

Stock Market Reactions before and during the COVID-19 Pandemic: Evidence from Indonesia

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Abstract: Research on market reactions to the phenomenon of The Day of Week Effect, Week Four Effect, Rogalsky Effect, and January Effect in several world capital markets finds different results. This study aims to determine the reaction of the Indonesian capital market before and during the Covid-19 pandemic which is associated with the phenomenon of the day of the week effect, week four effect, Rogalski effect, and January effect. By conducting a study of previous theoretical research, after that a survey was carried out to obtain data phenomena, classifying the closing daily JCI before and during the Covid-19 pandemic, calculating actual returns, calculating expected returns and abnormal returns, then classifying return or abnormal return data into 4 phenomena namely The Day of The Week Effect, Week Four Effect, Rogalsky Effect, and January Effect. For The Day of The Week Effect, return data is classified into Monday and non-Monday returns. For Week Four Effect, return data is classified into Monday week 1, 2, 3, and Monday week 4.5. For the Rogalsky Effect, returned data are classified into Monday, April, and Monday non-April. For the January Effect, returned data are classified into January 1st week and January 2nd week. Then do the Data Normality Test and Hypothesis Testing. This study produces empirical evidence that there is no phenomenon of the day of the week, week four effect, Rogalski effect, and January effect before and during the Covid-19 pandemic outbreak on the Indonesia Stock Exchange.

Key-Words: - market anomaly, the day of the week effect, week four effect, Rogalski effect, January effect.

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1 Introduction

The COVID-19 pandemic has had a major impact on the World Capital Markets, including Indonesia [1]. The movement of stock prices in the Indonesian Capital Market declined sharply [2]. Before the Covid-19 pandemic, namely 2018, the Composite Stock Price Index (JCI) was at 6,098.58, in 2019 it increased by 3.71% to 6,324.66 but when the Covid-19 Pandemic broke out in Indonesia, the JCI decreased 17.93% which is 5,190.41. The decline in the JCI was caused by the market reacting to information about the Covid-19 pandemic which was considered bad news. When viewed from the monthly JCI movement, the movement in 2018 and 2019 was relatively stable in 2018 the lowest JCI occurred in June of 5,799, the highest occurred in

January of 6,605. For 2019, the lowest JCI occurred in November at 6,011, the highest occurred in January at 6,532. Meanwhile, the movement in 2020 was more volatile, with the lowest JCI occurring in March at 4,538, and the highest occurring in December at 5,979. By looking at the monthly JCI movement, researchers are interested in researching on: Did the phenomenon of the day of the week, week four, Rogalski, and January effect occur on the Indonesia Stock Exchange before and during the Covid-19 pandemic in Indonesia.

Market reaction to information can be considered good news or bad news depending on the economic value contained by the information [3] [4]. Good news increases the JCI, while bad news causes the JCI to fall. In addition to good and bad news that

causes the market to react, several researchers have found that there is a market anomaly phenomenon, namely deviations from the efficient market hypothesis so that the Indonesian capital market is classified as a semi-strong form which also affects stock prices [5]. The phenomena are The Day of Week, Week Four, Rogalsky, and the January Effect. The Day of Week is a phenomenon where there is a significant difference in returns between Monday and other days of the week, Monday produces a negative return while the other day returns a positive one [6]. Meanwhile, Week Four is a phenomenon where the Monday Effect occurs on the 4th week of each month, while the 1st, 2nd and 3rd weeks do not. The Rogalsky Effect is a phenomenon where the average return is negative on Mondays and disappears during certain months. While the January Effect is the phenomenon of rising stock prices in January in the first week [7].

2 Literature Review

State of the art is assessed from several studies conducted in global capital markets, namely; NYSE Stock Exchange, Tadawul, Canada and Johannesburg, and Indonesia Stock Exchange. Bishal et al. [8] examined the effect of individual investors' trading patterns on the day of the week and the January effect on companies listed on the NYSE. Empirical findings show that the trading activity of individual investors on Monday is lower than any other day. Chowdhury et al. [9] examined the autocorrelation of stock returns of 159 companies listed on Tadawul (Saudi Arabian Capital Market) for the period 2004 - 2015 and found that returns are related to the effect of the day of the week where on Tuesdays, Wednesdays, and Thursdays have higher returns. larger than Mondays and Fridays. Washer et al. [10], identified the impact of the day of the week using three financial instruments in Canada for the period 1980 – 2009, resulting in that the Monday Effect occurred in 1980 for treasury bills (TB) and corporate papers, in contrast to banker acceptances (BA) not impact. In 1990 the Monday Effect disappeared, but in 2000 reappeared but was positively correlated with corporate paper and banker acceptances. Researchers also found that Wednesday is the day that produces the highest return. du Toit et al. [11] by using the GARCH model to test the effect of the day of the week on the Johannesburg Stock Exchange for the period March 1995 – March 2016. The empirical findings conclude that the results are contrary to the effect of the day of the week as indicated by return volatility with the highest return

occurring on the day of the week. Monday and the lowest occurred on Friday.

Ardila et al. [12] examined how the effect of stock trading days, Week Four, Rogalsky Effect, and The Day of the Week on stock returns in LQ 45 for the 2016 period. where there is a difference between 1-3 weeks of the 4th week of each month on trading days with the Rogalsky Securities occurring on the IDX. Then, Saraswati et al. [13] tested the phenomenon of Week Four, Rogalsky Effect, and The Day of The Week on stock returns of LQ 45 in 2013. The results showed that The Day of The Week in the Indonesian capital market experienced an anomaly, namely, there was a difference in the average daily stock return. in one year in a week and the Week, Four phenomena occur because of negative returns on Monday, the 4th and 5th week of each month, while the Rogalsky Effect phenomenon does not occur on the IDX.

The results of the study that tested the anomaly of The Day of The Week in the capital market, namely the NYSE, Tadawul, Johannesburg Stock Exchange, Canadian money market, and BEI, showed different evidence. This study also examines the anomalies of The Day of The Week, Week Four, and the Rogalsky Effect in the Indonesian stock market, which is expanded by examining the market reaction due to the Covid-19 pandemic and whether the anomalies of The Day of The Week, Week Four and the Rogalsky Effect this also happened when the market received bad news about the Covid-19 pandemic.

The phenomenon of The Day of The Week is a phenomenon that is contrary to the concept of an efficient market which states that there are differences in returns on Mondays with other days. Monday returns tend to be negative while other days are positive. Returns tend to be negative because of the individual's desire to transact on Mondays by selling shares at a higher price than the individual's desire to buy shares which affects lower stock prices [14]. The Monday Effect phenomenon occurs on the 4th week of every month. Negative returns occurred on Mondays in the last two weeks, although they were still negative but not significant [12]. The phenomenon of the Rogalsky Effect states that the average return will be negative on Monday and will disappear in certain months. Research on the Rogalsky Effect on the IDX produces inconsistent results. Saraswati et al. [13] researched LQ 45 companies in 2013 with a sample of 41 companies found that there was no Rogalsky Effect on the IDX while Ardila et al. [12] who also researched on LQ 45 in 2016 found that there was a Rogalsky Effect on the IDX. Meanwhile, the January Effect is a

phenomenon where stock prices increase during the first week of January. The results of research from Fitriyani and Sari [15] found that when viewed from stock returns and abnormal returns there is a January Effect on the IDX because companies have a strategy to improve their financial statements by marketing low-value stocks at the close of the year, and marketing profitable stocks entering the market early next year to increase profits attract investors.

The hypotheses in this study consist of: first, JCI stock returns due to The Day of The Week on the IDX are different before and after the Covid-19 pandemic, second, JCI stock returns due to The Day of The Week on the IDX are also different during the Covid-19 pandemic. Third, there are differences in the stock returns of the JCI due to the fourth-week effect on the IDX before the Covid-19 pandemic outbreak, fourth, there are differences in stock returns on the JCI caused by the fourth week of effects on the IDX during the Covid-19 pandemic, fifth, the stock returns of the JCI are different due to The Rogalsky Effect on the IDX before the Covid-19 pandemic, sixth, there was a difference in JCI stock returns due to the Rogalsky Effect on the IDX during the Covid-19 pandemic, and seventh, there was a difference in JCI stock returns on the January Effect on the IDX before the COVID-19 pandemic. On the eighth day, there was a difference in JCI stock returns on the January Effect on the IDX throughout Covid-19.

3 Research Methods

This research is an empirical study conducted on Indonesia's capital expenditures related to market reactions, trading days, and JCI stock returns [16]. The research procedure is as follows:

1. The research begins with a study of previous research and a study of theory
2. Then conduct a data survey on the IDX website, namely the JCI to obtain data phenomena to produce titles and design research proposals.
3. Collecting daily Composite Stock Price Index (IHSG) data from 2018 – 2020.
4. Classify daily JCI data before and during the Covid-19 pandemic.
5. Calculate actual returns before and during the Covid-19 pandemic.
6. Calculate the expected return before and during the covid-19 pandemic.
7. Classify the return or abnormal return data into 4 phenomena, namely The Day of The Week, Week Four, Rogalsky, and the January Effect.

8. For The Day of The Week, return data is classified into Monday and non-Monday returns.
9. For Week Four Effect, return data is classified into two, namely Monday week 1,2,3, and Monday week 4.5.
10. For the Rogalsky Effect, the return data is also classified into two, namely Monday, April, and Monday non-April.
11. For the January Effect, the return data are classified into two, namely January 1st week and January 2nd week of 2,3,4,5.
12. Perform Data Normality Test.
13. Test the hypothesis, namely the paired sample t-test or the Wilcoxon test.

Testing data that are normally distributed using paired sample t-test and if the data is not normally distributed, the Wilcoxon test is used. The difference test hypothesis is accepted if the p-value is 5%.

4 Results and Discussion

This study was conducted to examine the response of the Indonesian capital market caused by the COVID-19 pandemic and the anomalies of the day of the week, week four, Rogalski and January effect that occurred in the Indonesian capital market before and during the Covid-19 pandemic. The reaction of the Indonesian capital market is shown by changes in stock prices in the period before and during the COVID-19 pandemic as measured by abnormal returns [17]. Meanwhile, to see the anomaly of the day of the week, week four, Rogalski, and January effect before and during the Covid-19 pandemic, stock returns are used.

Hypothesis testing using the Paired Sample t-test if the data is normally distributed, on the contrary, the Wilcoxon test is used. The One-Sample Kolmogorov-Smirnov test was used to test the normality for the data to answer hypotheses 5 to 8 guided by statistical analysis by looking at the value of kurtosis and skewness. This is done because the One-Sample Kolmogorov-Smirnov Test cannot detect normality with small data consisting of only 3 to 4 data. The results of the normality test using the Kolmogorov-Smirnov Test are as follows:

Table 1. Normality KS Test Results

No.	Data	Sign. Value	Description
1	Hypothesis 1	0,200	Normal Data

2	Hypothesis 2	0,026	Abnormal Data
3	Hypothesis 3	0,200	Normal Data
4	Hypothesis 4	0,200	Normal Data

The results of Hypothesis 1, 3, and 4 tests are shown in table 1 which shows that the KS value is 0.200 which is greater than 0.05, so the data is normal, while for hypothesis 2, the KS value is 0.026 which is smaller than 0.05, the data abnormal. While the results of the Normality Test for data answering hypotheses 5 to 8 using statistical analysis using Kurtosis and Skewness gave the results shown in table 2.

Table 2. Test Results of Normality, Kurtosis, and Skewness

No	Data	Z Kurtosis	Z Skewness	Description
1.	Hypothesis 5	1,05	1,30	Normal Data
2.	Hypothesis 6	-	1,22	Normal Data
3.	Hypothesis 7	0,90	-0,91	Normal Data
4.	Hypothesis 8	0,81	0,76	Normal Data

Based on table 2 above, it appears that the Z value of Kurtosis and Z Skewness has a value less than 1.96, so all data for hypothesis testing 5, 6, 7, and 8 are normal. Furthermore, hypothesis testing is carried out with the following results:

Table 3. Hypothesis Test Results

No.	Hypothesis	Sign. Value	Description
1.	Hypothesis 1	0,487	Hypothesis Rejected
2.	Hypothesis 2	0,682	Hypothesis Rejected
3.	Hypothesis 3	0,865	Hypothesis Rejected
4.	Hypothesis 4	0,399	Hypothesis Rejected
5.	Hypothesis 5	0,678	Hypothesis Rejected
6.	Hypothesis 6	0,382	Hypothesis Rejected
7.	Hypothesis 7	0,395	Hypothesis Rejected
8.	Hypothesis	0,320	Hypothesis

	8		Rejected
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The results of testing the significance of hypothesis 1 shown in table 3 have a value of 0.487 which is greater than 0.05, with the decision of the hypothesis being rejected. In conclusion, there is no difference in JCI stock returns caused by The Day of The Week on the IDX before the Covid-19 pandemic outbreak. The significance test of hypothesis 2 produces a value of 0.682 which is greater than 0.05 with the decision of the hypothesis being rejected, it can be said that there is no difference in the stock returns of the JCI due to The Day of The Week on the IDX during the Covid-19 pandemic. The significance test of hypothesis 3 produces a value of 0.865 which is greater than 0.05 with the decision of the hypothesis being rejected, it can be said that there is no difference in the stock returns of the JCI because of the Week four effect on the IDX before the outbreak of the Covid-19 pandemic. The significance test of hypothesis 4 produces a value of 0.399 which is greater than 0.05 with the decision of the hypothesis being rejected, it can be said that there is no difference in the stock returns of the JCI due to the Week four effect on the IDX during the Covid-19 pandemic. The significance test of hypothesis 5 produces a value of 0.678 which is greater than 0.05 with the decision of the hypothesis being rejected, it can be said that there is no difference in the stock returns of the JCI caused by the Rogalsky Effect on the IDX before the outbreak of the Covid-19 pandemic. The significance test of Hypothesis 6 resulted in a value of 0.382 which is greater than 0.05 with the decision of the hypothesis being rejected, so it can be said that there is no difference in the JCI stock returns due to the Rogalsky Effect on the IDX during the Covid-19 pandemic. The significance test of hypothesis 7 produces a value of 0.395 which is greater than 0.05 with the decision of the hypothesis being rejected, it can be said that there is no difference in the stock returns of the JCI on the January Effect on the IDX before the outbreak of the Covid-19 pandemic. Finally, the significance test of hypothesis 8 produces a value of 0.320 which is greater than 0.05 with the decision of the hypothesis being rejected, so it can be said that there is no difference in the stock returns of the JCI on the January Effect on the IDX during the Covid-19 pandemic.

Testing for hypotheses 1 and 2 found that there was no difference in JCI stock returns caused by The Day of The Week on the IDX before and during the Covid-19 pandemic. This shows the anomaly of weekend holidays on the IDX both before and

during the COVID-19 pandemic, which means stock returns for Mondays and non-Mondays are homogeneous. The results of this study are in line with Ardila et al. [12] who found that the day of the week phenomenon did not occur in LQ 45 stocks. This result does not support the efficient market anomaly theory (days of the week) which states that trading days on the exchange affect stock returns.

The results of testing hypotheses 3 and 4 found that the IHSG stock returns due to the Week four effect on the IDX before and during the Covid-19 pandemic were no different. In other words, on the IDX there is no Week four effect phenomenon. This means that stock returns for Mondays 1, 2, and 3 are homogeneous with Mondays 4 and 5. Other findings also prove that there is no difference in JCI stock returns due to the Rogalsky Effect on the IDX before and during the Covid-19 pandemic. In other words, on the IDX there was no Rogalsky Effect phenomenon either before or during the Covid-19 pandemic. Stock returns for Mondays in April and Mondays in months other than April are homogeneous. Empirical research evidence supports the study of Saraswati et al. [13] who found that the Rogalsky Effect anomaly did not occur on the IDX.

The January Effect phenomenon also gave the same result, where the JCI stock returns on the January Effect on the IDX before and during the Covid-19 pandemic there were no differences. This can be seen from the stock returns in January the 1st week with the 2nd to 5th weeks being homogeneous. The results of this study found that there were no anomalies in The Day of The Week, Week four effect, Rogalsky Effect, and January Effect on the IDX before and during the Covid-19 pandemic outbreak. This identifies that stock returns on the Indonesia Stock Exchange are homogeneous and not influenced by trading day [18]. Stock returns are more influenced by macroeconomic variables [19], and financial performance [20].

5 Conclusion

In line with the research objectives, the empirical findings of the study can be concluded: first, there was no day of the week anomaly before and during the Covid-19 pandemic outbreak on the IDX, second, there was no week four effect phenomenon before and during the Covid-19 pandemic outbreak on the IDX, , third, there is no Rogalski effect phenomenon before and during the Covid-19 pandemic outbreak on the IDX, fourth, there is no January effect phenomenon before and during the Covid-19 pandemic outbreak on the IDX. With the results of these studies, it is recommended for

further research to increase the observation time to be longer so that the data used to meet the application requirements used in data processing, as well as add other phenomena or company actions to see the market reaction to the event.

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