1, then the country’s comparative advantage is above the world average. It means that the commodity has strong competitiveness.

2. If the RCA value is < 1, then the country's comparative advantage is below the world average. It means that the commodity has weak competitiveness.

The RCA index is a comparison between the current and the previous year's RCA value. Therefore, the result of the RCA Index calculation provides information on whether the level of competitiveness of Indonesian palm oil exports in the export destination countries has decreased or increased. Below is the RCA index formula used in this study [18].

$$Indeks\ RCA = \frac{(RCAt)}{(RCAt-\ )} \quad (2)$$

Description: RCAt: The RCA value of the current year (t); RCA t – 1: The RCA value of the previous year (t-1); RCA index commodity values can be concluded with two possibilities:

a. If the RCA index value is > 1, then the country's commodity competitiveness has increased compared to the previous year.
b. If the RCA index value < 1, then the country's commodity competitiveness has decreased compared to the previous year.

3. Results and Discussion

3.1. Export Volume and Value of Indonesian Palm Oil Products

Figure 3 provides information on the volume and value of Indonesian palm oil exports for the 2014-2021 period. The data presented in the figure shows that the export volume of Indonesian palm oil products has decreased since 2020. Even though this export commodity increased by 18.4%, the export volume decreased by 7.5%. A decrease in export volume also occurred in 2021 by 1.4% even though the export increased by 53.19%. This means that Indonesian palm oil products have been increasingly used for domestic consumption as the raw material of both palm oil derivative products and biofuel products [19].

The decrease in the export volume of Indonesian palm oil products was caused by the limited supply, high prices, and smaller price differences between the products produced in the form of palm oil and other vegetable oils, especially soybean oil. Additionally, the weather, limited availability of fertilizers, and a shortage of available manpower also contributed to the decrease. The biggest decrease in Indonesian palm oil exports occurred in the Netherlands and Malaysia by 83.5% and 81.74%. It was also followed by the decrease in palm oil exports to the Netherlands and Malaysia from outside Indonesia.

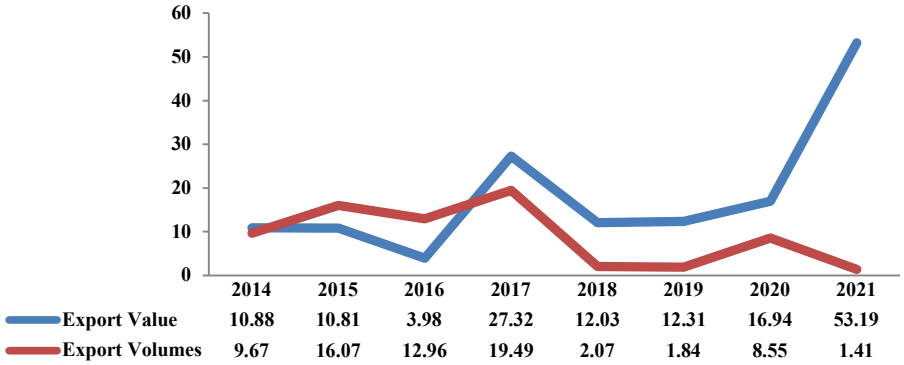

Figure 3. Export Volume of Indonesian Palm Oil Products in 2020-2021

3.2. RCA Calculation Results

The results of the RCA calculation of the six studied export destination countries show that all of them have an average RCA value >1 during the 2014-2020 period. Although every year the RCA values in the six main export destination countries do not always increase, the RCA values has never been <1. This means that Indonesia still has a high level of competitiveness in India, Malaysia, Singapore, the Netherlands, Italy and Spain. The estimation of the Revealed Competitive Advantage (RCA) of Indonesian palm oil products in the six main export destination countries is showed in Table 1:

Table 1. RCA Value Calculation Results of Indonesian Palm Oil Products to Main Export Destination Countries for the 2014-2020 Period

Country	RCA Value							
	2014	2015	2016	2017	2018	2019	2020	Average
India	30.67	25.33	22.09	20.78	17.38	15,12	16.28	18,12
Malaysia	17.71	14.71	17.11	16.44	9.35	20.89	20.11	18.33
Singapore	7.24	9.89	28,12	5.16	5.72	6.38	10.07	10.36
The Netherlands	68,12	66.46	49.57	62.58	49.07	57.47	44.83	56.87
Italy	152.65	109.90	49.57	159.66	143.51	130.58	106.50	121,75
Spain	85.56	68.03	69.47	112.64	92.25	105.63	74.27	86.83
Average								**52.04**

Data source: Data processed in 2022

Table 1 shows that generally, the average RCA value of Indonesian palm oil products to the main export destination countries: India, Malaysia, Singapore, the Netherlands, Italy and Spain in the 2014-2020 period was 52.04 US$ or >1. This number indicates that Indonesian palm oil products have a comparative advantage over the world average. In other words, this commodity has strong competitiveness. However, the RCA value of each export destination country fluctuated. It increased and decreased frequently. Even though the value of RCA decreased in each country during a certain period, there was no cause or implication that Indonesia competitiveness power in that country was weak. When the decrease occurred, the RCA value of Indonesian palm oil products to the main export destination countries was still worth more than one (> 1). Therefore, it is safe to say that the competitiveness of Indonesian palm oil products in India, Malaysia, Singapore, the Netherlands, Italy, and Spain is still relatively good

or strong. The RCA value decline in each country in certain periods was caused by the decline in the export value of Indonesian palm oil products to each of the main destination countries. However, this export value decline was also balanced by a decline in the value of exports of palm oil products from outside Indonesia to the main export destination countries.

The results of estimating the average RCA value for each export destination country for the main Indonesian palm oil products are also presented in Table 1. This table provides information that the highest average RCA value for Indonesian palm oil products is in Italy, which is 121.75, followed by Spain, the Netherlands, Malaysia, India, and Singapore. Look at the calculation results; the average RCA value of Indonesian palm oil products for India, Malaysia, Singapore, the Netherlands, Italy, and Spain is worth more than one (> 1). Therefore, it can be concluded that the competitiveness of Indonesian palm oil exports to all six main export destination countries has comparative advantages or high competitiveness capabilities. This can be proven by the overall average of the six countries' RCA value, which is 52.04. Rifai in his research in 2015 stated that if the RCA value obtained by a country is more than one (>1), then that country has a comparative advantage above the world average. Thus, it can be said that the export commodity has good competitiveness or quality. On the other hand, if the RCA value obtained by a country is less than one or not more than one (<1), then the country's comparative advantage is below the world average. Thus, it can be said that the export commodity has weak competitiveness.

When compared with previous research, the results of this study are in line with a research entitled Analysis of Indonesian Crude Palm Oil (CPO) Competitiveness to the Six Main Export Destination Countries for Indonesian palm oil products in Asia and the European market by [21]. The results show that Indonesia has good competitiveness in palm oil exports because it has an overall average RCA value of >1.

3.3. RCA Index

The RCA index is a ratio between the current year's and the previous year's RCA value. The purpose of calculating the RCA index is to find out whether the export competitiveness of Indonesian palm oil to the main export destination countries has decreased or increased. The competitiveness of Indonesia's palm oil exports is said to increase if RCA index is more than one, and it is said to decrease if RCA index is less than one. A number of previous studies have informed that when RCA index is more than one, it indicates that the country's commodity competitiveness has increased compared to the previous year. When the RCA index is less than one, it indicates that the country's commodity competitiveness has decreased compared to the previous year. The RCA index of Indonesian palm oil in the six main destination countries is presented in Table 2.

Table 2. RCA Index Value of Indonesian Palm Oil Products to the main export destination countries: India, Malaysia, Singapore, the Netherlands, Italy, and Spain for the 2014-2020 Period

Countries	RCA Index					
	India	**Malaysia**	**Singapore**	**The Netherlands**	**Italy**	**Spain**
2014-2015	0,82	0,85	1.36	0,97	0,81	0,79
2015-2016	0,94	1.16	0,90	0,84	1.40	1.02
2016-2017	0,94	0,96	0,57	1.26	1.09	1.62
2017-2018	1.10	1.29	1.11	0,98	0,89	0,81
2018-2019	0,96	0,97	1.15	1.17	0,95	1.41
2019-2020	1.35	0,96	1.57	0,88	0,91	0,70
Average	**1.02**	**1.03**	**1.11**	**1.01**	**1.08**	**1.05**

Data source: Data processed in 2022

Table 2 of the RCA Index of Indonesian Palm Oil to Main Export Destination Countries for the 2014-2020 period shows that the RCA Index of each country fluctuated or experienced frequent increases and decreases. Even though there is a decrease in the RCA index, it does not mean that is a decrease in the quality of Indonesian palm oil exports to the main export destination countries. This is in line with the decrease in the number of exports of palm oil products by countries outside Indonesia. In other words, the decline in the number of exports of palm oil products did not only occur in Indonesia but also in countries outside Indonesia.

Table 2 also shows that all RCA index averages of Indonesian palm oil products to the six main export destination countries are higher than one. The highest average RCA index is Singapore, followed by Italy, Spain, Malaysia, India, and the Netherlands. Thus, the overall competitiveness of Indonesian palm oil products to the six main export destination countries is categorized as questionable. Hagi, one of the previous researchers, in 2019 stated that if the RCA index is higher than one, then the country's commodity competitiveness still has very strong or good competitiveness, and vice versa. If the RCA index is less than one, then the country's commodity competitiveness is weak or poor. Nevertheless, Indonesia, having higher than one RCA index average in this case, has to continue to maintain the quality and quantity of palm oil products in order to have stronger or ever-increasing competitiveness since there are still some of each year's RCA index values that are less than one. Based on the RCA index for each period, the competitiveness of Indonesian palm oil export products decreased significantly in Singapore, which was then followed by Spain, Italy, India, the Netherlands, and Malaysia.

Compared to previous studies, there are similar results of research conducted by [23]-[24] concerning the Analysis of Indonesian Crude Palm Oil (CPO) Competitiveness in Six Main Destination Countries in Asian and European Markets. The results of this research show that the competitiveness of Indonesian palm oil export products fluctuated during certain periods. However, the whole average value of the RCA index in 2010-2016 shows that Indonesian competitiveness is still relatively good or high because its average RCA index value is higher than one. In addition, the results of this study are also in line with the research [30] on the

Competitiveness Analysis of Indonesian Crude Palm Oil (CPO) 2001-2012 where the results of the study show that Indonesia had the comparative advantage in CPO competitiveness indicated by the overall average of RCA Index higher than one. In other words, Indonesia's palm oil products have strong export competitiveness in the international market [25]. This is because the RCA Index value obtained is <1 which means that there is a positive trend or increase every year for Indonesian palm oil products in the main export destination countries.

4. Conclusion

Based on the research results by calculating the Revealed Competitive Advantage (RCA) value, it can be concluded that generally Indonesian palm oil products have good competitiveness, which is above the world average, in the six studied countries: India, Malaysia, and Singapore for the Asian market; and the Netherlands, Italy, and Spain for the European market during 2014-2020 research period. This is proven by the results of the calculation of the RCA value in each country which is <1. Furthermore, the calculation of the RCA value in this study does not show a positive trend every year, indicated by the RCA index which is below one in the markets of India, Malaysia, Singapore, the Netherlands, Italy, and Spain. These results are similar to the results of research conducted by [1] in 2020 entitled The Comparative Analysis of Indonesian CPO Competitiveness in the Main Destination Country, Malaysia, and resulted in research conducted by [8] in 2019 concerning the comparison of export advantages and performance of Indonesian palm oil in the international market.

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