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Competitiveness of the Top Five Main Export Destinations of Indonesia's Crude Palm Oil (CPO) For 2011–2020

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Abstract

Indonesia as the largest palm oil producing country in the world has the opportunity to compete in international trade. This study aims to analyze Indonesian CPO's comparative and competitive competitiveness in international trade. The analytical methods used are Revealed Competitive Advantage (RCA), Export Product Dynamics (EPD) and Trade Specialization Index (ISP). The data used are secondary data in the form of a time series for the period 2011 to 2020 and cross section of the main export destination countries for Indonesian palm oil, namely India, Spain, Malaysia, Italy and Kenya. The results of the analysis show that the RCA value of Indonesian palm oil exports in the five destination countries is greater than one, this indicates that Indonesian palm oil has a comparative advantage in the main export destination countries. When compared with the main CPO producer, RCA Indonesia is bigger than RCA Malaysia. Through ISP calculations, the main CPO producing countries, Indonesia and Malaysia, are countries that tend to become CPO exporting countries. Through the EPD analysis, the results show that the competitive position of Indonesian palm oil in the five export destination countries for the period 2011 to 2020 changes every year, this shows that Indonesian palm oil products do not always have a competitive advantage in the main export destination countries. Italy and Kenya are exporting countries with great potential for Indonesian CPO commodities, which each year are in the Rising Star position.

Keywords
crude palm oil (CPO); export product dynamic (EPD); revealed comparative advantage (RCA); trade specialization index (ISP)

I. Introduction

Indonesia's leading agricultural sector comes from the plantation sub-sector. The contribution of the plantation sub-sector to the formation of the agricultural sector's Gross Domestic Product (GDP) is 36.57 percent in 2020 or is the first order, followed by food crops, horticultural crops and livestock (Central Bureau of Statistics, 2020). In addition, the plantation sub-sector is also a provider of raw materials for the industrial sector, an absorber of labor and a producer of foreign exchange. One of the commodities from the plantation sub-sector that has a reasonably significant contribution and is the prima donna is oil palm. Oil palm is a commodity with the highest land area and production increase compared to other plantation commodities. Based on Table 1, it can be seen that the area and production of oil palm plantations in Indonesia have increased significantly from year to year, whereas in the last year 2019 it was 14,595 hectares with a production of 9,683 tons.

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Table 1. Land Area and Production of Oil Palm Plantations in Indonesia, 2010-2019

Year	Land area (Ha)	Production (Ton)	Volume (Ton)	Export Value (US$)
2010	8,548,828	4,499,371	11,158,124	9,084,888
2011	9,132,296	4,799,195	10,428,085	10,960,993
2012	10,133,322	5,203,104	7,262,831	6,676,504
2013	10,465,020	5,556,401	6,584,732	4,978,533
2014	10,754,801	5,855,638	5,726,820	4,206,741
2015	11,260,276	6,214,003	7,788,550	4,388,094
2016	11,201,465	6,297,597	5,283,953.00	3,305,575
2017	12,383,101	6,988,058	7,076,061.00	4,698,220
2018	14,326,350	8,576,726	6,554,495.00	3,576,480
2019	14,595,579	9,683,579	7,401,796.00	3,641,687

(Source: Ministry of Agriculture Republic of Indonesia, 2020)

As an agrarian and maritime country, Indonesia has a comparative advantage. Comparative advantage is the basis of the economy that needs to be utilized through economic development to become a competitive advantage. The main competitor for Indonesian palm oil in Malaysia. Even the production and quality of Malaysian palm oil are better. However, the development of Malaysian palm oil exports is expected to be hampered by limited land resources and high levels of labor wages. Meanwhile, Indonesia still has the potential to develop because of the potential land support that is still available and there are still opportunities to increase productivity (Carina *et al*., 2020). Development is a systematic and continuous effort made to realize something that is aspired. Development is a change towards improvement. Changes towards improvement require the mobilization of all human resources and reason to realize what is aspired. In addition, development is also very dependent on the availability of natural resource wealth. The availability of natural resources is one of the keys to economic growth in an area. (Shah, M. et al. 2020)

Destination Indonesia's palm oil export market is highest in five main countries, namely India, Spain, Malaysia, Kenya, and Italy based on Table 2. These five countries are the countries with the largest demand for palm oil. With a contribution of 62% to all other export destination countries. In 2020, the total distribution of palm oil exports in the five main export destination countries was 4,704,375 billion (US$). The largest export distribution by destination country was India at 2,870,996 billion (US$). The distribution of exports to Spain is in second place at 269.135 billion (US$). Meanwhile, Malaysia became the third largest export destination country with a total export distribution of 269.135 billion (US$), followed by Kenya of 232.778 billion (US$) and Italy of 230.894 billion (US$).

Table 2. Main Destination Countries for CPO (Crude Palm Oil) Exports in Indonesia, 2016-2020

Country	2016	2017	2018	2019	2020
India	1,868,494	3,068,293	2,174,876	1,943,963	2,870,996
Spain	139,889	138,607	126,811	430,160	513,038
Malaysia	96,404	136,969	217,683	395,188	269,135
Kenya	32,188	81,153	116,419	49,888	232,778
Italy	150,431	231,394	221,856	106,752	230,894
Singapore	359,879	398,616	239,934	247,371	199,065
Netherlands	424,593	415,656	350,863	234,430	173,650
France	0	0	2,420	83,514	111,457

Germany	105,204	92,076	45,393	41,531	56,453
Pakistan	0	33	45,201	52,823	46,909

Source: (UN-Comtrade processed, 2021)

Indonesia as one of the leading suppliers of palm oil products in the international market and from year to year the need for world CPO is increasing. This is caused by changes in consumption patterns of the world community from corn oil, soybean oil, sunflower oil and canola oil to CPO. Competitiveness is one of the criteria that determines the success of a country in international trade. Theoretically, the problem of competitiveness is explained by various theories, one of which is by Porter (1990) in Karlinda (2012) which states that competitiveness is the ability of a commodity to enter foreign markets and the ability to survive in that market. The notion of competitiveness also refers to a country's ability to market products produced by the country relative to the capabilities of other countries.

In international trade, the competitiveness of a commodity can be seen from its comparative advantage and competitive advantage. The comparative advantage of a product can be seen from Revealed Competitive Advantage (RCA) and its competitive advantage can be seen using Export Product Dynamics (EPD). International trade requires each country to have specialization and also the ability to compete for the existing market, market control by a country can be a measure of a country's ability to compete for certain commodities. Based on the existing data and the information that has been presented, it is necessary to conduct a study on the market control owned by Indonesia in the export destination country. Market control will determine the position of Indonesia's CPO export competitiveness in the international market. So this study aims to analyze the ompetitiveness of Crude Palm Oil (CPO) in Indonesia's Five Major Export Destinations. This research is expected to serve as a reference for the government in formulating policies related to increasing competitiveness and developing Indonesia's CPO export market.

II. Research Method

2.1 Data Collection

The data used in this study is secondary data in the form of a time series. Time series data (time series) includes annual data from 2011 to 2020 according to data availability. The data in this study were obtained from various sources related to the research object, such as the Central Statistics Agency (BPS) and UN Comtrade (United Nations Commodity trade). The object of this research is the Indonesian and Malaysian CPO (Crude Palm Oil) export commodities with the Harmonized System (HS) code 151110 and five Indonesian export destinations namely India, Spain, Malaysia, Kenya, and Italy. The five countries were selected based on the largest importing countries of CPO (Crude Palm Oil) in the world.

2.2 Analysis

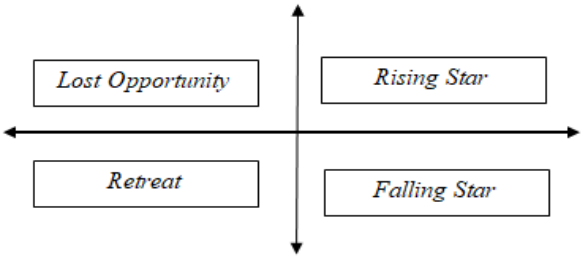
Processing and data analysis techniques were carried out quantitatively and descriptively. Quantitative analysis was carried out using analysis tools RCA (Revealed Comparative Advantage), EPD (Export Product Dynamic), and ISP (Trade Specialization Index). RCA is one of the analytical tools to measure competitiveness in international trade. The RCA method was first discovered and introduced by Balassa in 1965, based on the Ricardian concept of comparative advantage. The RCA formula in this study is shown as follows:

$$Indeks\ RCA\ = \frac{X_{ij}/X_t}{W_{ij}/W_t}$$

Description: Xij is the value of Indonesian CPO exports to the main destination countries (USD), Xt is the total value of Indonesia's exports to the main destination countries (USD), Wij is the value of CPO exports world to the main destination country (USD), and Wt is the total value of world exports to the main destination country (USD)

If the RCA value is greater than 1 to infinity, then good export performance is illustrated by a substantial share in the international market. Moreover, conversely, if the RCA value is less than 1 to 0 then poor export performance is described by a weak share in the international market (Balassa, 1965). The advantage of the RCA method is that it reduces government intervention's impact, so that a product's comparative advantage over time can be seen more clearly. The calculation of competitive power with RCA also has drawbacks, including that it is not symmetrical, making it easier to assess a country's competitiveness, the RCA index cannot explain whether the ongoing trade pattern is optimal or not, and the output produced cannot be compared on both sides.

Identifying the competitive advantage or competitiveness of a commodity and determining whether a commodity has dynamic performance or not using the Export Product Dynamics (EPD) approach. Even though a product is not an export commodity of a country, if it has growth that is above average or fast continuously for a long time, it can be considered a source of income for a country. If a product is dynamic and has specific production characteristics, this will be important information in export opportunities (relationships with products). This method contains a matrix consisting of market attractiveness and business strength information. Market attractiveness is calculated based on the growth of demand for a product for specific market purposes, here business strength information is measured based on the market share of a country for specific market destinations. The combination of market attractiveness and business strength results in the positional character of the product to be analyzed into four categories, namely "Rising Star", "Falling Star", "Lost Opportunity", and "Retreat" (Figure 1).



Source: Estherhuizen (2006)

***Figure 1**. Market Attractiveness and Business Strength in EPD*

The formula used in the calculation of this EPD method is as follows:
X-axis: Growth of business strength or export market share

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

Y-axis: Growth in market attractiveness or product market share

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

Description $X_{ij}$is the value of Indonesian palm oil exports to export destination countries, W_{ij} is the value of world palm exports to export destination countries, X_t is the total value of Indonesia's exports to export destination countries, W_t is the total value of world exports to export destination countries, and is the number of years analysis.

Rising Star's position is characterized by gaining market share for products growing rapidly in the country. Meanwhile, the Lost Opportunity position indicates a decline in market share for dynamic products, where this position is the most undesirable position or condition. This is due to the fact that the country has lost export share opportunities for dynamic commodities in the world market. The Falling Star position was also an undesirable position, but unlike the Lost Opportunity position. This is because in Falling Star's position, its market share is increasing, although not for dynamic products in the world market. Meanwhile, the Retreat position means that the product is no longer wanted in the market. However, it can be desired again if the movement is far from stagnant products and moves closer to an increase in dynamic products (Ade et al., 2018).

This ISP can describe whether for a type of product, Indonesia tends to be an exporter or importer country. Mathematically, ISP can be formulated as follows:

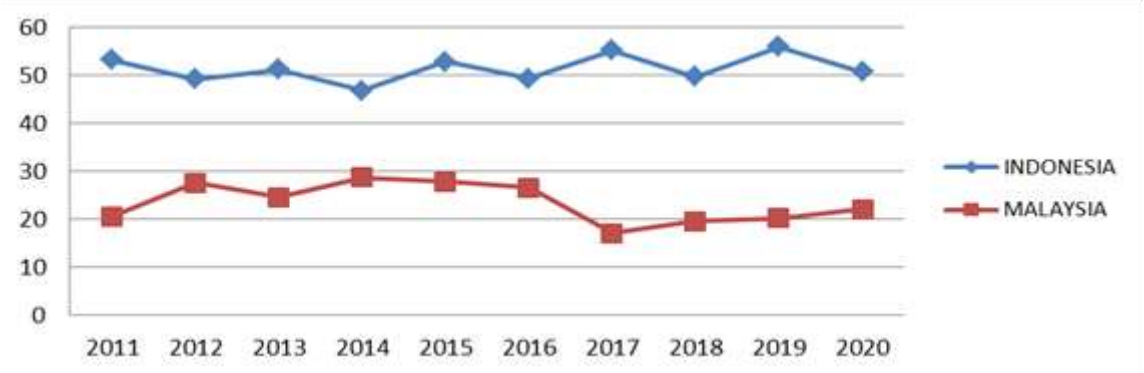
$$ISP = \frac{X_{ia} - M_{ia}}{X_{ia} + M_{ia}}$$

Where X and M are exports and imports, respectively, and i and a are goods of type i and country a, respectively. Implicitly, this index considers the demand side and the supply side, where exports are identical with domestic supply and imports are domestic demand, or in accordance with international trade theory, namely the net of surplus theory, where exports of an item occur when there is an excess of the goods in the domestic market. This index value has a range between -1 to +1. If the value is positive above 0 to 1, the commodity in question is said to have strong competitiveness or the country concerned tends to be an exporter of the commodity (domestic supply is more significant than domestic demand). On the other hand, the competitiveness is low or tends to be an importer (domestic supply is smaller than domestic demand), if the negative value is below 0 to -1. If the index increases, it means that the competitiveness increases, and vice versa (Ministry of Trade, 2021).

III. Result and Discussion

3.1 Competitiveness of Indonesian CPO in International Trade

Indonesia and Malaysia are the world's largest CPO producing and exporting countries. This is also reflected in the high RCA values of the two countries in the last ten years (2011-2020). The high value also reflects the ability of the two countries to compete in international trade. The graph of the movement of the Indonesian CPO RCA value can be seen in Figure 2.



(Source: UN-CONTRADE processed, 2021)
Figure 2. RCA value of Indonesian and Malaysian CPO

The average RCA level of the two main exporting countries in international trade has high competitiveness, this is indicated by the RCA value of each country which is greater than one. So overall it can be said that both Indonesia and Malaysia have a high comparative advantage over CPO. Indonesia has a higher comparative advantage over the world average. The results of another study by Turnip et al. (2016) also stated that the RCA value of Indonesian CPO of 66.12 illustrates that Indonesian CPO has the largest comparative advantage compared to Malaysia which has an RCA of 19.81 and Thailand of 1.91 in the period 1999 to 2014. Furthermore, research conducted Nayantakaningtyas and Daryanto (2012) also explained that from 2001 to 2011 the RCA value of Malaysian CPO was below Indonesia, this was because Malaysia was more focused on exports of downstream CPO industrial products compared to exports of CPO.

This study shows that Indonesian CPO has a higher RCA value than Malaysia. The supporting factors for the competitiveness of Indonesian CPO are production factors, human resources and government policies. Indonesia's geographical conditions which are very suitable for oil palm have made the area and production of Indonesian palm oil continue to increase yearly. The Central Statistics Agency (2021) noted that the area of oil palm plantations in 2011 was 9102.30 Ha, an increase to 14858.30 Ha in 2020. Indonesia is the largest producer country, and the movement of Indonesia's CPO competitiveness from 2011 to 2020 tends to fluctuate. The highest competitiveness occurred in 2019 which was 5.83 after that the competitiveness of Indonesian CPO decreased, the lowest CPO occurred in 2014 which was 46.69.

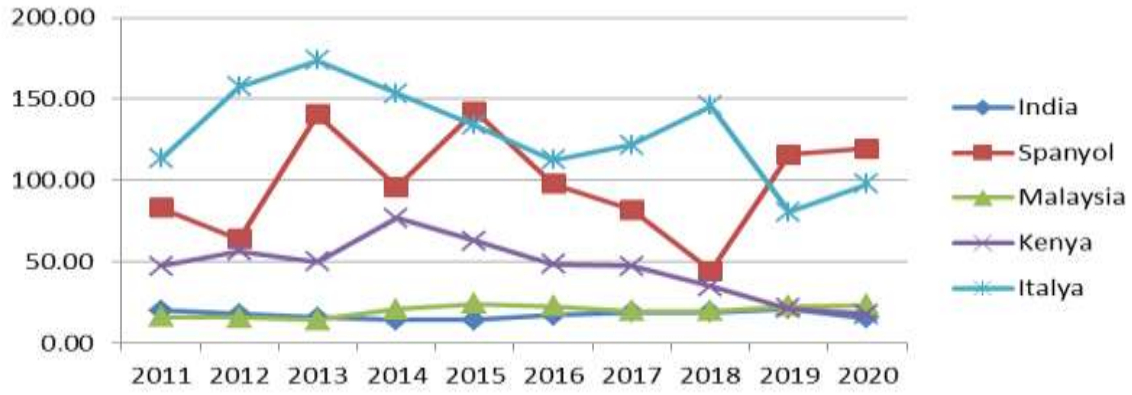
Malaysian CPO's competitiveness level from 2011 to 2020 experienced a positive upward trend in the last year, although its competitiveness is still far from that of Indonesia. Besides being the largest producing country, Malaysia is also one of the importing countries for Indonesian CPO. Malaysia has previously focused on derivative products from palm oil, so downstream industries and oil palm research institutions have developed earlier than Indonesia. The highest competitiveness of Malaysian CPO occurred in 2014 at 28.61 while the lowest CPO was in 2017 with an RCA value of 55.05.

The level of competitiveness of Indonesian CPO is still higher when compared to Malaysia. Indonesia's average level of competitiveness from 2011 to 2020 is 51.29 and the average value of CPO exports is US$ 9,798,553,295. Meanwhile, Malaysia's competitiveness growth rate tends to increase with an average RCA level of 23.42 and an average CPO export value of US$ 5,745,403,521. When viewed as a whole, the value of Indonesian and Malaysian CPO products tends to decrease this is due to the negative campaign carried out by the European Union, the European Union carried out the Palm Oil And Deforestation Of Rainforest campaign in the campaign stating that palm oil has a

positive effect on deforestation that occurs in the world. Thus it will worsen the negative image of CPO in the world market so that the demand for CPO will decrease and the price will fall.

3.2 Competitiveness of The Top Five Main Export Destinations of Indonesia

Competitiveness of Indonesian CPO in Export Destination Countries Basically, Indonesian CPO commodities in the five export destination countries have competitiveness or comparative advantage, the RCA value of Indonesian CPO indicates this in each export destination country which is more significant than one. The competitiveness of Indonesian CPO in each export destination country can be seen in Figure 3.



(Source: UN-Contrade processed, 2021)

Figure 3. *RCA Value of Indonesian CPO in Main Destination Countries*

The highest competitiveness of Indonesian CPO is in Italy, with a movement of competitiveness that exceeds other importing countries. The highest competitiveness occurred in 2013 amounting to 173.59 with an export value of US$ 529,876,776. However, in 2019 Italian CPO experienced a significant decline after Spain. The potential for the competitiveness of Indonesian CPO is also found in other European regions, namely in Spain. The movement of Indonesian CPO competitiveness in Spain was almost stable, fluctuated and experienced a significant decline in 2018 with an RCA of 44.22.

The many negative issues regarding Indonesian CPO in the European region can hamper export activities to importing countries, even though the European region has a large CPO export potential considering that Europe is the highest biodiesel user in the world. The Indonesian government has responded to this by issuing the Minister of Agriculture Regulation (Permentan) No. 19 of 2011 junto No. 11 of 2015 concerning Indonesian Sustainable Palm Oil (ISPO) certification. In the GAPKI study (2016) ISPO aims to ensure the implementation of laws and regulations related to oil palm plantations covering legal, economic, environmental and social aspects, so that they can be produced sustainably and support Indonesia's commitment to reducing greenhouse gas emissions. Therefore, ISPO is an obligation that must be carried out by all oil palm plantation business actors in Indonesia. In 2017 there were also negative accusations against Indonesian palm oil contained in the European Union resolution regarding Indonesian palm oil causing deforestation. In response, the Indonesian government prepared a document related to deforestation to block the European Union's palm oil resolution, entitled Report on Palm Oil and Deforestation of Rainforest.

Besides Europe, Asia is an area where Indonesian CPO also has high competitiveness. India and Malaysia are the largest exporting countries with average RCA

scores of 17.23 and 19.85 respectively. India is one of the countries with a large population and has a positive correlation with the use of vegetable oils. Meanwhile, Malaysia requires more CPO to meet downstream industries' demand for raw materials. Besides Europe and Asia, Indonesian CPO exports CPO to East Africa, namely Kenya with an average RCA of 46.24.

The EPD method analyzes the competitiveness of Indonesian Crude Palm Oil (CPO) Commodities. This method measures the position of the Indonesian CPO commodity market for the main market objectives studied. Besides that, this method can also show whether Indonesian CPO commodities' performance is dynamic. Results of EPD analysis shows that Indonesia's CPO commodity export market is in different positions. The four CPO export markets namely Italy, India, Spain, and Kenya are in the Lost Opportunity position and only Malaysia is in the Retreat position. Table 4 presents the results of the analysis EPD calculations in each of the main markets.

Table 4. Results of EPD analysis of Indonesian CPO in destination markets for 2011-2020

Countries	Growth X (%)	Growth Y (%)	Market Position
India	-1.03	0.28	Lost Opportunity
Spanyol	-7.23	0.45	Lost Opportunity
Malaysia	-43.65	-0.24	Retreat
Kenya	-0.67	0.3	Lost Opportunity
Italia	-3.4	0.05	Lost Opportunity

Source: ITC (2021) processed

The estimation results of Indonesia's palm oil EPD to the five main destination countries show that Malaysia occupies a retreat position. These results indicate a decline in the market share of Indonesian palm oil exports in that country and are followed by a decrease in demand for Indonesian palm oil products so that market growth and Indonesian palm oil commodity products are no longer dynamic. Based on research conducted by Sukirno and Romdhon (2020) found that Indonesia and Malaysia as the largest CPO exporting countries have a Rising Star market position. This means that the export share growth of the two countries is competitive and the growth of the CPO market share is dynamic. This also indicates that the CPO commodity is in an ideal market, namely increasing export share growth followed by increasing CPO commodity market share. In addition, his research also shows that Malaysia has a higher Y growth position than Indonesia. This position shows that Indonesia's CPO market share growth is more competitive than Malaysia's. However, when viewed from the X axis position, Malaysia occupies a slightly higher position than Indonesia. This position illustrates that Malaysia's CPO export share growth is more dynamic than Indonesia's.

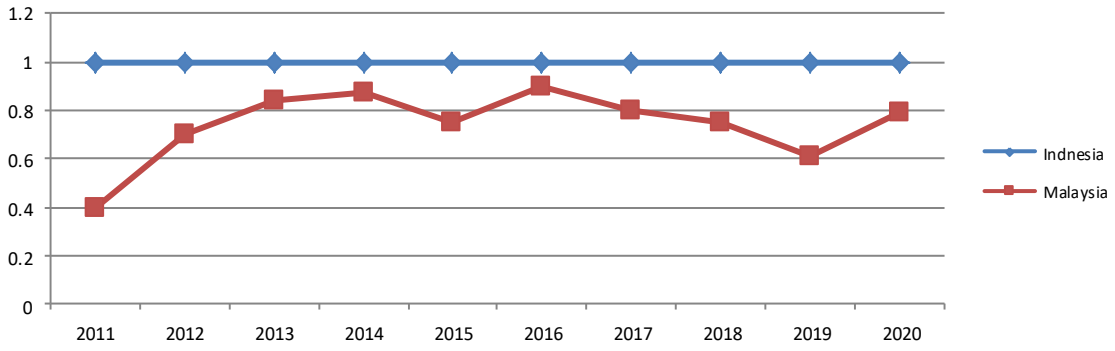
The condition of Indonesia's CPO market share, which is more competitive than Malaysia, is due to the fact that Indonesia has a much larger area of oil palm plantations and a much higher production volume than Malaysia. Malaysia's CPO export share is more dynamic than Indonesia's. It is strongly suspected that this condition is due to the productivity of Malaysian palm oil plantations being better than the productivity of Indonesian palm oil plantations. The advantages of the oil palm area in Indonesia are not matched by good land productivity. Malaysia has a palm oil productivity of 3.96 tons/ha/year, while Indonesia only has a palm oil productivity of 2.70 tons/ha/year (Koaksi Indonesia, 2019).

The results of the study in the Appendix show that the position of the CPO export market in the five destination countries has different positions each year. This shows that

Indonesian palm oil products do not always have a competitive advantage in the main export destination countries. India and Kenya are the two countries that have the most Rising Star positions, meaning that the Indonesian CPO commodity is in an ideal market, namely increasing export share growth in the two countries followed by an increase in the Indonesian palm oil commodity market share. This position needs to be maintained so that the Indonesian palm oil commodity can be used as a source of export income for Indonesia. Meanwhile, export destination countries Malaysia and Italy have the most frequent retreat positions, this indicates a decline in the growth of Indonesian CPO market share in these two countries and is followed by a decline in demand for Indonesian palm oil.

3.3 ISP (Trade Specialization Index)

ISP analyzes the position or stages of development of a commodity by describing whether a commodity product, the position of a country tends to be an exporter or importer country. In determining the results of the ISP method, that is, if the positive ISP value is above zero (ISP>0) to one (ISP≤1), then Indonesian and Malaysian CPO commodities are said to have strong competitiveness and have a tendency to become CPO exporters or domestic supply is greater. than domestic demand. On the other hand, the competitiveness of Indonesia and Malaysia is low if the ISP value is negative below zero (<0) to negative one (≥-1).



(Source: UN-Contrade processed, 2021)

Figure 4. *Indonesian and Malaysian ISP Values 2011-2020*

Figure 4. shows that the main CPO producing countries, Indonesia and Malaysia, are countries that are more likely to become CPO exporting countries. Indonesia is a country with the highest Trade Specialization Index (ISP) when compared to Malaysia. Indonesia from 2011 - 2020, calculated to have an ISP value of 0.99 - 1. Where the products produced are included in the category of products that have very strong competitiveness and are included in the category of products that are already in the maturity stage. Indonesia has an ISP value of almost 1, this can happen because Indonesia's CPO exports tend to increase and tend to never import CPO. Malaysia experienced a decline in value, with an ISP value of 0.399 this value was the lowest value in 2011.

IV. Conclusion

Based on the results of the analysis, it can be said that Indonesian and Malaysian CPO has more than 1 so it has a comparative advantage that Indonesian RCA has a higher value than Malaysia. The RCA value of Indonesian palm oil exports in the main destination countries namely India, Spain, Malaysia, Kenya and Italy is greater than one (>1), this indicates that Indonesian palm oil has a comparative advantage in the main export destination countries.

Through the EPD analysis, the results show that the competitive position of Indonesian palm oil in five export countries changes every year where palm oil occupies a position of increasing or decreasing market share and the position of increasing or decreasing market share in the main export destination countries. This shows that Indonesian palm oil products do not always have a competitive advantage in the main export destination countries. The development of the Indonesian CPO export market is still optimistic that it will provide opportunities for the Indian and Kenya markets. The ISP calculation shows that the main CPO producing countries, Indonesia and Malaysia, are countries that tend to become CPO exporters.

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