ANALYSIS OF CPO EXPORTS USING THE GRAVITY MODEL APPROACH INDONESIAN CPO EXPORTS WITH COMPETITOR MALAYSIA IN THE MAIN MARKETS OF CHINA AND INDIA

Nissa Nur Awaliyah[1], Haryo Kuncoro[2], Karuniana Dianta Arfiando Sebayang[3]

[1] *State University of Jakarta, Indonesia*
[2] *State University of Jakarta, Indonesia*
[3] *State University of Jakarta, Indonesia*
Email: nissanurawaliyah630@gmail.com[1] , harya_kuncara@unj.ac.id[2] , dianta.sebayang@unj.ac.id[3]

Article Info	Abstract
	This study aims to determine the Revealed Comparative Advantage analysis and the gravity model approach of Indonesian CPO exports with competitor Malaysia in the main markets of China and India. This study employs the RCA competitiveness method and determinant analysis using panel data regression. The analysis tool used is E-Views 12. This study utilizes secondary data from the two main crude palm oil-producing countries, Indonesia and Malaysia, in the largest CPO export markets of China and India. The data sources for this study include UN Comtrade, Trading Economics, Time and Date, World Development Indicators, the World Bank, previous studies, research journals, books, and other literature. The results of this study indicate that both Indonesia and Malaysia have an RCA value greater than 1. However, Indonesia is more advantageous than Malaysia. Economic distance has a positive and significant impact on the volume of CPO exports from Indonesia and Malaysia. International CPO prices have a negative and significant impact on Indonesia's CPO export volume. International CPO prices have a negative but insignificant impact on Malaysia's CPO export volume. Exchange rates have a negative and significant impact on Indonesia's and Malaysia's CPO export volumes. The real GDP of export destination countries has a positive but insignificant impact on Indonesia's and Malaysia's CPO export volumes.

1. INTRODUCTION

As the world's leading producer of crude palm oil (CPO), Indonesia holds a pivotal position in shaping the dynamics of the global palm oil market (N.N Awaliyah *et al*., 2023). Rapid economic growth, combined with rising demand for palm oil in diverse industries—such as food, cosmetics, biofuels, and other sectors—has been a key driver of Indonesia's CPO production expansion. Furthermore, geographical advantages, including an ideal tropical climate for oil palm cultivation, have reinforced Indonesia's role as a major global production hub.

In terms of exports, Indonesia exhibits a substantial comparative advantage in both the production and distribution of CPO in the global market, making it highly competitive relative to other producing countries (Yuhendra, 2017). One of the most widely used approaches to evaluate a commodity's comparative advantage is the Revealed Comparative Advantage (RCA) analysis (E. S. Ramadhani *et al*., 2019).
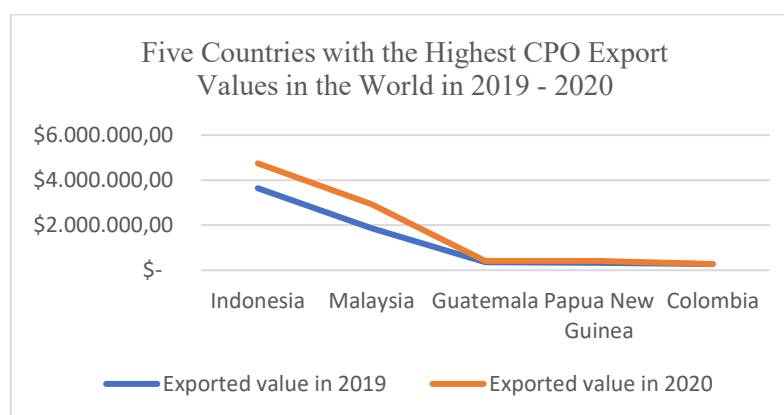
Figure 1.1 List of the Five Countries with the Highest CPO Export Values in the World in 2019-2020
Source: Trade Map processed data. (2024)

Based on Figure 1.1, sourced from Trade Map, Indonesia recorded the highest CPO export values among all producing countries, highlighting its pivotal role in the global CPO trade. The country's export value reached USD 3,641,687 in 2019 and USD 4,743,567 in 2020. Malaysia ranked second, with CPO export values of USD 1,862,350 in 2019 and USD 2,934,139 in 2020. Guatemala, Papua New Guinea, and Colombia followed in third, fourth, and fifth positions, respectively. These data indicate that, compared to Malaysia, Indonesia consistently demonstrates a stronger comparative advantage in the international trade of crude palm oil (Simanjuntak, 2022).

Based on data from the United States Department of Agriculture (2022) regarding the projected demand of major global CPO importing countries for the 2020/2021 and 2021/2022 periods, India is anticipated to record the highest demand worldwide, underscoring its pivotal role in shaping future market trends. The country's import volume is estimated at 8.5 million tonnes in 2020/2021, rising by 1.18% to 8.6 million tonnes in 2021/2022. Meanwhile, China ranks as the second-largest projected importer, with demand of 6.8 million tonnes in 2020/2021, increasing by 5.88% to 7.2 million tonnes in 2021/2022. These figures indicate that China and India remain the primary target markets for both Indonesian and Malaysian CPO producers.

While Indonesia and Malaysia remain among the foremost global producers of palm oil, their economies continue to depend heavily on international markets to absorb their output, despite facing numerous trade barriers. India, as the principal importer of palm oil, also cultivates other vegetable oil crops, thereby positioning palm oil from Indonesia and Malaysia as a substitute rather than a primary source. India's status as the largest importer is shaped by several factors, including demographic growth, shifting lifestyle patterns, increasing industrial demand for raw materials, and rising concerns over health and environmental sustainability (Zainuddin, 2022).
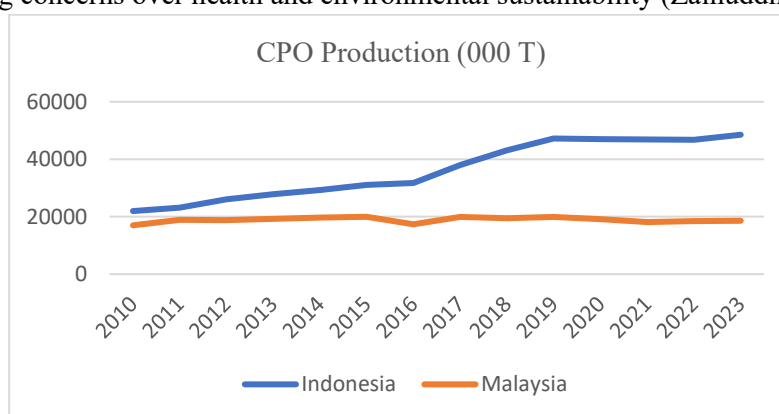

Figure 1.2 CPO production in tonnes
Source: CPOPC (2025), processed data.

Based on Figure 1.2, In terms of CPO output, Indonesia and Malaysia have demonstrated differing production trajectories over the 2010–2023 period. According to data from CPOPC (2025), Indonesia's CPO production has seen a significant increase from 21,958,000 tonnes in 2010 to 48,530,000 tonnes in 2023. This increase in production aligns with the expansion of oil palm plantation areas and the growth in global and domestic demand, particularly for biofuel needs.

Data from UN Comtrade (2024) indicate that, throughout the 2012–2022 period, Indonesia's crude palm oil (CPO) exports to China maintained a higher value compared to Malaysia's. Nonetheless, the export values of both countries exhibited volatility, reflecting broader fluctuations in global market dynamics.

In addition, export values to India from 2012 to 2022 show that Indonesia's export values are higher than Malaysia's. Indonesia's peak export value was achieved in 2017, amounting to USD 3,068,287,682, while the lowest export value was in 2016, amounting to USD 1,868,494,354. However, in 2021, Malaysia's export value was higher than Indonesia's, at USD 3,298,888,082, while Indonesia's export value was USD 2,044,945,030. For Malaysia, the highest CPO export value occurred in 2021 at USD 3,298,888,082, and the lowest export value occurred in 2017 at USD 923,095,390. These fluctuations are caused by various factors, including price fluctuations, government policies, high export costs, as well as low value and productivity (Patone *et al*., 2020).

Volatility in CPO export values can partly be explained by the imposition of export duties. Referring to Regulation of the Minister of Finance No. 39/PMK.010/2022 on the Determination of Export Goods Subject to Export Duties and Their Tariffs, elevated export tariffs are considered to potentially reduce the competitiveness of CPO in international markets. As a consequence, exporters may be encouraged to shift toward selling processed or value-added CPO derivatives rather than the raw commodity (Ridho & Nurcahyo, 2022)

Furthermore, economic distance between exporters and importers serves as an important determinant of trade expenses and the relative competitiveness of CPO in international markets. Trade performance is also shaped by elements such as tariff structures, non-tariff measures, regulatory frameworks, and spatial separation between countries. Although Indonesia and Malaysia are located in close proximity to major markets like India and China, disparities in port capacity and the effectiveness of national logistics networks continue to significantly influence the smoothness and cost-efficiency of export activities (Host *et al*., 2019).

Exchange rate volatility against the USD is also a key factor influencing export performance, as it directly affects CPO import levels in destination countries. In 2022, the Indian rupee depreciated by 10% against the USD due to the currency's safe-haven appeal amid the global recession, inflationary pressures, and the Russia–Ukraine war. This depreciation led to higher import prices for raw materials, including CPO, which in turn contributed to the decline in India's import volumes.

The real GDP of export destination countries reflects their domestic demand capacity, particularly in major importing nations such as China and India. According to World Development Indicator (2024), India's real GDP in 2023 reached USD 3,215,973,434,046, marking an 8.15% increase from USD 2,973,542,414,790 in 2022 (6.99%). This GDP growth aligns with the rise in Indonesia's CPO exports to India, which increased by 8.12%, from 2,883,818.68 tonnes in 2022 to 3,118,192.001 tonnes in 2023 (UN Comtrade). Conversely, during the COVID-19 pandemic, India's real GDP contracted sharply by 5.78% compared to the previous year. Despite this decline, CPO imports rose by 10% due to a surge in household food consumption during lockdown, with the food industry emerging as a key pillar of national economic resilience (Nawangsih *et al*., 2023).

Despite Indonesia's dominant position in the global CPO market, its export performance continues to exhibit fluctuations driven by various external factors, including trade barriers, price volatility, and competition from Malaysia. Although numerous studies have examined CPO competitiveness, their findings remain inconsistent. This indicates the presence of a research gap, particularly in studies that comprehensively explore the competitive dynamics between Indonesia and Malaysia in major export destination markets such as China and India. Furthermore, limited research has integrated variables such as economic distance, exchange rates, international prices, and the real GDP of importing countries within the framework of the gravity model

This study aims to examine the export competitiveness of Indonesia's crude palm oil using the Revealed Comparative Advantage (RCA) method in conjunction with the gravity model approach. The analysis incorporates key determinants such as economic distance, international market prices, exchange rates, and the real GDP of importing countries, while providing a comparative assessment with Malaysia as a competing exporter in the target markets of China and India.

2. LITERATURE REVIEW
2.1 Theoretical and Conceptual Background
International Trade Theory

International trade functions as a key mechanism of economic cooperation among nations, enabling the exchange of goods and services across national borders. Beyond its economic role, it also reflects the political and social interdependence of countries. The concept of the importance of trade between nations was first articulated by Adam Smith in *The Wealth of Nations* (1776), who argued that trade emerges from specialisation and the division of labour. Smith further asserted that trade openness not only enhances the efficiency of resource utilisation but also fosters innovation through technology transfer and the exchange of knowledge between countries (Sachs *et al*., 1995).

Trade activities particularly exports and imports represent vital contributors to foreign exchange reserves, thereby significantly supporting the financing of national development initiatives (Anggraeni, 2019). Accordingly,

international trade is widely regarded as a strategic lever for promoting economic growth, as reflected in the GDP, which measures a nation's overall income from goods and services produced within a given year (Amelia, 2018).

The comparative advantage theory, first introduced by David Ricardo, forms the cornerstone of international trade analysis. It posits that nations are inclined to export products they can produce at a relatively lower opportunity cost, and import those whose production would be less efficient domestically (Ricardo, 1821). In the context of crude palm oil (CPO) exports, Indonesia and Malaysia show a comparative advantage due to their lower production cost structure, supported by the availability of fertile land and tropical climatic conditions that are very suitable for oil palm growth.

The Theory of Competitive Advantage: Revealed Comparative Advantage

As a key determinant of a country's performance in global trade, competitiveness illustrates how well an entity positions itself relative to other players within comparable sectors (Patone *et al*., 2020; Yudha & Rasita Malau, 2023). Comparative advantage, defined as a country's capacity to produce specific goods at lower relative costs compared to other nations, is a crucial indicator of international competitiveness. The Revealed Comparative Advantage (RCA) approach is widely used to measure and assess this economic capability (T. N. Ramadhani & Santoso, 2019)

The RCA index commonly referred to as the Balassa Index—was developed by Hungarian economist Béla Balassa in 1965. A value greater than one suggests that the country possesses a comparative advantage in exporting the commodity in question (Balassa, 1965). This method is widely applied to assess the relative strength of a country or region in producing and exporting a specific good. As a descriptive and quantitative measure, the RCA index offers insights into a nation's position within the framework of comparative and competitive advantage, by comparing its export performance to that of other countries engaged in similar trade (Manalu, 2019).

Gravity Model

Developed by Jan Tinbergen in 1962, the Gravity Model in economics is adapted from the classical physics principle introduced by Sir Isaac Newton, which states that the gravitational pull between two objects depends on their mass and the distance between them. In the realm of international trade, this model explains trade flows by positing that the volume of trade between two countries is positively related to the size of their respective economies and negatively related to the geographical distance that separates them (aziza, 2021).

Under the Gravity Model framework, GDP serves as a primary indicator of economic size, playing a pivotal role in fostering trade linkages between countries. De Benedictis & Taglioni, (2011) The model is widely regarded as one of the most robust empirical tools in the field of international economics. It classifies the determinants of bilateral trade flows into three principal categories: (1) the importer's potential demand, (2) the exporter's production capacity, and (3) additional factors that may either facilitate or obstruct the efficiency of trade between nations

The distance variable occupies a fundamental role in the implementation of the gravity model, as it directly captures the spatial separation between trading partners. Every 1% increase in distance between two countries is estimated to reduce bilateral trade volume by 0.7 to 1%. This decrease is generally due to the increase in transport and logistics costs that must be borne by trade actors (Krugman, P., Melitz, M., & Obstfeld, 2018). In general, distance between countries has an impact on trade activity, but the magnitude of that impact can vary across industry sectors, depending on the inherent transport cost characteristics of each industry (Sawyer & Sprinkle, 2020).

According to Lipsey (1995), the relationship between the price of a commodity and its demand is negatively correlated. In other words, under the assumption of *ceteris paribus*, where other factors remain constant, an increase in price is typically associated with a decrease in the quantity demanded for that commodity.

The foreign exchange rate refers to the value of one nation's currency in relation to that of another country, which fluctuates with the influence of various domestic and global factors. The exchange rate set by government authorities may differ from the exchange rate established through the free market mechanism, depending on the strategy chosen to maintain economic stability and promote national growth (Sadono, 2013).

Real GDP reflects a country's market capacity or potential. An increase in real GDP reflects an increase in purchasing power and market size, indicating the country's ability to absorb products more widely. Therefore, countries with high GDP levels are often prime targets for foreign investors to market their products (eka putri, 2015)

2.2 Empirical Review and Hypothesis

To strengthen the proposed hypothesis, this section presents a review of relevant empirical studies related to the advantages of CPO and various factors that determine the determinants of CPO exports using the gravity model approach. The empirical findings can be organised as follows:

1. T. N. Ramadhani & Santoso, (2019), examined the competitiveness of Indonesian and Malaysian palm oil exports. The study found that, between 2001 and 2014, Indonesian palm oil exports consistently demonstrated higher competitiveness than those of Malaysia in five major importing countries: China, Singapore, India, Pakistan, and the Netherlands.

H1: Indonesian CPO has higher comparative competitiveness than Malaysia in China and India destination markets

2. Juni Karlina *et al*., (2022), conducted research by discussing the Analysis of Indonesian Palm Oil Exports to Ten Major Destination Countries in 2008-2020. The results of this study indicate that economic distance has a positive and significant effect.

    H2: Economic distance of export destination countries has a positive influence on the volume of Indonesian and Malaysian CPO exports.

3. Ningtias & Bachtiar, (2022), A study was conducted to examine the factors influencing Indonesia's CPO exports to India. The findings indicate that, in the short term, international CPO prices exert a negative impact on export performance

    H3: International CPO prices negatively affect the volume of Indonesian and Malaysian CPO exports.

4. Salma Raivana & Sani, (2024), The research examined the determinants affecting the volume of Indonesian crude palm oil exports to the Indian market. The findings suggest that fluctuations in the exchange rate have a statistically significant negative impact on the volume of exports.

    H4: The exchange rate has a negative effect on the volume of Indonesian and Malaysian CPO exports.

5. Salma Raivana & Sani, (2024), The research explored the determinants of Indonesia's crude palm oil export volume to India. The results indicate that while India's GDP exerts a positive influence, the effect is not statistically significant.

    H5: The real GDP of export destination countries has a positive effect on the volume of Indonesian and Malaysian CPO exports.

3. RESEARCH METHODOLOGY

The unit of analysis refers to the smallest entity that serves as the primary focus and reference in the data classification process (Efferin, 2008). This study adopts a quantitative approach, examining the Crude Palm Oil (CPO) export sector through the RCA method and the gravity model, incorporating export determinants such as economic distance, international commodity prices, exchange rates, and the real GDP of importing countries. The research scope covers Indonesia and Malaysia as exporting countries, with China and India as the primary import destinations.

This study relies on secondary data, which are obtained from documented sources (Gaol, 2018). The data were collected from various platforms, including UN Comtrade, Trading Economics, Time and Date, the World Development Indicators, the World Bank, as well as prior studies, academic journals, books, and other relevant literature. The dataset comprises panel data, combining cross-sectional units namely China and India with a time series covering the period from 2008 to 2023. The model estimation technique is carried out using panel data regression assisted by EViews 12 software. The econometric model applied in this research is summarized as follows:
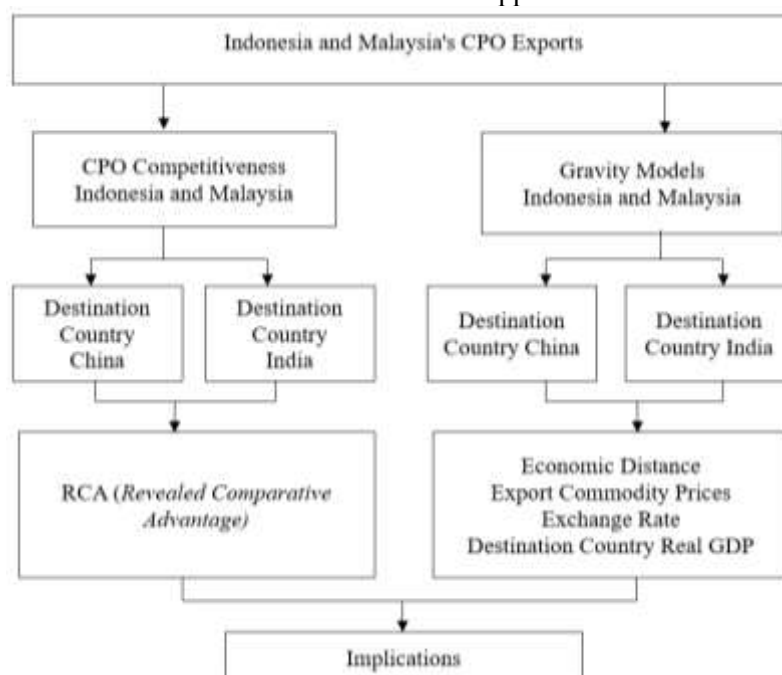

Figure 3.1. Conceptual Model of the Study
Source: Authors (2025)

Revealed Comparative Advantage (RCA) Data Analysis Technique

This study applies the Revealed Comparative Advantage (RCA) method to assess the competitiveness of Crude Palm Oil (CPO) exports from Indonesia and Malaysia in the Chinese and Indian markets. An RCA value greater than one (RCA > 1) suggests that a country possesses a comparative advantage in the export of a particular commodity, while a value less than one (RCA < 1) implies the absence of such an advantage. Theoretically, RCA scores can range from zero to infinity. The following is the formula for RCA:

$$RCA = \frac{Xai/Xat}{Wi/wt}$$

Description:

Xai	: represents the export value of commodity *i* from country *a*
Xat	: denotes the total export value of all commodities from country *a*
Wi	: refers to the total global export value of commodity *i*
Wt	: indicates the overall global export value of all commodities

To measure the estimated economic distance, the following mathematical formula is used:

$$Economy\ Distance = \frac{Geographic\ Distance\ x\ GDPij}{\Sigma GDPj\ during\ the\ observation\ period}$$

To investigate the determinants of CPO export volume, this study utilizes the gravity model framework within a panel data context. Panel data combines both cross-sectional and time-series dimensions, allowing for more comprehensive and robust analysis across countries and over time. In this context, distance is used as a proxy for trade barriers, which explains how much trade volume can occur between two countries. From this explanation, a model can be formulated as follows:

$$EVC_{Nt} = a + \beta_1 ED_{Nt} + \beta_2 PCPO_{Nt} + \beta_3 ER_t + \beta_4 GDP_t + e_t$$

Description:

EVC	: Export Volume of CPO (export volume of CPO in tonnes)
α	: Constant (CPO export volume when the value of the independent variable is zero)
ED	: Economic Distance with export destination country
PCPO	: International CPO price in US$
ER	: Exchange rate of exporting countries Indonesia IDR/US$ and Malaysia MYR/US$
GDP	: Real GDP of export destination country with unit US$

B1β2β3: Regression coefficient

E	: error
t	: research period

4. RESULT AND DISCUSSION
4.1 Result

This study employs the RCA index to quantify the comparative advantage of Indonesia and Malaysia in exporting CPO to the Indian market. An elevated RCA score signifies stronger competitive advantage in the destination market. The computed RCA values for both countries are detailed below:

Years	RCA Indonesia USD		RCA Malaysia USD	
	China	India	China	India
2008	38,71	36,42	22,1	2,83
2009	40,87	25,37	20,91	5,51
2010	52,11	24,77	13,66	4,94
2011	39,78	20,03	17,21	7,49
2012	34,29	17,93	24,25	14,06
2013	37,59	15,68	22,87	13,49
2014	0,09	14,15	0	15,71
2015	60,31	14,07	16,63	17,33
2016	71,75	16,88	0	15,79
2017	0	18,7	0	9,85
2018	433,97	18,74	127,1	12,8
2019	19,21	20,99	25,9	11,74
2020	18,55	14,43	0	12,17
2021	0	11,5	1,53	22,61
2022	21,07	8,98	10,33	17,61
2023	0	11,9	0	19,25
Mean	54,27	18,16	18,9	12,7
Median	35,94	17,4	15,15	13,14
Max	433,97	36,42	127,1	22,61
Min	0	8,98	0	2,83
Std.Dev	100,38	6,44	29,59	5,32

Table 4.1. RCA (Revealed Comparative Advantage) of Indonesian CPO compared to Malaysia
Source: Authors (2025)

Based on table 4.1, The RCA values of Indonesia's CPO in the Chinese market fluctuate but remain above one on average (54.27), indicating a sustained comparative advantage. Malaysia, as a competing exporter, also shows a comparative advantage with an average RCA of 18.9. However, there are some years when it does not dominate the Chinese export market. Indonesia is more competitive compared to its competitor, Malaysia. The RCA index of Indonesia's CPO commodity in the Indian market is fluctuating with an average value of more than one (18.16). The competing country, Malaysia, also has a comparative advantage with an average value above one (12.7). Indonesia is more competitive compared to its competitor, Malaysia.

Uji Chow

Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.884363	(1,26)	0.0144
Cross-section Chi-square	7.516823	1	0.0061

Table 4.2. Chow Test for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.842653	(1,26)	0.0230
Cross-section Chi-square	6.486724	1	0.0109

Table 4.3. Chow Test for Malaysian Exporting Countries
Source: Authors, *E-views 12* (2025)

Based on tables 4.2 and 4.3 For Indonesia, the Chow test yielded Prob. F Statistic and Chi-square values of 0.0144, which are below the 0.05 threshold. In the case of Malaysia, the corresponding values were 0.0230, also less than 0.05. These results indicate that the Fixed Effect model is a more appropriate estimation approach than the Common Effect model for both countries.

Classical Assumption Test
Multicollinearity Test

	ED	PCPO	ER	GDP
ED	1.000000	-0.002529	0.068502	-0.028381
PCPO	-0.002529	1.000000	-0.261908	0.103087
ER	0.068502	-0.261908	1.000000	-0.302050
GDP	-0.028381	0.103087	-0.302051	1.000000

Table 4.4. Multicollinearity-Test for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

	ED	PCPO	ER	GDP
ED	1.000000	-0.002887	0.089997	-0.056091
PCPO	-0.002887	1.000000	-0.214178	0.103087
ER	0.089997	-0.214178	1.000000	-0.223304
GDP	-0.056091	0.103087	-0.223304	1.000000

Table 4.5. Multicollinearity-Test for Malaysia Exporting Countries
Source: Authors, *E-views 12* (2025)

Based on the test results presented in Table 4.4, the correlation coefficient between the dependent variables is less than 0.8, where negative values indicate an inverse relationship between variables. These results suggest that the panel data regression model is free from multicollinearity.

Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	406.3095	232.5129	1.747471	0.0924
LN_ED	-56.93691	30.13618	-1.889321	0.0701
LN_PCPO	1.868323	0.978979	1.908439	0.0674
LN_ER	6.020205	2.107676	2.856325	0.0083
LN_GDP	-5.52E-05	0.088449	-0.000624	0.9995

Table 4.6. Heteroscedasticity Test for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	98.67885	547.2754	0.180309	0.8583
LN_ED	-11.92097	67.65791	-0.176195	0.8615
LN_PCPO	-0.667678	1.198548	-0.557073	0.5822
LN_ER	1.173964	3.186388	0.368431	0.7155
LN_GDP	0.138448	0.132858	1.042072	0.3070

Table 4.7. Heteroscedasticity Test for Malaysia Exporting Countries
Source: Authors, *E-views 12* (2025)

Based on tables 4.6 and 4.7 of the heteroscedasticity test results, the Prob t Statistic on each variable> 0.05. Hence, the panel data regression equation meets the requirement of being free from heteroscedasticity.

F Test

F-statistic	22.00740
Prob(F-statistic)	0.000000

Table 4.8. F Test for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

F-statistic	11.13389
Prob(F-statistic)	0.000008

Table 4.9. F-test for Malaysia Exporting Countries
Source: Authors, *E-views 12* (2025)

Based on tables 4.8 and 4.9, It is observed that the F-statistic probability is less than 0.05, suggesting that the independent variables have a statistically significant effect on the export volume of CPO in Indonesia and Malaysia.

T Test

Variable	t-Statistic	Prob.
C	-2.008035	0.0551
LN_ED	2.235157	0.0342
LN_PCPO	-2.541329	0.0174
LN_ER	-3.740328	0.0009
LN_GDP	1.232140	0.2289

Table 4.10. T-test for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

Variable	t-Statistic	Prob.
C	-1.970255	0.0595
LN_ED	1.987289	0.0575
LN_PCPO	-0.777812	0.4437
LN_ER	-2.836591	0.0087
LN_GDP	1.526182	0.1390

Table 4.11. T-test for Malaysia Exporting Countries
Source: Authors, *E-views 12* (2025)

The test results in tables 4.10 and 4.11 using EViews 12 show that for Indonesia, with a t-value of 2.235157 greater than -2.008035 and a p-value of 0.0342 (less than 0.05), it can be concluded that economic distance positively and significantly influences CPO export volumes to China and India. While for Malaysia, the t-count is 1.987289 > -1.970255, but the p-value is 0.0595 > 0.05, so the effect is positive and significant only at the 10% level, but not significant at the 5% level.

The test results for the international CPO price variable reveal that Indonesia's t-value of -2.541329 is lower than the critical value of -2.008035, with a p-value of 0.0174, indicating a significant negative influence on the volume of Indonesian CPO exports to China and India. Conversely, Malaysia's t-value of -0.777812 exceeds the critical threshold of -1.970255 and is associated with a p-value of 0.4437, suggesting that while the effect is negative, it is not statistically significant for Malaysia's exports to the same markets

The exchange rate variable for Indonesia shows a t-value of -3.740328, which falls below the critical threshold of -2.008035, with a p-value of 0.0009, indicating a statistically significant negative effect on Indonesian CPO export volumes to China and India. Likewise, Malaysia's t-value of -2.836591 is lower than the critical value of -1.970255, with a p-value of 0.0087, demonstrating that the exchange rate similarly exerts a significant negative influence on Malaysia's CPO exports to these markets.

The test results for the real GDP variable of the export destination countries indicate that Indonesia's t-value of 1.232140 is above the critical value of -2.008035, with a p-value of 0.2289, which is not statistically significant. This suggests a positive but insignificant effect on the volume of CPO exports to China and India. Likewise, Malaysia's t-value of 1.526182 exceeds the critical value of -1.970255, with a p-value of 0.1390, similarly reflecting a positive yet insignificant influence on CPO export volumes to both countries.

R² Test

R-squared	0.808876
Adjusted R-squared	0.772121

Table 4.12. R2 Test for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

R-squared	0.681644
Adjusted R-squared	0.620421

Table 4.13. R2 Test for Malaysia Exporting Country
Source: Authors, *E-views 12* (2025)

.

The R-Square value in tables 4.12 and 4.13 for the Indonesia model is 0.808876, which indicates that the independent variables are able to explain the variability of CPO export volume by 80.89%, while the remaining 19.11% is explained by other factors outside this research model. Meanwhile, the R-Square value in the Malaysia model was recorded at 0.681644, Thus, 68.16% of the variation in exports can be explained by the independent variables, with the remaining 31.84% influenced by other external factors beyond the scope of this model.

Interpretation of Panel Data Regression Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-843.3895	420.0074	-2.008035	0.0551
LN_ED	121.6763	54.43749	2.235157	0.0342
LN_PCPO	-4.494116	1.768412	-2.541329	0.0174
LN_ER	-14.24044	3.807269	-3.740328	0.0009
LN_GDP	0.196863	0.159773	1.232140	0.2289

Table 4.14. FEM for Indonesian Exporting Countries
Source: Authors, *E-views 12* (2025)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2551.267	1294.892	-1.970255	0.0595
LN_ED	318.1318	160.0833	1.987289	0.0575
LN_PCPO	-2.205755	2.835848	-0.777812	0.4437
LN_ER	-21.38567	7.539216	-2.836591	0.0087
LN_GDP	0.479759	0.314352	1.526182	0.1390

Table 4.15. FEM for Malaysian Exporting Countries
Source: Authors, *E-views 12* (2025)

Referring to Table 4.12, So, for Indonesia, the panel data regression output results can be expressed as follows:

Y = -843,3895 + 121,6763 (ED) -4,494116 (PCPO) -14,24044 (ER) + 0,196863 (GDP)

The constant value of -843.3895 indicates that when all independent variables are zero, the export volume of Indonesian CPO is estimated at -843.3895 tonnes. The economic distance coefficient of 121.6763 suggests that a 1% increase in economic distance to trading partners is associated with a 121.6763 tonne increase in Indonesia's CPO export volume. Conversely, the international CPO price negatively affects exports; a 1 USD rise in price corresponds to a decrease of 4.494116 tonnes in export volume. Likewise, the rupiah to US dollar exchange rate has a negative impact, where a one-unit increase in IDR/USD may reduce CPO exports by 14.24044 tonnes. On the other hand, the real GDP of the destination country shows a positive influence, with a 1% increase in real GDP leading to a 0.196863-tonne rise in Indonesia's export volume.

Based on table 4.13. Then, for Malaysia, the panel data regression output results can be expressed as follows:

Y = -2551.267 + 318.1318 (ED) -2.205755 (PCPO) -21.38567 (ER) + 0,479759 (GDP)

The intercept value of -2551.267 implies that if all independent variables equal zero, the Malaysian CPO export volume is projected to be -2551.267 tonnes. The coefficient for economic distance at 318.1318 suggests that a 1% increase in economic distance leads to a 318.1318 tonne increase in export volume. In contrast, the international CPO price has a negative impact, where a 1 USD increase results in a decline of 2.205755 tonnes in exports. The MYR/USD exchange rate also negatively affects export volume, with a one-unit rise estimated to decrease exports by 21.38567 tonnes. Meanwhile, the real GDP of the export destination countries exerts a positive effect, with every 1% increase corresponding to a 0.479759 tonne rise in Malaysian CPO exports.

4.2 Discussion
RCA Analysis of Indonesian CPO with Malaysia in China and India Destination Markets

Using the Balassa method, the Revealed Comparative Advantage (RCA) index was applied to assess the competitiveness of Indonesia's CPO compared to Malaysia. The results spanning from 2008 to 2023 demonstrate that Indonesia exhibits a greater comparative advantage than Malaysia in both the China and India export markets.

In the market of China, Indonesia's average RCA value was recorded at 54.27, far above Malaysia's 18.9. This shows that Indonesian CPO is more competitive and dominates the Chinese market. This advantage is reinforced by close bilateral trade relations, the realization of trade contracts worth USD 2.6 billion by 2022, as well as the elimination of import tariffs through the implementation of ACFTA since 2010, which significantly increased Indonesia's CPO exports (Pratama, 2019).

In the market of India, Indonesia's average RCA value is 18.16, also higher than Malaysia's 12.7. According to data from Satu Data Pertanian (2024), Indonesia's dominance in this market is supported by its palm oil land area of 16.83 million ha and production of 46.82 million tonnes in 2022, much larger than Malaysia with a land area of 5.86 million ha (mpogcf, 2022). In addition, the reduction of import tariffs on Indonesian CPO by India in 2019 and the agreement on palm oil sustainability standards between the two countries also strengthened Indonesia's position.

While Malaysia is known to excel in quality and production efficiency, its competitiveness faces challenges from limited land and high labour costs. On the other hand, Indonesia has greater growth potential, both in terms of land and downstream industries, including the oleochemical sector.

These findings are in accordance with previous empirical evidence (Patone *et al*., 2020; Ramadhani & Santoso, 2019; Simanjuntak, 2022; Itamary, 2022; Wahyuningsih, 2019) which concluded that Indonesia consistently outperforms Malaysia, especially in RCA and exports to the Chinese and Indian markets.

Thus, Indonesia's CPO competitiveness does not only rely on production factors such as land and volume but is also strengthened by economic diplomacy strategies and international trade policies that support sustainable exports.

The Effect of Economic Distance on the Export Volume of Indonesian and Malaysian CPO in Export Destination Markets of China and India

The findings confirm that economic distance exerts a positive and statistically significant influence on Indonesia's CPO export volume to China and India. The estimation results from EViews 12 show that the t-value (2.235157) exceeds the critical threshold (-2.008035), while the p-value (0.0342) is below the 5% significance level. This suggests that greater economic distance encompassing both geographical separation and the economic scale of the importing country (as measured by real GDP) is associated with increased CPO exports. This finding strengthens the previous study by Juni Karlina *et al.*, (2022) and Nibras & Widyastutik, (2020) which suggests that economic distance may positively influence trade dynamics in the CPO sector.

In contrast to Malaysia, although the estimation results also show a positive coefficient, it is only significant at the 10% confidence level (p = 0.0595 > 0.05), thus not strong enough to state a statistically consistent effect at the 5% level. This finding indicates that Indonesia's CPO exports to China and India are more resilient to variations in economic distance than Malaysia, which is more sensitive to this factor.

The difference in influence is explained by differences in trade schemes. Indonesia adopts the CIF (Cost, Insurance, and Freight) method, where the exporter bears the logistics costs up to the port of destination, making the value of Indonesian exports relatively unaffected by physical distance (Benarto, 2016). Malaysia, on the other hand, according to The Palm Oil Refiners Association of Malaysia (PORAM) still uses the FOB (Free On Board) method, where the logistics responsibility falls on the buyer, so economic distance has more influence on demand. This makes Malaysia's export volumes more responsive to changes in shipping costs and geographical conditions.

Another important finding is that Indonesia's strategic geographical position, especially the ports in Sumatra and Kalimantan, has contributed to a notable expansion in the country's port infrastructure (Pacheco, 2017). Meanwhile, access to China is also relatively closer and more efficient through the Strait of Malacca which can be accessed directly by ports in eastern Sumatra and western Kalimantan. Compared to Malaysia, especially the southern part such as Port Klang, these Indonesian ports have shorter and straighter shipping lanes to these two major markets, enabling shorter and more efficient shipping routes to India and China than Malaysia. In addition, Indonesia's much larger production volume, more integrated export infrastructure, as well as strong bilateral trade relations such as the reduction of RBDPO tariffs by India and the USD 2.6 billion trade contract with China in 2022 are significant supporting factors for Indonesia's export competitiveness.

In contrast, Malaysia's limited land expansion and focus on environmental conservation and processing of CPO-derived products limits its raw export volume. Malaysia's export structure that emphasizes processed products also lengthens the distribution chain, reducing the efficiency of exports in the form of raw CPO. Malaysia also faces logistical challenges such as the need to process palm fruits within a short time post-harvest and relatively higher shipping costs (Pacheco, 2017).

Thus, the findings of this study confirm that Indonesia has structural and strategic advantages in managing CPO exports, making it more resilient to economic distance variables than Malaysia. Distance is no longer the main obstacle for Indonesia in CPO exports to China and India. Instead, it has become an element that can be mitigated through proactive export policies, logistics schemes, and trade cooperation.

The Effect of International CPO Prices on the Volume of Indonesian and Malaysian CPO Exports in China and India Export Destination Markets

The regression analysis reveals that international CPO prices exert differing impacts on the export volumes of Indonesian and Malaysian CPO to major markets such as China and India. For Indonesia, global CPO prices have a negative and statistically significant influence on export volume, as reflected in a t-statistic of -2.541329 lower than the critical t-value of -2.008035 and a p-value of 0.0174, which is below the 0.05 significance threshold. This suggests that rising international CPO prices are associated with a decline in Indonesia's export volume, supporting Lipsey's (1995) demand theory, which posits an inverse relationship between commodity prices and demand.

This finding is further corroborated by earlier studies, including those conducted by Pradina & Adhitya, (2023), Ningtias & Bachtiar (2022), The conclusion drawn by Juni Karlina *et al.* (2022) also reinforces this result, as their study consistently found that higher international CPO prices significantly suppressed Indonesia's export volume. Conversely, in the case of Malaysia, the regression output indicates that global CPO prices do not have a statistically significant impact on export volume, as reflected by a t-statistic of -0.777812 which exceeds the critical value of -1.970255 and a p-value of 0.4447, which is above the 0.05 significance level. This indicates that global price fluctuations do not substantially affect Malaysia's CPO exports. This resilience of Malaysian exports in the face of international price volatility can be explained through several factors, such as the active role of institutions such as the Malaysian Palm Oil Board(MPOB) in managing export stabilization, market diversification, as well as stable long-term trade relationships with key partners such as China (asiapalmoil, 2024; Reuters, 2025).

In the context of Ricardo's theory of comparative advantage, this difference in response reflects that although both countries have advantages in CPO production, cost structure, logistics efficiency, and export policies also determine sensitivity to global prices.

Thus, the findings of this study confirm that Indonesia, as a major exporter with high dependence on global markets, is more vulnerable to international price fluctuations than Malaysia, which tends to be more resilient due to its structured export strategy and stable trade relations.

The Effect of Exchange Rates on the Volume of Indonesian and Malaysian CPO Exports in China and India Export Destination Markets

The estimation results for the exchange rate variable indicate a negative and statistically significant relationship between exchange rates and the export volume of CPO in both Indonesia and Malaysia. Based on the regression analysis conducted using EViews 12, the Indonesian model yields a t-statistic of -3.740328, which is lower than the critical value of -2.008035, with a p-value of 0.0009 well below the 0.05 significance level. This suggests that fluctuations in the IDR/USD exchange rate adversely affect Indonesia's CPO export volume to China and India. A similar trend is observed for Malaysia, where the t-statistic of -2.836591 is lower than the threshold of -1.970255, and the corresponding p-value of 0.0087 also confirms a significant negative influence of the MYR/USD exchange rate on Malaysia's CPO exports.

This finding is further corroborated by earlier studies, including those conducted by Ningtias & Bachtiar (2022), Salma Raivana & Sani (2024), and Pradina & Adhitya (2023), which consistently conclude that fluctuations in exchange rates exert a detrimental effect on the volume of CPO exports. Exchange rate appreciation (strengthening against the US dollar) causes CPO prices to become less competitive in the global market, so export volumes tend to decline. Conversely, exchange rate depreciation provides a relative price advantage, which encourages increased demand and exports (Awaliyah *et al.*, 2023).

A key point to highlight in this study is that the adverse and statistically significant impact of exchange rate fluctuations on CPO export volumes was consistently observed in both leading exporting nations, Indonesia and Malaysia, throughout the 2008–2023 period. Such consistency indicates the sensitivity of the CPO export market to exchange rate dynamics and confirms the urgency of implementing exchange rate stabilization policies to maintain export competitiveness. The findings also show that although both countries compete in the same market, they still face similar external risks due to exchange rate volatility, thus requiring adaptive risk mitigation strategies from each country.

The Effect of Real GDP of Export Destination Countries on the Export Volume of Indonesian and Malaysian CPO in China and India Export Destination Markets

The estimation results regarding the influence of the real Gross Domestic Product (GDP) of destination countries on CPO export volume indicate a positive yet statistically insignificant relationship for both Indonesia and Malaysia. Using the EViews 12 software, the analysis reveals that for Indonesia, the t-statistic value of 1.232140 exceeds the critical value of -2.008035, while the probability of 0.2289 is greater than the 0.05 threshold. This implies that although the real GDP of China and India tends to have a positive effect on Indonesia's CPO exports, the impact is not statistically significant. A similar result is found for Malaysia, where the t-statistic of 1.526182 is greater than the critical value of -1.970255, and the associated probability of 0.1390 also exceeds 0.05, suggesting that real GDP in these export destinations does not significantly influence Malaysia's CPO export volume either.

This finding is further corroborated by earlier studies, including those conducted by Salma Salma Raivana & Sani, (2024), which indicates that India's per capita GDP exerts a positive yet statistically insignificant influence on the volume of CPO imports. This insignificant relationship reflects that although GDP reflects a country's economic capacity to import, in the context of commodity trade such as CPO, demand is more influenced by external factors such as global price fluctuations, weather conditions, vegetable oil substitution policies, and domestic consumption trends. The relationship between destination country GDP and CPO exports is inconsistent, and depends more on demand dynamics and trade strategies of partner countries (Nawangsih *et al*., 2023; Ningtias & Bachtiar, 2022).

This condition is clearly illustrated in the case of India, which remains a major importer of CPO from Indonesia despite its real GDP contracting during the COVID-19 pandemic. When India's GDP declined by-5.78%, Indonesia's CPO exports increased due to a surge in household demand that could not be met by domestic production. On the other hand, China experienced a slowdown in demand despite its GDP growth, due to lockdowns and reduced household consumption during the pandemic. In addition, price factors also played an important role in Malaysia's declining CPO demand, where high reference prices caused importers to switch to cheaper alternative vegetable oils.

Therefore, the results of this study reaffirm that the real GDP of importing countries does not serve as a primary factor in shaping the fluctuations in CPO export volumes from Indonesia and Malaysia. Other structural factors such as consumption substitution, food energy diversification, price stability, and bilateral trade policies play a more important role in shaping demand. Therefore, CPO export policy strategies to destination countries such as China and India cannot only refer to macroeconomic indicators alone but need to consider the complexity of market factors and external conditions that directly affect demand.

5. CONCLUSION

The analysis indicates that, throughout the period 2008–2023, Indonesia consistently maintained a stronger comparative advantage over Malaysia in the export of CPO to the Chinese and Indian markets, as indicated by RCA values that are consistently above one. This finding confirms the dominance of Indonesia's competitiveness in these two key markets. Furthermore, the economic distance variable was found to exert a positive and significant influence on the volume of CPO exports from both Indonesia and Malaysia, signaling that distance is no longer the main obstacle for Indonesia in CPO exports to China and India, but has become an element that can be mitigated through export policies, logistics schemes, and proactive trade cooperation. The international CPO price variable was found to have a negative and statistically significant impact on Indonesia's CPO export volume, but insignificant on Malaysia's exports, indicating a difference in price sensitivity between the two exporting countries. The IDR/USD and MYR/USD exchange rates exerted a negative and statistically significant influence on export volumes, reaffirming that exchange rate volatility constitutes a major external risk to the competitiveness of CPO exports. Meanwhile, the real GDP of importing countries exhibits a positive yet statistically insignificant impact on the CPO export volumes of both Indonesia and Malaysia, indicating that the economic growth of destination countries has not been a major determinant of CPO demand.

Acknowledgements

REFERENCES

Amelia, F. (2018). Perdagangan Internasional Booster Dalam Pertumbuhan Ekonomi. *Change Think Jounal*, *1*(Analisis Strategi Pemasaran Dalam Meningkatkan volume Penjualan Dalam Perspektif Ekonomi Islam (studi kasus pada Toko AGS kuningan)), 50–59.

Anggraeni, N. (2019). Perang Dagang dalam Hukum Perdagangan Internasional. *Al-Ahkam*, *15*(1), 1. https://doi.org/10.37035/ajh.v15i1.1967

Asia Palm Oil.(2024).*Malaysia and China's 50-year palm oil partnership: from inception to global impact. Malaysia and China's 50-Year Palm Oil Partnership: From Inception to Global Impact. .* (diakses pada tanggal 12 Mei 2025)

Awaliyah, N. N., Iranto, D., & Mukhtar, S. (2023). Analysis of Factors Affecting Indonesia'S Crude Palm Oil (Cpo) Exports in the Global Market 1992 - 2022. *Jurnal Pendidikan Ekonomi, Perkantoran, Dan Akuntansi*, *4*(3), 115–125. https://doi.org/10.21009/jpepa.0403.11

Aziza, H. (2021). *Analisi Intra Industry Trade pada Industri Kendaraan Roda Empat Indonesia Terhadap Partner Dagang dalam Organusasi APEC Tahun 2012-2019.*

Benarto. (2016). *Analisis Penerapan Cost Insurance and Freight (CIF) pada Komoditi Ekspor Indonesia: Studi Kasus Komoditi Crude Palm Oil (CPO).*

De Benedictis, L., & Taglioni, D. (2011). The Gravity Model in International Trade. *The Trade Impact of European Union Preferential Policies*, 55–89. https://doi.org/10.1007/978-3-642-16564-1_4

Eka putri, yosi. (2015). Pengaruh Pdb Riil Dan Variabel Fiskal Terhadap Penanaman Modal Asing Langsung Di Indonesia. *Economica*, *1*(1), 133–147. https://doi.org/10.22202/economica.2012.v1.i1.113

Gaol, D. F. L. (2018). *Faktor Penghambat Diplomasi CPO Indonesia di Pasar Eropa. 2*(2), 38–50.

Host, A., Skender, H. P., & Zaninović, P. A. (2019). Trade Logistics — The Gravity Model Approach. *Zbornik Radova Ekonomskog Fakulteta u Rijeci / Proceedings of Rijeka Faculty of Economics*, *37*(1), 327–342. https://doi.org/10.18045/zbefri.2019.1.327

Juni Karlina, C., Sri WInarti, A., & Sodik, J. (2022). Analisis Ekspor Minyak Kelapa Sawit (CPO) Indonesia ke Sepuluh Negara Tujuan Utama Tahun 2008-2020. *SINOMIKA Journal: Publikasi Ilmiah Bidang Ekonomi dan Akuntansi*, *1*(4), 851–864. https://doi.org/10.54443/sinomika.v1i4.444

Krugman, P., Melitz, M., & Obstfeld, M. (2018). *International Economics: Theory and Policy (11th ed.). Pearson.*

Manalu. (2019). *Posisi Daya Saing dan Kinerja Ekspor Kopi Indonesia di Pasar Global. 3*, 830–839.

MPOGCF. (2022). *Keluasan Tanaman Sawit Mengikut Negeri Di Malaysia. https://www.mpogcf.org/keluasan-tanaman-sawit-mengikut-negeri-di-malaysia/#:~:text=Keluasan%20tanaman%20kelapa%20sawit%20di%20Malaysia%20ialah%205,865,297,iaitu%201,584,520%20hektar%20diikuti%20Sabah%20dengan%201,543,054%20hektar*

Nawangsih, W. S., Manumono, D., & Ambarsari, A. (2023). Faktor-Faktor yang Mempengaruhi Volume Ekspor CPO Indonesia ke India, Tiongkok, dan Eropa (Belanda dan Italia). *Agrotechnology, Agribusiness, Forestry, and Technology: Jurnal Mahasiswa Instiper (AGROFORETECH)*, *1*(2), 1033–1042. https://jurnal.instiperjogja.ac.id/index.php/JOM/article/view/644

Nibras, G. S., & Widyastutik, W. (2020). Daya Saing, Ekuivalen Tarif, dan Faktor-Faktor yang Memengaruhi Permintaan Ekspor Minyak Sawit Indonesia di Negara OKI. *Jurnal Ekonomi Dan Kebijakan Publik*, *10*(2), 111–124. https://doi.org/10.22212/jekp.v10i2.1295

Ningtias, I. Z., & Bachtiar, A. (2022). Analisis Faktor-Faktor yang Mempengaruhi Ekspor Cpo Indonesia ke India. *Jurnal Ilmiah Wahana Pendidikan*, *8*(18), 213–225. https://doi.org/10.5281/zenodo.7134257.

Nissa Nur Awaliyah, Iranto, D., & Mukhtar, S. (2023). Policy Analysis of European Union Deforestation Regulation (EUDR) on Indonesian Palm Oil Exports. *International Student Conference on Business, Education, Economics, Accounting, and Management (ISC-BEAM)*, *1*(1), 501–510. https://doi.org/10.21009/isc-beam.011.34

Pacheco. (2017). The Palm Oil Global Value Chain: Implications for economic growth and social and environmental sustainability. *CIFOR*. https://doi.org/10.17528/cifor/006405

Patone, C. D., Kumaat, R. J., & Mandeij, D. (2020). Analisis Daya Saing Ekspor Sawit Indonesia Ke Negara Tujuan Ekspor Tiongkok Dan India. *Jurnal Berkah Ilmiah Efisiensi*, *20*(3), 22–32.

Pradina, Y. B. A., & Adhitya, D. (2023). Effect of International CPO Prices, Substitution Goods Prices, and Exchange Rates on Crude Palm Oil (CPO) Export Volume in Indonesia. *Jurnal Ekonomi Pembangunan*, *21*(1), 1–12. https://doi.org/10.29259/jep.v21i1.19447

Pratama, L. (2019). Dampak ASEAN-China Free Trade Area (AFTA) Terhadap Perkembangan Ekspor Crude Palm Oil (CPO) Indonesia ke Tiongkok. *Jom Fisip*, *6*(1), 1–15.

Ramadhani, E. S., H, I. M., & Asmara, K. (2019). *Analisis Daya Saing Ekspor Kakao Olahan Indonesia di Pasar Jerman (The Analysis of Indonesian Processed Cocoa Export Competitiveness in The Market of Germany)*. *8*(2), 132–137.

Ramadhani, T. N., & Santoso, R. P. (2019). Competitiveness analyses of Indonesian and Malaysian palm oil exports. *Economic Journal of Emerging Markets*, *11*(1), 46–58. https://doi.org/10.20885/ejem.vol11.iss1.art5

Reuters.(2025). The end of cheap palm oil? Output stalls as biodiesel demand surges. *The end of cheap palm oil? Output stalls as biodiesel demand surges | Reuters*.

Ricardo, D. (1821). *On the principles of political economy*. J. Murray. http://www.econ.ucdavis.edu/faculty/gclark/210a/readings/Ricardo.pdf

Ridho, M. H., & Nurcahyo, M. A. (2022). Pengaruh Harga, Nilai Tukar, Tarif Bea Keluar, Dana Perkebunan Sawit, Dan Jumlah Produksi Terhadap Nilai Ekspor Crude Palm Oil. *Tirtayasa Ekonomika*, *17*(2), 225. https://doi.org/10.35448/jte.v17i2.15240

Sachs, J. D., Warner, A., Åslund, A., & Fischer, S. (1995). *Economic Reform and the Process of Global Integration*. *1995*(1), 1–118.

Sadono, S. (2013). Makro Ekonomi: Teori Pengantar. In *Rajawali pers*. Rajawali pers.

Salma Raivana, K. N., & Sani, S. F. (2024). Analisis Faktor-faktor yang Memengaruhi Volume Ekspor CPO Indonesia ke India. *WELFARE Jurnal Ilmu Ekonomi*, *4*(2), 106–113. https://doi.org/10.37058/wlfr.v4i2.10194

Satu Data.(2024).Outlook Komoditas Perkebunan Kelapa Sawit Tahun 2024. https://satudata.pertanian.go.id/details/publikasi/696.

Sawyer, W. C., & Sprinkle, R. L. (2020). Applied international economics. In *Applied International Economics*. https://doi.org/10.4324/9780429425547

Simanjuntak, A. R. (2022). *Persaingan Produk Turunan CPO Indonesia dan Malaysia di Pasar Internasional*. *1*(1), 1–6.

Yudha, E. P., & Rasita Malau, H. E. (2023). Analisis daya saing ekspor jeruk Indonesia, Singapura dan Thailand ke pasar Malaysia pada periode 2013-2018. *EQUILIBRIUM : Jurnal Ilmiah Ekonomi dan Pembelajarannya*, *11*(1), 1. https://doi.org/10.25273/equilibrium.v11i1.13752

Yuhendra, A. (2017). *Analisis Determinan dan Daya Saing Ekspor Minyak Kelapa Sawit Indonesia di Pasar Dunia*. *8*, 47–61.

Zainuddin. (2022). *Daya Saing Ekspor Crude Palm Oil dan Refined Palm Oil Asal Indonesia dan Malaysia di Pasar India*. *7*, 132–142. https://doi.org/10.33087/mea.v7i2.138