

Reactions of Indonesia Stock Market to Covid-19 Pandemic

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Abstract

This study aims to examine negative responses to COVID-19 pandemic in Indonesia in the stock market. Striking since March 2020, coronavirus has been really fast and unexpected, sparking concerns among investors particularly over conditions of stock market in Indonesia. Stock market reactions are manifested in Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR). Samples were collected using purposive sampling method. Population of the study was all companies listed on Indonesia Stock Exchange and investors possessing securities account. This event study adopted market-adjusted model along with an observation period of 15 days, seven days prior to announcement of the first two cases of coronavirus in Indonesia and seven days after. Results indicate statistically significant abnormal return on certain days within the window period.

Keywords: Abnormal Return, Covid-19 Pandemic, Event Study.

I. INTRODUCTION

Stock market plays significant roles in economic growth of a country. According to Executive Chairman of Capital Market Supervisor of Financial Services Authority (FSA), as quoted in FSA press release, Indonesia comes third in capital market growth in Asia after recording a 19.43 percent of growth. India and Thailand outrank the country after recording 24.02 and 25.49 percent of growth respectively, sending Thailand to the first place. Philippines is just below Indonesia as the country records only 16.74 percent of growth within the same period of time. Economic growth determines development of a country. With advanced globalization, every country will always require capital to finance its development plan. Capital needs are associated with the increasing needs for production activities. As a result, government, together with other economic bodies, establishes capital market whose presence aims to fulfill companies' needs for finance and investment.

In making investment, an investor is influenced by his expectation to gain return. An investor will invest if they see profit potential from an investment. Gain and loss of an investment are highly determined by environmental factors. The capital market itself is greatly influenced by various environmental factors, both economic and non-economic environment. The influence of micro-economic environment such as company's performance, implementation of company's strategies, issuance of financial statement, and dividend payment will always attract market players in capital market to react. Similarly, macro-economic environment that includes changes in interest rate, exchange rate, inflation, as well as a number of novel regulations and deregulations on economy stipulated by the government also affects price fluctuation and volume in capital market.

Likewise, non-economic environment will always affect stock exchange activities. Non-economic environment relating to issues such as natural life, human rights, and unexpected events such as disasters or virus outbreaks often becomes the key factor that causes stock price in stock market in the world fluctuate. The role of stock exchange in economic activities has grown stronger, making it more sensitive to either economic or non-economic issues.

One of major issues that has caused fluctuation of stock price is a natural disaster striking in 2020 or the novel coronavirus diseases (COVID -19). Rapid spread of the virus from human to human has created negative sentiment among investors. Market players tend to respond to this incidence negatively.

Event study is conducted to examine the influence of an event on company's value (Corrado, 2011). Company's value is indicated by company's accounting profit and stock price. However, over the years, stock price has been considered as real indicator of company's performance. According to McWilliams and Siegel as cited in Hartono

(2010:5), stock price reflects company's value as it reflects the present value of a company's future cashflows and incorporates all relevant information.

Examination of information about the spread of coronavirus in stock exchange activities aims to see how market reacts to virus outbreak as measured using abnormal return. Market reaction is reflected in changes in price of related securities. This reaction can be measured through return, which indicates the change in price, or through abnormal return. When abnormal return is generated, it can be said that an announcement or event contains information content. On the other hand, announcement or event does not contain information content if it does not provide market with abnormal return.

II. LITERATURE REVIEWS

2.1. Coronavirus Disease (COVID-19) Pandemic

According to World Health Organization (WHO), coronaviruses (CoV) are viruses that infect respiratory system. Infection of these viruses is known as COVID-19. Illnesses caused by coronaviruses range from mild flu to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). As zoonotic viruses, they are transmitted between animals and people (WHO, 2020). According to the Health Ministry of Indonesia, COVID-19 was first identified in Wuhan on December 30, 2019 with Wuhan Municipal Health Committee declaring "urgent notice on the treatment of pneumonia of unknown cause". Coronavirus spreads very quickly across the globe. According to data compiled by Worldometer (2020), there have been more than 200 countries confirming coronavirus cases. The virus has spread around the globe, along with its impacts on the economy including trading, investment, and tourism.

China is the biggest exporter in the world. Besides exporting to Indonesia, China also remains Indonesia's major trading partner. Coronavirus outbreak in China has jeopardized China's trade and affected trade in the whole world including Indonesia. China's reduced demand for raw materials such as coal and palm oil will hurt Indonesia's exports, causing prices of commodities and minerals to plummet.

In addition, tax revenue generated from trading sector also declines despite the sector being second biggest contributor to tax revenue. According to the Statistics Indonesia (BPS), exports of oil and gas and non-oil and gas decreased as China, the biggest crude oil importer, reduced its demand. Besides, the spread of coronavirus has slowed down manufacturing in China despite the country being the world's manufacturing center. Decrease in the country's production will potentially harm global supply chain while disrupting production of materials from the country. Indonesia is greatly dependent on materials produced in China such as plastic, textile, electronic, computer, and furniture materials.

Coronavirus also has an impact on investment as people become more careful with the money they spend on goods or invest. Moreover, coronavirus also affects market forecast. Investors may postpone their investment due to uncertain supply chain or shifting market assumption. In the context of investment, China is one of the countries that invests in Indonesia. In 2019, China's realized investment in Indonesia came second, with Singapore being the first. Around US \$5 billion of investment in Sulawesi is still awaiting as many Chinese workers are unable to come to Indonesia.

2.2. The Role of Capital Market

The role of Capital Market in a country's economy is vital. In capital market, a range of long-term financial products, including bonds, stocks, mutual funds, and derivatives such as options, futures, and many more, available for trade. Capital Market does not just provide fund for companies and institutions but also facilitates investment. In other words, capital market facilitates a range of facilities and infrastructure for trading and other related activities. According to Law No. 8/1995 concerning the Capital Market, capital market is defined as activities related to Public Offering and Securities trade, Public Companies and the securities they issue, as well as Securities-related institutions and professions.

Capital Market plays significant role in the economy of a country as it serves two main functions. Firstly, Capital Market is financial sources for business or means for business to generate funding from investors. The fund generated from the market is used for business development, expansion, working capital and so forth. Secondly, Capital Market is a place for people to invest in financial instruments such as stocks, bonds, and mutual funds.

2.3. Capital Market Information

Information is a critical element for investors and business people as it provides people with details, notes or description of past, present or future situation that is related to sustainability of a company and its securities in the market. Investors really need complete, relevant, accurate and timely information as analysis tools for making investment decision. Information published as public announcement is a signal for investors to make investment decisions. It is expected that market will react when receiving information that contains positive values.

Market reactions manifest in changes in trading volume. When information is disseminated and then received by market players, these people will first interpret and analyze the information as good or bad news. If an event is considered good news for investors, changes in trading volume will occur.

2.4. Signalling Theory

Signalling theory emphasizes on the importance of information disseminated by a company to external parties and their decision making. In other words, this theory is associated with asymmetric information theory in which one party (management) possesses more complete information signal than the other party (investor). George Akerlof, a researcher, first introduced this theory in 1970. Akerlof (1970) defined asymmetric information as different information owned by different parties engaged in certain economic activities, causing average value of certain commodities to relatively lower.

2.5. Hypothesis

Information is said to have information content if market reacts to certain events. Market reactions can be measured either using return, which indicates changes in price, or using abnormal return (Hartono, 2013). By referring to the theory, this study aims to examine negative responses to the spread of coronavirus in Indonesia. The hypotheses of the study include:

H₀: There was no average abnormal return during coronavirus outbreak period in Indonesia.

H_a: There was average abnormal return during coronavirus outbreak period in Indonesia.

III. METHOD

3.1. Sample Collection Method

Samples in this study were collected using purposive sampling method and secondary data. Population of the study was companies listed on Indonesia Stock Exchange by 2020. To ensure relevance and ease of measurement, these companies had met several criteria, including:

- Stocks must have been listed on Indonesia Stock Exchange within study period
- Stocks are active and traded every day during the event
- Stocks are not suspended; there is no temporary suspension in stock trading, commonly known as trading halt, usually marked by volume at zero historical price on certain days
- Stocks must be issued by companies that do not commit any corporate action to avoid confounding effect

3.2. Observation Period

COVID-19 pandemic in Indonesia has continued after the first case was confirmed on March 3, 2020 and published through printed and electronic media and broadcasted on television on the very same day. Determination of date becomes vital in event study. It was determined that window period of this study was 15 days, seven days prior to the event and seven days after, expecting that effects of the event can be captured more significantly (Ryngaert and Netter as cited in Hartono, 2010:22)

3.3. Analysis Method

This study adopted an event study method. According to Hartono (2013:555), an event study is a study that examines market reactions to certain event whose information is published as an announcement. To estimate expected return, market adjusted model was applied in this study. Researchers had also used the market model to determine expected

return beforehand. Referring to results of market model analysis, some stocks used as samples have negative betas. The market model was no longer used as negative betas would generate bias results. As a result, market adjusted model, another model to estimate expected return based on market adjustment, was selected. Abnormal return shows how market reacts to certain event. This return is statistically and significantly different from zero and may be either negative or positive. The steps to analyze abnormal return involve:

- a. Calculating actual return

$$\text{Return} = \frac{P_1 - P_0}{P_0}$$

Remark:

P1 = current price of securities

Po = price of securities on previous day

- b. Calculating expected return

$$E(R_i) = R_m$$

Remark:

E(R_i) = expected return

R_m = IDX composite return

- c. Calculating abnormal return

$$RTN_i = R_i - E(R_i)$$

Remark:

RTN_i = abnormal return

R_i = actual return

E(R) = expected return

Before conducting hypothesis testing, statistical test was conducted by calculating average abnormal return of each stock and measuring the standard error of estimate before generating standardized abnormal return and t-value subsequently.

3.4. Hypothesis Test

Hypothesis test was conducted to examine whether there was any negative market reaction to average abnormal return of stocks in Indonesia Stock Exchange during COVID-19 pandemic in Indonesia in 2020. This test was done by comparing t-value to t-table. Stages in hypothesis test include:

- t-value was generated from calculation of average abnormal return and cumulative abnormal return
- t-table was generated from table T
- One-sample t-test was used to examine whether the results are significantly different by comparing t-value to t-table.

IV. RESULTS AND DISCUSSION

4.1. Sample Selection and Event Date Determination

Purposive sampling technique was applied to select which securities to involve in the study. According to criteria used in the purposive sampling, 410 of total 600 companies listed on Indonesia Stock Exchange were considered eligible (as of June 2020).

Date of the event was determined by waiting for public announcement of the first COVID-19 case in Indonesia through all news channels, particularly on national television. After announcement on television, it was certain that the event occurred on Tuesday, March 3, 2020; and Tuesday is trading day. This date was then set as date of the event (t₀).

Estimation window of this study is 100 days prior to event window, while event window ranges seven days prior to the event (t-7) and seven days after event (t+7).

4.2.Descriptive Statistics

Analysis of stock return data used as samples generated abnormal return data of sample group, including average abnormal return (AAR) and cumulative average abnormal return (CAAR) during the event window. These values were calculated at each event so that hypothesis test could be performed in the following stage. AAR and CAAR prior to, during, and after announcement of the first COVID-19 case in Indonesia are presented in Table 4.1 and Figure 4.1.

Table 4.1: AAR and CAAR Calculation Results during Event Window (prior to, during, and after Announcement of the First COVID-19 Case in Indonesia)

Period	Date	Abnormal Return				Cumulative Average Abnormal Return
		Average	Max	Min	Std Dev	
-7	21 February 2020	-0,0055	0,9438	-0,1130	0,0201	-0,0055
-6	24 February 2020	0,0020	0,9285	-1,3723	0,0194	-0,0047
-5	25 February 2020	0,0070	0,7931	-0,2612	0,0854	0,0033
-4	26 February 2020	0,0010	0,8063	-0,0938	0,0965	0,0054
-3	27 February 2020	-0,0052	0,8854	-0,1039	0,0958	-0,0016
-2	28 February 2020	0,0063	0,7743	-0,0148	0,0035	0,0052
-1	02 March 2020	0,0132	0,8924	-0,8292	0,0591	0,0219
0	03 March 2020	0,0060	1,1736	-0,9230	0,0549	0,0229
1	04 March 2020	-0,0061	0,8632	-0,2039	0,0416	0,0171
2	05 March 2020	0,0038	1,0050	-0,1536	0,0958	0,0104
3	06 March 2020	0,0012	0,9222	-0,2635	0,0194	0,0132
4	09 March 2020	-0,0040	0,9306	-0,8747	0,0285	0,0231
5	10 March 2020	0,0039	1,0241	-0,3977	0,0215	0,0235
6	11 March 2020	0,0034	0,5958	-0,6284	0,0507	0,0296
7	12 March 2020	-0,0021	1,1028	-0,6234	0,0741	0,0243

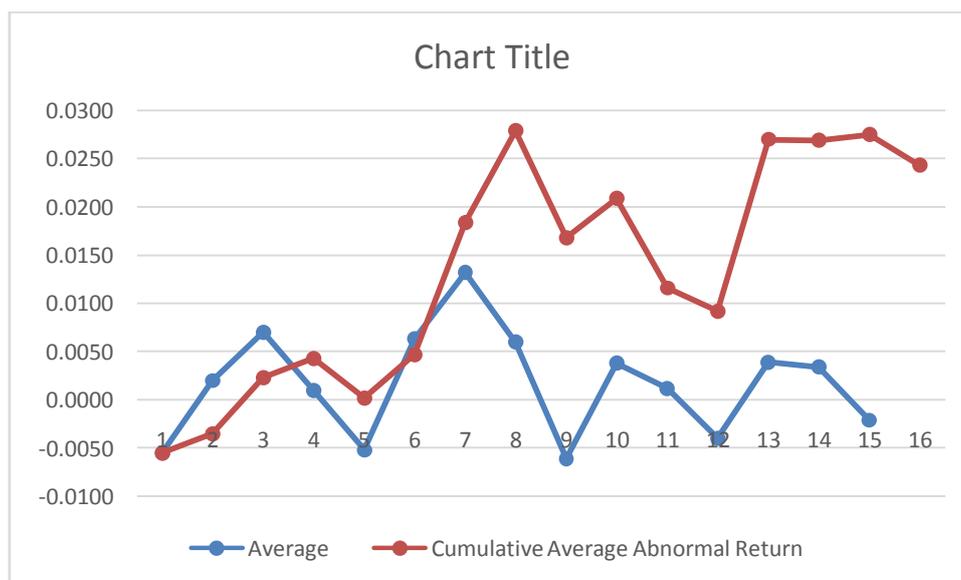


Figure 4.1 Movement of AAR and CAAR during Event Window of Announcement of the First COVID-19 Case in Indonesia

4.3. Abnormal Return Calculation

At first, researchers calculated abnormal return using two methods namely market adjusted model and market model aiming to compare calculations of abnormal return. Market model, however, generated biased beta estimates (negative beta), making calculation invalid and incompatible for basis of abnormal return calculation. Therefore, market adjusted model was then applied to calculate abnormal return. It was to determine abnormal return of each stock. According to market adjusted model, the expected return of securities equals market index returns within the period. If expected return equals market index returns, estimation window will be unnecessary for estimation model. This study used data of all listed stocks and therefore used IDX Composite as its stock market index. IDX Composite returns within the event window are listed in Table 4.2.

Table 4.2. Return of IDX Composite within Event Window

Period	Date	IHSG
-7	21 February 2020	0,0192
-6	24 February 2020	0,0107
-5	25 February 2020	-0,0042
-4	26 February 2020	0,0075
-3	27 February 2020	0,0049
-2	28 February 2020	-0,0038
-1	02 March 2020	-0,0068
0	03 March 2020	-0,0291
1	04 March 2020	-0,0182
2	05 March 2020	-0,0031
3	06 March 2020	-0,0001
4	09 March 2020	-0,0013
5	10 March 2020	-0,0034
6	11 March 2020	-0,0021
7	12 March 2020	-0,0102

4.4. Abnormal Return Hypothesis Testing

Hypothesis testing was to determine statistical significance of abnormal returns seven days prior to, during, and seven days after the event date. Results of hypothesis testing are presented in Table 4.3.

Table 4.3 shows AAR significance resulted within event window of 15 Indonesian trading days. The table also demonstrates statistical significance at 5% significance level on certain days during event window including t-5, t-2 and t-1 and negative value on t+1. Positive AARs were reported on t-6, t-5, t-4, t-2, t-1, t0, t+2, t+5 and t+6 during event window.

Table 4.3. AAR Significance

Period	Date	ARR	Standard Error	t	Mark
-7	21 February 2020	-0,0035	0,0036	-1,4020	*
-6	24 February 2020	0,0023	0,0092	0,4291	
-5	25 February 2020	0,0064	0,0037	2,1501	**
-4	26 February 2020	0,0020	0,0055	0,2329	
-3	27 February 2020	-0,0041	0,0052	-1,1525	
-2	28 February 2020	0,0059	0,0030	1,9874	**
-1	02 March 2020	0,0098	0,0065	1,6273	***
0	03 March 2020	0,0038	0,0034	1,8254	*
1	04 March 2020	-0,0083	0,0028	-1,4259	
2	05 March 2020	0,0072	0,0031	1,5276	*
3	06 March 2020	0,0010	0,0047	1,0817	
4	09 March 2020	-0,0039	0,0045	-0,7283	
5	10 March 2020	0,0048	0,0076	1,2528	
6	11 March 2020	0,0029	0,0019	0,6326	
7	12 March 2020	0,0082	0,0063	0,1230	

Remarks

- T-table for 10% = 2.588 *= a significance level of 10%
- T-table for 5% = 1.965 ** = a significance level of 5%
- T-table for 1% = 1.648 *** = a significance level of 1%

4.5. Cumulative Average Abnormal Return Hypothesis Testing

Hypothesis testing was also conducted on cumulative average abnormal return (CAAR) during announcement of COVID-19 outbreak. This test was to determine whether cumulative AAR during event window differed significantly from zero. If t-value is greater than t-table at 5% significance level, null hypothesis is rejected. Conducting this test is important to determine whether investors cumulatively earned statistically significant gain or loss within 15 days of observation. There were days on which investors earned gain or loss in daily basis; however, cumulative results may differ at the end of the period due to negation of CAAR (some AARs are positive, some others are negative) within observation period. Test results are presented in Table 4.4.

Table 4.4 Significance of Cumulative Average Abnormal Return (CAAR)

CAAR	Std. Dev	t-value	t-table	Hypothesis (H ₀)
0,0243	0,3459	1,1829	1,6449	Not rejected

Table 4.4 suggests that cumulative t-value of 410 stocks during event window is less than t-table. CAAR significance test was conducted to determine cumulative results over 15 days. CAAR is the sum of AAR over 15 days of event window. Referring to Table 4.4, it can be seen that, cumulatively, investors did not earn any significant gain or loss. It was due to information leakage on both printed and electronic media prior to the event, stimulating normal reactions of capital market.

4.6. Discussion

As an event study, this study examined whether capital market reacted positively to the announcement of the first COVID-19 case in Indonesia. Referring to results of abnormal return test, in general, announcement of COVID-19 outbreak in Indonesia has information content as can be seen from presence of abnormal return during event. Capital

market responses can be seen from positive average abnormal returns on t-6, t-5, t-4, t-2, t-1, t0, t+2, t+3, t+5, and t+6. It is also supported by t-test on average abnormal return (AAR) that generated significant results on t-5, t-2 and t-1 at 5% significance level, indicating significant results around the event day. As t-value during event window falls inside critical region, H_0 is rejected. It means that abnormal returns were present on days around announcement of COVID-19 outbreak in Indonesia and indicates that the announcement contains information content that influences investors' decision making.

Statistical test at 5% significance level generated statistically significant results on t-5, t-2 and t-1; therefore, H_a (there was positive capital market reaction to announcement of the first COVID-19 case in Indonesia) was accepted. At 5% significance level, a t-value of 1.965 was generated. H_a will be accepted if t-value is greater or equal to t-table. In this study, results of t-test generated t-values of 2.15 and 1.98 on t-5 and t-2, which, in other words, are greater than a t-table of 1.965. Hence, H_0 is rejected.

Market reactions can also be seen from movement of cumulative average abnormal return (CAAR). CAAR was found negative on t-7 and t-6 but then became positive on t-5 before dropping to negative on t-3. CAAR was found positive on t-2 and remained positive up to t+7. Referring to overall CAAR significance test result in 15 days (from t-7 to t+7), null hypothesis was not rejected. It indicates that investors did not earn any significant gain or loss cumulatively.

V. CONCLUSION

5.1. Summary

This study adopted an event study method to examine market reactions to announcement of the first COVID-19 case in Indonesia. This study aims to analyze positive market reactions and differences in average abnormal return of all stocks listed on Indonesia Stock Exchange. No less than 410 companies were eligible and were therefore selected as samples of the study. Data analysis and a series of hypothesis tests indicated statistically significant abnormal return on certain days during the event. Therefore, the null hypothesis of the study was rejected. In short, it can be said that information concerning announcement of COVID-19 influences stock price as indicated by statistically significant average abnormal return found in the study.

5.2. Conclusions

- Problem formulation of the study was to analyze market's positive responses to all stocks listed on Indonesia Stock Exchange after announcement of the first COVID-19 case in Indonesia. Results indicate positive responses after announcement of the first COVID-19 case in Indonesia.
- Results of hypothesis test on average abnormal return within window period of 15 days demonstrate rejection of null hypothesis with statistically significant results on t-5, t-2.
- Referring to results of hypothesis test on cumulative average abnormal return within window period of 15 days, H_0 was not rejected. Cumulatively, investors earned neither significant gain nor loss while capital market tended to react normally.
- According to calculation of average abnormal return, tests have proved that market showed relatively fast absorption of information and presence of information content on announcement of the first COVID-19 case in Indonesia. It has proven that the market is efficient and semi-strong.

5.3. Limitations

- Within study period, other unknown information might be present but was not taken into account as this study focuses on announcement of COVID-19 outbreak in Indonesia. This, however, can influence average abnormal return.
- Only one calculation method, namely market adjusted model, was used to estimate expected return.

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