Analyzing Stock Market Reaction: The Impact of Crude Palm Oil (CPO) Export Ban in the Plantation Sub-Sector

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Abstract. Ban on Crude Palm Oil (CPO) exports caused a decline in the movement of the Composite Stock Price Index (CSPI). The purpose of this research is to test and analyze the stock market's reaction before and after the ban. The research was conducted on companies listed in the Plantation Sub-Sector of the Indonesia Stock Exchange (IDX). The observation period for this study is 10 days before and after the CPO export ban event. The research used purposive sampling, with 22 samples that meet the research criteria. The analysis method used in this research is the Wilcoxon Sign Rank Test. Based on the analysis results, it is shown that there is a significant difference in abnormal return and no significant difference in trading volume activity. This indicates that the stock market reacts to stock prices but does not react to trading volume before and after the CPO export ban event.

Keywords: Crude Palm Oil, Event Study, Stock Market Reaction, Abnormal Return, Trading Volume Activity

1 Introduction

Investment is an activity of allocating capital into specific assets with the aim of increasing the value of those assets over time. Investors expect their investments to appreciate in value and generate profits. One of the avenues for investment is the capital market.

The capital market provides various investment instruments ranging from debt-to-equity ownership. It serves as an alternative financing option for companies as it involves the public directly in financing their activities. One popular form of investment is stocks. Stocks represent ownership in a company and are traded on the stock exchange. The Indonesia Stock Exchange has listed 864 companies that have issued stocks.

The stock market involves the study of events that analyze the market's reaction to published information. These events can include political, social, economic, government policy, and other occurrences. Market reactions to these events can result in profits but also carry risks. Investors need to be vigilant and sensitive to information in order to make informed decisions and achieve gains. Good news can have a positive impact, causing stock prices to rise, while bad news can lead to a decline in stock prices.

On April 22, 2022, there was information regarding the outcome of a meeting held at the Istana Merdeka, discussing the fulfilment of basic needs, particularly related to the availability of cooking oil in Indonesia. During the meeting, President Joko Widodo stated, “In that meeting, the government has decided to ban the export of raw materials for cooking oil and cooking oil itself, starting Thursday, April 28, 2022, until a later determined time”[1].

The policy of banning the export of Crude Palm Oil (CPO) is regulated in the Minister of Trade of

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the Republic of Indonesia Regulation No. 22 of 2022 concerning the “Temporary Ban on the Export of Crude Palm Oil, Refined, Bleached and Deodorized Palm Oil, Refined, Bleached and Deodorized Palm Olein, and Used Cooking Oil.” CPO is a raw palm oil and is one of the commonly consumed vegetable oils. The policy to ban CPO exports is driven by the scarcity and high price of cooking oil, which is a concern. The government intends to alleviate the cooking oil issue by urging palm oil producers to prioritize domestic needs, considering Indonesia is the world's largest oil producer. Following the event of the CPO export ban, on Monday, April 25, 2022, the Composite Stock Price Index (CSPI) decreased by 0.13% to the level of 7,215.979. During the first trading session, CSPI experienced a significant decline of up to 1%, reaching its lowest level of 7,121.86 at around 09:00 AM WIB. However, it recovered during the second trading session [2].

CSPI represents the composite stock price index of all listed companies on the Indonesia Stock Exchange. This phenomenon can serve as evidence of the stock market's reaction after the information is published.

According to Jogiyanto, “If the market reacts quickly and accurately to reach a new equilibrium price that fully reflects the available information, then such a market condition is called an efficient market” [3]. An efficient market is a market where security prices can be obtained rapidly and reflect the available information.

Testing the information content is intended to observe the market's reaction to an announcement or event. If the announcement contains information, then it is expected that the market will react when the announcement is received[3].

The reaction of the stock market is observed through trading volume activity and abnormal return. Trading volume activity refers to the buying and selling of stocks within a specific observation period and serves as an indicator of trading activity. It reflects the level of investor participation and the intensity of market activity during a particular period. Higher trading volume activity may indicate increased market interest and liquidity.

Abnormal return, on the other hand, measures the deviation of actual returns from expected returns. It represents the abnormal or unexpected profits or losses generated by an investment compared to what would be anticipated based on market trends and expectations. Abnormal return is calculated by subtracting the expected return from the actual return.

In the context of the research conducted, the study examines the trading volume activity and abnormal returns during a specific observation period. The period includes one day surrounding the event and ten days before and after the event of the CPO export ban in the plantation sub-sector. By analyzing the trading volume and abnormal returns during this period, researchers can assess the market's reaction to the news and evaluate the impact of the event on stock prices and investor behaviour.

Based on this information, the researcher aims to examine the extent to which the stock market reacts to an event. This analysis helps researchers and market participants understand how the stock market responds to significant events and announcements, and it provides insights into the efficiency and informational content of the market.

2 Literature Review and Hypothesis Development

2.1 Signaling Theory

According to Fahmi, “Signaling theory is a theory that discusses the rise and fall of stock prices in the market, which will influence investor decisions” [4].

According to Jogianto as cited in Sholihah, “Information published as an announcement provides a signal for investors in making investment decisions” [5].
From the opinions of the experts above, it can be concluded that Signalling Theory refers to informational signals that assist investors in considering and determining whether they will invest in a company or not.

2.2 Efficient Market Hypothesis

The Efficient Market Hypothesis was first introduced and popularized by Fama in 1970. According to Fama (1970) as cited in Jogiyanto, “The efficient market hypothesis states that a market is efficient if the stock prices of traded securities reflect all available information” [3].

Fama (1970) in Jogiyanto, presents three main forms of market efficiency based on the information used to make decisions as follows:

1. Weak-form market efficiency: Market efficiency is said to be weak-form when the stock prices fully reflect all past information. In this form of efficiency, past information cannot be used to predict current prices, meaning investors cannot use past information to obtain abnormal returns.
2. Semi-strong form market efficiency: Market efficiency is said to be semi-strong form when stock prices fully reflect all publicly available information and past information. Stock prices react quickly to information such as company earnings, stock splits, dividend announcements, earnings forecasts, mergers, management changes, accounting principal changes, acquisitions, and others. In semi-strong form efficiency, investors can use publicly available information to obtain abnormal returns but not over a long period.
3. Strong-form market efficiency: Market efficiency is said to be strong form when stock prices fully reflect all available information, including both publicly available and insider information. In this form, as all information is incorporated into stock prices, no investor can obtain abnormal returns [3].

2.3 Abnormal Return

According to Jogiyanto, “Abnormal return or excess return is the difference between the actual return and the expected return. The expected return is the return anticipated by investors” [3]. Thus, abnormal return represents the deviation between the actual return and the expected return.

According to Jogiyanto as cited in Kudus and Sutrisno, “Abnormal return is the investment gain obtained by investors from the difference between the estimated expected return and the realized return” [6].

From the various opinions above, it can be concluded that abnormal return or excess return is the difference between the actual return and the expected return. The expected return is the return anticipated by investors, while the actual return is the return that actually occurs. Abnormal return is calculated to measure the extent of the difference between the expected return and the actual return, providing an indication of the effectiveness of investment decisions. In this context, abnormal return can serve as an indicator of the profit or loss derived from investments.

2.4 Trading Volume Activity

According to Jogiyanto, “stock trading volume is the number of shares traded on a daily basis. Therefore, it can be concluded that stock trading volume represents the number of shares traded within a certain period of time” [3].

Stock trading volume is also considered as one of the factors that influence stock movements. The higher the trading activity, the better the performance of the stock, as a large trading volume reflects the stock's popularity among investors.

However, Sharpe et al. (1997) as cited in Kudus and Sutrisno state that “trading volume can also indicate the market's ability to absorb information. Trading volume provides a basis for predicting the current market condition” [6].

Based on the opinions of the experts, it can be concluded that trading volume activity refers to the number of shares traded within a specific time period. Stock trading volume can impact stock movements, where higher trading activity is associated with better stock performance due to its popularity among investors. Additionally, trading volume can serve as an indicator to predict the current market condition, as it reflects the market's ability to absorb information. Therefore, trading volume activity is an important factor to be considered by investors in making investment decisions.

2.5 Research Framework

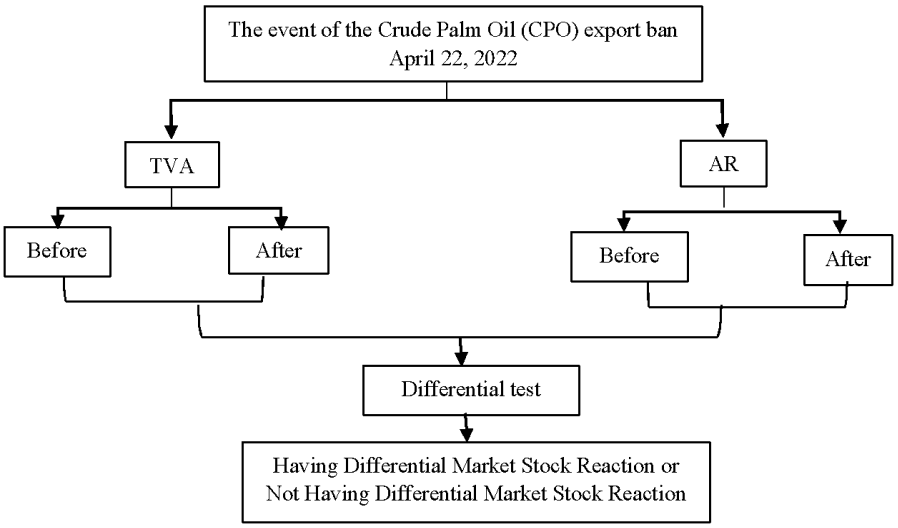

Fig.. 1. Research Framework

2.6 Hypothesis

H1: There is a significant difference in abnormal return in the stock market reaction before and after the announcement of the Crude Palm Oil (CPO) export ban on April 22, 2022.

H2: There is a significant difference in trading volume activity in the stock market reaction before and after the announcement of the Crude Palm Oil (CPO) export ban on April 22, 2022.

3 Research Methods

This study utilizes the event study method. The event under investigation is the ban on the export of crude palm oil (CPO). Market reactions are observed through abnormal returns as an indicator of stock price changes and changes in trading volume activity. Stock trading activity on the Indonesia Stock Exchange is used as an indicator reflecting investment decisions by investors.

The data collection technique employed in this research is secondary data collection. The required data includes company names, stock codes, daily stock prices, daily composite stock price index (CSPI), the number of shares traded during the observation period, and the number of shares outstanding. These data can be accessed through the official website idx.co.id.

The population in this study consists of all companies listed on the Indonesia Stock Exchange in the Plantation Sub-Sector in 2022, totalling 24 companies. The sampling method used is purposive sampling. The observation period spans from April 7, 2022, to May 17, 2022, encompassing 10 days before and after the event. A total of 22 companies met the sample selection criteria, which are companies in the plantation sub-sector that have complete data (closing price, traded shares, outstanding shares).

3.1 Operational Definition of Research Variables

Abnormal Return. Abnormal Return is the difference between the actual return and the expected return. The formula for abnormal return is as follows:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (1)$$

Where:
$AR_{i,t}$ = Abnormal Return of stock i in event period t
$R_{i,t}$ = Actual Return of stock i in event period t
$E(R_{i,t})$ = Expected Return of stock i in event period t

Below is the formula to calculate the Average Abnormal Return (AAR):

$$AAR_{Before} = \frac{\sum_{t=-10}^{t=-1} AR_{After}}{t} \quad (2)$$

$$AAR_{After} = \frac{\sum_{t=+10}^{t=+1} AR_{Before}}{t}$$

Explanation:
AAR_{Before} = Average Abnormal Return before the event
AR_{Before} = Abnormal Return before the event
AAR_{After} = Average Abnormal Return
AR_{After} = Abnormal Return after the event
t = Time Period

Trading Volume Activity. Trading volume activity is an indicator tool to assess market reactions to information in the capital market by examining the movement of trading volume activity. The formula is:

$$TVA = \frac{\sum \ traded\ shares\ of\ stock\ i\ during\ period\ t}{\sum \ outstanding\ shares\ of\ stock\ i\ during\ period\ t} \quad (3)$$

Below is the formula to calculate the Average Trading Volume Activity (ATVA):

$$ATVA_{Before} = \frac{\sum_{t=-10}^{t=-1} TVA_{Before}}{t} \quad (4)$$

$$ATVA_{After} = \frac{\sum_{t=+10}^{t=+1} TVA_{After}}{t}$$

Explanation:
Keterangan:
$ATVA_{Before}$ = Average Trading Volume Activity before the event
TVA_{Before} = Trading Volume Activity before the event
$ATVA_{After}$ = Average Trading Volume Activity after the event
TVA_{After} = Trading Volume Activity after the event
t = Time Period

3.2 Data Analysis Techniques

Descriptive Analysis. Descriptive statistics is an analysis that provides a general overview of the characteristics of each research variable, observed through measures such as minimum, maximum, mean, and standard deviation.

Normality Test. According to Andarini,"Normality testing is conducted on abnormal return and trading volume activity to determine whether the data follows a normal distribution or not" [7]. This study uses the Kolmogorov-Smirnov test. The normality of the data is assessed by examining the significance value (Sig). If Sig > 0.05, the data is normally distributed. If Sig < 0.05, the data is not normally distributed.

Paired Sample t-Test. According to Montolalu & Langi,"Paired sample t-test is a hypothesis testing method used when the data is not independent (paired)" [8]. If the data is normally distributed, hypothesis testing is conducted using the paired sample t-test to determine whether two related samples have different means. A significance level (α) of 5% is used, indicating a 95% probability or a 5% margin of error in drawing conclusions.

Wilcoxon Signed Rank. Test, According to Sholihah,"Wilcoxon Signed Rank Test is used when the data is not normally distributed, and it is a non-parametric statistical test" [5]. The decision-making criteria for the Wilcoxon signed rank test are based on whether the Asymp.sig (2-tailed) value is smaller than 0.05, indicating a significant difference in means.

Hypothesis Testing. The hypotheses in this study will be tested for their validity based on the information obtained from data analysis, and the hypotheses will be accepted or rejected accordingly.

4 Results And Discussion

4.1 Descriptive Analysis

The results of the descriptive statistical analysis for abnormal return and trading volume activity can

be seen in the table below:

Table 1. Descriptive Analysis Abnormal Return

Descriptive Statistics					
	N	Minimu	Maximu	Mean	Std. Deviatio
AAR Before	22	-.01311	.047258	.0008278	.011316042
AAR After	22	-.00731	.015515	.0042552	.006032702
Valid N (listwise	22				

Based on Table 1, the descriptive analysis of abnormal return, it is found that before the CPO export ban, the AAR (Average Abnormal Return) ranged from -0.0131 to 0.0473, with a mean of 0.0008 and a standard deviation of 0.0113. This indicates variability in the company's stock performance before the event. After the CPO export ban, the AAR ranged from -0.0073 to 0.0155, with a mean of 0.0043 and a standard deviation of 0.0060. During this period, there is observed a change in the company's stock performance, albeit with a smaller variation compared to before the event. Overall, the data suggests that the company's stock performance tends to be more stable after the CPO export ban, with a narrower range of AAR values and lower standard deviation.

Table 2. Descriptive Analysis Trading Volume Activity

Descriptive Statistics					
	N	Minimu	Maximu	Mean	Std. Deviatio
ATVA Before	22	.000018	.109366	.00610514	.023096550
ATVA After	22	.000001	.044705	.00291180	.009389982
Valid N (listwise	22				

Based on Table 2, the descriptive analysis of trading volume activity before and after the crude palm oil (CPO) export ban event, there is a significant difference in stock trading activity. Prior to the event, trading volume activity had a wider range, with a minimum value of 0.000018 and a maximum value of 0.109366. The mean trading volume activity was 0.00610514 with a standard deviation of 0.023096550. However, after the event, trading volume activity showed a decrease, with a minimum value of 0.000001 and a maximum value of 0.044705. The mean trading volume activity was 0.00291180 with a standard deviation of 0.009389982. This indicates that the CPO export ban event has impacted stock trading activity with changes in the trading volume that occurred.

4.2 Normality Test

The purpose of conducting a normality test is to determine whether a variable in the research follows a normal distribution or not. This information helps in selecting the appropriate hypothesis test, either the paired sample t-test or the Wilcoxon signed-rank test. Here are the results of the normality tests conducted for abnormal returns and trading volume activity:

Table 3. Normality Test Abnormal Return

Tests of Normality			
	Kolmogorov-Smirnova		
	Statistic	Df	Sig.
AAR Before	.316	22	.000
AAR After	.105	22	.200

In Table 3, the results of the normality test for abnormal return before and after the export ban on Crude Palm Oil (CPO) on April 22, 2022, can be seen in Table 1 above. The normality test yielded significant results of 0.000 and 0.200, indicating that one of the significant results is not normally distributed with a significance value <0.05. Hence, the Wilcoxon Sign Rank Test will be used as the method to compare the means of abnormal return before and after the export ban on crude palm oil.

Table 4. Normality Test Trading Volume Activity

Tests of Normality			
	Kolmogorov-Smirnova		
	Statistic	Df	Sig.
ATVA Before	.488	22	.000
ATVA After	.411	22	.000

In Table 4, the results of the normality test on trading volume activity before and after the export ban on Crude Palm Oil (CPO) on April 22, 2022, are presented. Both normality tests obtained the same significant result of 0.000. Therefore, it is stated that the data is not normally distributed since the significance value is <0.05. The method to be used for testing the difference in means of trading volume activity before and after the export ban on CPO is the Wilcoxon Sign Rank Test.

4.3 Wilcoxon Signed Rank Test

Here are the results of the Wilcoxon signed-rank test conducted to analyze the abnormal return before and after the event.

Table 5. Wilcoxon Signed Rank Test Abnormal Return

Test Statistics	
	AAR Before - AAR After
Z	-2.321
Asymp. Sig. (2-tailed	.020

Table 5 presents the hypothesis test results from the Wilcoxon Signed Rank Test for comparing abnormal return before and after the export ban on CPO. From the table, it can be observed that the z-value, indicating the comparison of abnormal return before and after the export ban on CPO over a 20-day period, is -2.321. Additionally, the Asymp. Sig (2-tailed) value is calculated to be 0.020. The resulting Asymp. Sig (2-tailed) value is less than 0.05, indicating that the first hypothesis of this study is accepted. Therefore, there is a significant difference in stock market reactions to abnormal return before and after the export ban on CPO. Since the Z value is negative, this difference tends to decrease.

The results of the hypothesis test for trading volume activity before and after the event, using the Wilcoxon Signed Rank Test, can be seen as follows:

Table 6. Wilcoxon Signed Test Trading Volume Activity

Test Statistics	
	ATVA Before –ATVA After
Z	-1.672
Asymp. Sig. (2-tailed	.095

Table 6 presents the hypothesis test results from the Wilcoxon Signed Rank Test for comparing trading volume activity before and after the export ban on CPO. From the table, it can be observed that the z-value, indicating the comparison of trading volume activity before and after the export ban on CPO over a 20-day period, is -1.672. Additionally, the Asymp. Sig (2-tailed) value is calculated to be 0.095. The resulting Asymp. Sig (2-tailed) value is greater than 0.05, indicating that the second hypothesis of this study is not accepted. Therefore, there is no significant difference in stock market reactions to trading volume activity before and after the export ban on CPO.

5 Conclusions

The research findings based on the Wilcoxon signed-rank test conducted in this study on the variables of abnormal return and trading volume activity before and after the export ban on Crude Palm Oil (CPO) in the Plantation Sub-Sector yield the following results:

1. The movement of the Composite Stock Price Index (CSPI) experienced a decline due to the panic attack among investors triggered by the information on the export ban of CPO on April 22, 2022, resulting in a reaction in the stock market.
2. The analysis of the Abnormal Return variable indicates a significant difference in the average abnormal return between the periods before and after the export ban on CPO in the Plantation Sub-Sector during the observation period. Therefore, the analysis results suggest that there is a difference in stock market reactions to abnormal return before and after the export ban on CPO.
3. On the other hand, the analysis of the Trading Volume Activity variable shows no significant difference in the average trading volume activity between the periods before and after the export ban on CPO in the Plantation Sub-Sector during the observation period. Therefore, the analysis results suggest that there is no difference in stock market reactions to trading volume activity before and after the export ban on CPO.

Here are a few recommendations that can be provided:

1. For future researchers intrigued by the event study method, it is advised to investigate diverse time periods rather than confining the analysis to a single period. This approach can lead to more accurate results and a deeper understanding of the phenomenon being studied.
2. Investors are advised to pay close attention to the fundamental conditions of the stocks they intend to purchase in the market. It is important to conduct thorough analyses of both internal and external events, including government policies. By employing sound analytical techniques, investors can obtain accurate predictions and minimize potential losses.

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