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Analysis of The Relationship Between Crude Palm Oil (CPO) Prices and Stock Prices of Issuers of The Palm Oil Plantation Group in 2023

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ABSTRACT:

Crude palm oil (CPO) is an essential commodity in the industrial and food world. This oil is obtained through an extraction process from the flesh of the oil palm fruit. CPO has a variety of uses in various sectors. CPO is used in the food and beverage industry, for example, in margarine, cooking oil, and processed food products. In addition, it is also used in the production of biodiesel as an alternative environmentally friendly fuel. In the cosmetics industry, it is used in the manufacture of soap and other skincare products. The chemical industry also utilizes CPO as a raw material in the production of various products, including detergents. With the great potential and advantages of CPO, oil palm plantations in Indonesia have a very important role in the world economy, and Indonesia is even considered the largest producer and supplier of CPO. Geographical support and a large land area can produce the highest production volume in the world. The law of demand and supply for CPO affects the share price of issuers of the Large Private Plantation group listed on the Indonesia Stock Exchange. This study was conducted to determine whether there is a relationship between CPO price fluctuations and fluctuations in issuers' stock prices. CPO price fluctuations are positioned as the independent variable, and fluctuations in the stock prices of some issuers are positioned as the dependent variable. The statistical method used to explain this relationship is simple linear regression analysis. The data used were collected using documentation techniques from several sources, such as publications by the Central Statistics Agency (BPS-Statistics Indonesia), GAPKI (Indonesian Palm Oil Association) publications, and publications from the Indonesia Stock Exchange portal.

Keywords: Crude Palm Oil Price, Crude Palm Oil, CPO, Stock Price of Listed Companies, Oil Palm Plantations, Large Private Plantations.

I. INTRODUCTION

The Agriculture, Forestry, and Farming sectors in Indonesia made a considerable contribution to the Gross Domestic Product (GDP) in 2022. According to the Central Bureau of Statistics, the contribution is around 12.4%, which is third after the Manufacturing Industry sector and the Wholesale and Retail Trade, Car and Motorcycle Repair sector. The sub-sector with great

potential is the plantation sub-sector, with a contribution of 3.76% to GDP and 30.32% to the Agriculture, Forestry, and Farming sectors, which means it is the first-ranked sub-sector.

A publication of the Central Bureau of Statistics (BPS - Statistics Indonesia) shows that by 2022, the area of oil palm plantations is estimated to be around 15.34 million hectares. This area is spread across all provinces in Sumatra and Kalimantan, West Java Province, Banten Province, Central Sulawesi Province, South Sulawesi Province, Southeast Sulawesi Province, West Sulawesi Province, Gorontalo Province, Maluku Province, North Maluku Province, Papua Province, and West Papua Province.

The control status of oil palm plantation area is dominated by Large Private Plantations 55.92% (about 8.58 million hectares), followed by Smallholder Plantations 40.51% (about 6.21 million hectares) and Large State Plantations 3.57% (about 0.55 million hectares). Similarly, when viewed from the status of the company, the production of Large Private Plantations dominates with CPO production of 27.36 million tons or 60.64%. Smallholder Plantations produced 15.50 million tons of CPO, or 34.36%, while the remaining 2.30 million tons, or 5%, were produced by Large State Plantations.

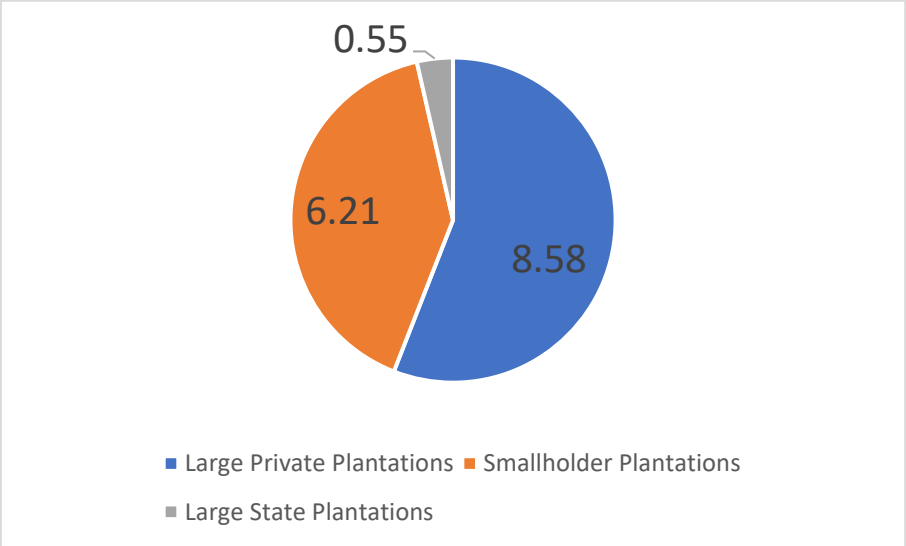


Figure 1. Oil Palm Plantation Area Control (in a million hectares)

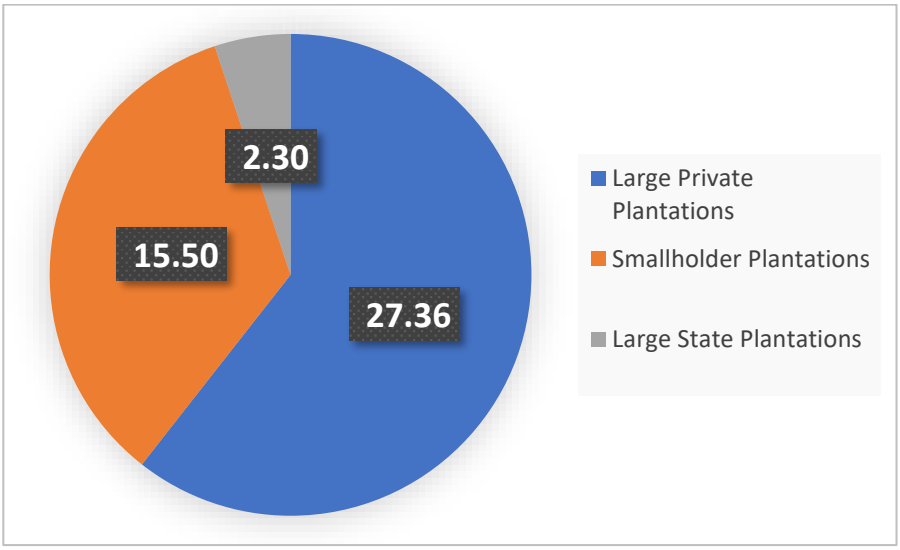


Figure 2 Oil Palm Plantations (in million tons)

During 2020, the price of CPO on the world market soared to 752 US$/mt. This price increase increased the value of exports by 16.94% compared to 2019. However, the export volume decreased by 8.55%. In the period 2021 to 2022, CPO prices rose again, causing a significant increase in export value to 29.75 billion US$ in 2022.

Based on data from PT Kharisma Pemasaran Bersama Nusantara (INACOM), a subsidiary of PTPN III (Persero), there is a tendency for stability in the direction of CPO price movements in 2023. The highest achievement was IDR13,125/kg, and the lowest was IDR9,731/kg. This CPO price is expected to influence the share prices of 26 issuers of the Large Private Plantation group on the Indonesia Stock Exchange.

Figure 3. CPO Price at Exchange Closing and Physical Market of PT Kharisma Pemasaran Bersama Nusantara 2023
Source: https://gapki.id/posisi-harga-komoditas/

Control of oil palm plantation areas is partly carried out by issuers listed on the Indonesia Stock Exchange. As of 2023, there are 26 listed companies in this group with a planted oil palm area of around 2 million hectares (this area does not include a land area that has not been planted because it is still in the process of licensing and other administrative processes). Meanwhile, the issuer's planted land has generated CPO sales of more than 7 million tons. Listed below are the issuers and their stock codes listed on the Indonesia Stock Exchange.

Table 1. Issuers of Large Private Plantation Groups Listed on the Indonesia Stock Exchange in 2023

No.	Issuer	Stock Code	IPO Date
1	PT. ANDIRA AGRO TBK	ANDI	16 August 2018
2	PT. AUSTINDO NUSANTARA JAYA TBK	ANJT	8 May 2013
3	PT. EAGLE HIGH PLANTATIONS TBK	BWPT	27 October 2009
4	PT. CITRA BORNEO UTAMA TBK	CBUT	8 November 2022
5	PT. CISADANE SAWIT RAYA TBK	CSRA	9 January 2020
6	PT. DHARMA SATYA NUSANTARA TBK	DSNG	14 June 2013
7	PT. FAP AGRI TBK	FAPA	4 January 2021
8	PT. GOZCO PLANTATIONS TBK	GZCO	15 May 2008
9	PT. JHONLIN AGRO RAYA TBK	JARR	4 August 2022

No.	Issuer	Stock Code	IPO Date
10	PT. JAYA AGRA WATTIE TBK	JAWA	30 May 2011
11	PT. PERUSAHAAN PERKEBUNAN LONDON SUMATRA INDONESIA TBK	LSIP	5 July 1996
12	PT. MAHKOTA GROUP TBK	MGRO	12 July 2018
13	PT. MENTHOBI KARYATAMA RAYA TBK	MKTR	8 November 2022
14	PT PROVIDENT INVESTASI BERSAMA TBK	PALM	8 October 2012
15	PT. PRADIKSI GUNATAMA TBK	PGUN	7 July 2020
16	PT. PINAGO UTAMA TBK	PNGO	31 August 2020
17	PT. PALMA SERASIH TBK	PSGO	25 November 2019
18	PT. SAMPOERNA AGRO TBK	SGRO	18 June 2007
19	PT. SALIM IVOMAS PRATAMA TBK	SIMP	9 June 2011
20	PT. SINAR MAS AGRO RESOURCES AND TECHNOLOGY TBK	SMAR	20 November 1992
21	PT. SAWIT SUMBERMAS SARANA TBK	SSMS	12 December 2013
22	PT. SUMBER TANI AGUNG RESOURCES TBK	STAA	10 March 2022
23	PT. TRIPUTRA AGRO PERSADA TBK	TAPG	12 April 2021
24	PT. TUNAS BARU LAMPUNG TBK	TBLA	14 February 2000
25	PT. TELADAN PRIMA AGRO TBK	TLDN	12 April 2022
26	PT. BAKRIE SUMATERA PLANTATIONS TBK	UNSP	6 March 1990

II. LITERATURE REVIEW

A. Efficient Market Hypothesis

The Efficient Market Hypothesis states that the stock price formed is a reflection of all available information, both fundamentals and insider information. In his statement, Statman (1998, p.18) said that investors cannot beat market returns systematically and stock prices are rational. What is meant by rational is that stock prices reflect fundamentals such as value at risk and do not reflect psychological aspects such as the sentiments of investors.

According to Fama (1970), the concept of an efficient market means that current stock prices reflect all available information. This means that information can come from past, present, and added information from the company itself (insider information).

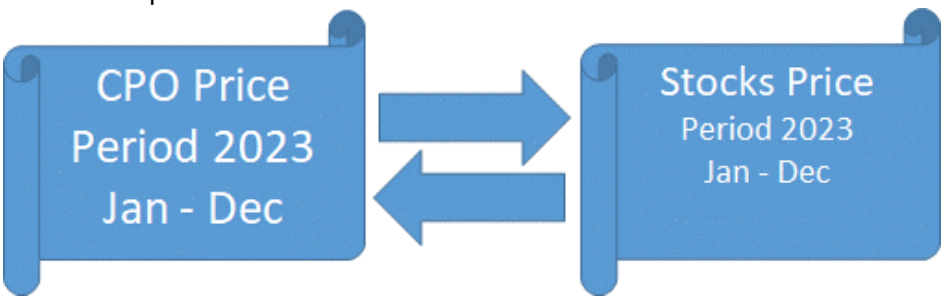
There are three assumptions of the Efficient Market Hypothesis (Shleifer, 2000, p.2), namely:

1. Investors are assumed to be rational, so they will value stocks rationally.
2. Some investors will act irrationally, but their behavior in making trading transactions is random, so their influence will eliminate each other and not affect prices.
3. Arbitrary investors who behave rationally will reduce the influence of irrational investor behavior on prices in the capital market.

Investors who act rationally will value stocks based on fundamental value, namely the net present value of future cash flows, by discounting the level of risk of the stock. When investors are aware of new information that will affect the fundamental value of the stock, they will quickly react to the information by bidding at high prices when the information is good (good news) and bidding at low prices when the information is bad (bad news). The implication is that stock prices will always reflect all available information quickly, and stock prices will move to price levels according to the new fundamental value, so it can be said that stock prices will move randomly and unpredictably.

B. Hypothesis

The hypothesis description of this research is as follows:



CPO price is the position of CPO price at the closing of the exchange and physical market published by PT Kharisma Pemasaran Bersama Nusantara (INACOM) in the period January to December 2023. The stock price is the closing price of the shares of 26 issuers of the Large Private Plantation group traded on the Indonesia Stock Exchange in the period January to December 2023.

The purpose of this study is to determine, analyze, and obtain empirical evidence regarding:

1. Is there a relationship between the price of CPO as an independent variable and the dependent variable, which consists of the stock price of issuers of the Large Private Plantation group?
2. H0: There is no effect of CPO price (independent variable) partially on the share price of issuers of the Large Private Plantation group.

H1: There is an effect of CPO price (independent variable) partially on the share price of issuers of the Large Private Plantation group.

III. METHODS

A. Research Paradigm

Research is an effort made to predict, discover, or verify the truth through appropriate academic approaches (Muslim, 2016). In conducting research, there needs to be a research paradigm; the paradigm is a fundamental way of thinking, assessing, and determining perceptions of various things related to the research we do. The paradigm of this research is positivism because it is a paradigm used to test the theory through research variables. This is in accordance with the research objectives that want to test how the capital market reacts (reflected by stock prices) to an event that occurs in society (described by the price of crude palm oil / CPO).

B. Data Collection Methods

The data collection method in this research is the documentation technique. The data collected were obtained from several sources, such as Indonesian Palm Oil Statistics published by the Central Statistics Agency (BPS-Statistics Indonesia). CPO price data is collected from the publication of GAPKI (Indonesian Palm Oil Association), which is an organization consisting of large state-owned plantations, large national and foreign private plantations, and oil palm farmers who are members of cooperatives.

Stock price data and stock price movements are obtained through the Indonesia Stock Exchange portal. The data sources used in this study are as follows:

1. Stock price data of 26 issuers of the Large Private Plantation group that can be accessed on the Indonesia Stock Exchange website or other sites that provide information on stock prices.

2. The stock price data used in the study is the last stock price/closing (closing price) in the period 2023.

C. Variables in Research

The variables in this study are divided into Variable X and Variable Y. Variable X, as an independent variable, is the price of CPO in the period January to December 2023. Variable Y, as the dependent variable, is the closing stock price of 26 issuers of the Large Private Plantation group in the same period. In other words, the dependent variable is the average stock market price at the last stock price/closing (closing price).

By using these variables, statistical tests are then carried out, namely descriptive statistics, classical assumption tests, simple linear regression analysis, and hypothesis testing.

D. Data Analysis Method

The data analysis method or technique used in this study uses the cross-section data regression method. Cross-section data is a type of data consisting of variables collected on a number of individuals or categories at a certain point in time.

1. Descriptive Statistics

Descriptive statistics is a method used to provide an overview or description of data seen from the average value, standard deviation, variance, maximum, minimum, range, sum, slope, and distribution (Ghozali, 2016). The tests used in this study are maximum value, minimum value, average, and standard deviation.

2. Classical Assumption Test

a. Normality Test

Monitoring the normality of data is the first step that must be taken in any multivariate analysis, especially for analysis with inference purposes (Ghozali, 2016). The normality test that will be used in this study is the Liliefors Test. The significance in this study is 0.05, which means that it can be categorized as normally distributed if the data has a significance of more than 0.05 and vice versa; if the data has a significance of less than 0.05, the data is categorized as not normally distributed.

Normality testing is used using the Liliefors Test. The hypothesis and criteria used are as follows:

H0: The sample comes from a population of normally distributed stock prices

H1: The sample does not come from a population of normally distributed stock prices

If the L test value < L table value, then H0 is accepted, and H1 is rejected

If the L test value> L table, then H0 is rejected, and H1 is accepted

b. Heteroscedasticity Test

The heteroscedasticity test is a regression model test tool to determine the inequality of variance from the residuals of one observation to another. If the variance of the residuals of one observation to another observation is constant, it is called homoscedasticity, and if it is different, it is called heteroscedasticity. A good regression model is one that is homoscedastic or has no heteroscedasticity problem. According to Ghozali (2013), "The heteroscedasticity test aims to determine whether, in the regression model, there is an inequality of variance from an observation residual to another observation."

The Glejser test is used to test the presence or absence of heteroscedasticity. The hypothesis and criteria in the test are as follows:

H0: There is no heteroscedasticity

H1: There is heteroscedasticity

If the P value ≤ 5%, then H0 is rejected, meaning there is heteroscedasticity
If P-value > 5%, then H0 is accepted, meaning there is no heteroscedasticity

c. Regression, Correlation, and Coefficient of Determination

Regression shows the relationship between one variable and another. The nature of the relationship can be explained by the fact that one variable is the cause (independent variable), and the other variable is the effect (dependent variable). Correlation does not show a causal relationship, but it shows the relationship between one variable and another.

If there is only one independent variable and one dependent variable in the regression equation, it is called a simple linear regression equation. Meanwhile, if there is more than one independent variable, it is called a multiple linear regression equation. In this study, there is one independent variable and one dependent variable, so this study produces a simple linear regression equation.

Correlation is an analytical technique that is included in one of the relationship measurement techniques. Relationship measurement is a general term that refers to a group of techniques in bivariate statistics used to measure the strength of the relationship between two variables. This study also aims to determine the magnitude of the influence of the CPO price variable (as the independent variable) on stock prices (as the dependent variable).

The coefficient of determination (R square) measures the ability of the model to explain the variation in the independent variable on the dependent variable, or it can also be said to be the proportion of the influence of the independent variable on the dependent variable. The coefficient of determination ranges from 0 to 1. A small R square value indicates that the ability of the independent variable to explain the dependent variable is very limited. An R square value close to 1 means that the independent variables provide almost all the information needed to predict variations in the dependent variable.

IV. RESULTS

A. Descriptive Statistics

Descriptive statistics is a method used to provide an overview or description of data seen from the average value, standard deviation, variance, maximum, minimum, range, sum, skewness, and distribution (Ghozali, 2016). The tests used in this study are maximum value, minimum value, average, and standard deviation.
Descriptive statistics for CPO price data and average stock market prices from January 2023 to December 2023 are as follows:

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CPO Price	197	9,731	13,125	11,199	679
Share Price	197	895	1,026	977	34

Based on the descriptive statistical test results in Table 1, N is the number of valid variable data. The interpretation of the independent variable (X) has a minimum value of 9,731 and a maximum of 13,125, with an average value of 11,199 and a standard deviation of 679. The results can be identified as good.

As the dependent variable (Y) is the average stock market price, it is known that the minimum value, maximum value, and average value are compared with the standard deviation. With an

average value of 977, greater than the standard deviation of 34, it can be identified that the results are good.

B. Classical Assumption Test

1. Normality Test

This normality test is carried out on CPO prices. To find out the normality level of the data distribution, the data obtained needs to be tested for normality. The normality test is carried out with the Liliefors test with a significance level of 0.05 or 5%. By using a significance value of 5%, if the test results show a significance value of <5% or <0.05, then the data is not normally distributed. If the significance value shows a number> 5% or> 0.05, then the data is normally distributed.

The formula used in the Liliefors Test is as follows:

$$Z = \frac{Xi - \bar{\bar{X}}}{S} \qquad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(1)$$

Liliefors Test Hypothesis:

H0: The sample comes from a population of normally distributed stock prices

H1: The sample does not come from a population of normally distributed stock prices

If the L test value < L table value, then H0 is accepted, and H1 is rejected

If the L test value> L table value, then H0 is rejected, and H1 is accepted

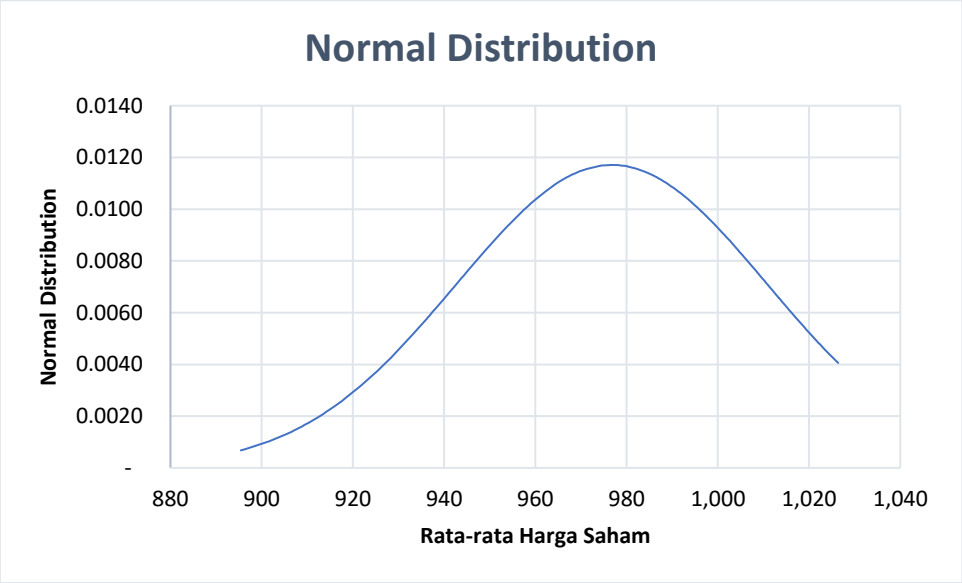


Figure 4. Normality Test Results Distribution Data Independent Variable Stock Price

The results of the data distribution normality test show that the dependent variable comes from a normally distributed population because the L test value is smaller than the L table. The Z value as a result of the Lilliefors test is as follows:

Table 3. Normal Distribution - Lilliefors Test

	Z
L test Value	0.01171
L table Value	0.06312

2. Heteroscedasticity Test

The heteroscedasticity test uses the following hypothesis and test criteria:

H0: There is no heteroscedasticity
H1: There is heteroscedasticity
1. If the Significance value > 0.05 means there are no symptoms of heteroscedasticity
2. If the Significance value < 0.05, it means that there are symptoms of heteroscedasticity
Test heteroscedasticity by calculating the P-value. With the results below, it can be concluded that the P value is 0.13691, which means it is greater than α 5%, so there is no heteroscedasticity.

Table 4. Heteroscedasticity Test - Glejser Test

	P - Value
Intercept	0.75085
CPO Price (X)	0.13691

Regression, Correlation, and Coefficient of Determination
A correlation test is carried out before getting the regression equation. The test criteria are as follows:
If R Count> R Table, then there is a relationship between variables
If R Count < R Table, then there is no relationship between variables
The results obtained are as follows:

Table 5. Correlation Test

	CPO Price (X)	Share Price (Y)
CPO Price (X)	1	
Share Price (Y)	0.28471	1

With the results of the R Count of 0.28471 greater than the R Table of 0.13984 at α 0.05, there is a relationship between CPO prices and stock prices.
The results of the influence test between variables using the simple linear regression method are attached in the table below:

Table 6
Simple Linear Regression

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.28471
R Square	0.08106
Adjusted R Square	0.07635
Standard Error	32.82801
Observations	197

ANOVA

	df	SS	MS	F	Significance F
Regression	1	18537.16041	18537.16041	17.20102	0.00005
Residual	195	210147.21358	1077.67802		
Total	196	228684.37398			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	816.43321	38.72769	21.08138	0.00000	740.05432	892.81211	740.05432	892.81211
CPO Price (X)	0.01432	0.00345	4.14741	0.00005	0.00751	0.02112	0.00751	0.02112

The interpretation of these results says that R Square of 0.08106 means that the variation in the stock price variable can be explained by 8% by the CPO price. With a Significance F value of 0.00005 smaller than α 0.05, it means that the independent variable CPO price has an effect on the dependent variable stock price. The positive coefficient value means that when the CPO price increases, the stock price increases, and vice versa.

The result of the simple linear regression equation becomes Y = 816.43321 + 0.01432X

V. DISCUSSION

According to R. Porwati (2024), CPO prices have a significant effect partially on the share price of companies in the oil palm plantation sub-sector. CPO price variables, inflation rate, and rupiah exchange rate together (simultaneously) have a significant effect on the share price of companies in the oil palm plantation sub-sector. In line with the selling price of CPO in the commodity market, it has an effect on company profits. If the world CPO price increases, it will positively impact the company's share price, which will also rise. Companies that can print profits attract investors to buy company shares.

According to Sunaryo (2020), CPO prices positively and significantly affect stock prices. Buying action on the shares of issuers in the agricultural sector illustrates an increase in demand for shares, thus impacting the agricultural sector's share price.

Two previous studies align with this study's results, which show that CPO prices have a relationship with stock prices. CPO prices positively affect the share prices of issuers of the Large Private Plantation Group listed on the Indonesia Stock Exchange..

VI. CONCLUSION

The results of this test answer the purpose of this study, which is that there is a relationship between CPO prices as an independent variable and the dependent variable consisting of the stock prices of issuers of the Large Private Plantation group.

The H0 hypothesis, which states that there is no effect of CPO prices (independent variable) partially on the stock prices of issuers of the Large Private Plantation group, is rejected. Meanwhile, the H1 hypothesis, which states that CPO prices (independent variable) partially affect the share prices of issuers of the Large Private Plantation group, is accepted. In other words, CPO prices (independent variable) partially affect the share prices of issuers of Large Private Plantations, totaling 26 issuers during the period 2023.

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