

Between Ramadhan Effect Vs Covid-19 Pandemic

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ABSTRACT

This study investigated the Efficient Market Hypothesis (EMH) in stock market. The current study explores what happens before and after Ramadan month, starting 2018 until the Covid-19 pandemic (2021). We have found that generally, average abnormal return full period or year on year have lower abnormal return, indicate did not significant. The research proved that there are significant differences in average trading volume activity before and after Ramadan effect. The interaction of Ramadan and Covid-19 have result significant in 2020 for variable average trading volume activity.

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I. INTRODUCTION

According to (Levy, 1996) market anomalies, there are four anomalies, namely seasonal anomalies, company anomalies, accounting anomalies and event anomalies. In addition, there are also calendar anomalies. This calendar anomaly consists of non-religious and religious calendar anomalies. Non-religious calendar anomalies are January Securities, Wednesday Securities, and Weekend Securities. While religious anomalies such as the Christmas and Good Friday Effect, Jewish High Holy Days Effect, Easter Week Holiday, and the Ramadan Effect. Ramadan is one of the months in the Islamic calendar. The month of Ramadan can be identified based on the lunar system. Thus, the Islamic calendar is shorter than the Gregorian (usually based on the solar cycle and used internationally). As a result, about eleven days, causing the mapping in the Islamic calendar to shift by about two weeks in the Georgian calendar each year. The Ramadan month makes every Muslim to fast during the day, which is to refrain from eating, smoking and other sensual pleasures. In Ramadan month, there is a special prayer that is performed every night of Ramadan known as the Tarawih prayer. The Ramadan month is used to increase spiritual and social interactions with positive sentiments. With the unique nature of Ramadan, a series of studies have investigated whether the time of the month has a special effect on the dynamics of abnormal returns. In the past research abnormal returns are positive during the month of Ramadan (Bialkowski, 2012) (Alkhazali, 2014). Another study on Ramadan month was associated with trading volume. This was due to a slowdown in trading activity (due to fasting throughout the day and reduced productivity). In addition, trading hours are shorter than usual. (Andrikopolous, 2020). The effect of Ramadan is specifically correlated with the social atmosphere and trading volume. Based on the two opposite potential effects during Ramadan, we take the variables of abnormal return and trading volume activity. However, none of the studies has compared the effect of Ramadan between before and during the Covid-19 periods. In this regard, in this study we propose to investigate the Ramadan effect between before and Covid-19 periods. By doing this, we will understand how investor behavior in different situations. (Hawaldar, et al, 2020) (Kumar et al 2018) (Shaaikh, 2022)

II. DATA AND METHODOLOGY

Data

This research was conducted on the Indonesia Stock Exchange and the object of research is all companies that are continuously joined to the Pefindo i-Grade group for the 2018-2021 period and are listed on the Indonesia Stock Exchange .

Methodology

This research applying an event study methodology for approach an informational event. Event study is a research methodology that is based on the Efficient Market Hypothesis (EMH). According to EMH, the share prices of a firm reflect all the information about it, so every single event related to the firm is depicted on its stock returns (Schwert, 2011). Abnormal return in a phase before and after the event runs in the same way as a measure of the unexpected effect of the incident on the company's performance. It is calculated by deducting the expected (as normal earnings) from the real earnings of the stocks. Rai and Pandey (2022) and Ullah et al (2021) using the market adjusted model for measure abnormal return (AR) and trading activity volume in before and after an event. The market adjusted model, according (Marisetty, 2021) has advantage other model such as market model, mean adjusted model. Because abnormal return increasing than that all models provide

the almost same result (Marisetty,2021). In our study, we have used the market adjusted model for abnormal return.

$$\text{Abnormal Return (AR}_{xi,t}) = R_{it} - E[R_{it}]$$

R_{it}= Stock Return observed on day t

E[R_{it}]= Market or index return observed on day t

Futhermore, the sample average AR at time t (AR_t) for N sample is calculated as follows:

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^N AR_{jt}$$

The cumulative average abnormal return from event time p up to event time q called as cumulative abnormal return (CAR_{p,q}) is calculated as :

$$CAR_{p,q} = \sum_{t=p}^q \overline{AR}_t$$

$$CAR_{i(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t}$$

Where AR_{i,t} describe the average abnormal return rate of stock i on the trading day , obtained by deducting the anticipated eraning from the actual return. CAR_{i(t₁,t₂)} denotes the aggregate abnormal return degree of stock i appearing in the event window perioed (t₁, t₂). The normal process investigating the CAR for a event window, with the null hypothesisi being that the car is zero. Meaning the market no haas response the incidence.

Trading Volume Activity is a transaction that occurs in stock trading activities that change hands and is used as a reference to measure the intensity of changes in the number of shares (Edianto Ong, 2016). To find out the Trading Volume Activity , the following calculations can be carried out:

$$TVA = \frac{\sum \text{saham perusahaan i yang diperdagangkan pada waktu}}{\sum \text{saham perusahaan i yang beredar pada tahun t}}$$

III. RESEARCH RESULT

Descriptive Analysis

Based on the research conducted, the data used are abnormal returns and trading volume activity . These data will be explained as follows:

Abnormal Return

The following are descriptive statistics, namely the Average Abnormal Return on H-15 (before Ramadan) and H+15 (after Ramadan) on Perfindo i-grade indexed stocks:

Table Error! No text of specified style in document. . 1 AAR Descriptive Analysis for the Period 2018-2021

Descriptives						
Average Abnormal Return 2018-2021						
	N	mean	Std. Deviation	Std. Error	Min	Ma x
Before Ramadan	60	-.0003	0.0120	.0015	-.0224	.0447
After Ramadan	60	.0020	0.0125	.0016	-.0164	.0356
Total	120	.0005	0.0120	.0009	-.0277	.0447

Source: Data Processed using SPSS 25 (2022)

Based on table 4.1 above, before Ramadan has a minimum value of -0.0224 and a maximum value of 0.0447. With a mean of -0.0003 and a standard deviation of 0.0120 which refers to the extent of deviation from the mean. After Ramadan, the minimum value is -0.0164 and the maximum value is 0.0356. With the mean after that is 0.002 and the standard deviation is 0.0125.

Trading Volume Activity

The following are descriptive statistics of the Average Trading Volume Activity variable on H-15 (before Ramadan) and H+15 (after Ramadan) on Perfindoi-grade indexed stocks:

Table Error! No text of specified style in document.. 2
ATVA Descriptive Analysis for the Period 2018-2021

Descriptives						
Average Trading Volume Activity (ATVA) 2018-2021						
	N	mean	Std. Deviation	Std. Error	Min	Max
Before Ramadan	60	0.0014	0.0006	0.0001	0.0006	0.0032
After Ramadan	60	0.0023	0.0022	0.0003	0.0007	0.0108
Total	120	0.0017	0.0014	0.0001	0.0006	0.0108

Source: Data Processed using SPSS 25 (2022)

Based on table 4.2 above, before Ramadan the *Average Trading Volume Activity* had a minimum value of 0.0006 and a maximum value of 0.0032. With a mean of 0.0014 and a standard deviation of 0.0006 which refers to the extent of deviation from the mean. After Ramadan, the minimum value is 0.0007 and the maximum value is 0.0108. With the mean after that is 0.023 and the standard deviation is 0.0022.

Normality test
Abnormal Return

The results of the normality test in this study can be seen in the following table:

Table Error! No text of specified style in document.. 3
AAR Normality Test Results 2018-2021 Period

Tests of Normality				
Ramadan Effect		Kolmogorov-Smirnov ^a		
		Statistics	df	Sig.
AAR 2018-2021	Before Ramadan	0.102	60	0.192
	After Ramadan	0.128	60	0.016
*. This is a lower bound of the true significance.				
a. Lilliefors Significance Correction				

Source: Data Processed using SPSS 25 (2022)

Based on table 4.3 above, there are asymp values. Sig on the *Average Abnormal Return* before Ramadan is 0.200. The value is > 0.05 which means the data is normally distributed. While the asymp value. Sig on the *Average Abnormal Return* after Ramadan is 0.001. The value is < 0.05, which means the data is not normally distributed. While the statistical *Abnormal Return test per year* is as follows:

Table Error! No text of specified style in document.. 4
AAR Normality Test Results Per Year

Tests of Normality				
Ramadan Effect		Kolmogorov-Smirnov ^a		
		Statistics	df	Sig.
AAR 2018	Before Ramadan	0.141	15	0.200 [*]
	After Ramadan	0.149	15	0.200 [*]
AAR 2019	Before Ramadan	0.103	15	0.200 [*]
	After Ramadan	0.146	15	0.200 [*]
AAR 2020	Before Ramadan	0.131	15	0.200 [*]
	After Ramadan	0.136	15	0.200 [*]
AAR 2021	Before Ramadan	0.168	15	0.200 [*]
	After Ramadan	0.200	15	0.108
*. This is a lower bound of the true significance.				

a. Lilliefors Significance Correction

Source: Data Processed using SPSS 25 (2022)

Based on table 4. 4 above, the asymp value. Sig on *Average Abnormal Return* before and after Ramadan per year shows greater than the significance level of 0.05. These results mean that the data is normally distributed.

Trading Volume Activity

The results of testing the normality of the data for the *Abnormal Return variable* in this study can be seen in the table below:

Table Error! No text of specified style in document.. 5
ATVA Normality Test Results 2018-2021 Period

Tests of Normality				
Ramadan Effect		Kolmogorov-Smirnov ^a		
		Statistics	df	Sig.
AVA	Before Ramadan	0.163	60	0.000
	After Ramadan	0.278	60	0.000
a. Lilliefors Significance Correction				

Source: Data Processed using SPSS 25 (2022)

Based on table 4.5 above, it is found that the asympvalue .Sig on *Average Trading Volume Activity* before and after Ramadhan is 0.000. The value of 0.000 < 0.05 which indicates the data is not normally distributed. While the average trading volume statistical test per year is as follows:

Table Error! No text of specified style in document.. 6
ATVA Normality Test Results Per Year

Tests of Normality				
Ramadhan Effect		Kolmogorov-Smirnov ^a		
		Statistics	df	Sig.
ATVA 2018	Before Ramadhan	0.171	15	0,200 *
	Sesudah Ramadhan	0.187	15	0.169
ATVA 2019	Before Ramadhan	0.204	15	0.093
	Sesudah Ramadhan	0,160	15	0,200 *
ATVA 2020	Before Ramadhan	0.153	15	0.200 *
	After Ramadan	0.234	15	0.026
ATVA 2021	Before Ramadan	0.180	15	0.200 *
	After Ramadan	0.183	15	0.191
*. This is a lower bound of the true significance.				
a. Lilliefors Significance Correction				

Source: Data Processed using SPSS 25 (2022)

Based on table 4. 6 above, the asymp value. Sig on *The Average Abnormal Return* before and after Ramadan in 2018, 2019, and 2021 shows greater than the significance level of 0.05. These results mean that the data is normally distributed. Meanwhile, the asymp value. The Sig on the *Average Abnormal Return* before Ramadan and after Ramadan in 2020 after Ramadan shows it is smaller than the significance level of 0.026. Thus, the data is not normally distributed.

Hypothesis testing
Abnormal Return

Based on the results of data normality, the overall *Average Abnormal Return* has data that are not normally distributed. Therefore, the *Wilxoncon Signed Rank Test* was carried out . While the *Average Abnormal Return*

per year, shows the overall data is normally distributed. Then the test is carried out using the *Paired Samples Test*. The results of the *Wilxoncon Signed Rank Test for the Abnormal Return* variable in this study can be seen in the table below:

Table Error! No text of specified style in document.. 7
Wilxoncon Signed Rank Test AAR Test Results 2018-2021 Period

Test Statistics ^a	
	AAR_After Ramadhan-AAR_Before Ramadan
Z	-0.869 ^b
asypm. Sig. (2-tailed)	0.385
a. Wilxoncon Signed Ranks Test	
b. Based on negative ranks.	

Source: Data Processed using SPSS 25 (2022)

Based on table 4. 7 above, it is found that the asymp value. Sig on the *Average Abnormal Return* before and after Ramadhan is 0.385. This value is greater than the significance level of 0.05. Therefore, it shows that the hypothesis H0 is accepted. This means that there is no significant difference in the *Average Abnormal Return* before and after Ramadhan.

Table Error! No text of specified style in document.. 8
Paired AAR Test Results Per Year

Paired Samples Test					
		T	df	t table = 5%	Sig. (2-tailed)
Pairs 1	2018_Before Ramadan - 2018_After Ramadan	-0.201	14	±1.7613	0.844
Pair 2	2019_Before Ramadan - 2019_After Ramadan	-1,456	14		0.167
Pair 3	2020_Before Ramadan - 2020_After Ramadan	0.056	14		0.956
Pair 4	2021_Before Ramadan - 2021_After Ramadan	-0.570	14		0.578

Source: Data processed using SPSS 25 (2022)

Based on the test results of table 4. 8 above, the value of sig (2-tailed) for four years is greater than the significance level of 0.05. Thus, it means that H0 is accepted or there is no significant difference in *Average Abnormal Return* between before Ramadhan and after Ramadhan from 2018 to 2021.

Trading Volume Activity

Based on the results of data normality, the *Average Trading Volume Activity* as a whole has data that are not normally distributed. Therefore, the *Wilxoncon Signed Rank Test* was carried out for the 2018-2021 period. While the *Average Trading Volume Activity* per year shows that data in 2018, 2019 and 2021 are normally distributed. Then the test is carried out using the *Paired Samples Test*. Meanwhile, the *Average Trading Volume Activity* in 2020 shows that it is not normally distributed. Thus, testing is carried out through the *Wilxoncon Signed Rank Test*. The results of the *Wilxoncon Signed Rank Test for the Trading Volume Activity* variable in this study can be seen in the table below:

Table Error! No text of specified style in document.. 9
Wilxoncon Signed Rank Test ATVA Test Results 2018-2021 Period

Test Statistics ^a	
	ATVA_After Ramadhan - ATVA_Before Ramadan
Z	-3,534 ^b
asypm. Sig. (2-tailed)	0.000
a. Wilxoncon Signed Ranks Test	
b. Based on negative ranks.	

Source: Data Processed using SPSS 25 (2022)

Based on table 4. 9 above, it is found that the asymp value. Sig on *Average Trading Volume* before and after Ramadhan for four years is 0.000. This value indicates that it is smaller than the significance level (5%), so the hypothesis H0 is rejected. This means that there is a significant difference in *Trading Volume Activity* before

and after Ramadan. To prove that there is a significant difference, it is carried out to compare the *Average Trading Volume Activity* for 2018, 2019 and 2021 using the *Paired Samples T-Test* as follows:

Table Error! No text of specified style in document.. 10
Paired Atva Test Results Per Year

Paired Samples Test					
		T	df	t table = 5 %	Sig. (2-tailed)
Pair 1	2018_Before Ramadan - 2018_After Ramadan	-0.9022	14	±1.7613	0.382
Pair 2	2019_Before Ramadan - 2019_After Ramadan	-1.1317	14		0.277
Pair 3	2021_Before Ramadan - 2021_After Ramadan	0.3869	14		0.705

Source: Data Processed using SPSS 25 (2022)

Based on the test results of table 4.1 0 above, the value of sig (2-tailed) for three years is greater than the significance level of 0.05. This is evidenced by the value of t count which is in the area of acceptance of t table, namely $-1.7613 < t \text{ count} < 1.7613$. Thus, it means that H_0 is accepted or there is no significant difference in *Average Trading Volume Activity* between before Ramadan and after Ramadan since 2018, 2019 and 2021. Meanwhile, for the 2020 test, it was carried out using the *Wilxoncon Signed Rank Test* . The test results are as follows:

Table Error! No text of specified style in document.. 11
Wilxoncon Signed Ranks Test ATVA 2020 Results

Test Statistics ^a	
	2020_Before Ramadan - 2020_After Ramadan
Z	-3,351 ^b
asympt. Sig. (2-tailed)	0.001
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

Source: Data Processed using SPSS 25 (2022)

Based on table 4.1 1 above, the Asymp value. Sig(2-tailed), shows a value of 0.001 which is a smaller value than the significance level of 5%. Thus, hypothesis testing H_0 is rejected or there is a significant difference in *Average Trading Volume Activity* before and after Ramadan.

IV.DISSCUSION

Abnormal Return

This study proves that the phenomenon before and after Ramadan does not have a significant difference in *Abnormal Return* of companies that are members of the Pefindoi-Grade. First, this is because investors tend to hold back their investments to meet basic needs ahead of Ramadan and even sell their shares to fulfill their needs. It is proven by the average proportion of income through a consumer survey by Bank Indonesia which states that the average proportion of income is used for consumption before and after Ramadan. With the level of income saved (*saving*) decreased. (Bank Indonesia, 2022) So that *abnormal returns* tend to decrease before Ramadan. Second, the absence of information content that causes market reactions. This test is in accordance with the theory of *Efficiency Market Hypothesis* , namely market efficiency in a weak form. That is, past information will reflect prices formed in the present. The impact is that investors cannot predict the stock market value using technical analysis that refers to historical data. So, investors do not get a significant *abnormal return* . Third, the psychological condition ahead of Ramadan to adapt which causes negative feelings and moods. So that it affects the movement of negative abnormal returns ahead of Ramadan(Sonjaya&Wahyudi, 2016)(Pratama&Wijaya, 2020)

The results of this study are in line with research conducted by (Siska&Arigawati, 2020)which states that there is no significant difference in *Average Abnormal Return* before and after Ramadan. In addition, research by (AtrinaKudusia et al., 2020). Based on the results of testing the average difference per year, during the *Covid-19 pandemic*, namely in 2020 and 2021, there was also no significant difference between before and after Ramadan. Thus, *Abnormal Return* in that period has a relatively the same level of stock return. The results

of this study are contrary to research (Widyarti, 2020), which revealed a significant difference between before and after Ramadan in 2021.

Trading Volume Activity

This study proves that the phenomenon before and after Ramadan does not have a significant difference in the Trading Volume Activity of companies that are members of the Pefindo i-Grade. This is due to several things. First, before and after Ramadan, there is no information content that causes differences in the average trading volume activity value. Thus, investors do not respond quickly to the information received. (Muhammad & Yuniarti, 2019) Second, the momentum before and after Ramadan makes investors implement passive strategies such as wait and see. This strategy allows investors to wait, observe and analyze stock movements. When investors apply this strategy, investors do not make transactions such as selling or buying. Therefore, investors are waiting for the right momentum for the next transaction. (Fadhani & Yunita, 2019)

The results of research in 2018 and 2019 before the Covid-19 pandemic, are in line with research (Husen et al., 2021) and research by (Siska & Arigawati, 2020) and (Atrina Kudusia et al., 2020). In addition, (Linda & Mulyono, 2020) stated that Trading Volume Activity had no significant effect before and after Ramadhan Effect in 2018 and 2019. Thus, Trading Volume Activity did not react before and after Ramadan.

However, in 2020, the impact of the Covid-19 pandemic indicates that there is a difference in Average Trading Volume Activity. That is, according to Beaver in (Faih & Nafiah, 2019) stating that an event that has information content will cause the number of shares traded to increase or decrease at the time of the event. Increasing or decreasing makes that news has good news or bad news. This difference indicates an increase in Trading Volume Activity which is in line with the increase in stock prices. However, it is inversely proportional to the purchase of durable goods. (Bank Indonesia, 2020). Under these conditions, investors choose to invest in order to avoid a decline in the value of the currency. So, as a result of this investor reaction, there was a massive purchase of stock portfolios after Ramadan at the beginning of the Covid-19 pandemic. This increase can be seen based on the Average Trading Volume Activity chart in 2020, which tends to increase after Ramadan. These results are supported by research (Sambuari et al., 2020) which reveals that there are differences in the frequency of trading before and after the announcement of Covid-19 in Indonesia. Meanwhile, the results of the study in 2021, found no significant difference in Average Trading Volume Activity before and after Ramadan. This result is in line with research (Widyarti, 2020) which states that there is no significant difference between before and after Ramadan on the Indonesia Stock Exchange 2021.

V. CONCLUSION

Based on the research that has been done, the *Abnormal Return variable* before and after the *Ramadhan Effect* was tested by *Paired Samples Test* and the *Wilxoncon Signed Rank Test*, it was concluded that the result was that there was no significant difference in *Abnormal Return* between before and after the *Ramadhan Effect* on Perfindo i-Grade stocks which listed on the Indonesia Stock Exchange for the period 2018-2021.

Trading Volume Activity variable, the results show that there are significant differences in *Trading Volume Activity* between before and after the *Ramadhan Effect* on Perfindo i-Grade shares listed on the Indonesia Stock Exchange for the 2018-2021 period. To prove the existence of this difference, then in the annual test, a significant difference was found in *Trading Volume Activity* between before and after the *Ramadhan Effect* which only occurred in 2020. An indication that there is a significant difference in 2020, is due to the *Covid-19 pandemic*. As a result, the reaction of investors was to sell shares after Ramadan at the beginning of the *Covid-19 pandemic*.

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