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Indonesia Composite Index and Market Reaction in Indonesia Due to Covid-19 Pandemic

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Abstract
This study aims to examine the impact of the Covid-19 pandemic on the Indonesia Composite Index (ICI) and the reaction of the Indonesian capital market to events related to the Covid-19 pandemic in Indonesia. There were two events observed, the first event was the announcement of the first positive case of Covid-19 in Indonesia, and the second event was the determination of the status of a national disaster by the Indonesian government. Testing of effect of the Covid-19 pandemic on stock prices was carried out by using an independent sample t-test against the average ICI before and after the two events. Testing the market reaction using the event study methodology. The test results found that the ICI average decreased significantly after the announcement of the first positive Covid-19 case. The ICI average also decreased significantly after the determination of the national disaster status. The average ICI return did not differ significantly before and after the two events. The market reaction test found no significant abnormal returns around the two events. The Covid-19 pandemic had an impact on the Indonesian capital market, marked by a decline in the ICI, although investors in the capital market did not react excessively, so there was no significant abnormal return.

Keywords
abnormal return; event study; ICI; market reaction; Covid-19
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Introduction

Stock prices in the capital market are affected by events that have an economic impact. Previous research has investigated the relationship of capital market returns with important events such as political events (Kirana & Sembel, 2019), natural disasters (Wang & Kutan, 2013), nuclear disasters (Ferstl et al., 2012).

Covid-19 outbreak first pitch detection in Wuhan City, Hubei Province, China in December 2019. This plague quickly spread throughout the world. The World Health Organization (WHO) declared the Covid-19 pandemic on March 11, 2020.

In February 2020, the Indonesian government still believes that Covid-19 has not entered Indonesia, even though researchers from Harvard University predict that Covid-19 should have entered Indonesia. Even on February 26, 2020, the government has budgeted IDR 72 billion for

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travel promos. On March 2, 2020, the Indonesian government announced two patients' cases Covid-19, first confirmed in Indonesia. On March 14, 2020, President Joko Widodo declared the Covid-19 outbreak a national disaster, and on March 31, 2020, the Government issued Government Regulation Number 21 of 2020 concerning Large-Scale Social Restrictions (PSBB).

Even though until the end of February 2020 the government still showed a calm attitude, the capital market seems to have shown a negative reaction first, as indicated by the continuing decline in the closing price of the Indonesia Composite Index (ICI). Table 1 shows the ICI closing price at the end of December 2019-March 2020. The ICI, which usually closed higher every January, did not occur during the 2019-2020 transition.

Table 1. Changes in the ICI at the December 2019-March 2020

Month	Closing Price (IDR)	Change (%)
December 2019	6,299.54	
January 2020	5,940.05	-5.71
February 2020	5,452.70	-8.20
March 2020	4,538.93	-16.76

Source : Indonesia Stock Exchange

Table 1 shows the percentage decline continues to increase every month. The biggest decrease occurred in March 2020, when the Covid-19 case was found in Indonesia and the government determined the status of a national disaster. The decline in March was even more than double the decline in February, this indicates that the determination of the status of a national disaster had a big enough impact to bring down stock prices on the Indonesia Stock Exchange (IDX) which had previously declined.

Table 2. ICI Closing Prices at the End of December and January for the Last 5 Years

December	ICI (IDR)	January	ICI (IDR)	Change (%)
2015	4,593.01	2016	4,615.16	0.48
2016	5,296.71	2017	5,302.66	0.11
2017	6,355.65	2018	6,605.63	3.93
2018	6,194.50	2019	6,532.97	5.46
2019	6,299.54	2020	5,940.05	-5.71

Source : Indonesia Stock Exchange

The Coronavirus pandemic is interesting to study its impact on the capital market because it is an unexpected event. The data displayed in Table 1 and Table 2 indicate that the Covid-19 outbreak had an impact on the Indonesian capital market. Previous research also supports this. Nurcahyono (2021) with panel data regression found that the number of deaths due to Covid-19 had an impact on decreasing ICI returns, even though the growth of recovered patients was quite high. This study used a different approach, namely the event study. Several previous studies have used the event study approach to study the market reaction as a result of the announcement of an event. The Covid-19 pandemic is interesting to study its impact on the capital market as an unexpected event. Liu et al. (2020) in his research using the government news program of the People's Republic of China on January 20, 2020, that the virus can be transmitted between people. Irfan et al. (2021) in their research using the announcement of a global pandemic by WHO on March 11, 2020.

Polemis & Soursou (2020) in their study in Greece using the announcement of a lockdown by the government, on March 23, 2020. Bash (2020) in their study used the first case event that is known. Although several previous studies have used event studies in their research, these studies are still limited to one event, whereas this study highlights two events, namely: (1) positive announcements of Covid-19 1 and 2 patients in Indonesia on March 2, 2020., and (2) the determination of the Covid-19 Pandemic case as a National Disaster by the Indonesian government on March 14, 2020. This research also examines its impact on two variables, namely the stock price and the reaction of the Indonesian capital market.

He, et al. (2020) stated that the Covid-19 has a negative but short-term impact on stock markets of affected countries, Ngwakwe (2020) found that the Covid-19 pandemic had different effects on each stock index investigated, while Pitaloka et al. (2020) concluded that the Covid-19 Pandemic does not affect the price of the stock. Khan, et al. (2020) stated that the Covid pandemic affected market reactions, while Liu et al. (2020) found the reaction of the market does not change with the Covid-19 pandemic.

This research has two purposes. The first objective is to examine the effect of the two events related to the Covid-19 case on the ICI. Testing is done by comparing the average ICI and the average return of the ICI before and after the event. The second objective is to test for market reactions around events. Testing is done by seeing if there is an abnormal return around the date of the event.

Theoretical Framework and Hypothesis Development

This study aims to explain that the COVID-19 pandemic can affect the combined price index and the reaction of the Indonesian capital market. Figure 1 presents the conceptual framework of this study.

The Impact of the Announcement of an Event on the ICI Return

Information published as an announcement will give a signal to investors in making investment decisions, if the announcement contains positive values, the market is expected to react when the announcement is received by the market (Jogiyanto, 2010). Market reactions are indicated by changes in share trading volume due to the announced information and all market participants have received the information. Market participants first interpret and analyze the information as good news or bad news (Wang & Zhu, 2013). The results of the interpretation of this information will later affect the demand and supply from investors, if many investors are pessimistic about the bad news from the information received, it will reduce the number of purchases that occur which are lower than the supply in the market so that prices will increase (Hu, 2017). Conversely, if an investor looks optimistic because of the good news from the information he receives, then he will increase the number of purchases that occur which is higher than the supply in the market so that the price will be pushed up. Stock price volatility is influenced by information on the capital market. Basically, volatility or fluctuations in the market have a role in the return on investment, if the result of huge profits usually have risk high also it is commonly called the investment profile (Tandelilin, 2010).

Research previously had found the relationship between the event and pandemic of disease to return the market capital. The SARS pandemic that occurred in the 2002-2003 period was known to have a negative impact on the tourism and trade sectors in Taiwan (Chen et al., 2009). Not only pandemics in humans, but pandemics that occur in animals are also known to have an impact on the sector that is related to (Park et al., 2008; Pendell & Cho, 2013). However, not all negative events have a significant impact on stock returns. In the AirAsia accident in 2014, it was found that there no significant difference of abnormal

returns of stocks of travel and leisure industry listed at Kuala Lumpur Stock Exchange between before and after the crash of AirAsia plane. (Gumanti et al., 2018).

Return is the result obtained from investing in the capital market. There are several definitions of return used in this study. Abnormal return is the difference between the return and actual return expected (Caporale et al., 2019). The actual return is return realized or returns that have occurred can be calculated based on historical data (Ferguson & Lam, 2016). The expected return is the return expected by investors in the future (Maysami & Koh, 2000).

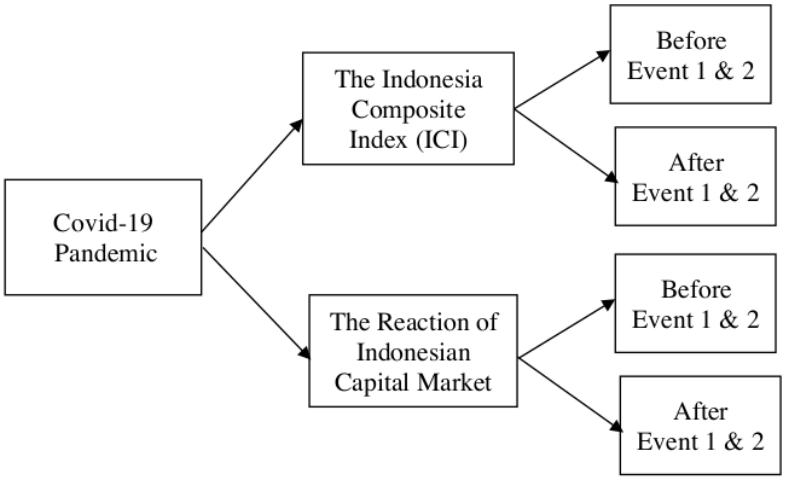

Figure 1. Conceptual Framework

Testing Market Reaction to an Event

The market is said to be efficient if the price of securities does not deviate too much from its intrinsic value. The intrinsic value in question is based on the information contained in the financial statements of the share issuing company (Tandelilin, 2010). Investors will not get a consistent abnormal return on the days when the relevant information is available. Event studies are carried out to examine market reactions to an event whose information is published as an announcement (Caporale et al., 2019). Event studies can be used to test the information content of announcements, and can also be used to test the market efficiency of the semi-strong form (Ferstl et al., 2012). An announcement that contains information will give an abnormal return. The market is called a semi-strong efficient form if no investor can get an abnormal return from the announced information, or if there is an abnormal return, the market must react quickly to absorb the abnormal return towards the new equilibrium price.

Several previous studies used the event study method to investigate market reactions to events related to the Covid-19 outbreak. Bash (2020) finds that capital market returns decreased significantly after the announcement of the first registered Covid-19 case. Irfan et al. (2021) found that the Islamic stock price index in India responded negatively to the announcement of the global Covid-19 pandemic by WHO, but the Islamic stock price index in Indonesia responded positively to the announcement. Liu et al. (2020) found that capital markets in several countries responded to the news broadcast in the People's Republic of China that the Covid-

19 virus can be transmitted to humans. Polemis & Soursou (2020) found that there is a significant abnormal return on the shares of energy companies in Greece around the announcement of the implementation of the lockdown.

Hypotheses

The hypotheses that can be formulated in this study is as follows:

H1: There is a difference in the ICI before and after event 1.
H2: There is a difference in the ICI returns before and after event 1.
H3: There is a difference in the ICI before and after event 2.
H4: There is a difference in the ICI returns before and after event 2.
H5: There is an abnormal return around the date of event 1.
H6: There is an abnormal return around the date of event 2.

Research Methods

Testing the Effect of the Covid-19 Pandemic on the ICI

To answer whether the Covid-19 pandemic against the ICI was carried out by comparing the ICI before and after the event. The data used were daily ICI and daily ICI return, seven days before and seven days after the event, respectively. The ICI data is obtained from the IDX, while the ICI return is calculated using the ICI data with the formula in equation (1) as follows:

$$\text{Return ICI}_t = \frac{\text{ICI}_t - \text{ICI}_{t-1}}{\text{ICI}_{t-1}} \dots\dots\dots\dots (1)$$

Where t represents day t. Analysis of this test data using two different tests of independent sample averages that are processed by the SPSS v.23 program.

Testing the Market Reaction to the Covid-19 Pandemic

If the announcement contains information, the market will react around the time of the announcement, resulting in an abnormal return (Cready & Gurun, 2010). To answer the market reaction is done by statistically testing the abnormal return. Abnormal return is the difference between actual return and expected return (Johannesen & Larsen, 2016). If the actual return is the same as the expected return, then there is no abnormal return (abnormal return equals zero). If the average abnormal return is zero, it means that there is no information content about the price changes that have occurred. The definition around the time of the event in this study was from five days before the event to five days after the event (Cready & Gurun, 2010).

The calculation of the actual return in this study using the returns of the sectoral index in IDX to represent the entire business sector. The actual return calculation is formulated in equation (2). The calculation of expected return uses a market adjustment model, where the ICI return is used as a proxy for expected return so that the abnormal return in this study is defined as the difference between the actual return and the ICI return (equation 3). The ICI return calculation is in accordance with equation (1).

$$\text{Actual return}_{ti} = \frac{\text{price}_{ti} - \text{price}_{ti-1}}{price_{ti-1}} \dots (2)$$

$$\text{Abnormal return}_{ti} = \text{Actual return}_{ti} - \text{Return ICI}_t (3)$$

In which t is trading t day, i is sector index to i. i = 1, 2, 3…, 9, namely: Agriculture; Mining; Basic Industry and Chemicals; Various Industries; Consumer Goods Industry; Property, Real Estate, and Building Construction; Infrastructure, Utilities, and Transportation; Finance; Trade, Service and Investment. Then the average abnormal return is calculated as follows:

$$\text{Abnormal return}_t = \frac{\sum_{i=1}^{n} \text{abnormal return}_i}{n} \dots (4)$$

Where n denotes the number of sectors (i) observed. The number of observations in this study was nine, namely all IDX sectors based on the Jakarta Stock Industrial Classification (Jasica) classification. Data analysis used one-variable hypothesis

testing which was processed by the SPSS23 program

Results and Discussion

Results of Testing the Effect of the Covid-19 Pandemic on the ICI

Table 3 shows the results of the normality test for the ICI and Return of the ICI. The null hypothesis of the Kolmogorov-Smirnov and Shapiro-Wilk test states that there is no difference between the distribution of observations and the distribution of expectations. The test results show that all of the results are insignificant (sig > 0.05) means that the null hypothesis is accepted. The data analyzed were normally distributed. Furthermore, testing the research hypothesis using the parametric test, namely the independent sample t-test.

Table 3. Variable Normality Test Results

Variable	time	Kolmogorov-Smirnov [a]		Shapiro-Wilk	
		Statistics	Sig.	Statistics	Sig.
ICI_1	before	0.200	0.200 *	0.940	0.639
	After	0.202	0.200 *	0.919	0.465
$RICI_1$	before	0.152	0.200 *	0.983	0.971
	After	0.174	0.200 *	0.925	0.505
ICI_2	before	0.195	0.200 *	0.918	0.453
	After	0.143	0.200 *	0.955	0.772
$RICI_2$	before	0.162	0.200 *	0.947	0.698
	After	0.263	0.155	0.818	0.061

Note: ICI is the composite stock price index, and RICI is the ICI return subscripts 1 and 2 represent event 1 and event 2

Source: Data Process

Table 4 shows the ICI descriptive statistics and the ICI returns before and after the two events related to Covid-19. After it was found that the first patient was positive for Covid-19, the average ICI decreased from IDR. 5,728 to IDR. 5,432. The average return of the ICI actually increased slightly from -1.18% to -0.57 %, although both before and after the event the average ICI return was negative. The negative return on the ICI shows that the ICI continued to decline both before and after the first case of Covid-19 was found. The slightly increased ICI return showed that the ICI decreased after the first Covid-19 case was slightly lower than before the case.

After the determination of the status of a national disaster, the ICI decreased again from IDR. 5,207 to IDR. 4,243. The deeper decline from this first event caused ICI to return to decline from -1.95% to -3.06%, which means that the ICI decline after the status determination was greater than before the determination of the National disaster status. These descriptive statistics show that the determination of the status of a national disaster has a greater impact on the decline in the ICI compared to the first patient announcement of Covid-19. The decline in the ICI and the Return of the ICI is in accordance with the findings by He et al. (2020) that COVID-19 has a negative but short-term impact on the stock markets of affected countries.

Table 4. ICI Descriptive Statistics and ICI Returns

Variable	Time	Mean	Std. Deviation
ICI_1	Before	5728.0357	179,74473
	After	5432.0471	199.47532
$RICI_1$	before	-0.0118	0.00948
	After	-0.0057	0.03341
ICI_2	before	5207.3914	278.48331
	After	4243.6557	268,48728
$RICI_2$	before	-0.0195	0.02950
	After	-0.0306	0.02712

Note:
- ICI is the composite stock price index, and ICI is the ICI return
- ICI and RICI observations were 7 days before and 7 days after the event, respectively
- subscripts 1 and 2 represent event 1 and event 2
- Event 1 is the announcement of patients 1 and 2 positives for Covid-19 in Indonesia on March 2, 2020,
- Event 2 is the determination of the Covid-19 pandemic as a national disaster by the government on March 14, 2020.

Source: Data Process

Table 5 shows the results of the ICI difference test and the ICI return before and after events 1 and 2. The difference in the ICI before and after the announcement of the first Covid-19 case was statistically significant, indicated by a significance value of 0.013 < 0.05. However, the difference in ICI returns is not significant, indicated by a significance value of 0.648 > 0.05. Thus, the first research hypothesis is accepted, while the second research hypothesis is rejected. These results indicate that the announcement of the first Covid-19 patient had an impact on the decline in the ICI.

The difference between the ICI before and after the determination of the national disaster status was also statistically significant, as indicated by a significance value of 0.000 < 0.05. However, the difference in ICI returns is not significant, indicated by a significance value of 0.478 > 0.05. Thus, the third research hypothesis is accepted, while the fourth research hypothesis is rejected. These results indicate that the announcement of the national disaster status determination also has a significant impact on the decline in the ICI. The significant difference between the ICI in events 1 and 2 indicates that the ICI continued to decline, but the decline occurred gradually so that the difference in ICI returns was not statistically significant. This result is different from the findings by Chowdhury & Abedin (2020) in the U.S. that there was a significant abnormal return around the announcement of the first confirmed Covid-19 case. Nurcahyono et al. (2021) found that the number of cases of death due to Covid-19 in Indonesia had a negative effect on ICI. For the case in Indonesia, capital market returns may be more influenced by cases of death as a direct impact of Covid-19, rather than the announcement of a particular event.

Table 5. Different Test Results

Variable	t	Sig. (2-tailed)
ICI_1	2,916	0.013 **
$RICI_1$	-0.468	0.648
ICI_2	6,592	0.000 ***
$RICI_2$	0.733	0.478

Note: ** significant at α = 5%
*** significant at α = 1%

- ICI is the composite stock price index, and RICI is the ICI return
- subscripts 1 and 2 represent event 1 and event 2
- Event 1 is the announcement of patients 1 and 2 positives for Covid-19 in Indonesia on March 2, 2020,
- Event 2 is the determination of the Covid-19 pandemic as a national disaster by the government on March 14, 2020.

Source: Data Process

Results of Testing the Market Reaction to the Covid-19 Event

Table 6 shows the descriptive statistics of abnormal returns. Event 2, namely the determination of the status of a national disaster occurred on Saturday, which is not a trading day, so there is no data on the event date (D0). Data D+1 using the data on Monday 16 March 2020. Table 6 shows that there is no too large average abnormal return around event 1 and event 2.

Table 6. Descriptive Statistics of Abnormal Return

Day	Event 1		Event 2	
	Mean	Std. Dev	Mean	Std. Dev
D-5	-0.0004	0.00337	-0.0017	0.01557
D-4	0.0009	0.01194	-0.0049	0.00875
D-3	-0.0017	0.01024	-0.0053	0.01479
D-2	0.0058	0.00902	-0.0009	0.01524
D-1	-0.0077	0.01813	-0.0073	0.01572
D0	0.0071	0.01406		
D+1	-0.0011	0.00835	0.0010	0.01116
D+2	-0.0025	0.01122	0.0058	0.0164
D+3	0.0004	0.00726	0.0024	0.01243
D+4	0.0021	0.01231	0.0050	0.01339
D+5	-0.0017	0.01557	0.0024	0.03385
Min	-0.0077		-0.0073	
Max	0.0071		0.0058	

Event 1 is the announcement of patients 1 and 2 positives for Covid-19 in Indonesia on March 2, 2020,
Event 2 is the determination of the Covid-19 pandemic as a national disaster by the government on March 14, 2020.

Source: Data Process

Table 7 shows that the market reacts quickly to negative events in the presence of negative abnormal returns. Table 7 also shows the results of the abnormal return significance test, the null-testing hypothesis states that the average abnormal return is equal to zero. The test results show that there is no significant abnormal return around the date of announcement of the first Covid-19 patient and around the date of the announcement of the determination of the national disaster status, which is indicated by the overall sig value > 0.05. The absence of an abnormal return means that there is no excessive market reaction, where the actual return is not different from the expected return. Thus, the fifth and sixth research hypotheses were rejected. The absence of abnormal returns does not mean that there is no information contained on the Covid-19 incident, because the data shows a declining ICI movement, unlike previous years. The results of this event study support the efficiency of a semi-strong market. The market is called a semi-strong efficient form if no investor can get an abnormal return from the announced information, or if there is an abnormal return, the market must react quickly to absorb the abnormal return towards the new equilibrium price.

This result is not following the findings of Polemis & Soursou (2020) that there is a significant abnormal return as a result of Covid-19. However, these results are consistent with the findings of Liu (2020) that there is a decline in the stock price index but there is no significant abnormal return around the events for the Indonesian capital market, even though they find significant abnormal returns in the capital markets of several other Asian countries. Irfan et al. (2021) stated that the reaction of a stock exchange is dependent on other economic factors unique to the country, resulting in the impact of the event of the Covid-19 to vary from one country to another. He et al. (2020) found that the impact of COVID-19 on stock markets has bidirectional spill-over effects between Asian countries and European and American countries.

Table 7. Significance Test Results for Abnormal Return

Day	Event 1			Event 2		
	T	Sig. (2-tailed)	Mean Difference	t	Sig. (2-tailed)	Mean Difference
H-5	-0.326	0.752	-0.00037	-0.333	0.747	-0.00173
H-4	0.230	0.824	0.00092	-1,669	0.134	-0.00487
H-3	-0.484	0.641	-0.00165	-1,072	0.315	-0.00528
H-2	1.928	0.090	0.00580	-0.174	0.866	-0.00088
H-1	-1.270	0.240	-0.00767	-1,397	0.200	-0.00732
H0	1.511	0.169	0.00708			
H+1	-0.408	0.694	-0.00114	0.279	0.787	0.00104
H+2	-0.676	0.518	-0.00253	1,055	0.322	0.00576
H+3	0.158	0.878	0.00038	0.575	0.581	0.00238
H+4	0.520	0.617	0.00214	1,110	0.299	0.00495
H+5	-0.333	0.747	-0.00173	0.212	0.838	0.00239

Event 1 is the announcement of patients 1 and 2 positives for Covid-19 in Indonesia on March 2, 2020.
Event 2 is the determination of the Covid-19 pandemic as a national disaster by the government on March 14, 2020.

Source: Data Process

Conclusions, Limitations, and Suggestions

From all the test results, it can be concluded that the Covid-19 pandemic has a negative effect on the ICI. There is a significant difference in the average ICI before and after the two studied events. The ICI average decreased after the announcement of the first Covid-19 case in Indonesia and declined again after the determination of the status of a national disaster. In terms of ICI returns, no significant differences were found before and after the two events studied. The average ICI return before and after the events was all negative. Although the Covid-19 outbreak had a negative impact on the ICI, abnormal returns were not found around the events studied, these indicates a market reaction that is fast adjusting securities prices towards the new equilibrium.

From a practical aspect, the research results have implications so that investors can better understand seeing ICI movements during the Covid-19 pandemic in order to minimize investment risk. From a theoretical point of view, the results of the analysis can be used as an academic referral to see the external impact such as Covid-19 on ICI and the market reactions that occur.

The limitation of this study is that it only examines the market reaction in Indonesia so that the findings of this study cannot be generalized to capital markets in other countries. The market reaction to the announcement of an event may vary between different capital markets. The test results did not find a significant difference in ICI return before and after the two events studied. Future studies are suggested to compare the two long periods in order to better capture the differences. The absence of significant abnormal returns due to the Covid-19 outbreak in the Indonesian capital market is also a limitation of this study. Abnormal returns may occur beyond the announcement of the events studied in this research. Investors may have anticipated the announcement about Covid-19 in Indonesia because it had happened earlier in other countries. It is recommended to study the announcements of other events related to the Covid-19 outbreak in the country and abroad.

Notes on Contributor

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