

**THE EFFECT OF CPO (CRUDE PALM OIL) PRICE ON
FINANCIAL PERFORMANCE AND ITS IMPACT ON STOCK
PRICES OF PALM OIL COMPANIES LISTED ON THE
INDONESIA STOCK EXCHANGE 2014-2024**

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ABSTRACT

Indonesia is the world's largest producer of crude palm oil (CPO). Global CPO price fluctuations do not always align with the financial performance of palm oil plantation companies. This study aims to analyze the effect of CPO price on financial performance (ROA) of palm oil companies, the effect of financial performance (ROA) on stock prices; and the mediating role of ROA in the relationship between CPO price and stock prices. A quantitative associative method was employed using balanced panel data from 9 palm oil companies listed on the Indonesia Stock Exchange (IDX) for the period 2014-2024 (99 observations). Panel data regression and Sobel test were conducted using EViews 12. Results show that: (1) CPO price has a significant positive effect on ROA at the 10% significance level (coefficient = 0.0584, $p = 0.0504$); (2) ROA has a significant positive effect on stock prices at the 5% level (coefficient = 1.499, $p = 0.0282$); (3) ROA has not been proven as a statistically significant mediator at the 5% level (Sobel statistic = 1.68), although a mediating tendency is observed at the 10% level. These findings suggest that rising CPO prices increase company profitability; however, the effect on stock prices through the profitability channel is limited due to time lag factors and the capital-intensive nature of the palm oil industry.

Keywords: CPO Price, Financial Performance, ROA, Stock Price, Path Analysis

INTRODUCTION

Indonesia holds a dominant position in the global palm oil industry as the world's largest producer and exporter of crude palm oil (CPO). The palm oil sector plays a strategic role in the national economy, contributing to foreign exchange earnings, employment creation, and rural development. The production volume of CPO and palm kernel oil in Indonesia has increased significantly each year, with CPO production reaching 44.76 million tons in 2020, representing an 86.5% growth over eleven years (BPS, 2021). Despite the impressive growth in production and export volume, CPO prices have experienced considerable volatility in the global market. Historical data shows that CPO prices declined in 2013, 2015, 2018, and 2019, with the lowest price recorded at Rp 7,086/kg in 2019 (Bappebti, 2022). Paradoxically, the trend of increasing CPO prices has not always been aligned with the financial performance of palm oil companies listed on the Indonesia Stock Exchange (IDX). Average Return on Assets (ROA) of palm oil companies showed declining trends in 2013, 2015, 2016, 2018, and 2019, with some companies recording negative ROA values in 2018 and 2019.

Prior studies have individually examined the effect of CPO prices on financial performance (Riany, 2016; Suryani et al., 2024) and the effect of financial performance on stock prices (Hilmi et al., 2025; Andini, 2024; Abdullah et al., 2022). However, a critical research gap remains: no study has comprehensively examined the mediating role of financial performance (ROA) in the relationship between CPO price and stock price within the Indonesian palm oil sector. It remains unclear whether and to what extent CPO price fluctuations affect investor valuation of palm oil firms indirectly through their profitability, particularly given the structural constraints of a capital-intensive industry subject to time-lag effects. This gap is important because understanding the transmission mechanism is essential for both managerial decision-making and investor strategy in the commodity-linked equity market. In the context of financial theory, stock prices are expected to reflect the fundamental performance of a company. According to Signaling Theory (Ross, 1977), financial reports that reflect sound financial performance serve as positive signals to investors, thereby driving increased demand and higher stock prices. However, the transmission mechanism from CPO price

fluctuations to company profitability, and subsequently to stock prices, may be subject to various structural constraints specific to the palm oil industry.

The palm oil sector is characterized by its capital-intensive nature, requiring substantial investments in plantations, processing mills, and supporting infrastructure. These high operational costs may absorb a significant portion of revenue gains from rising CPO prices, limiting the direct impact on profitability. Furthermore, there is an inherent time lag between global CPO price changes and their reflection in company financial statements, as the process involves production cycles, shipment, and accounting periods. Several prior studies have examined the relationship between CPO prices, financial performance, and stock prices, but with mixed findings. Riany (2016) found that domestic CPO prices significantly affect the financial performance of the palm oil industry, while Hilmi et al. (2025) confirmed that financial performance is a key determinant of stock prices in the palm oil sector. However, comprehensive empirical evidence on the mediating role of financial performance in the CPO price–stock price relationship remains limited. This study aims to analyze the effect of CPO price on the financial performance (ROA) of palm oil companies listed on the IDX for the period 2014–2024, analyze the effect of financial performance (ROA) on the stock prices of palm oil companies, analyze the mediating role of ROA in the relationship between CPO price and stock prices of palm oil companies.

METHODOLOGY

This study employs a quantitative associative method using panel data analysis. The research focuses on palm oil plantation companies listed on the Indonesia Stock Exchange (IDX), which was selected as the research site for two reasons: (1) the IDX is the primary regulated platform where palm oil companies in Indonesia publicly disclose their audited financial statements, enabling systematic and verifiable data collection; and (2) Indonesia's palm oil companies listed on the IDX represent the dominant players in the world's largest CPO-producing nation, making them the most relevant subjects for examining the CPO price–profitability–stock price nexus. Data collection was conducted from January 2024 to March 2026, covering the analysis period of January 2014 to December 2024. Secondary data were obtained from annual financial reports published on

the IDX website (www.idx.co.id) and global CPO futures price data from the Malaysia Derivatives Exchange (BMD) via Investing.com. The population consists of 21 palm oil plantation companies listed on the IDX. Purposive sampling was applied based on the following criteria: (1) listed on the IDX prior to 2014; (2) published complete audited annual financial reports throughout 2014–2024; and (3) financial reports were audited by a public accountant. Based on these criteria, 9 companies were selected as the sample, yielding a total of 99 balanced panel observations across 11 periods. The sample companies are: Astra Agro Lestari Tbk (AALI), Eagle High Plantations Tbk (BWPT), Gozco Plantations Tbk (GZCO), Jaya Agra Wattie Tbk (JAWA), PP London Sumatra Indonesia Tbk (LSIP), Sampoerna Agro Tbk (SGRO), Salim Ivomas Pratama Tbk (SIMP), Smart Tbk (SMAR), and Bakrie Sumatra Plantations Tbk (UNSP).

Three variables are employed in this study: (1) CPO Price – the year-end closing price of CPO futures contracts traded on the Malaysia Derivatives Exchange (BMD), expressed in natural logarithm (CPO); (2) Financial Performance – measured by Return on Assets (ROA), which represents the ratio of net profit after tax to total assets, expressed as follows:

$$ROA = \frac{\text{Nett Profit After Tax}}{\text{Total Asset}}$$

A higher ROA value indicates more efficient use of assets to generate profit (Chen, 2025). (3) Stock Price – the year-end closing stock price of each sample company, expressed in natural logarithm (STOCK) to normalize the distribution and reduce heteroscedasticity.

Data were analyzed using panel data regression and path analysis with EViews 12 software. The analysis followed five systematic steps:

- 1) Descriptive Statistics: Descriptive analysis was performed to characterize the distribution of all variables (mean, median, standard deviation, skewness, kurtosis, Jarque-Bera normality test).
- 2) Panel Model Selection: For each sub-structural equation, the most appropriate estimator was selected via: (a) Chow Test, to choose between Common Effect Model (CEM) and Fixed Effect Model (FEM); and (b) Hausman Test, to choose between Fixed Effect Model (FEM) and Random Effect Model (REM). A Lagrange Multiplier test was also available if needed.

- 3) Multicollinearity Check: A correlation matrix was examined for all independent variables. A correlation coefficient above 0.90 between any two predictors indicates multicollinearity (Hair et al., 2019).
- 4) Sub-structural Regression: Two panel regression equations were estimated:

Sub-structural 1 (Eq. 1): $ROA = a + \beta_1 CPO + \varepsilon_1$

Sub-structural 2 (Eq. 2): $STOCK = a + \beta_1 CPO + \beta_2 ROA + \varepsilon_2$

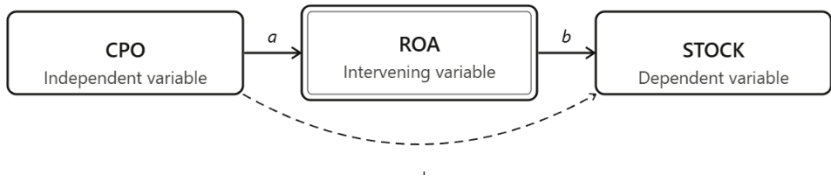


Figure 1. Path Analysis Framework

- 5) Sobel Test: The indirect (mediation) effect of CPO price on stock price through ROA was assessed using the Sobel test statistic. The formula is as follows (Sobel, 1982; Baron & Kenny, 1986):

$$t = \frac{ab}{\sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2}}$$

Where:

- a = regression coefficient of path CPO → ROA (sub-structural 1);
b = regression coefficient of path ROA → STOCK (sub-structural 2);
SE_a = standard error of coefficient a;
SE_b = standard error of coefficient b.

If the absolute value of t exceeds 1.96, the indirect effect is statistically significant at the 5% level (t > 1.645 for 10% level).

HASIL DAN PEMBAHASAN

Descriptive Statistics

Table 1 presents the descriptive statistics of the research variables over the 2014–2024 observation period. CPO exhibited a mean of 6.6129 with a standard deviation of 0.2440, indicating relatively stable CPO prices during the study

period. The Jarque-Bera probability of 0.1135 (> 0.05) confirms a normal distribution for this variable, consistent with the theoretical expectation that commodity prices in mature markets tend to follow log-normal distributions (Hull, 2018). STOCK showed greater variability with a standard deviation of 1.6105, reflecting heterogeneity in stock prices across sample companies – a pattern consistent with the efficient market hypothesis (Fama, 1970), which posits that stock prices incorporate all available firm-specific and market information, including operational performance differentials.

Table 1. Descriptive Statistics

Statistic	CPO	STOCK	ROA
Mean	6.6129	6.3186	-0.0006
Median	6.5482	5.9915	0.0170
Maximum	7.0031	9.7220	0.1350
Minimum	6.2106	3.9120	-0.5310
Std. Dev.	0.2440	1.6105	0.0956
Skewness	0.1182	0.3252	-2.9543
Kurtosis	2.0005	1.9926	15.3893
Jarque-Bera	4.3512	5.9314	777.1842
Probability	0.1135	0.0515	0.0000
Observations	99	99	99

Source: Processed data from EViews 12, 2026

ROA recorded a near-zero mean of -0.0006 with a minimum of -0.531, indicating that several companies experienced significant losses during the observation period. The highly negative skewness (-2.954) and high kurtosis (15.389), confirmed by a Jarque-Bera probability of 0.000, suggest a leptokurtic distribution driven by extreme loss observations – a pattern commonly observed in commodity-dependent sectors subject to price cycles (Brigham & Houston, 2019). This distributional characteristic underscores the need for robust estimation methods such as panel data regression with cross-section corrections applied in this study.

Sub-structural 1: Effect of CPO Price on ROA

Table 2 presents the model selection results and regression estimates for sub-structural 1.

Table 2. Model Selection Tests – Sub-structural 1

Test	Statistic	d.f.	Prob.	Selected Model
Chow Test (Cross-section F)	6.456096	(8,89)	0.0000	Fixed Effect
Hausman Test (Cross-section random)	0.000000	1	1.0000	Random Effect

Source: Processed data from EViews 12, 2026

The Chow Test result ($p = 0.0000$) initially pointed to the Fixed Effect Model; however, the Hausman Test result ($p = 1.0000 > 0.05$) confirmed that the Random Effect Model (REM) is more appropriate for sub-structural 1. The multicollinearity test yielded a correlation coefficient of 0.149 between CPO and ROA, well below the 0.90 threshold, indicating no multicollinearity issue.

Table 3. Panel Regression Results – Sub-structural 1 (Dependent Variable: ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant (C)	-0.386818	0.188558	-2.051452	0.0673
CPO	0.058398	0.026260	2.223892	0.0504*
R-squared	0.031895			
Adj. R-squared	0.021915			
F-statistic	3.195749			
Prob(F-stat)	0.076953			
Durbin-Watson	1.686706			

Source: Processed data from EViews 12, 2026. (*Significant at $\alpha = 10\%$)

The regression equation for sub-structural 1 is:

$$\text{ROA} = -0.386818 + 0.058398 \text{ CPO}$$

The coefficient of CPO (0.058398) is positive and significant at the 10% level ($p = 0.0504$), indicating that a 1-unit increase in CPO is associated with a 0.0584-unit increase in ROA. This result supports Hypothesis 1 (H1) at the 10% significance level. However, the low R-squared (0.0319) suggests that CPO price alone explains only 3.19% of ROA variation, implying that other factors – such as operational efficiency, cost structure, and macroeconomic conditions – play dominant roles in determining profitability.

This finding is consistent with Riany (2016), who found that domestic CPO prices significantly affect the financial performance of palm oil industry firms. The

positive relationship is theoretically grounded in the Revenue-Profit Linkage principle (Putong, 2002), whereby higher selling prices for the primary product directly increase revenue and, consequently, net profit and ROA. The limited explanatory power of CPO price alone aligns with Suryani et al. (2024), who demonstrated that CPO price dynamics are moderated by multiple external factors including exchange rates, production volumes, and export policies.

Sub-structural 2: Effect of CPO Price and ROA on Stock Price

Table 4 summarizes the model selection results for sub-structural 2. Both the Chow Test ($p = 0.0000$) and Hausman Test ($p = 0.0001$) confirm that the Fixed Effect Model (FEM) is the most appropriate specification for sub-structural 2. The multicollinearity matrix showed all inter-variable correlations below 0.90, confirming no multicollinearity problem.

Table 4. Model Selection Tests – Sub-structural 2

Test	Statistic	d.f.	Prob.	Selected Model
Chow Test (Cross-section F)	135.776694	(8,88)	0.0000	Fixed Effect
Hausman Test (Cross-section random)	18.138609	2	0.0001	Fixed Effect

Source: Processed data from EViews 12, 2026

The regression equation for sub-structural 2 is:

$$\text{STOCK} = 9.353521 - 0.458796 \text{ CPO} + 1.499266 \text{ ROA}$$

The coefficient of ROA (1.499266) is positive and statistically significant at the 5% level ($p = 0.0282$), confirming Hypothesis 2 (H2). This indicates that a 1-unit increase in ROA is associated with a 1.499-unit increase in STOCK, reflecting that companies with higher profitability command higher market valuations. The high R-squared of 0.9492 indicates that the model explains 94.92% of stock price variation, demonstrating strong explanatory power when company-specific fixed effects are controlled for.

The direct effect of CPO price on stock price (coefficient = -0.458796, $p = 0.0784$) is not statistically significant at the 5% level. This suggests that CPO price changes do not directly and immediately translate into stock price movements, consistent with the notion that equity markets price in a broader set of information beyond commodity prices.

Table 5. Panel Regression Results – Sub-structural 2 (Dependent Variable:

STOCK)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant (C)	9.353521	1.589000	5.886420	0.0002
CPO	-0.458796	0.234067	-1.960108	0.0784
ROA	1.499266	0.584710	2.564117	0.0282**
R-squared	0.949172			
Adj. R-squared	0.943396			
F-statistic	164.3327			
Prob(F-stat)	0.000000			
Durbin-Watson	1.077704			

Source: Processed data from EViews 12, 2026. (*Significant at $\alpha = 5\%$)

The finding that ROA significantly and positively affects stock prices is well-supported in the literature. Andini (2024) demonstrated that ROA has a significant positive impact on stock prices for food and beverage companies at the IDX, while Abdullah et al. (2022) found similar results for mining sector companies. Sofyan (2025) and Gea (2022) also confirmed this relationship in the health and manufacturing sectors, respectively. The result is theoretically grounded in Signaling Theory (Ross, 1977), whereby a high ROA signals sound management of assets to investors, prompting increased demand and higher stock prices (Chen, 2025).

Path Analysis and Sobel Test

Table 6. Summary of Path Analysis Coefficients

Relationship	Coefficient	Std. Error	t-Statistic	Prob.	Note
CPO Price → ROA (a)	0.058398	0.026260	2.223892	0.0504	Sig. at 10%
ROA → Stock Price (b)	1.499266	0.584710	2.564117	0.0282	Sig. at 5%
CPO Price → Stock Price (c')	-0.458796	0.234067	-1.960108	0.0784	Not Sig.

Source: Processed data from EViews 12, 2026

The Sobel test yielded a t-statistic of 1.6800, which is slightly below the critical value of 1.96 at the 5% significance level. Therefore, Hypothesis 3 (H3) is not supported at the 5% level, indicating that ROA does not serve as a statistically significant mediator between CPO price and stock price at this threshold. However, the Sobel statistic of 1.6800 is above the critical value of 1.645 at the 10% significance level, suggesting a mediating tendency at the 10% level. This indicates that profitability (ROA) does play a partial role in bridging the effect of CPO price

fluctuations on market value (stock price), albeit with limited strength.

Table 7. Sobel Test Results

Path	a	SE(a)	b	SE(b)	Sobel Stat.	Conclusion
CPO → ROA → Stock	0.0584	0.02626	1.4993	0.58471	1.6800	No mediation at 5%

Source: Processed data from EViews 12, 2026

The Sobel test yielded a t-statistic of 1.6800, which is slightly below the critical value of 1.96 at the 5% significance level. Therefore, Hypothesis 3 (H3) is not supported at the 5% level, indicating that ROA does not serve as a statistically significant mediator between CPO price and stock price at this threshold. However, the Sobel statistic of 1.6800 is above the critical value of 1.645 at the 10% significance level, suggesting a mediating tendency at the 10% level. This indicates that profitability (ROA) does play a partial role in bridging the effect of CPO price fluctuations on market value (stock price), albeit with limited strength.

Two structural factors explain the limited mediation effect. First, there is a significant time lag between CPO price changes in the global market and their reflection in company financial statements (ROA). Price movements are not immediately recorded in the income statement on the same day or period; rather, the effect is distributed across production cycles, shipping periods, and accounting intervals. This temporal misalignment weakens the contemporaneous relationship between CPO prices and ROA in annual panel data. Second, the palm oil sector is highly capital-intensive, requiring substantial fixed investments in plantations, mills, and logistics infrastructure. High operational costs frequently absorb gains from rising CPO prices, reducing the net impact on profitability. This 'cost absorption' effect means that the pathway from CPO price → ROA → Stock Price loses significant power at each stage (Awaliyah et al., 2023).

These findings are consistent with the concept of partial or no mediation in path analysis frameworks (Baron & Kenny, 1986) and align with the low R-squared (0.0319) observed in sub-structural 1, which confirms that CPO price explains only a small fraction of ROA variation. Investors in palm oil equities should therefore look beyond CPO price movements and consider broader fundamental indicators, macroeconomic conditions, and company-specific operational efficiencies when making investment decisions.

CONCLUSION AND POLICY RECOMMENDATIONS

This study confirms that CPO price has a significant positive effect on

financial performance (ROA) at the 10% significance level (coefficient = 0.0584, $p = 0.0504$). Rising global CPO prices tend to increase company profitability, as higher selling prices translate into greater revenue. Financial performance (ROA) has a significant positive effect on stock prices at the 5% significance level (coefficient = 1.499, $p = 0.0282$). Companies with higher ROA are rewarded with higher stock market valuations, consistent with Signaling Theory. ROA does not serve as a statistically significant mediator between CPO price and stock price at the 5% level (Sobel statistic = 1.68). A mediating tendency is observed at the 10% level, but the overall indirect effect remains limited due to time lag between CPO price changes and their financial statement impact, as well as the capital-intensive cost structure that absorbs profitability gains.

Policy Recommendation for company management, relying solely on commodity price movements is insufficient to sustain financial performance. Firms should invest in operational efficiency, downstream diversification, and effective cost control mechanisms to maintain profitability regardless of CPO price cycles. For investors, a comprehensive fundamental analysis incorporating ROA, macroeconomic indicators, and company-specific operational metrics is recommended rather than relying solely on CPO price trends. The significant ROA-stock price relationship underscores the importance of profitability as a key valuation driver. For policymakers, the limited transmission of CPO prices to firm profitability and stock prices suggests that policies aimed at stabilizing CPO prices alone may be insufficient to ensure the financial health of the palm oil sector. Complementary policies supporting downstream industry development, export diversification, and environmental sustainability would enhance the sector's long-term resilience and investor confidence. Then, future research is encouraged to incorporate additional macroeconomic variables (exchange rate, inflation, interest rate), other financial ratios (DER, PBV), and longer observation periods to yield more robust findings on the CPO price transmission mechanism.

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