# Analysis of Competitiveness and Export Performance: Indonesian Crude Palm Oil (HS 15111000) Commodity against Major Competitor in Indian Market

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## Abstract

International trade has become a key pillar in driving a country's economic growth. The stability of international trade is reflected in export-import activities. The amount of exports that exceeds the amount of imports will increase national income and positively affect the country's economic growth. Crude Palm Oil (CPO) is Indonesia's dominant export product that plays a critical role in the country's economic growth. Indonesia's CPO production in 2018 was recorded at 40.57 million tons. India is Indonesia's largest main market in exporting CPO. The purpose of this study is to determine the competitiveness and performance of Indonesia's CPO exports compared to the main competitor countries, namely Malaysia and Thailand. The data analysis process utilizes Revealed Comparative Advantage (RCA), Constant Market Share (CMS), and the Man-Whitney Test with the period of research statistics from 2013-2022.The results show that Indonesia's RCA value has competitiveness and comparative advantage in CPO exports against Thailand, but does not show significant differences with Malaysia in the Indian market. The results of data analysis using *Constant Market Shares* (CMS) to measure Indonesia's CPO export performance through standard growth, commodity composition effects, market distribution effects and competitiveness effects show that the export performance of CPO commodities against major competitor countries in the Indian market tends to have a positive trend.

**Keywords:** Export, Crude Palm Oil, Revealed Comparative Advantage, Constans Market Share

## Introduction

The stability of international trade is reflected in export-import activities. The value of exports that exceeds the amount of imports will increase national income and positively affect

the country's economic growth. The ability of a country to export will give an idea of the potential that the country has in conducting international trade. Indonesia is one of the countries whose economy depends on the role of exports. As a tropical country, plantations are one of the abundant sources of wealth for Indonesia (Santoso et al., 2023). Plantations are a leading industry that plays a significant function in increasing national income and serves as the primary contributor to the national foreign currency reserves. The total value of plantation exports in 2018 amounted to 28.1 billion dollars or equivalent to 393.4 trillion rupiah. In 2022, the plantation subsector contributed 3.76 percent to the increase in total GDP and 30.32 percent to the agriculture, forestry and fisheries sector (DIREKTORAT JENDERAL PERKEBUNAN, 2022)

Palm oil, a key of plantation products, significantly impacts international trade. In 2018, national palm oil production rose to 48.68 million tons, comprising 40.57 million tons of crude palm oil (CPO) and 8.11 million tons of palm kernel oil (PKO).In 2022, CPO production increased to 46.82 million tons, up 3.77% compared to 2021. The type of Indonesian palm oil with the highest demand in foreign markets is *Crude Palm Oil* (HS 15111000) (Gultom, 2023). According to data from the *United Nations Commodity Trade Statistics Database* (UN COMTRADE) in 2022, Indonesia is in the first position as the largest CPO exporting country in the world with projected CPO production reaching 45.5 million metric tons (MT) and a market share of 45% in the 2022/2023 period. Malaysia is the main competitor of Indonesia's CPO export commodity with a total growth of 18.8 million tons. Then followed by Thailand with a total of 3.26 million and other countries with an average market percentage below 1% (UN COMTRADE, 2022).

As Indonesia's trading partner, India is the main CPO export destination in the Asian region with a projection of 11.3 million tons for the period 2013-2022. India's food oil consumption reaches 23.87 million tons annually. Palm oil imports from Indonesia are used to fulfill the industrial needs of CPO in India and meet the need for vegetable oil consumption (Ardiansyah et al., 2023). It is difficult for India to escape palm oil consumption due to the relatively higher price of substitutes and limited *supply*. The market share of palm oil exports from Indonesia to India was the largest in 2018, where the value reached 3.6 billion (US$) or IDR 49.92 trillion. The total distribution of Indonesian palm oil exports to India in the last 10 years amounted to 17.3 billion (US$).



The Export Value of Crude Plam Oil (CPO) Indonesia, Malaysia, and Thailand in the Indian Market from 2013-2022
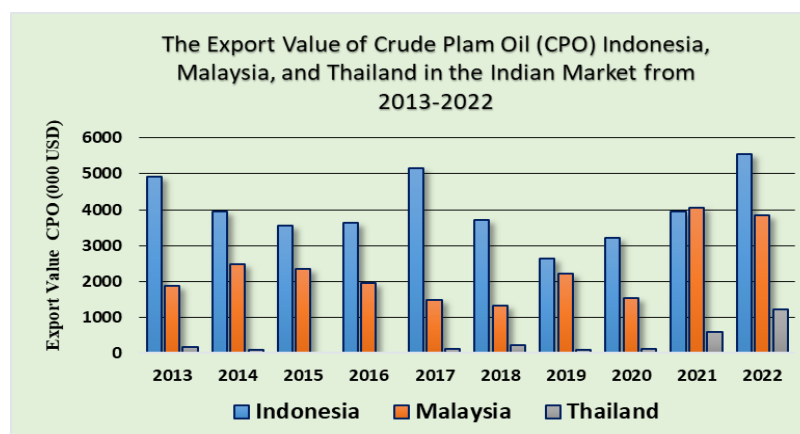
Figure 1. The Export Value of CPO Indonesia, Malaysia, Thailand in Indian's Market 2013-2022
*Source: TRADE MAP, ITC (2023)*

The Southeast Asian region is quite productive in exporting CPO to the Indian market. The largest exporters of CPO to the Indian market from Southeast Asia are Indonesia, Malaysia, and Thailand. Indonesia is the largest CPO exporter to India compared to other countries. In 2022, Indonesia exported CPO to India with a total value of USD 5,561,190, accounting for 47.4% of the total exports. Malaysia is in the second position with a total export value in 2022 of 3,851,433 USD and an export percentage of 32.8%. Thailand in 2022 has an export percentage of 6.1% and a total export value to India of 1,223,501 USD (Trademap, 2023).
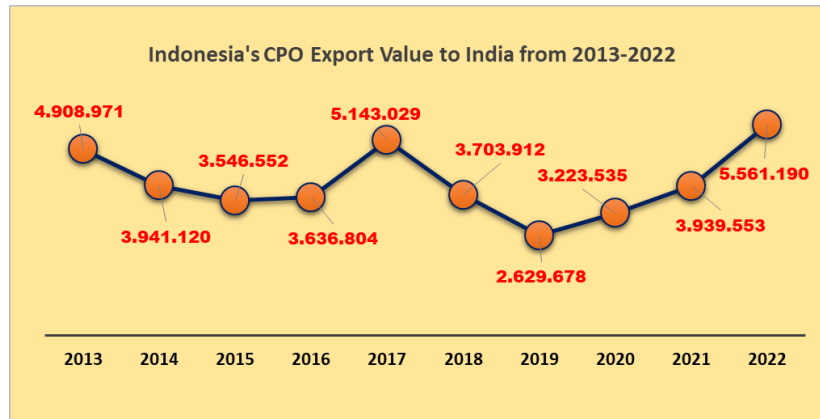


Chart 2. Indonesia's CPO Export Value to India from 2013-2022
*Source: TRADE MAP,ITC (2023)*

Despite being the foremost exporter of CPO to India, the value of Indonesia's exports to India has shown fluctuation from 2013 to 2022. It can be seen that in 2013 the value of US$ 4,908,971 increased to US$ 5,561,190 in 2022. The decrease was 13.3% or US$ 652,219. The increase in export value is an encouragement for Indonesia to maintain the value of its commodity market share to remain competitive in the Indian market. Indonesia as a CPO producer in the Indian market has several main competitors in maintaining its export value. Indonesia's competitors as a CPO exporter in the Indian market come from neighboring countries, namely Malaysia and Thailand, which have geographical similarities to support production. CPO production in the Southeast Asia region is reflected in the ability and performance of each country in the demand for CPO consumers in India (Pratomo et al., 2022). The existence of cross-country competition makes the volume and value of Indonesian CPO exports fluctuate, which has a great potential to reduce the market share of CPO to the main export destination country, India. In terms of competitiveness, Indonesian palm oil has the highest comparative competitiveness among other exporting countries (Latifah & Kadir, 2021).

Competitiveness can make Indonesia superior in the international market with proper management. Strengthening the domestic economy as a policy stimulus can help domestic products compete in the global market. CPO export competition between Indonesia and its main competitor in the Indian market has become a matter of concern. India holds the title of being the world's largest importer of CPO. The largest CPO competitor countries from Indonesia are countries within the scope of the Southeast Asia region, namely Malaysia and Thailand. The value of Indonesia's CPO exports to India in the vulnerable years of the 2013- 2022 period tends

to fluctuate. Observations related to the competitiveness and performance of Indonesian CPO exports need to be made so that Indonesia is able to maintain and increase the value of CPO exports in the Indian market. This research striving to assess the competitiveness and export effectiveness of Indonesian Crude Palm Oil (CPO) in comparison to major competitors in the Indian market. The analysis will utilize the Revealed Comparative Advantage (RCA) indicator to evaluate the competitiveness of CPO against those of Indonesia's main exporting rivals, Malaysia and Thailand. Meanwhile, the CPO export performance of Indonesia, Malaysia, and Thailand will be analyzed using Constant Market Share (CMS). This analysis will provide an initial interpretation of the position of Indonesian CPO commodities in the EU market. The investigation will contribute to the increasingly competitive CPO industry.

## Literature Review

### Competitivness

Competitiveness is the ability of a commodity managed by the state to enter the foreign market share and can survive in the face of market demand. Meanwhile, export competitiveness refers to the strength of a country in maintaining the products produced so as not to be eroded by competitors in the same market in the realm of export destination countries (Rahayu et al., 2023).

A product must have a competitive value to survive to face long-term industrial market competition. A country's competitiveness is determined by its ability to generate revenue through its market share abroad and how productive it is in producing goods to improve the living standards of its people. Market share is the overall demand for a good within a region. Market segmentation is typically used to identify, target customers, and provide supporting data for marketing plan elements (Djirimu & Sading, 2020).

The indicator that can be used to measure product competitiveness is Revealed Comparative Advantage (RCA). In 1965 Bela Balassa introduced the concept of RCA (Revealed Comparative Advantage) (Ganda Sukmaya, 2017). The RCA index can show changes in comparative advantage. RCA can explain the strength of competitiveness of Indonesian export products against similar products from other countries.

### Export Performance

A country's export performance is a comprehensive evaluation of export results that include the volume, value, and composition of goods and services successfully exported to international markets within a certain period. Exports are an international trade activity that has a significant impact on domestic demand and can trigger positive changes in a country's economy. This occurs through the sale of domestic output to foreign markets. The ability to export is influenced by various factors including competitiveness in international markets, the state of the global economy, and foreign trade policies. The benefits of exports include market expansion, increased foreign exchange, and job creation. In addition, exports also play a role in developing domestic economic growth through increasing production and market demand, as well as encouraging domestic business and production cycles (Muharami & Novianti, 2018).

A country's export performance is reflected in the international sales achieved by domestic firms. Factors that affect export performance include currency exchange rates, product prices, and production stability. Analysis of a country's export performance can be done through three main components: market composition effect, market distribution effect, and competitiveness effect. These parameters provide an overview of the world market's interest in certain commodities, the country's ability to market its products, and the competitiveness of a country's export products. Evaluation of export performance is important as a basis for designing more effective export policies and strategies for a country (Arifina et al., 2022).

**Research Method**

This type of research is a quantitative approach used in analyzing the competitiveness of Indonesian CPO exports compared to major competitors in the Indian market. The object of this research is CPO exports with HS code 151110 in Indonesia, Malaysia, and Thailand. The collected data consists of time series secondary data spanning from 2013-2022. The data is obtained from official institutions such as BPS, Trademap (ITC) and UN COMTRADE.

The data analytics employs the Revealed Comparative Advantage (RCA) method to illustrate comparative advantage, and utilizes the Constant Market Share (CMS) method to elucidate a national export performance. Both outcomes of this analysis require the conduct of Mann-Whitney statistical tests to examine the disparity between Indonesia's competitiveness and performance compared to Malaysia and Thailand in the target country, India. Analytics data processing involves the utilization of Microsoft Excel 2010 and SPSS Statistics 25.0 for conducting the Mann-Whitney test.

**Revealed Comparative Advantage (RCA)**

*The Revealed Comparative Advantage* (RCA) method is used to see the position of a country's competitiveness in a particular commodity in terms of its comparative advantage. In this research, the authors utilized the RCA method to assess Indonesia's CPO export competitiveness relative to Malaysia and Thailand, specifically within the Indian market. For systematic calculations use the following formula (Ahmad et al., 2021):

$$\text{RCA} = \frac{Xij / Xt}{Xiw / Xw}$$

Description:

Xij = export value of commodity from country j to the relevant market  Xt = total export value from country j to the corresponding country   Xiw = world export value of commodity i to the corresponding country  Xw = total world export value to the relevant market

In the RCA index value, the value is 0 (zero) to greater than 1 (one). A value of one is interpreted as a standardization of superior and not superior, if:

a.  An RCA value is more than one (>1), meaning that the competitiveness of a country

concerned with products or commodities has a comparative advantage value above average or high/superior.

b. An RCA value of less than one ($<1$), means that the competitiveness of a country in question for a product or commodity has a value that has a comparative advantage below average or low / not superior.

**Constant Market Share (CMS)**

The Constant Market Share (CMS) method is used to evaluate the performance of CPO exports in the global market. This approach is often used to assess the fluidity of competitiveness or performance of a product or commodity in the global market. The CMS method not only identifies slow growth and low demand for commodities but also analyzes the bottlenecks in international distribution and the link between product quality and price. In this method, four effects are described including market share effect, market growth effect, market structure effect, and trade effect (Atmadji et al., 2019):

a. Standardized Growth Effect
$$r = W(t) - W(t-1) / W(t-1)$$
Where:
r    = Standardized growth of world exports.
W(t)        = World exports in year t
W(t-1)      = World exports in year t-1

b. Commodity Composition Effect
$$\Sigma i \ (ri-r) \ Ei(t-1) / E(t-1)$$
Where:
ri  = Standardized growth of exports of commodity i
r    = Standard world export growth
Ei(t-1)     = Export of commodity i in year t-1
E(t-1)      = Total exports of all commodities in year t-1

c. Efek Distribusi Pasar
$$\Sigma i \Sigma j (rij-ri) Eij(t-1) / E(t-1)$$
Where:
rij = Standardized growth for exports of commodity i to country j            ri = Standardized growth for exports of commodity i
Eij(t-1)    = Exports of commodity i to country j in year t-1

d. Efek Daya Saing
$$\Sigma i \Sigma j (Eij(t) - Eij(t-1) - rijEij(t-1)) / E(t-1)$$
Eij(t)      = Exports of commodity i to country i in year t
Eij(t-1)    = Exports of commodity i to country i in year t-1
rij = Export growth of commodity i to country j
E(t-1)      = Total exports of the country an in year t-1

**Non-parametric T-test (Man-Whitney Test)**

The Man-Whitney test is a non-parametric statistical test used to see whether or not there is a difference in the average of two unpaired samples and the amount of research sample data is very small (less than 30). Because it includes non-parametric statistics, this test does not necessitate research data that follows a normal distribution or normality requirements can be ignored and can be used as an alternative to the Independent Sample *T-Test test* if the research data is not normally distributed (Mubarok, 2021). With the assumptions taken:

**H0**: There is no significant difference between the competitiveness and performance of Indonesian palm oil (CPO) against Malaysia and Thailand in the Indian market.

**H1**: There is a significant difference between the competitiveness and performance of Indonesian palm oil (CPO) against Malaysia and Thailand in the Indian market.

Decision Making

 a.  If the value Sig. (2.tailed) > 0.05 then H0 is accepted.

 b.  If the value Sig. (2.tailed) < 0.05 then H0 is rejected.

**Result**

 a.  **Result of** *Revealed Comparative Advantage* **(RCA) Analysis of Indonesia, Malaysia, and Thailand 2013 -2022 in the Indian Market**

Table. 1 RCA Test

| Year | Indonesia | Malaysia | Thailand |
|------|-----------|----------|----------|
| 2013 | 21,92 | 13,35 | 2,15 |
| 2014 | 18,2 | 15,94 | 0,95 |
| 2015 | 16,91 | 16,27 | 0 |
| 2016 | 18,87 | 14,35 | 0 |
| 2017 | 20,79 | 10,9 | 1,18 |
| 2018 | 21,32 | 11,74 | 2,8 |
| 2019 | 14,96 | 18,91 | 1,12 |
| 2020 | 19,28 | 14,82 | 1,54 |
| 2021 | 14,04 | 19,99 | 4,03 |
| 2022 | 12,12 | 17,76 | 6,79 |
| **Average** | **17,84** | **15,4** | **2,06** |

*Source: Output Result (2024)*

The findings of data interpretation using the Revealed Comparative Advantage (RCA) method during the period 2013-2022 show that the RCA values of Indonesia, Malaysia, and Thailand experienced fluctuating conditions. Indonesia's RCA value was the highest at 21.92 in 2013 and the lowest at 12.12 in 2022. Malaysia's RCA value was the highest at 19.99 in 2021 and the lowest at 10.90 in 2017. While Thailand's RCA value was the highest at 6.79 in 2022 and the lowest at 0.00 in 2015 and 2016.

In 2013 the worth of Indonesian exports increased, because in that year the share of

Indonesian exports increased, while the share of world exports tended to decrease from the previous year. So that this also affects Indonesia's high RCA value in that year. While the lowest Indonesian RCA value occurred in 2022, due to a decrease in the value of post-Covid-19 CPO production and exports even though the volume of commodity exports also grew in that year.

The highest increase in Malaysia's RCA value in 2021 occurred because in that year the value of Malaysia's CPO exports increased from the previous year, even though the world's export share of CPO also increased in that year. So this also affects Malaysia's high RCA value in that year. The positive COVID-19 trend of Malaysia's RCA value increase was supported by good management of CPO production during and after the COVID-19 pandemic. Not much different from Malaysia, Thailand has a positive RCA trend. This is due to Thailand's good management of CPO production during and after the COVID-19 pandemic amid market instability during and after the pandemic. In general, although the RCA values of Indonesia, Malaysia and Thailand have fluctuated, when viewed from the average RCA for the period 2013-2022, both Indonesia, Malaysia, and Thailand have an RCA value> 1 for CPO commodities, meaning that Indonesia, Malaysia, and Thailand have a comparative advantage in CPO commodities in the Indian market.

The findings of the analysis using Revealed Comparative Advantage (RCA) confirm that Indonesia has competitiveness and comparative advantage in palm oil (CPO) exports against major competitor countries in the Indian market. Although Indonesia's RCA value shows a negative trend from 2013 to 2022, this study still supports previous findings by Itamary & Hendrati in 2022 (Itamary et al., 2022) and Sukirno & Romdhon in 2020, which confirmed that Indonesia has a comparative advantage in CPO exports. Factors such as Indonesia's vast oil palm plantations and high CPO production support Indonesia's export competitiveness (Mustopa Romdhon, 2020).

However, it is crucial for Indonesia to maintain the stability of the CPO export market in each consumer country, especially in the Indian market. The need to maintain this stability is reinforced by the fact that Indonesia's CPO exports face competition from Malaysia and Thailand which have positive RCA trends. This market stability is crucial given Indonesia's economic dependence on exports, which can have a direct impact on national income and economic growth. In this context, improving the competitiveness and comparative advantage of Indonesian CPO in the global market is a priority to maintain domestic economic stability and improve the overall welfare of the Indonesian people.

b. **Result of** *Constant Market Share* **(CMS) Analysis of CPO Indonesia, Malaysia, and Thailand**

**Standardized Growth Effect**

*Table. 2 Growth Effect Test*

| Year | World | Indonesia | Malaysia | Thailand |
|------|-------|-----------|----------|----------|
| 2013 | -0,11772 | -0,0556 | -0,2586 | 23,78617 |
| 2014 | -0,05962 | -0,19716 | 0,33451 | -0,56028 |
| 2015 | -0,09591 | -0,10012 | -0,05044 | -1 |

| | | | | |
|---|---|---|---|---|
| 2016 | -0,04756 | 0,02545 | -0,16723 | 0 |
| 2017 | 0,19951 | 0,41416 | -0,24731 | 0,50231 |
| 2018 | -0,18782 | -0,27982 | -0,10562 | 0,9961 |
| 2019 | -0,01584 | -0,29003 | 0,68085 | -0,61635 |
| 2020 | -0,05355 | 0,22583 | -0,3155 | 0,26192 |
| 2021 | 0,86911 | 0,22212 | 1,66505 | 4,22502 |
| 2022 | 0,22577 | 0,41163 | -0,05021 | 1,0887 |
| **Average** | **0,07164** | **0,03765** | **0,14855** | **2,86836** |

*Source: Output Result (2024)*

Analysis of the standard growth of CPO exports of Indonesia, Malaysia, and Thailand from 2013 to 2022 shows fluctuations. However, the average increase of Indonesia's Crude Palm Oil exports is below the world average, while Malaysia and Thailand exceed the global average. The average value of CPO export growth is 0.07164, Indonesia's is 0.03765, Malaysia's is 0.14855 and Thailand's is 2.86836. In the Indian market, Indonesia's CPO export growth was slower than average, indicating a potential underdevelopment or decline in export performance there. Meanwhile, Malaysia and Thailand showed faster growth than the world average in the Indian market, reflecting positive export performance for both countries.

**Commodity Composition Effect**

Table. 3 Commodity Composition Effect

| Year | Indonesia | Malaysia | Thailand |
|---|---|---|---|
| 2013 | -0,00418 | -0,00169 | 0 |
| 2014 | 0,00091 | 0,00028 | 0,00003 |
| 2015 | -0,00056 | -0,00026 | -0,00001 |
| 2016 | -0,0004 | -0,0002 | 0 |
| 2017 | 0,0025 | 0,00103 | 0 |
| 2018 | -0,00594 | -0,00132 | -0,0001 |
| 2019 | -0,00114 | -0,0003 | -0,00005 |
| 2020 | 0,00373 | 0,00222 | 0,00009 |
| 2021 | 0,00497 | 0,00164 | 0,00012 |
| 2022 | 0,00038 | 0,0003 | 0,00005 |
| **Average** | **0,00003** | **0,00017** | **0,00001** |

*Source: Output Result (2024)*

The outcomes of analyzing the commodity composition impact on CPO export goods from Indonesia, Malaysia, and Thailand in the Indian market from 2013-2022 show a tendency to vary. According to the table, it is known that the effect value of Indonesia's CPO commodity composition in the Indian market is the highest with a value of 0.00497, Malaysia 0.00164 and Thailand 0.00012 in 2021. Meanwhile, the effect value of Indonesia's CPO commodity composition in the Indian market is the lowest with a value of -0.00594, Malaysia -0.00132 and Thailand -0.00010 in 2018. The mean value of the commodity composition impact for Indonesia is 0.00003, for Malaysia it's 0.00017, and for Thailand, it's 0.00001 can be defined that the commodity composition of Indonesia, Malaysia, and Thailand is sufficient to meet market demand and market requirements in the Indian market with the assumption that the product is in

demand because the mean value of the commodity composition effect has a optimistic average or greater than zero.

## Market Distribution Effect

Table. 4 Market Distribution Effect

| Year | Indonesia | Malaysia | Thailand |
|---|---|---|---|
| 2013 | -0,00028 | -0,00011 | 0 |
| 2014 | 0,00252 | 0,00076 | 0,00007 |
| 2015 | -0,00131 | -0,00062 | -0,00002 |
| 2016 | 0,00001 | 0 | 0 |
| 2017 | 0,00007 | 0,00003 | 0 |
| 2018 | 0,00285 | 0,00063 | 0,00005 |
| 2019 | -0,00142 | -0,00037 | -0,00006 |
| 2020 | 0,00353 | 0,0021 | 0,00008 |
| 2021 | -0,00696 | -0,0023 | -0,00017 |
| 2022 | -0,00157 | -0,00125 | -0,0002 |
| **Average** | **-0,00026** | **-0,00011** | **-0,00003** |

***Source:** Output Result (2024)*

The analysis findings regarding the market distribution impact of CPO commodity exports from Indonesia, Malaysia, and Thailand in the Indian market from 2013 to 2022 tend to vary. The data indicates that in 2020, the market distribution impact value of Indonesian CPO commodities in the Indian market was the highest at 0.00353, followed by Malaysia at 0.00210, and Thailand at 0.00008. Meanwhile, the value of the composition effect of Indonesian CPO commodities in the Indian market is the lowest with a value of -0.00696, Malaysia -0.00230 in 2021 and Thailand - 0.00020 in 2022. The average value of the market distribution effect of Indonesia -0.00026, Malaysia -0.00011 and Thailand -0.00003 can be defined that Indonesia, Malaysia and Thailand did not obtain success in achieving market penetration or product diversification which contributed negatively to export growth because the average value is negative or less than zero.

## Competitiveness Effect

Table. 5 Competitiveness Effect

| Year | Indonesia | Malaysia | Thailand |
|---|---|---|---|
| 2013 | 0,0017 | -0,00156 | 0,00074 |
| 2014 | -0,0037 | 0,00321 | -0,00038 |
| 2015 | -0,00009 | 0,00048 | -0,00031 |
| 2016 | 0,00172 | -0,00141 | 0 |
| 2017 | 0,0054 | -0,00462 | 0,00054 |
| 2018 | -0,0028 | 0,00056 | 0,00058 |

| | | | |
|---|---|---|---|
| 2019 | -0,00564 | 0,00372 | -0,00056 |
| 2020 | 0,00438 | -0,00244 | 0,00011 |
| 2021 | -0,01277 | 0,00519 | 0,00164 |
| 2022 | 0,00316 | -0,00374 | 0,00189 |
| **Average** | **-0,00086** | **-0,00006** | **0,00043** |

*Source: Output Result (2024)*

The results of the analysis of the effect of export competitiveness of Indonesian, Malaysian and Thailand CPO commodities in the Indian market in 2013-2022 tend to fluctuate. The data presented in the table illustrates that the competitiveness effect of Indonesian CPO commodities in the Indian market peaked at 0.00540 in 2017. Malaysia 0.00519 in 2021 and Thailand 0.00189 in 2022. Meanwhile, the effect value of Indonesia's CPO competitiveness in the Indian market is the lowest with a value of -0.00564 in 2019, Malaysia -0.00462 in 2017 and Thailand -0.00056 in 2019. The average value of commodity composition effect of Indonesia -0.00086, Malaysia -0.00006 and Thailand 0.00043 can be defined that Indonesia and wekMalaysia in general do not have good export competitiveness or are weak in competition. This reflects problems such as lack of efficiency and inability to compete in the global market as the mean of the competitiveness effect is negative or less than zero. Thailand has good competitiveness because the average value of the competitiveness effect is optimistic or greater than zero.

Analysis of data employing Constant Market Shares (CMS) reveals a favorable trajectory in Indonesia's palm oil (CPO) export performance to the Indian market, particularly concerning consistent growth, commodity composition impacts, and market distribution effects. Although Indonesia's standardized growth experienced a positive trend, the average value of Malaysia's and Thailand's CPO standardized growth exceeded Indonesia's, indicating the two countries' domestic policies were more effective in addressing investment and the private sector. The competitiveness effect analysis shows that Indonesia has a negative average value, signaling the lack of competitiveness of Indonesia's CPO exports compared to Malaysia and Thailand. This finding is consistent with previous research which shows that despite Indonesia's superior competitiveness position, Indonesia's CPO export volume tends to decline.

The negative performance of Indonesian CPO exports in the Indian market is also reflected in the analysis of market distribution effects and commodity composition. Although the commodity composition effects of Indonesia, Malaysia, and Thailand meet the market demand and requirements in India, the average value of the market distribution effects and commodity composition analysis of Indonesia remains below the average of Malaysia and Thailand. Factors such as productivity of the plantation subsector and external variables such as exchange rates and international prices of palm oil significantly affect Indonesia's CPO export performance.

According to Pratinda and Harta (2021), one of the factors affecting the export performance of agricultural subsector commodities is the amount of production of the plantation subsector itself so if you want to improve the export performance of the plantation subsector, it is advisable to encourage an increase in the productivity of the agricultural subsector (Wildan Nu Arrasyiid Sane Pratinda & Harta, 2021). Meanwhile, according to Advent, Zulgani, and Nurhayani (2021), the variable that has the most influence on Indonesia's palm oil export

performance is the amount of production, besides that there are variables of land area, exchange rate, and also the international price of palm oil (Advent et al., 2021). Research by Rosyadi et al. (2021) shows that the price variable of CPO is constant so the decline in Indonesia's CPO export intensity is influenced by the productivity of the CPO company itself. In this context, efforts are needed to increase the productivity of the plantation subsector as well as policies that support the competitiveness of Indonesian CPO exports in the Indian market (Rosyadi et al., 2021). Market stability and export sustainability need to be maintained to prevent a decline in export prices and volumes that could hurt the Indonesian economy as a whole.

## c. Results of Non-Parametric (*Man-Whitney Test*)

**Man-Whitney Test on RCA of Indonesian CPO commodities against Malaysia and Thiland in the Indian Market**

Table. 6 RCA Man-whitney Test

| Test Statistics[a] | | |
|---|---|---|
| | RCA Indonesia-Malaysia | RCA Indonesia-Thailand |
| Mann-Whitney U | 28 | 0 |
| Wilcoxon W | 83 | 55 |
| Z | -1,663 | -3,781 |
| Asymp. Sig. (2-tailed) | 0,096 | 0 |
| Exact Sig. [2*(1-tailed Sig.)] | 0,105[b] | 0,000[b] |

*Source: Output Result SPSS 25.0 (2024)*

The findings from the Man-Whitney test analysis of the RCA for Indonesian CPO commodities compared to Malaysia and Thailand in the Indian market indicate that the significance value (2-tailed) for the RCA of Indonesia compared to Malaysia in the Indian market is 0.096 or greater than 0.05. Therefore, it can be inferred that there is no significant disparity between the RCA indices of Indonesian and Malaysian CPO commodities in the Indian market. Conversely, the significance value (2-tailed) for the RCA of Indonesia compared to Thailand in the Indian market is 0.000 or less than 0.05, indicating a significant disparity between the RCA indices of Indonesian and Thai CPO commodities in the Indian market.

**Man-Whitney test of Indonesian's CPO commodity CMS against Malaysia and Thailand in the Indian market**

- **Standardized Growth Effect**

Table. 7 Growth Effect Man-whitney Test

| | EPS Indo-World | EKK Indo - Malaysia | EKPD Indo-Thailand |
|---|---|---|---|
| Mann-Whitney U | 48,000 | 48,000 | 37,000 |
| Wilcoxon W | 103,000 | 103,000 | 92,000 |
| Z | -0,151 | -0,151 | -0,983 |

| Asymp. Sig. (2-tailed) | 0,880 | 0,880 | 0,326 |
|---|---|---|---|
| Exact Sig. [2*(1-tailed Sig.)] | 0,912b | 0,912b | 0,353b |

*Source: Output Result SPSS 25.0 (2024)*

The Mann-Whitney test analysis of the standardized growth of Indonesian CPO commodities compared to global, Malaysian, and Thai counterparts in the Indian market reveals that there is no notable distinction between the standardized growth indices of Indonesian and global CPO, as well as between Indonesian and Malaysian CPO in the Indian market, with a significance value (2-tailed) of 0.880, exceeding 0.05. Similarly, No notable distinction is observed between the standardized growth of Indonesian and Thai CPO in the Indian market, with a significance value also exceeding 0.05, specifically 0.326.

- **Commodity Compisition Effect**

Table. 8 Commodity Composition Effect Man-whitney Test

|  | EKK_Indo-Malaysia | EKPD_Indo-Thailand |
|---|---|---|
| Mann-Whitney U | 50,000 | 50,000 |
| Wilcoxon W | 105,000 | 105,000 |
| Z | 0,000 | 0,000 |
| Asymp. Sig. (2-tailed) | 1,000 | 1,000 |
| Exact Sig. [2*(1-tailed Sig.)] | 1,000b | 1,000b |

*Source: Output Result SPSS 25.0 (2024)*

The results of the Mann-Whitney test analysis of the composition effect of Indonesian CPO commodities on Malaysia and Thailand in the Indian market show that there is no significant difference between the index of the composition effect of Indonesian and Malaysian CPO commodities, as well as between Indonesian and Thai CPO in the Indian market. This is indicated by the significance value (2-tailed) which is greater than 0.05 for both comparisons.

- **Market Distribution Effect**

Table. 9 Market Distribution Effect Man-whitney Test

|  | EKK_Indo-Malaysia | EKPD_Indo-Thailand |
|---|---|---|
| Mann-Whitney U | 50,000 | 50,000 |
| Wilcoxon W | 105,000 | 100,500 |
| Z | 0,000 | -0,341 |
| Asymp. Sig. (2-tailed) | 1,000 | 0,733 |
| Exact Sig. [2*(1-tailed Sig.)] | 1,000b | 0,739b |

*Source: Output Result SPSS 25.0 (2024)*

The analysis of the Man-Whitney Test indicates that there is no significant distinction observed in the market distribution of Indonesian and Malaysian palm oil (CPO) within the Indian market, as evidenced by a significance value (2-tailed) of 1.000, exceeding 0.05.

Similarly, there is no significant difference detected in the market distribution of Indonesian and Thai CPO within the Indian market, as the significance value (2-tailed) stands at 0.7333, also surpassing the threshold of 0.05.

- **Competitiveness Effect**

Table. 10 Competitiveness Effect Man-whitney Test

|  | EKK_Indo-Malaysia | EKPD_Indo-Thailand |
|---|---|---|
| Mann-Whitney U | 490,000 | 49,000 |
| Wilcoxon W | 104,000 | 100,500 |
| Z | -0,076 | -0,076 |
| Asymp. Sig. (2-tailed) | 0,940 | 0,940 |
| Exact Sig. [2*(1-tailed Sig.)] | 0,971[b] | 0,971[b] |

*Source: Output Result SPSS 25.0 (2024)*

The findings from the Mann-Whitney test analysis indicate that there is no notable contrast in the competitiveness of Indonesian and Malaysian palm oil (CPO) commodities within the Indian market. This conclusion is drawn from a significance value (2-tailed) of 0.940, which surpasses the threshold of 0.05. Similarly, there is no significant disparity observed in the competitiveness of Indonesian and Thai CPO commodities within the Indian market, as evidenced by a significance value (2-tailed) of 0.940, which also exceeds 0.05.

**Conclusion**

This study concludes that, although the RCA values of Indonesia, Malaysia, and Thailand fluctuate, the average RCA for the period 2013-2022 shows that all three countries have an RCA value > 1 for CPO commodities in the Indian market, signaling their comparative advantage in CPO exports. However, the outcomes of the Constant Market Share (CMS) analysis reveal that Indonesia's performance in exporting CPO is inferior to that of Malaysia and Thailand in relation to standardized growth effects.Although the commodity composition effect is sufficient to meet the market demand in India for all three countries, the market distribution effect and competitiveness effect show that Indonesia, Malaysia, and Thailand face challenges in achieving market penetration and competing effectively in the global market, with the average value of the effect being negative or less than zero.

**Recomendation**

Indonesia should focus on improving productivity to increase the amount of CPO production. With increased production, it can fulfill domestic needs, increase demand, and expand the market. It is also important to maintain the quality of CPO products to build consumer confidence. Government support through positive policies and campaigns is needed to increase the value of CPO exports. Additional investigation is required to ascertain the specific CPO products demanded by the market, as well as the factors influencing the competitiveness and market distribution of CPO in destination countries.

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