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Macroeconomic and Commodity Prices Determinant of Agricultural Sector Stock Price Index in Indonesia

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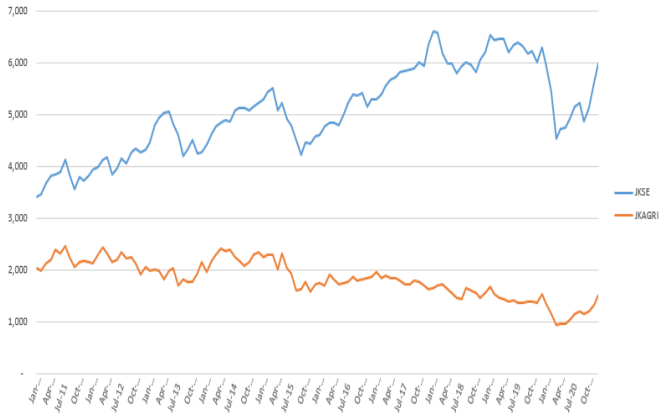
Abstract:- This study aims to examine and analyze the contribution and shock of , interest rates, inflation rates, foreign exchange rates (USD), world oil prices, and CPO prices to the stock price index of the agricultural sector on the Indonesia Stock Exchange. The data used is monthly time series data with a period starting from January 2011 to December 2020. The data processing and analysis method uses the Vector Error Correction Model (VECM). The results showed that in the short term period currency exchange and CPO price variables has significant effect to the stock price index of the agricultural sector. In the long term period currency exchange, oil price and CPO price variables has significant effect to the stock price index of the agricultural sector. Meanwhile, inflation and interest rate variables have not significant effect. From the results of the response and variance decomposition of CPO prices are the main variables that provide the largest contribution to the stock price index of the agricultural sector in Indonesia. The results of the forecasting test with the MAPE value on the agricultural sector stock price index variable of 7.7%, it can be concluded that the forecasting results are accurate for the next 4 month period.

Keywords:- *Macroeconomics Variable, Commodity Price, Indonesia Stock Exchange Agriculture Index, VECM.*

I. INTRODUCTION

Gemah ripah loh jinawi, a motto that describes the abundance of Indonesia's natural resources, specifically in agricultural sector.

Central Bureau of Statistics Republic of Indonesia stated that until August 2020, employment in the agricultural sector was up to 38.3 million people, 29% of the 128 million people who worked, the trade sector was 19% and the manufacturing industry was 13%. The agricultural sector also able to contribute and increase national economic growth. In 2016 the GDP of this sector was Rp. 936.3 trillion, and continues to increase to Rp. 970.2 trillion in 2017, and Rp. 1,005,6 trillion in 2018, Rp. 1038.9 trillion in 2019 and Rp. 1,060.8 trillion in 2020 (Central Bureau of Statistics, 2020). The agricultural sector is able to support the economy from 2016 to 2020, even during economic recession due to the Covid-19 pandemic. However, this is different with the movement of the agricultural sector stock price index (JKAGRI) from 2016 - 2020 which tends to decrease and is not in line with the JKSE which shows an increase.



Source: Indonesia Stock Exchange 2020 (processed)

Fig 1 JKSE Graph and Agricultural Stock Price Index 2016 – 2020

Figure 1 shows that there are problems with the Agricultural Sector Index where there is a downward trend from January 2016 to December 2020, while the JKSE tends to fluctuate and increase in the same period.

Along with the increase in the number of Single Investor Identification (SID) investors on the stock exchange, from 2016 as many as 894 thousand SID to 3.87 million SID at the end of 2020 (IDX, 2020), the need for more detailed information to the public will also increase. One of them is obtained from the stock price index as a reflection of stock price movements. Agricultural sector stock price index is an illustration of the performance of stocks that have been categorized in the agricultural sector. An increase in the index will describe an increase in the performance of the company's condition, and vice versa.

In addition to being influenced by fundamental factors of the company's internal performance, stock returns are also influenced by external factors, including non-economic macro factors such as the impact of the corona virus pandemic, war, and politics, or macroeconomic factors such as economic policy, rising interest rates, inflation, exchange rates, people's income, the money supply, and others.

This study will analyze the effect of macroeconomic variables (interest rates, inflation, exchange rates, world oil prices, and CPO prices) on the stock index of the agricultural sector. This study will also model and forecast stocks in the agricultural sector using the VECM method for the next four periods.

II. LITERATURE REVIEW

Ross (1976) in Arbitrage Pricing Theory states that stock returns are influenced by macroeconomic indicators. This theory predicts the relationship between portfolio returns or single asset returns through a linear combination of multiple macroeconomic variables. Anantayoga et. al (2014) assessed that APT can be more flexible than the Capital Asset Pricing Model (CAPM) because the modeling can use various macroeconomic factors to calculate the risk premium in an asset, or in forming an asset valuation model. The formed macroeconomic factors can change over time, as well as the inherent risk premium.

The concept of an efficient market (Efficient Market Hypothesis) by Fama (1970) said to be efficient if no one, both individual investors and institutional investors, will be able to obtain abnormal returns after adjusting for risk, using existing trading strategies. The prices formed in the market are a reflection of the available information.

The interest rate is a measure of the investment profits that can be obtained by the owners of capital and is also a measure of the cost of capital that must be incurred by the company for the use of funds from the owners of capital (Suseno TW Hg, 1990).

Inflation is a continuous increase in the prices of most goods and services. "When the prices of most goods and services are rising over time, the economy is said to be experiencing inflation" (Abel et. al, 2011:6). Meanwhile, according to Boediono (2005:155), inflation is defined as the tendency of prices to rise continuously.

Currency exchange rate is the exchange rate at which two different currencies can be exchanged (Abel et. al 2011:474). It is the US Dollar which has been the unit of currency used in international trade.

The foreign exchange rate (USD) affect the stock price index can be explained that the depreciation or appreciation of the foreign exchange rate affects the company's sales or costs, especially for companies that are export and import oriented. In the theory of supply (supply) and demand (demand) describes the interaction between the seller of resources and buyers of resources. This theory explains the interaction between the existence or availability of a product and the demand for that product on the price of the product.

Oil is a commodity that is quite important for the economy of a country. The volatile development of world crude oil from time to time during the crisis in America and Europe also put pressure on stock trading on the stock market. Rising world crude oil prices can affect stock prices in various sectors. Therefore, the movement of world oil prices will also be responded to by investors in the capital market which will ultimately have an impact on stock trading (Prayitno, 2011: 3).

According to Malini & Jais (2014) the relationship between Crude Palm Oil and stock prices is related to the pattern of CPO consumption and production in one country. The production pattern depends on how many companies included in the stock market use CPO as the main ingredient for their production. In Indonesia, most companies included in the agricultural sector category are issuers of CPO-producing palm oil plantations, so that the increase and decrease in CPO prices brings a lot of influence to stock price movements.

The hypothesis in this study are as follows:

H1: in the long term interest rates have a negative effect on the stock price index of the agricultural sector.
H2: in the short term interest rates have a negative effect on the stock price index of the agricultural sector.
H3: In the long term inflation has a negative effect on the stock index of the agricultural sector.
H4 : In the short term inflation has an effect on the stock index of the agricultural sector.
H5 : in the long term the exchange rate has a negative effect on the stock index of the agricultural sector.
H6 : in the short term the exchange rate has a negative effect on the stock index of the agricultural sector.
H7 : in the long term world oil prices have a negative effect on the stock index of the agricultural sector.
H8 : in the short term world oil prices have a negative effect on the stock index of the agricultural sector.
H9 : in the long term CPO price has a positive effect on the stock index of the agricultural sector.
H10: in the short term CPO price has a positive effect on the stock index of the agricultural sector.

III. RESEARCH METHODOLOGY

The type of research used is quantitative research based on time series data using secondary data from books, literature, scientific journals, as well as data sources published by several agencies that have relevance to the research theme. The modeling used in this study is VECM (Vector Error Correction Model) using the Eviews 12 program as data processing.

The population used in this study is the Agricultural Stock Price Index listed on the Indonesia Stock Exchange for the period 2011 to 2020, 25 listed companies. In this study using saturated sampling or all the population is a sample with 120 monthly data.

Agricultural Sector Stock Price Index data was downloaded from the website www.idx.co.id. Markoeconomic variable data, interest rates (IRF), inflation (INF), exchange rates (EXR) from www.bi.go.id, world oil prices (OIL) and CPO prices downloaded from www.investing.com.

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IV. RESULTS AND DISCUSSION

Descriptive Statistical Research, a general description of research data for the period January 2011 to December 2020 :

Variable	UOM	N	Mean	Med	Max	Min	Std. Dev.
Agricultural Sector Index	Poin	120	1,825.87	1,807.50	2,456.00	928.00	366.36
CPO Price	MYR/ Ton	120	2,576.69	2,463.50	3,891.00	1,865.00	442.08
Exchange Rate	Rp./ USD	120	12,363	13,293	16,300	8,495	2,062
Inflation	%	120	4.50	4.06	8.79	1.32	1.84
Interest rate	%	120	5.94	5.75	7.75	3.75	1.18
Oil Price	USD/ Barrel	120	68.56	60.00	114.00	19.00	24.09

Table 1. Descriptive Statistics

The Agricultural Sector Index has an average value of Rp. 1,815.87 with a maximum value of Rp. 2,456.00 in July 2011 with a standard deviation of Rp. 266.36. The high index value during that period was a blessing while hot money was a transfer of funds from foreign investors. This investment is the impact of the financial crisis situation in the European Union (EU) because an issue of an acute budget deficit and the debt crisis in Greece.

The peak of the decline occurred when the Covid-19 pandemic hit in March 2020, the lowest value of the agricultural sector index was Rp. 928.46. International Monetary Fund (IMF) stated that economic downturn due to the Covid-19 pandemic crisis is worse than financial crisis in 1998 and 2008.

The World Bank also provides projections on the impact of Covid-19 on the global economy, in which it is predicted that the global economy will decline by -5.2% which will cause 70-100 million people around the world to experience extreme poverty. Seeing this, it can be concluded that this pandemic crisis can cause a massive recession in all corners of the world, which can have many negative effects on all levels of society.

The interest rate has an average value of 5.94% with a maximum value of 7.75% which occurred in November 2014 – January 2015. While the lowest value of 3.75% occurred in November – December 2020. The high interest rate interest rates in November 2014 – January 2015 because Bank Indonesia maintained high interest rates to respond to expectations of high inflation. In addition, the Board of Governors sees that there are still several risks that could put pressure on exchange rate stability, such as unstable world oil prices, global imbalances and the ongoing tight monetary cycle in the global economy. This is also expected to maintain and increase banking liquidity.

The lowest interest rate in the November – December 2020 period was 3.75% due to the consideration of the low inflation forecast, maintained external stability, and as a follow-up step to accelerate the national economic recovery.

Inflation has an average value of 4.5% with a maximum value of 8.79% which occurred in August 2013, and the lowest value of 1.32% occurred in August 2020. The high inflation in August 2013 was triggered by an increase in fuel oil) dated June 22, 2013 where the premium price increased from Rp.4,500/liter to Rp.6,500/liter and the price of diesel from Rp.4,500/liter to Rp.5,500/liter. The domino effects of rising fuel prices that are felt indirectly include transportation costs, production costs to rising commodity prices.

Meanwhile, the low inflation rate in August 2020 was below the inflation target range set by the government, which was between 2% to 4%. The low inflation in 2020 is in line with the downward trend in demand and purchasing power due to the Covid-19 pandemic. In addition, the public tends to hold back on demand for credit and investment, and to increase the saving rate so that there is not much money in circulation. This is the impact of a decline in demand and the circulation of money stemming from a decline in economic activity due to Covid-19.

The rupiah exchange rate has an average value of Rp.12,363/USD with a maximum value of Rp.16,300/USD which occurred in March 2020. While the lowest value of Rp.8,495/USD occurred in July 2011. The weakening of the exchange rate rupiah caused by external and internal factors. This external factor cannot be separated from the increase in demand for US dollars as a response to economic uncertainty and global panic affected by the Covid-19 pandemic.

From internal factor, the weakening was driven by market disappointment with Finance Minister Sri Mulyani statement about poor expectations of the Indonesian economy due to Covid-19 which caused economic growth to grow negatively.

The strong exchange rate of the rupiah against the USD in July 2011 was due to the positive potential to invest in Indonesia when viewed from the fairly good economic growth so that foreign investors were increasingly aggressive in placing their funds in the domestic capital market. The increasing number of foreign funds entering Indonesia strengthens the position of the balance of payments and increases the demand for the rupiah.

Oil price (CPI) has an average value of USD.68.56/Barrel with a maximum value of USD.114.00/Barrel in April 2011.

While the lowest value of USD.19.00/Barrel occurred in April 2020.

Oil price fluctuations are caused by supply and demand factors as well as geopolitical factors. The supply and demand factor is due to the increasing demand from big countries such as America and China, while in terms of supply, the world oil producing countries (OPEC) did not increase their production to keep up with the increase in demand. Meanwhile, geopolitical factors are caused by security disturbances in Arab and African countries which are the largest oil producing countries. This situation raises concerns about the disruption of oil supply to the world market.

For the Asia Pacific region, the increase in oil prices was mainly due to the high demand for oil from China and India. In addition, after the earthquake and tsunami, Japan's demand for crude oil has increased to meet the need for electricity and construction development.

The price of palm oil (CPO) has an average value of MYR. 2,575.69/Ton with a maximum value of MYR. 3891.00/Ton which occurred in December 2020. In that month the CPO price managed to print the highest price in the last seven years. Limited stock of fresh fruit bunches (FFB) production in oil palm plantations in Indonesia and Malaysia as a result of La Nina. Another sentiment is that production and garden maintenance activities are not optimal due to regional restrictions since the Covid-19 pandemic has become a sentiment that has driven CPO prices to move up. Another factor that supports the increase in CPO prices is the surge in soybean prices. The price of this commodity has increased due to the anticipation of the dwindling supply of palm oil from Indonesia and Malaysia this year.

While the lowest value is MYR. 1865,00/Ton occurred in June 2019, which was more due to competition from other alternative vegetable oils. The palm oil industry will compete with soybean oil especially for the Indian market. Overall, the price of CPO fluctuated throughout the research period.

- *Inferential Statistics Research,*

The test method used to test the stationarity of the data in this study is the ADF

(Augmented Dickey Fuller) test using a 5% significance level. Stationarity test on the variables shows that all variables are not stationary at the level level but are stationary at the first difference level.

Determination of the optimal lag used in this study is based on the shortest lag using the Akaike Information Criterion (AIC) criteria. The selection of this lag as the optimal lag because based on the results of Eviews that the highest number of asterisks (*) and based on the smallest AIC criteria are in lag 1.

The VAR Stability Test is carried out by calculating the roots of the polynomial function, the VAR model is said to be stable, if all the roots of the polynomial function are in the unit circle or if the absolute value (Modulus) is less than one so that the IRF and VD performed are considered valid. .

Cointegration test results show that there is one cointegrated equation with Trace Statistics greater than Critical Value. The results of the cointegration test can be seen in Table 4. Through the cointegration test, it can be seen that the right method to analyze in this study is VECM.

The VECM estimation results explain that in the short term there are two variables that have an effect on the 5% significant level of the Agricultural Sector Stock Index, namely the exchange rate variable and CPO price, while in the long term there are three variables that influence the exchange rate, oil price and CPO price, with the calculation criteria T Statistics > t-table.

Table 2. Short-Term and Long-Term VECM Test Results

Variable	t-table	Short Term	Long Term
CointEq1		[1.42153]	
CPO	1.658330	**[1.76490]***	**[2.82055]***
EXR	1.658330	**[-1.76637]***	**[4.73158]***
INF	1.658330	[-0.53254]	[1.28241]
IRF	1.658330	[-0.38776]	[0.08541]
OIL	1.658330	[-0.29331]	**[5.39454]***

Based on the results of the IRF test (Table 3), it can be seen that the shocks of all independent variables of one standard deviation have not had a major influence on the movement of the stock price index of the agricultural sector. The agricultural sector stock price index shock of one standard deviation was responded positively by the agricultural sector stock price index itself, which began to show an upward trend in the 3rd period and reached stability in the 10th period. This means that the performance of companies in the agricultural sector itself is a significant factor in influencing the share price index of the agricultural sector positively. If the performance of the agricultural sector stock companies is getting better, the value of the agricultural sector stock price index will be even greater.

Table 3. Impulse Response Function Test Results

Response of JKAGRI:						
Period	**JKAGRI**	**CPO**	**EXR**	**INF**	**IRF**	**OIL**
1	121.93	0.00	0.00	0.00	0.00	0.00
2	105.53	20.99	-18.19	-5.26	-3.92	3.48
3	114.93	19.23	-12.80	-7.00	-6.79	8.80
4	114.56	20.40	-14.72	-7.68	-6.44	11.69
5	116.25	21.04	-14.15	-7.71	-6.06	13.60
6	116.85	21.55	-14.23	-7.49	-5.64	15.15
7	117.56	21.93	-14.08	-7.25	-5.26	16.35

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8	118.04	22.24	-14.03	-7.02	-4.95	17.30
9	118.45	22.49	-13.96	-6.84	-4.69	18.06
10	118.77	22.69	-13.91	-6.68	-4.48	18.66

Based on Table 4, in the initial period, the variable share price index of the agricultural sector (JKAGRI) provided the largest contribution, which was 100 percent. This shows that in the first period JKAGRI was affected by the shock of JKAGRI itself by 100 percent. Meanwhile, in the first period the variables CPO, EXR, INF, IRF and OIL have not had an effect on JKAGRI. However, in the next period, the influence of JKAGRI on the variable itself decreases. And in the second period all the variables start to show . At the end of the observation period, the effect of JKAGRI on itself was reduced to 94.02 percent, while other variables other than JKAGRI which had the greatest influence on JKAGRI were CPO, EXR and OIL.

Table 4. Variance Decomposition Test Results

Variance Decomposition of JKAGRI:							
Period	**S.E.**	**JKAGRI**	**CPO**	**EXR**	**INF**	**IRF**	**OIL**
1	121.93	100.00	0.00	0.00	0.00	0.00	0.00
2	163.80	96.92	1.64	1.23	0.10	0.06	0.05
3	201.86	96.24	1.99	1.21	0.19	0.15	0.22
4	233.97	95.61	2.24	1.30	0.25	0.19	0.41
5	263.02	95.19	2.41	1.32	0.28	0.20	0.59
6	289.51	94.86	2.55	1.33	0.30	0.20	0.76
7	314.11	94.59	2.65	1.33	0.31	0.20	0.92
8	337.14	94.37	2.74	1.33	0.31	0.20	1.06
9	358.87	94.18	2.81	1.32	0.31	0.19	1.19
10	379.50	94.02	2.87	1.32	0.31	0.18	1.31

Based on JKAGRI's prediction table in January 2021, Rp. 1,553,- and experienced a correction until April 2021 which reached Rp. 1,542,-. From the results of forecasting calculations, the MAPE value is 7.7% so that the forecasting results are categorized as very accurate forecasts.

Table 5. MAPE . Test Results

Period	**Forcast**	**Actual**	**Presentase Erorr Absolut (%)**
Jan-21	1,553	1,381	11.1
Feb-21	1,549	1,438	7.2
Mar-21	1,545	1,388	10.2
Apr-21	1,542	1,577	2.3
MAPE			**7.7**

- *The Effect of Interest Rates on the Agricultural Sector Stock Price Index,*

According to the test results, interest rates have no effect on the agricultural sector stock index in the long run. This is because the level of return provided by the stock index of the agricultural sector is no less competitive with the increase in interest rates, which is the central bank's instrument in controlling the money supply and controlling inflation. Although interest rates rise, investors have a tendency to invest their money in the capital market, resulting in an increase in the amount of capitalization in the capital market. An increase in the number of requests for shares in the capital market will increase the value of shares and ultimately increase the index, including the index of the agricultural sector. Thus, hypothesis 1 which states that interest rates have a negative effect on the agricultural stock price index is rejected.

Likewise, in the short-term research results, there is no effect of interest rates on the stock index of the agricultural sector. Thus, hypothesis 2 which states that in the short term interest rates have a negative effect on the stock price index of the agricultural sector is also rejected. The results of this study are in line with those of Priyambudi and Thamrin (2020) as well as rejecting the research of Aggarwal and Saqib (2017), and Alshihab (2021).

- *The Effect of Inflation on the Agricultural Sector Stock Price Index,*

From the test results obtained that inflation has no effect on the agricultural sector stock index in the long term. The agricultural sector with the largest product is palm oil with its derivative products such as cooking oil, margarine and so on, then other products are sugar, cocoa and tea. Almost all of these products are basic needs of the community, so that even if there is an increase in prices due to inflation, people will still buy these products. In addition, in Indonesia, the cause of inflation from the food sector is still high and contributes greatly to total inflation, for example during the celebration of religious holidays, especially before Eid al-Fitr, inflation caused by rising food prices is the biggest cause of total inflation. Thus, inflation can be seen by capital market participants as describing an increase in income for companies engaged in the agricultural sector. With an increase in income, it will increase profits for the company, so that it has a positive effect on company shares and subsequently on the stock index of the agricultural sector. Thus, hypothesis 3 which states that in the long-term inflation has a negative effect on the stock index of the agricultural sector is rejected.

In the short-term research results, there is no effect of inflation on the stock index of the agricultural sector. Thus, hypothesis 4 which states that in the short-term inflation has a

negative effect on the stock price index of the agricultural sector is also rejected. The results of this study are in line with the research Arintoko (2021) and reject the results of Hosseini, Ahmad, and Lai (2011).

- *The effect of the exchange rate on the stock index of the agricultural sector*,

In the long term, the value has a positive and significant effect on the stock index of the agricultural sector. If the rupiah exchange rate against the USD increases or there is a strengthening against the USD value, there will also be an increase in the agricultural sector stock index, and vice versa.

Most of the products of the agricultural sector are palm oil (CPO) and its derivative products such as olein, stearin and so on, cocoa and rubber are exported commodities so that the increase in the value of the USD currency will increase the company's income. Likewise, the decline in the exchange rate will be an advantage that boosts the competitiveness of Indonesian companies in the price of commodity products because it will be cheaper than countries producing the same product as Malaysia for palm oil products and Brazil for cocoa products.

In addition to export sales factors, the largest agricultural sector products such as CPO and cocoa are commodity goods whose prices are listed on international commodity exchanges. This international price is used as a reference for producers in determining the selling price of their products, so that even if they are sold domestically at international standard prices using foreign currencies (USD), they will be affected by fluctuations in the foreign exchange rate (USD).

The strengthening of the USD currency and the weakening of the rupiah currency will have an impact on increasing the number of export sales and will also increase the company's income. So that it will also increase the profits of companies in the agricultural sector and ultimately increase the stock value and index of the agricultural sector.

Thus, hypothesis 5 which states that in the long term the exchange rate has a negative effect on the stock index of the agricultural sector is rejected.

On the other hand, for the short-term test results, the exchange rate has a negative and significant effect on the agricultural sector stock index. This is in accordance with the initial hypothesis analysis. So that hypothesis 6 which states that in the short term the exchange rate has a negative effect on the stock index of the agricultural sector is accepted.

The results of this study are in line with those of Priyambudi and Thamrin (2020), Thenmozhi and Srinivasan (2016), Alshihab (2021) and rejecting the research results of Aggarwal and Saqib (2017).

- *The Effect of World Oil Prices on the Agricultural Sector Stock Price Index.*

Long-term test results show that world oil prices have a positive and significant impact on the agricultural sector stock index.

In general, this indicates that if world oil prices rise, the agricultural sector index will rise and vice versa if oil prices fall, the agricultural sector index will also fall. As the largest energy source, petroleum is very strong in describing the real condition of the world economy. In the research period, namely in the first half of 2020 there was a crisis due to a pandemic which continued into the world economic crisis.

The crisis reduced economic activity and production, which meant reduced company activities, this is very strongly illustrated in the trend of fluctuations in world oil prices. Oil price fluctuations caused by declining demand are interpreted by investors as a picture of a declining economy, thus affecting the psychology of capital market investors. On the other hand, an increase in world oil prices will stimulate the economy due to aggregate demand due to increased welfare. With a high level of community welfare, people tend to invest in stock instruments.

Thus, hypothesis 7 which states that in the long-term world oil prices have a negative effect on the stock index of the agricultural sector is rejected.

In the short term, the results of the study show that world oil prices have no effect on the stock index of the agricultural sector. This is more because in the short term, the company still has sufficient oil stocks to meet its production process. Thus, hypothesis 8 in the short-term world oil prices have a negative effect on the stock index of the agricultural sector is rejected.

The results of this study are in line with the research of Thenmozhi and Srinivasan (2016), Alshihab (2021), Hosseini, Ahmad, and Lai (2011).

- *The effect of CPO Prices on the Agricultural Sector Stock Index*

On the other hand, when there is an increase in world oil prices due to increased demand, it can also be interpreted as an increase in economic activity. The relationship of changes in world oil prices to the stock price index of the agricultural sector is caused by the substitution relationship of the main product of the agricultural sector from companies listed on the Indonesia Stock Exchange, namely Crude Palm Oil (CPO). When the demand for fuel oil soars and there is a price spike, the market demand for CPO which is used as bio fuel also increases and vice versa when there is a decrease in the demand for world fuel oil, the demand for CPO also decreases. The increase and decrease in demand also affects prices which in turn affect the income of agricultural sector companies and the value of company shares.

The fluctuations in the stock price index of the agricultural sector are largely determined by the stock price movements of plantation issuers, all of which are engaged in the oil palm plantation business. The profit of companies engaged in the oil palm plantation business is also determined by the price of palm oil (CPO) in the world market where the higher the price of CPO, the company's profits will increase so that more investors want to buy the company's shares which results in an increase in share prices.

According to Malini and Jais (2014) the relationship between Crude Palm Oil and stock prices is related to the pattern of CPO consumption and production in one country.

The production pattern depends on how many companies included in the stock market use CPO as the main ingredient for their production. In Indonesia, most companies included in the agricultural sector category are issuers of CPO-producing palm oil plantations, so that the increase and decrease in CPO prices brings a lot of influence to stock price movements. According to their research, any shocks to the CPO price increase will have a significant negative effect on Islamic stock prices in Indonesia, either before or after the crisis period. This is different from the results found by Nordin, Nordin & Ismail (2014), the results of their research show that the price of CPO has a positive influence, in the long and short term. CPO prices have a positive effect on the agricultural stock price index. This result is also in line with the results of research by Arintoko (2021) and rejects the results of Puspitasari, Syaukat, and Irawan (2019) research. Hypothesis 9 and hypothesis 10 which state that CPO commodity prices have a positive effect on the agricultural stock price index are accepted.

V. CONCLUSION

- There is a short-term and long-term relationship between the Agricultural Sector Stock Index and Interest Rates, Inflation, Exchange Rates, World Oil Prices, and CPO Prices.
- From the results of long-term analysis that the exchange rate, world oil prices, and CPO prices have a positive and significant effect on the movement of the stock price index of the agricultural sector. This means that if the variable increases, the stock index of the agricultural sector will also increase and vice versa, if the variable decreases, the stock index of the agricultural sector will also decrease. Meanwhile, interest rate and inflation variables have no effect.
- The results of the short-term research show that the exchange rate, , and CPO prices have a positive and significant effect on the movement of the stock price index of the agricultural sector.
- Based on the results of the IRF test, it can be seen that the shock of all independent variables is one standard deviation which has a major influence on the movement of the agricultural sector stock price index that occurred in the second period. In the next period, in the third to the tenth period, value stability begins to reach. This means that the performance of companies in the agricultural sector itself becomes a significant factor in influencing the share price index of the agricultural sector positively. If the better the performance of agricultural sector stock companies, the value of the agricultural sector stock price index will be even greater.
- Based on the results of variance decomposition, the fundamental condition of the agricultural sector companies itself makes the largest contribution to the stock price index of the agricultural sector, followed by the variables of CPO prices, exchange rates, and world oil prices.
- From the forecasting results 4 months after the research method, it shows the MAPE value of 7.7%, which means this research is able to accurately predict the stock index value of the agricultural sector in the future

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