THE INFLUENCE OF COVID-19 EVENTS TO VACCINATION ON ABNORMAL RETURN AND TRADING VOLUME ACTIVITY IN IDX30 COMPANIES

Martina Rapolo Lumbantoruan[a], Harry Patuan Panjaitan[a*], Teddy Chandra[a]

[a]Business Faculty, Institut Bisnis dan Teknologi Pelita Indonesia

*Corresponding author
harry.patuan@lecturer.pelitaindonesia.ac.id

Abstract

The purpose of this study was to analyze how the market reacted to the covid-19 event that occurred in Indonesia, namely the existence of PSBB Volume I, New Normal, PSBB Volume II, the entry of the sinovac vaccine phase 1 to Indonesia, and the injection of the first vaccine to President Jokowi using abnormal returns and trading volume activity as an indicator of investor reaction in the capital market. In this study, there were 30 samples of IDX30 companies for the January 2021 period. To test investor reactions, an event study was used to measure the difference in reactions before and after the event. This study also used paired sample t-test for normally distributed data and the Wilcoxon sign rank test for data that were not normally distributed. The results of this study in the PSBB Volume I and New Normal events there was no abnormal return either before or after the event, in the PSBB Volume II event there was a positive abnormal return, 2 days before PSBB Volume II and negative abnormal returns 3 days after, in the event of the entry of the sinovac vaccine phase 1 into Indonesia, there was a negative abnormal return 2 days before the event, and in the event of the first vaccine injection to President Jokowi, there was a negative abnormal return 2 days before the event. However, there is no significant difference between abnormal returns before and after all events. While trading volume activity in the PSBB Volume I, New Normal, the entry of the sinovac vaccine phase 1 to Indonesia, and the first vaccine injection to President Jokowi, there was no difference between the activities before and after the event. But in the PSBB Volume II, there were significant differences in trading volume activity before and after the event.

Keywords: Abnormal Return, Trading Volume Activity

1.0 INTRODUCTION

In March 2020, Indonesia became one of the countries that was exposed to and infected with the corona virus (covid-19), a virus that is currently a disease outbreak that has hit the whole world. The first cases that occurred were two residents of Depok, West Java, which were announced directly by President Joko Widodo at the Presidential Palace, Jakarta, Monday, March 2nd 2020. According to Jokowi, the two Indonesian citizens were a mother (64 years) and her daughter (31 years). Both of them were suspected of contracting the corona virus due to contact with Japanese citizens who came to Indonesia (Kompas.com, March 3, 2020). Positive cases of Covid-19 have actually increased in number because the transmission is very easy, which can occur if people inhale droplets that come out of coughs or sneezes from people who are exposed to the Corona virus.

To prevent and suppress the spread of Covid-19, the government has taken various ways to handle it. This is shown where the Government of DKI Jakarta Anies Baswedan announced on April 7 2020 that it would carry out PSBB (Large-Scale Social Restrictions) Volume I starting April 10 2020 for 14 days. This will certainly affect the economy because there will be many limited community activities such as employees who have to WFH (Work From Home), people who have to stay at home causing many companies to experience a sharp decline in turnover. Restrictions on community activities will actually affect business activities which will then impact the economy where both from the demand side such as consumption, investment, exports and even government activities have decreased so that the number of employees who have been laid off and laid off without wages and salaries is as many as 3.05 million people. this covid-19 pandemic (Cnnindonesia.com, 20 July 2020). It can also be seen from the declining economic activity that the central statistics agency stated in the official statistics report that the

Indonesian economy in the second quarter of 2020 compared to the second quarter of 2019 experienced a growth contraction of 5.32 percent (y-on-y). From the production side, the Transportation and Warehousing Business Field experienced the highest growth contraction of 30.84 percent. From the expenditure side, the Export of Goods and Services and Import of Goods and Services experienced a growth contraction of 11.66 percent and 16.96 percent respectively (Bps.go.id, 2020).

In the world of capital markets, this is also the case with the impact of events that occurred where the JCI movement fell far from before. In the stock market, there are several indices, including the IDX30, which is 30 companies that have high liquidity and large market capitalization supported by good company fundamentals, so they want to see how investors react to these 30 large companies responding to turmoil during this pandemic. In this case, it turns out that the IDX30 was also unable to withstand the turmoil from the pandemic that occurred and experienced a decline in its price index. Even if you look at it sectorally, stock price movements in all sectors simultaneously experienced a decline in stock prices. Simultaneously the reactions that occur in all sectors indicate that there is information (Chandra, Renaldo, & Putra, 2018) that investors get as bad news so that the movement that occurs actually decreases stock prices.

There have been so many government efforts in handling the Covid-19 pandemic, such as the existence of large-scale social restrictions (PSBB) Volume I which was explained earlier, and even the New Normal which will be implemented starting June 1, 2020. This New Normal is carried out as a stage for the community to be able to doing activities side by side with covid-19, namely being able to carry out activities as usual but by implementing health protocols. This policy is expected to be a step towards restoring people's productivity so that it will impact demand and supply in any sector. However, this has not been able to hold back the positive number of Covid-19 which is still very high in its spread, so on Wednesday, September 9, 2020 the Governor of DKI Jakarta Anies Baswedan made a decision to re-implement strict large-scale social restrictions (PSBB) starting Monday (14/9) in order to suppressing the transmission of the corona virus in DKI Jakarta actually sent a negative signal to the domestic stock market. Responding to the decision to implement PSBB volume II, the composite stock price index (IHSG) on the Indonesia Stock Exchange (IDX) immediately fell 5% on trading Thursday (10/9) (Beritasatu.com, 2020). It doesn't end there, the Covid-19 virus requires a vaccine to break the chain of transmission where the vaccine forms the body's immune system. Therefore, the government brought in the vaccine and on Sunday (6/12/2020), 1.2 million of the first stage of the Covid-19 Sinovac vaccine arrived in Indonesia via Soekarno-Hatta Airport. The Minister of Health of the Republic of Indonesia, Terawan Agus Putranto, said that the first 1.2 million Sinovac Covid-19 vaccines that had arrived were still waiting for permission to be used by the Food and Drug Supervisory Agency (BPOM) (Kompas.com, 10 December 2020). Even though it cannot be circulated yet because it is waiting for the results of clinical trials and permits from BPOM, this is a bright spot that has been eagerly awaited. This is expected to improve (Renaldo, Sudarno, & Hutahuruk, 2020a) the economic situation, which is good news for companies and investors. Where raises the positive abnormal return that occurs when the actual return has a difference of more than the expected return. With the improving economy in Indonesia, the development of stock trading volume reflects the strength between supply and demand which is a reflection of investor behavior.

Because positive cases of Covid-19 have not been controlled with so many positive cases of Covid-19 increasing, the government is trying to accelerate the handling of the Covid-19 pandemic, namely with a vaccination program. Paying attention to emergency conditions and responding to the need to accelerate handling of Covid-19, the POM took a policy step by implementing an Emergency Use Authorization (EUA) or approval for use in emergency conditions for the Covid-19 vaccine, namely on January 11 2021. Head of the RI POM, Penny K. Lukito said that the implementation of this EUA was carried out by all drug regulatory authorities around the world to overcome the Covid-19 pandemic. The results of an analysis of the efficacy of the CoronaVac vaccine from a clinical trial in Bandung showed a vaccine efficacy of 65.3%, and based on reports from vaccine efficacy in Turkey it was 91.25%, and in Brazil it was 78%. These results have met WHO requirements with a minimum vaccine efficacy of 50%. "The vaccine efficacy of 65.3% from the results of the clinical trial in Bandung shows hope that this vaccine will be able to reduce the incidence of Covid-19 disease by up to 65.3%," said the Head of the BPOM (Pom.go.id, 2021). With the approval from BPOM, the government immediately took quick steps in the vaccination program where on January 13 2021 the process of injecting the first sinovac covid-19 vaccine to President Joko Widodo began. President Joko Widodo became the first person to be injected with the sinovac vaccine, Wednesday (13/1/2021). This marked the start of the covid-19 vaccination process in Indonesia in the first stage, namely for the group of people who get priority (Kompas.com, January 13, 2021).

In research regarding the events of the Covid-19 pandemic, many have conducted their research. However, there are different research results on abnormal returns and trading volume activity. In Ismanto's research results (2020), the results obtained show that the average abnormal return value for the events before and after the announcement of DKI Jakarta PSBB (Large-Scale Social Restrictions) Volume II, there is a significant difference in the LQ-45 stock price with a negative mean direction. Meanwhile (Atahau & Sakti, 2020) in his research stated that there was no significant difference in the average abnormal return in the period before and after. Meanwhile, the results of research on trading volume activity in Ismanto's research (2020) showed that there was no significant difference in the average the average trading volume before and after the event with a negative average direction, in contrast to Nafisa's research (2021) which states that the results of the test for the

difference in average trading volume activity (TVA) show that there is a significant difference in the average stock trading volume in the periods before and after the announcement of PSBB DKI Jakarta volume II.

Due to differences in the results of previous studies, the research was carried out again with the aim of analyzing the reaction of the capital market with the five events that occurred, namely PSBB Volume I, New Normal, PSBB Volume II, the introduction of stage 1 of the Sinovac vaccine to Indonesia and the injection of the first vaccine to President Jokowi regarding abnormal returns and trading volume activity (TVA) at IDX30 companies on the IDX.

2.0 LITERATURE REVIEW

Large-Scale Social Restrictions (*Pembatasan Sosial Berskala Besar* / PSBB)
In the legal paradigm in Indonesia, social distancing and lockdown have a legal basis in the form of Law no. 6 of 2018 concerning Health Quarantine. Health Quarantine according to Law no. 6 of 2018 is an effort to prevent and ward off the emergence or entry of diseases and/or public health risk factors that have the potential to cause a public health emergency. The implementation of social distancing and lockdowns is actually an effort to create a health emergency. Public health emergencies are extraordinary public health events characterized by the spread of infectious diseases and/or events caused by nuclear radiation, biological pollution, chemical contamination, bioterrorism and food which pose a health hazard and have the potential to spread across regions or across countries (President of the Republic of Indonesia, 2018).

Sinovac Covid-19 Vaccine
Regulation of the Minister of Health of the Republic of Indonesia number 84 of 2020 states regarding the implementation of vaccinations in the framework of tackling the corona virus disease 2019 (covid-19) pandemic, that to carry out the provisions of article 16 of Presidential regulation number 99 of 2020 concerning procurement of vaccines and implementation of vaccinations in the context of tackling the corona pandemic virus disease 2019 (covid-19) (Covid19.go.id, 2020).

Market Efficiency
An efficient market is if the market reacts quickly and accurately to reach a new equilibrium price that fully reflects the available information (Hartono, 2017). The market is said to be efficient if no investor can get an abnormal return in the long term by using the existing trading mechanism. (Hartono, 2017) states that there are two forms of market efficiency, namely an efficient market from an informational point of view is called informationally efficient market. While an efficient market viewed from the sophistication of market participants in making decisions based on available information is called decisionally efficient market.

Information Market Efficiency
The main key to measuring an efficient market is the relationship between security prices and information (Lasrya, Chandra, & Panjaitan, 2021). The question is which information can be used to assess an efficient market, whether it is old information, information that is being published or all information including private information (Sari, Chandra, & Panjaitan, 2021). Fama (1970) presents three main forms of market efficiency based on the three forms of information, namely past information, current information being published and private information as follows. (1) Weak form market efficiency if the prices of securities fully reflect past information. Past information is information that has already happened. (2) Market efficiency in a semi-strong form if the prices of securities fully reflect all publicly available information, including information contained in the financial statements of the issuer companies. (3) Strong form market efficiency if security prices fully reflect all available information including private information. If the market is efficient in this form, then no individual investor or group of investors can obtain abnormal returns because they have private information.

Decisional Market Efficiency
Market efficiency in decision is also market efficiency in semi-strong form according to Fama's version which is based on distributed information. The difference is that if informational efficient markets only consider one factor, namely the availability of information, then decision-wise efficient markets consider two factors, namely the availability of information (Halim, Chandra, & Sudarno, 2019) and the sophistication of market participants.

Stock Returns
Return is the result obtained from the investment. Stock return is referred to as stock income and is a change in the value of the stock price, which means that the higher the change in stock prices, the higher the return generated. According to (Hartono, 2017), returns are divided into two, namely realized returns which are returns that have occurred in the form of capital gains and Expected returns which are returns expected to be obtained by investors in the future in the form of dividends.

Expected Return

In addition to the realized return, there is also what is called the expected return (Expected rate of return). Expected return is the expected income in the future.

Abnormal Return
According to (Hartono, 2017), event studies analyze abnormal returns (abnormal returns) from securities that may occur around the announcement of an event. Abnormal return or excess return is the excess or deficiency of the actual return over the normal return. Normal return is the expected return (return expected by investors). Thus the abnormal return (abnormal return) is the difference between the actual return that occurs and the expected return.

Trading Volume Activity
(Ghoniyah et al., 2008) stated that trading volume activity is an instrument that can be used to see the reaction of the capital market to information through the parameters of the movement of stock trading volume activity in the capital market. Calculation of trading volume activity is done by comparing the number of company shares traded in a certain period with the total number of outstanding shares of the company in the same period.

Event Study
Studies to see the impact of an information announcement on security prices are termed event studies. Jogiyanto (2013: 585-587) states that an event study is a study that examines market reactions to events where information is published as an announcement. Event studies can measure the information contained in announcements and can be used to test market efficiency in a semi-strong form.

Framework
Based on the existing hypotheses, this study will further examine the effect of each event on abnormal returns and trading volume activity. Based on the background, literature review, and previous research, the framework for this research is as follows:
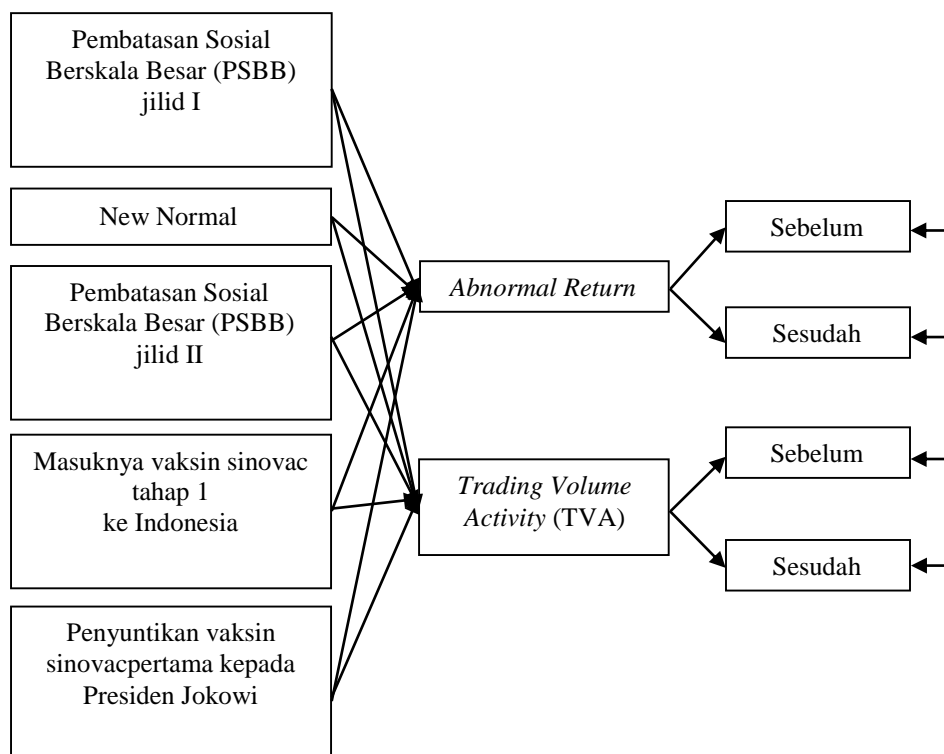
Source: Processed Data, 2020
Figure 1. Thinking Framework

3.0 METHODOLOGY

Place and Time of Research
The research began in November 2020 by taking IDX30 data, which is an index that measures the price performance of 30 stocks that have high liquidity and large market capitalization and are supported by good company fundamentals, so that in this study to see the effect of an event in large companies and also is expected to represent other companies listed on the Indonesia Stock Exchange (IDX) www.idx.co.id.

Population
The population of this study are all companies that are included in the IDX30 which are on the Indonesia Stock Exchange (IDX) for the 2020 period. Based on data obtained from www.idx.co.id from this study, there are 30 companies.

Sample
The sample is part of the population which is of course capable of representing the population. It's just that in this study all companies in IDX30 have been evaluated up to the last period. So that a sample of 30 IDX30 companies was obtained on the Indonesia Stock Exchange (IDX) for the January 2021 period.

Data Types and Sources
The type of data used is secondary data. The secondary data is IDX30 company data on the Indonesia Stock Exchange. The data source comes from the price movement records of the IDX30 shares on the Indonesia Stock Exchange obtained from the sites www.idx.co.id and www.finance.yahoo.com.

Operational Definition of Research Variables
In this study there are several variables. The following is the measurement of each variable to be studied.

Table 1. Operational Definition of Research Variables

No	Variabel	Defenisi	Indikator Pengukuran
1	Stock returns	The return an investor gets from an investment.	$R_{it} = \dfrac{P_t - P_{t-1}}{P_{t-1}}$
2	Expected Return	Investor's expectation of return on investment.	$E(R_{it}) = \alpha_i + \beta_i . R_{mt}$
3	Abnormal Return	The difference between the actual return and the expected return.	$RTN = R_{i.t} - E[R_{i.t}]$
4	Trading Volume Activity (TVA)	Comparison between the number of shares traded and the number of shares outstanding.	$TVA = \dfrac{\text{Stock trading volume in the period t}}{\text{The number of outstanding shares in the period t}}$

Source: (Chandra, 2013)

Observation Period
In event study research, the observation period is divided into two, namely the window period and the period of estimation. The estimation period is 250 days, namely t-250. As for taking the event period, this research is for 6 days, namely 3 days before the t-3 event and 3 days after the t+3 event, namely: (1) Announcement of Large-Scale Restrictions (PSBB) volume I on 7 April 2020, (2) New Normal on June 1, 2020, (3) Announcement of volume II Large-Scale Restrictions (PSBB) volume II on September 14, 2020, (4) Phase 1 entry of the Sinovac Covid-19 vaccine to Indonesia on December 6, 2020, (5) First injection of the Covid-19 vaccine sinovac against President Jokowi on 13 January 2021.

The observation period is only 6 days due to the nature of investors who are very sensitive to the market, so this is to anticipate the influence of events other than those being studied and can describe investor reactions to these events as well as to avoid confounding effects from other events.

Data Analysis Technique
Paired Sample t-test
This test is conducted to determine the difference in the average abnormal return and trading volume activity before and after the event if the data is normally distributed. This test uses a significance level of 5%. The basis for decision making in the paired samples t-test is: (a) If the probability value or sig. (2-tailed) < 0.05, so there is a significant difference between before and after the event (H0 is rejected, Ha is accepted). (b) If the probability value or sig. (2-tailed) > 0.05, so there is no significant difference between before and after the event (H0 is accepted, Ha is rejected).

Wilcoxon sign rank test
If the data in the normality test are not normally distributed, a non-parametric test is performed, namely the Wilcoxon Signed Rank Test. The basis for decision making in the Wilcoxon Signed Rank Test is: (a) Asymp value. sig (2-tailed) < 0.05 then H1 is accepted, H0 is rejected. (b) Asymp sig (2-tailed) value > 0.05, then H1 is rejected, H0 is accepted.

Hypothesis test

Hypothesis I
Abnormal Returns

$$RTN = R_{i.t} - E[R_{i.t}]$$

Information :
RTN=Abnormal return of the ith security in the tth event period
Ri.t = Realized return that occurs for the ith security of the tth event period
E[Ri.t]= Expected return of the i-th security for the t-event period

Stock Return (Actual Return)

$$R\_it = (P\_t - P\_(t-1))/P\_(t-1)$$

Information :
Rit = Stock Return
Pt = stock price period t
Pt-1 = Stock price period t-1

Expected Return
Expected Return is calculated using a single index market model, with realizable data during the estimation period to estimate the expected return in the event window, with the following equation:

$$E(R_{it}) = \alpha_i + \beta_i . R_{mt}$$

Information :
E(R_it) = expected return for stock i in period t
R_mt = market return in period t

The coefficients α and β are obtained from the calculation of the time series regression equation between stock returns (R_it) and market returns (Rm). From the coefficients α and β obtained, the expected return for each E(R_it) stock is then calculated.

Market Returns

$$R\_mt = (⟦IHSG⟧\_t - ⟦IHSG⟧\_(t-1))/⟦IHSG⟧\_(t-1)$$

Information :
R_mt = return of the i-th market index of the t-period
⟦IHSG⟧_t = composite stock price index on day t
⟦IHSG⟧_(t-1) = composite stock price index on the previous day

Average Abnormal Returns

$$(AR)\overline{}it = (\textstyle\sum\_(i=1)^n ⟦AR⟧\_it)/n$$

Information :
(AR)‾_it = average abnormal return of stock i in period t
⟦AR⟧_it = abnormal return of stock i in period t
n = number of samples

Cumulative Average Abnormal Return

$$CAAR = \textstyle\sum \overline{AR}_{it}$$

Information :
CAAR = cumulative average abnormal return
∑(AR)‾_it = total average abnormal return of stock i in period t

Standard Deviation

$$\sigma\_ie = (\textstyle\sum(⟦AR⟧\_it - (AR)\overline{}it)^2)/(n-1)$$

Information :
σ_ie = standard deviation of security i
⟦A̅R⟧_it = abnormal return of stock i in period t
(AR)‾_it = average abnormal return of stock i in period t
n = number of samples

Standardized Abnormal Returns

$$⟦SAR⟧\_nt = ⟦AR⟧\_it/\sigma\_ie$$

Information :
⟦SAR⟧_nt = standardized abnormal stock return in period t
⟦AR⟧_it = abnormal return of stock i in period t
σ_ie = standard deviation of security i

One Sample t-test

$$t = (\sum [SAR]\_nt)/\sqrt{n}$$

Information :
∑〖SAR〗_nt = total standardized abnormal stock return in period t
n = number of samples

Hypothesis II
Hypothesis II testing is to test the difference in abnormal returns before and after the events studied. The formula used is as follows:

Average Abnormal Returns
Before the event:
$$(AR)\bar{\ }before = (\sum\_(t = -3)^{(t = -1)} [AR]\_before)/n$$

After the event:
$$(AR)\bar{\ }after = (\sum\_(t = +3)^{(t = +1)} [AR]\_after)/n$$

Standard Deviation
Before the event:
$$\sigma\_before = \sqrt{(\sum\_(t = -3)^{(t = -1)}([AR]\_before - (AR)\bar{\ }before)^2/((n - 1)))}$$
After the Event:
$$\sigma\_after = \sqrt{(\sum\_(t = +3)^{(t = +1)}([AR]\_after - (AR)\bar{\ }after)^2/((n - 1)))}$$
Statistical Test (α = 5%)
$$t = ((AR)\bar{\ }after - (AR)\bar{\ }before)/([\sigma\_after]^2/n + [\sigma\_before]^2/n)$$

Hypothesis III
Hypothesis III testing is to test differences in stock trading volume activity (TVA) for the events studied. The formula used is as follows:

Trading Volume Activity (TVA)
$$TVA = \text{(Trading volume of n shares in period t)}/\text{(Number of outstanding shares in period t)}$$

Average Trading Volume Activity
$$(TVA)\bar{\ } = (\sum\_(t = 1)^n TVA)/n$$

Information :
(TVA)⌐ = average trading volume activity of shares in period t
TVA = trading volume activity of stock i in period t
n = time period

Standard Deviation
$$\sigma\_ie = \sqrt{((\sum(TVA - (TVA)\bar{\ })^2)/(n - 1))}$$

Information :
σ_ie = standard deviation of security i
TVA = trading volume activity of stock i in period t
(TVA)⌐ = average trading volume activity of stock i in period t
n = time period

Standardized Trading Volume Activity (TVA)
$$[STVA]\_nt = [TVA]\_it/\sigma\_ie$$

Information :
〖STVA〗_nt = standardized trading volume activity of shares in period t
〖TVA〗_it = trading volume activity of stock i in period t
σ_ie = standard deviation of security i

One Sample t-test
$$t = (\sum [STVA]\_nt)/\sqrt{n}$$

Information :
∑〖STVA〗_nt = total standardized trading volume activity of shares in period t
n = number of samples

Trading Volume Activity (TVA)
Before the event:
$$(TVA)\bar{\ }before = (\sum\_(t = -3)^{(t = -1)} [TVA]\_before)/n$$

After the event:
$$(TVA)\bar{\ }after = (\sum\_(t = +3)^{(t = +1)} [TVA]\_after)/n$$

Standard Deviation
Before the event:
$$\sigma\_before = \sqrt{\sum\_(t=-3)^{(t=-1)}(\llbracket TVA \rrbracket\_before - (TVA)^-before)^2/((n-1))}$$
After the event:
$$\sigma\_after = \sqrt{\sum\_(t=+3)^{(t=+1)}(\llbracket TVA \rrbracket\_after - (TVA)^-after)^2/((n-1))}$$

Uji Statistik (a = 5%)
$$t = ((TVA)^-after - (TVA)^-before)/(\llbracket \sigma\_after \rrbracket^2/n + \llbracket \sigma\_before \rrbracket^2/n)$$

4.0 RESULTS AND DISCUSSION

Data Normality Test
The normality test was carried out to find out whether the sample data used were normally distributed or not.

Table 2. One-Sample Kolmogorov-Smirnov Test

		AAR_ 100420	ATVA_ 100420	AAR_ 010620	ATVA_ 010620	AAR_ 140920	ATVA_ 140920	AAR_ 061220	ATVA_ 061220	AAR_ 130121	ATVA_ 130121
N		6	6	6	6	6	6	6	6	6	6
Normal Parameters[a]	Mean	.00317	.00240	.00377	.00500	-.00003	.00223	-.00179	.00414	-.00372	.00494
	Std. Deviation	.00952	.00082	.00518	.00144	.00537	.00085	.00409	.00120	.00936	.00089
Most Extreme Differences	Absolute	.264	.261	.188	.207	.212	.206	.155	.162	.301	.346
	Positive	.264	.261	.144	.143	.127	.206	.155	.141	.236	.346
	Negative	-.218	-.223	-.188	-.207	-.212	-.199	-.150	-.162	-.301	-.198
Kolmogorov-Smirnov Z		.647	.639	.461	.508	.519	.505	.380	.396	.738	.847
Asymp. Sig. (2-tailed)		.797	.808	.984	.958	.950	.960	.999	.998	.647	.469

a. Test distribution is Normal.

Source: Processed Data, 2020

Seen in table 3 shows that the significance value of Asymp. Sig. (2-tailed) on the average abnormal return and average trading volume activity in the five events is greater than 0.05. Therefore, the data studied were normally distributed so that a paired sample t-test could be performed.

Hypothesis I

Table 3. Abnormal Return Test for Overall Covid-19 Events Up to Vaccination

Event	PSBB Volume I		New Normal		PSBB Volume II		Enter the Vaccine		First Vaccine Injection	
	Sig	Result	Sig	Result	Sig	Result	Sig	Result	Sig	Result
Day -3	0.32960	Insig	0.68381	Insig	0.28424	Insig	0.77084	Insig	0.20441	Insig
Day -2	0.17867	Insig	0.45823	Insig	0.01580	Sig	0.00136	Sig	0.03852	Sig
Day -1	0.97121	Insig	0.63976	Insig	0.66786	Insig	0.60887	Insig	0.17961	Insig
Day +1	0.76181	Insig	0.36477	Insig	0.52855	Insig	0.08174	Insig	0.19085	Insig
Day +2	0.08945	Insig	0.33798	Insig	0.78728	Insig	0.83057	Insig	0.82964	Insig
Day +3	0.56866	Insig	0.89798	Insig	0.01113	Sig	0.55729	Insig	0.67325	Insig

Source: Processed Data, 2020

The results obtained from table 4 show that the events of PSBB Volume I and the new normal from 3 days before and 3 days after had no significant effect on abnormal returns. This indicates that the events of PSBB Volume I and the new normal did not receive (Renaldo, Sudarno, & Hutahuruk, 2020b) a significant response from investors. This shows that the events of PSBB volume I and the new normal are considered not to affect the condition of the stock market, thereby supporting the theory presented by Fama in 1970 to Jogiyanto (2017) that the market is efficient when no investor gets abnormal returns within a certain period of time. The old time, in this condition

the market is efficient. However, in the PSBB Volume II event, there was a significant effect on abnormal returns, namely 2 days before (-2) the implementation of PSBB Volume II with a positive abnormal return indicating that investors gave a positive response that the implementation of PSBB Volume II would improve the economic situation in Indonesia so that investors have returned to building confidence to invest, but this did not last long. It can be seen 3 days after (+3) it actually received a negative response on the stock market that the implementation of PSBB Volume II had not provided a bright spot for prevention and suppression of the positive number of Covid-19 in Indonesia so that investors began to falter in responding to the stock market. In the event that the Sinovac vaccine stage 1 entered Indonesia, it stated that there was a significant abnormal return 2 days before (-2) the entry of the stage 1 Sinovac vaccine to Indonesia on 6 December 2020 with a negative abnormal return indicating that investors gave a negative response that the vaccine had not been introduced yet. can give hope that the vaccine still needs to be carried out clinical trials from BPOM so that the vaccine cannot be directly used and distributed. This is also due to the fact that there are still many people who do not believe in the existence of the Covid-19 virus, causing people to think that there is no need for a vaccine and that this vaccine is considered only for business purposes. Similarly, the event of the first vaccine injection to President Jokowi also stated that there was a significant abnormal return 2 days before (-2) the first vaccine injection to President Jokowi January 13 2021 with a negative abnormal return indicating that investors gave a negative response to this event because there are still many people who are still reluctant to participate in getting vaccinated even though President Jokowi has become the first person to be vaccinated because information on BPOM test results of 65.3% is considered still low compared to Brazil producing 78% and Turkey 91%. Of course it's not because of the low efficacy results of this vaccine that is the only reason people are reluctant to get vaccinated, but also that public awareness of the benefits of this vaccine is still lacking. In the event of PSBB volume II, the entry of the vaccine and the first injection of the vaccine, the market looks inefficient due to the abnormal returns received by investors, both positive abnormal returns and negative abnormal returns, however this is not because the market is inefficient but rather these events reflect more efficiency semi-strong form market (Semistrong) submitted by Fama in 1970 to Jogiyanto (2017).

Hypothesis II

Table 4. Paired Sample T-Test Abnormal Return of Overall Covid-19 Events Up to Vaccination

Explanation	PSBB Volume I	New Normal	PSBB Volume II	Enter the Vaccine	First Vaccine Injection
T-count	0.095470	0.805409	-1.04088	0.039924	2.513395
T table	4.302653	4.302653	4.302653	4.302653	4.302653
P Value / Sig.	0.932646	0.252559	0.407235	0.971781	0.128488
Conclusion	Insig	Insig	Insig	Insig	Insig

Source: Processed Data, 2020

The results obtained from table 5 show that in the paired sample t-test on the five Covid-19 events, both PSBB Volume I, new normal, PSBB Volume II, the introduction of stage 1 of the Sinovac vaccine to Indonesia, as well as the first vaccine injection to President Jokowi, was abnormal. Return is not significant, which means that there is no significant difference in abnormal return before compared to the abnormal return after the event. The results of this study are in line with research conducted by Rahmawati (2020) in her research which stated that there was no significant difference in the average abnormal return in the period before and after.

Hypothesis III

Table 5. Test of Differences in Trading Volume Activity for the Overall Event of Covid-19 to Vaccination

Information	PSBB Volume I	New Normal	PSBB Volume II	Enter the Vaccine	First Vaccine Injection
Difference (-3), (+3)	-0.00160	0.00226	-0.00081	0.00072	-0.00022
Difference (-2), (+2)	0.00029	0.00203	-0.00164	0.00232	0.00011
Difference (-1), (+1)	-0.00085	-0.00129	-0.00154	0.00126	0.00174
Average	-0.00072	0.00100	-0.00133	0.00143	0.00054
Standard Deviation	0.00095	0.00199	0.00045	0.00082	0.00105
T-Count	-1.30893	0.87055	-5.09644	3.03823	0.89800
Sig.	0.32074	0.47579	0.03641	0.09340	0.46395

Information	PSBB Volume I	New Normal	PSBB Volume II	Enter the Vaccine	First Vaccine Injection
Conclusion	Insig	Insig	Sig	Insig	Insig

Source: Processed Data, 2020

The results obtained from table 6. show that the testing of trading volume activity during the PSBB Volume I event, new normal, the entry of phase 1 vaccines into Indonesia and the injection of the first vaccine to President Jokowi was not significant, which means that there was no significant difference in trading volume activity before compared to trading volume activity after the event even though trading volume activity 3 days before and 3 days after the event showed significant results in a positive direction. The results of this study are in line with research conducted by Ismanto (2020) that there is no significant difference in the average trading volume before and after the event. Whereas the PSBB Volume II event showed that the results of the trading volume activity test were significant with an average negative direction, meaning that there was a significant difference in trading volume activity prior to the implementation of PSBB Volume II September 14 2020 compared to trading volume activity after (when it was still PSBB) this is because the level of trading activity before implementation was actually higher than after (during PSBB). This means that many investors have responded negatively after PSBB Volume II. The results of this study are in line with research conducted by Nafisa (2021) which states that the results of the different test on the average trading volume activity (TVA) show that there is a significant difference in the average stock trading volume in the period before and after the announcement of PSBB DKI Jakarta volume II.

5.0 CONCLUSION

Based on the results of this study, it shows that during the PSBB Volume I and New Normal events there were no abnormal returns either before or after the event, during the PSBB Volume II events there were positive abnormal returns, namely 2 days before PSBB Volume II took place and negative abnormal returns 3 days after, in the event that the sinovac vaccine stage 1 entered Indonesia there was a negative abnormal return 2 days before the event, and in the event of the first vaccine injection to President Jokowi there was a negative abnormal return 2 days before the event. However, there is no significant difference between the abnormal returns before and after all events. While trading volume activity during PSBB Volume I, New Normal, the entry of stage 1 of the Sinovac vaccine to Indonesia, and the injection of the first vaccine to President Jokowi, there was no difference between activity before and after the incident. Meanwhile, during the PSBB Volume II event, there was a significant difference in trading volume activity before and after the event.

In this study only examined 6 exchange days, namely 3 days before the event and 3 days after the event. This is done to avoid the influence of other events outside of the event you want to examine. The short time frame of this research is one of the limitations of this study. Some suggestions for interested parties through this research are: (1) For Investors, From the results of this research it is hoped that investors can be proficient at technical analysis of information obtained from events that often occur, due to the variety of events that occur and their impact so that investors can get profit on their investment. However, it is advisable not to make seasonal events that don't always happen all the time to be a guideline for investment decisions. (2) For academics, for future researchers, research on event studies can be carried out to see the effect of an announcement on abnormal returns and trading volume activity with the punctuality of the announcement based on existing official news.

References

Atahau, A. D. R., & Sakti, I. M. (2020). REAKSI PASAR MODAL ATAS PEMBERLAKUAN PSBB DI TENGAH PANDEMI COVID 19 (Studi Kasus Perusahaan Sub Sektor Hotel, Restoran dan Pariwisata di BEI. *Journal of Banking and Financial …*, *1*(02), 58–66. https://edumediasolution.com/index.php/jbft/article/view/32

Beritasatu.com. 11 September (2020). *PSBB Jilid II*. https://www.beritasatu.com/tajuk/7315/psbb-jilid-ii#!, diakses 20 Februari 2021.

Bps.go.id. 5 Agustus (2020). *Ekonomi Indonesia Triwulan II 2020 Turun 5,32 Persen..* https://www.bps.go.id/pressrelease/2020/08/05/1737/-ekonomi-indonesia-triwulan-ii-2020-turun-5-32-persen.html, diakses tanggal 01 Desember 2020.

Chandra, T. (2013). *THE IMPACT OF FUEL PRICE INCREASE ON STOCK PRICE IN INDONESIA STOCK EXCHANGE*. *16*(3), 385–398.

Chandra, T., Renaldo, N., & Putra, L. C. (2018). Stock Market Reaction towards SPECT Events using CAPM Adjusted Return. *Opción, Año 34*(Especial No.15), 338–374.

Cnnindonesia.com. 20 Juli (2020). *Pekerja Dirumahkan dan Kena PHK Akibat Corona Capai 3,05 Juta*. https://www.cnnindonesia.com/ekonomi/20200720114203-92-526610/pekerja-dirumahkan-dan-kena-phk-akibat-corona-capai-305-juta, diakses tanggal 29 Agustus 2021.

Covid19.go.id. 14 Desember (2020). *PMK No. 84 Th 2020 tentang Pelaksanaan Vaksinasi Dalam Rangka Penanggulangan Pandemi Corona Virus Disease 2019 (Covid-19)*, https://covid19.go.id/storage/app/media/Regulasi/2020/Desember/PMK No. 84 Th 2020 ttg Pelaksanaan Vaksinasi Dalam Rangka Penanggulangan COVID-19.pdf, diakses tanggal 09 Februari 2021.

Ghoniyah, N., Mutamimah, & Widayati, J. (2008). Reaksi Pasar Modal Indonesia Terhadap Pengumuman Penerbitan Obligasi Syariah. *Reaksi Pasar Modal Indonesia Terhadap Pengumuman Penerbitan Obligasi Syariah*, 23–24.

Halim, M., Chandra, T., & Sudarno. (2019). Analisis Faktor-faktor yang Mempengaruhi Struktur Modal dan Nilai Perusahaan Sektor Makanan dan Minuman yang Terdaftar di Buesa Efek Indonesia Tahun 2012-2017. *Procuratio: Jurnal Ilmiah Manajemen, 7*(4), 420–437. http://www.ejournal.pelitaindonesia.ac.id/ojs32/index.php/PROCURATIO/index

Hartono, Jogiyanto 2017. *Teori Portofolio dan Analisis Investasi*. Edisi Kesebelas, Yogyakarta: BPFE.

Ismanto, J. (2020). Reaksi Pasar Modal Terhadap Pengumuman PSBB DKI Jakarta Jilid II (Event Study LQ-45 Terdaftar BEI). *JURNAL Edueco*, 16.

Kompas.com. 3 Maret (2020). *Fakta Lengkap Kasus Pertama Virus Corona Di Indonesia*, https://nasional.kompas.com/read/2020/03/03/06314981/fakta-lengkap-kasus-pertama-virus-corona-di-indonesia?page=all, diakses tanggal 05 November 2020.

Kompas.com. 10 Desember (2020). *Vaksin Covid-19 Sinovac Masuk Indonesia Epidemiolog Tunggu Hasil Uji Klinik Fase 3*. https://www.kompas.com/sains/read/2020/12/10/080500423/vaksin-covid-19-sinovac-masuk-indonesia-epidemiolog--tunggu-hasil-uji?page=all, diakses tanggal 15 Desember 2020.

Kompas.com. 13 Januari (2021). *Jokowi Disuntik Vaksin Pertama Ini Cara Kerja Vaksin Sinovac Cegah Covid-19*. https://www.kompas.com/tren/read/2021/01/13/134500065/jokowi-disuntik-vaksin-pertama-ini-cara-kerja-vaksin-sinovac-cegah-covid-19?page=all, diakses tanggal 20 Januari 2021.

Lasrya, E., Chandra, T., & Panjaitan, H. P. (2021). Determinants of Earnings Persistence with Capital Structure as Intervening Variable of Manufacturing Companies Listed on Indonesia Stock Exchange Period 2015-2019. *Journal of Applied Business and Technology, 2*(2), 98–108.

Nafisa, I. A. (2021). *REAKSI PASAR MODAL INDONESIA TERHADAP PENGUMUMAN PSBB DKI JAKARTA JILID II* (Doctoral dissertation, Universitas Muhammadiyah Malang).

Pom.go.id. 11 Januari (2021). *Penerbitan Persetujuan penggunaan Dalam Kondisi Darurat Atau Emergency Use Authorization (EUA) Pertama Untuk Vaksin Covid-19*. https://www.pom.go.id/new/view/more/pers/584/Penerbitan-Persetujuan-Penggunaan-Dalam-Kondisi-Darurat-Atau-Emergency-Use-Authorization--EUA--Pertama-Untuk-Vaksin-COVID-19.html, diakses tanggal 9 Februari 2021.

Presiden Republik Indonesia. (2018). Undang Undang Nomor 6 tahun 2018 tentang Kekarantinaan Wilayah. *National Standardization Agency of Indonesia*, 31–34. https://jdih.bsn.go.id/produk/detail/?id=730&jns=2, diakses tanggal 05 November 2020.

Renaldo, N., Sudarno, & Hutahuruk, M. B. (2020a). The Improvement of Generation Z Financial Well-being in Pekanbaru. *Jurnal Manajemen Dan Kewirausahaan, 22*(2), 142–151. https://doi.org/10.9744/jmk.22.2.142-151

Renaldo, N., Sudarno, S., & Hutahuruk, M. B. (2020b). Internal Control System Analysis on Accounts Receivable in SP Corporation. *The Accounting Journal of Binaniaga, 5*(2), 73. https://doi.org/10.33062/ajb.v5i2.382

Sari, Chandra, T., & Panjaitan, H. P. (2021). The Effect of Company Size and DER on ROA and Company Value in the Food and Beverage Sub Sector on the Indonesia Stock Exchange (IDX). *Journal of Applied Business and Technology, 2*(2), 134–141.

https://scholar.google.co.id (Diakses tanggal 05 November 2020)

www.finance.yahoo.com(Diakses tanggal 05 November 2020)

www.idx.co.id (Diakses tanggal 20 November 2020)