

ISSN 2809-929X (Print)
ISSN 2809-9303(Online)

Journal of Social Commerce

Vol. 5 No. 3, 2025 (Page: 468-483)

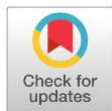
DOI: <https://doi.org/10.56209/jommerce.v5i3.184>

Does the Jakarta Islamic Index Reflect Efficient Market? Insights from Calendar Effects and Volatility Modelling

Purwanto Widodo¹, Faizi¹, Airlangga Surya Kusuma¹

¹Faculty of Economics and Business, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia

Article History



Keywords

JII
Crisis
The Day of Week Effect
Monday Effect
Friday Effect

JEL Classification

G12, G14, C22, C58, C32,
C13

Abstract

This study examines the efficiency of the Jakarta Islamic Index (JII) by testing for anomalies such as the Day of the Week Effect, Monday Effect, Friday Effect, and Week-Four Effect, both under normal conditions and during the Covid-19 crisis. This study seeks to determine whether JII adheres to the Efficient Market Hypothesis (EMH) or exhibits predictable patterns in stock returns. The study utilizes daily return data from JII, covering periods before (January 2008–February 2020), during (March 2020–December 2022), and combined before and during the Covid-19 crisis. Stationarity tests (Augmented Dickey-Fuller and Philips–Perron) were conducted, followed by ARMA/ARIMA modelling to address autocorrelation and heteroscedasticity. ARCH-GARCH models, including EGARCH, TARCH, and PARCH, were employed to analyze the volatility and leverage effects. Dummy variables for trading days and weeks are used to test for anomalies. The results confirm the presence of the day of the week, Monday, and Week four effects in JII returns, indicating market inefficiency. However, the Covid-19 crisis did not significantly alter return patterns, suggesting resilience in the Islamic stock market. The study also identifies asymmetric volatility responses, with EGARCH (1,1) being the most suitable model, following a non-normal distribution (GED). These findings align with some prior research but contrast with others, highlighting mixed evidence on market anomalies in Islamic indices.

Introduction

The Islamic stock index is a statistical measure that reflects the price movement of a group of Islamic stocks selected based on certain criteria. These criteria are based on the fatwa of the Indonesian Ulema Council (MUI) regarding the Financial Services Authority (OJK) issuing a List of Sharia Securities (DES), based on this fatwa, the IDX conducts a selection of stocks on the stock exchange that belong to the sharia group (BEI, 2023). Sharia stocks are stocks of companies which in carrying out their business follow sharia principles (Nasution, 2015). The DSN-MUI (National Shariah Council, Majelis Ulama Indonesia) has so far issued 17 fatwas

¹ Corresponding Author: Purwanto Widodo, Email: purwanto.widodo@upnvj.ac.id, Address: MQMV+RJ5, Jl. RS Fatmawati, Pd. Labu, Kec. Cilandak, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta 12345

used by the IDX to classify stocks on the stock exchange into sharia stocks (BEI, 2023). It is hoped that this will make the Islamic stock market efficient in the sense that price movements are only influenced by relevant information (Nasution, 2015).

Justifying reality on the ground, like that? This study intends to determine whether the Islamic stock index, represented by Jakarta Islamic Index (JII), is truly efficient, as hypothesized by the Efficient Market Hypothesis (EMH). Efficient in this case is that the pattern of stock movements is only influenced by the movement of the previous period, so it does not have a daily return movement pattern. Herni (2013) shows that JII's daily returns for the period 2005 – 2011 were efficient in the sense that stock return movements did not have a specific pattern; thus, there was no visible pattern of stock return movements within a week (the day of the week effect). Shamsir & Mustafa (2014) used the Karachi Stock Exchange (KSE) for 2009 – 2013, giving the same results as Herni Ali (2013). Kafou & Chakir (2015), using the Dow Jones Islamic Market Index (DJIMI) for the period May 25, 1999, to November 28, 2013, concluded that DJIMI returns during the subprime crisis period did not show a day of the week effect; in other words, DJIMI's daily returns showed a pattern that is randomly unpredictable. Nassar (2016), using the stock exchanges of Qatar, Amman, Palestine, Egypt, and Bahrain) did not find the day of the week effect in these five countries. Syed & Khan (2017) used KSE-100 (the Karachi Stock Exchange) for 1991 – 2014 and found no EMH anomalies.

However, different results were obtained by Wenhui et al. (2009) using the FTSE Bursa Malaysia Hijrah Shariah (FBMHS), with daily stock returns from 1 January 1999 to 14 August 2007, found an anomaly Day-of-the-Week Effect, Iswadi & Hafni (2018) using JII daily returns period December 2017 – May 2017, found a day of the week effect on JII daily returns. Mardila (2020) JII for the period June 2018 to May 2019 found a day-of-the-week effect on JII's daily returns. Supriadi (2021) used stocks that were active in JII for the 2009-2019 period, found that there was a day-of-the-week effect on JII's daily returns.

In addition, many researchers want to know the impact of the economic crisis on stock return patterns. Susianti & Rahmawati (2020), using the JII index before and during Covid-19, found that there was no change in the pattern of JII returns before and during Covid-19. Uses weekly returns from April 2019 to December 2020; then, the sample is grouped before and during Covid-19, the results show that there is no difference in the pattern of returns before and during Covid-19. Kafou & Chakir (2015) examined the changes in daily return patterns of the Dow Jones Islamic Market Index (DJIMI). The results show that there is no visible change in the pattern of daily returns before, during, or after the subprime crisis. Huna et al. (2022) uses the Jakarta Islamic Index 70 (JII70) for the April 2019-March 2020 (pre-Covid-19) and April 2020-June 2021 (post-Covid-19) periods, the results show that there is a difference in the pattern of returns before and during the Covid-19 crisis.

Based on the explanation above, it can be concluded that the results of research conducted by experts regarding the efficient return of Islamic stocks under both normal and crisis conditions do not provide uniform results. Therefore, the present study was conducted. However, it is different from previous research because it used the time before the Covid-19 crisis, during and before – during Covid-19. Another difference is the data analysis used. Initially, researchers used a linear regression model to examine the presence of EMH anomalies on world stock exchanges. The linear regression model used includes dummy variables (Monday, Tuesday, Wednesday, Thursday, and Friday) to determine if there are certain days that have a return that is statistically different from zero. The ordinary least squares (OLS) model is generally used to estimate the coefficients of dummy variables. Some researchers who use OLS to test EMH

anomalies include Cross (1973), Solnik & Bousquet (1990), and Agrawal & Tandon (1994), Abdalla (2012).

However, the use of OLS, especially in the analysis of dummy independent variables, has several problems, several specific problems may arise while using this approach: (i) the returns are likely to be autocorrelated; (ii) the residuals are possibly non-normal; (iii) the issue of heteroscedasticity may arise; and (iv) outliers with high/low value of return may distort the overall picture (Abdalla, 2012), (v) time series data has a stationarity problem so it will produce spurious regression (Widodo, 2022).

Literature Review

Efficient Market Hypothesis Theory

In 1970, Eugene F. Fama in *The Journal of Finance* volume 25, year 2, with the title “Efficient Capital Markets: A Review of Theory and Empirical Work” stated that “the price of a security “full reflects” available information was assumed to imply that successive price changes (or more usually, successive one-period returns) are independent”. This concept shows that the behavior of stock market asset prices under certain conditions includes informational efficiency. Furthermore, Spulbar et al. (2021) show that the EMH concept was actually inspired by the random walk theory from Kendall (1953) which states that “stock price fluctuations are independent of each other and have the same probability distribution.” stated that “the future path of the price level of a security is no more predictable than the path of a series of cumulated random numbers”. Furthermore, Fama discussed the matter of efficient capital markets and suggested that the perfect scenario targets a capital market “in which prices provide accurate signals for resource allocation.” The efficient market hypothesis (EMH) theory, although still an unfinished debate, has more or less been able to change the perspective of financial experts and investors about how the capital market works. Competition between investors is very tight, causing stock prices to accurately reflect all relevant information so that investors can believe that the price is fair.

The earliest empirical examinations of the day of the week effect seem to return to the studies by Cross (1973) and Harris (1986), who have also investigated this effect across different markets. These studies provide evidence of differences in the distribution of stock returns for each day of the week and conclude that Mondays' average returns are negative and Fridays' are positive, which means that the stock exchange market starts downwards and ends upward.

On the other hand, some researchers found no evidence of a day of the week effect. For instance, Gardeazabal & Regulez (2002) document insignificant weekday effects on the Spanish stock market. Brooks & Persaud (2001) found no day-of-the-week effect for the Philippines. Lone and Bashir (2018) examined G5 (Germany, Japan, Canada, the United Kingdom, and the USA) for 2011 – 2015. The results showed that the G5 countries did not show a day of the week effect.

Research in Indonesia has yielded inconsistent results. Pratiwi (2017) shows that there is an anomaly in the weekday and weekend effects, but is unable to prove the existence of a Monday effect. Suryandari & Wirawan (2018) found an anomaly of the day of the week effect, Monday Effect and The Month of the year effect, but did not show the January Effect. Hendrawati & Huzaemah (2019) have an anomaly The day of the week effect, Monday Effect, but there is no weekend effect or January Effect. Mustafa & Soritaon (2019) found an anomaly in the week four effect. Wakhidah and Rafik (2019) anomaly the day of the week effect. Ilianto and Daryanto (2019) found an anomaly on the day of the week effect.

Extreme events such as the global financial crisis (GFC) have significantly affected the development of the financial sector. For example, the recent COVID-19 pandemic caused a severe lockdown in most countries of the world, whether they were developed, emerging, or underdeveloped, thus affecting the performance of all sectors of the economy, including the financial system (Batool et al., 2020). However, Spulbar et al. (2020) consider that global financial liberalization generates a lower impact on emerging economies compared to the case of developed economies. Consequently, it is important to have a theoretical foundation that provides efficient solutions, especially in times of financial turmoil.

The Day of Week Effect

According to the EMH concept, the return of securities traded on a stock exchange will be relatively the same from Monday to Friday, but empirical evidence shows that there is a significant difference in returns between Monday and other days of the week, which is called the day of the week effect. The Monday Effect is a part of the day of the week effect, where Monday tends to produce negative returns, whereas positive returns occur on days other than Monday (Werastuti, (2012). The weekend or Friday effect is a condition in which stock returns on Monday Fridays are higher than on other days.

Week-four Effect

The Week-four Effect is a phenomenon that reveals that the Monday Effect only occurs in the fourth or fifth week of each month. Meanwhile, Monday's return from the first week to the third week is considered not significantly negative or equal to zero. first revealed the phenomenon of the Week Four effect. The Week-four Effect tests whether negative Monday returns only occur in the fourth and fifth weeks (Werastuti, 2012); Saraswati et al. (2015), Cahyaningdyah & Faidah (2017)). According to Cahyaningdyah & Faidah (2017) this happened for liquidity reasons.

Furthermore, Cahyaningdyah & Faidah (2017) stated that the concept of the day of the week effect is a significant difference in returns between Monday and other days of the week. The negative return on Monday was due to selling pressure on Monday. The high selling activity on Monday was probably due to investors, especially individual investors, who received unfavorable information about the stock market conditions that occurred on the previous Friday.

Covid-19 and Its Influence on the EMH Anomaly

Related to the Covid-19 pandemic, several studies have been conducted that show the impact of the spread of the virus, including research conducted by Sansa (2020) on the Shanghai Stock Exchange and New York Dow Jones Aditiya (2022) uses stocks that belong to the banking group for the period Before Covid-19 September 2019 – February 2020 and September 2020 – February 2021, the results show that there is no difference in banking stock returns Before and During Covid-19, besides that, it does not show any anomalies EMH.

Methods

This study uses the Jakarta Islamic Index (JII) daily return, which is the main index of the Indonesian capital market. The initial research on the global financial crisis that began in the United States in 2008 ended on December 30, 2020.

Most financial series are trendy at the level of heavy fluctuations; therefore, it is implausible to attain valid inferences. The log reduces the fluctuation to some extent and the difference

makes the series stationary or mean reversion, so JII's daily return calculation uses the method used by Widodo (2022).

$$RJII_t = \ln \left(\frac{JII_t}{JII_{t-1}} \right) \dots\dots\dots (1)$$

Where JII_t is the daily Jakarta Islamic Index in period t and JII_{t-1} is the index of the previous period.

The data used in this study are a time series; therefore, it is necessary to examine the stationarity problem. Stationary testing uses augmented Dickey (ADF) and Philips – Perron (PP).

The first step of data analysis is modeling with the ARMA/ARIMA Box Jenkins model, which is considered fit if it is proven that there is no white-noise problem. For white noise testing, the authors used the Box and Pierce Test or the Q Test (Portmanteau Test).

$$Q = n \sum_{k=1}^m \rho_k^2 \sim \chi_{df=m}^2 \dots\dots\dots (2)$$

If the value of probability Q is greater than the level of significance, then it is concluded that the series of data is white noise.

After confirming that the ARMA/ARIMA model had white noise. The LM test was used to determine the ARCH effect. If there is an ARCH effect problem, then the ARMA/ARIMA model has white noise modeled with: ARCH (autoregressive conditional heteroskedastic model); GARCH (Generalized Autoregressive Conditional Heteroskedastic Model); EGARCH (Exponential Generalized Autoregressive Conditional Heteroskedastic Model); TARCH (Threshold GARCH); and PARCH (The Power ARCH) are developed (Nur & Dewangkara, 2020).

Model I for estimating The Day of Week Effect

$$RJII_t = \beta_0 + \beta_1 Mon_t + \beta_2 Tues_t + \beta_3 Wed_t + \beta_4 Thurs_t + \sum_{i=1}^p \gamma_i RJII_{t-i} + \varepsilon_i \dots\dots\dots (3)$$

where Mont, Tuest, Wedt, and Thurst are dummy variables for Monday, Tuesday, Wednesday, and Thursday, respectively. Where $\sum_{i=1}^p \gamma_i RJII_{t-i}$ are the lag values of the return variable. It was included in the equation to eliminate the possibility of autocorrelated errors and heteroscedasticity problems) (Nur & Dewangkara, 2020).

After modeling with ARCH-GARCH, testing is performed for the presence or absence of Asymmetries in Volatility. To test asymmetries in volatility, we use the model developed by (Brooks, 2019):

$$\hat{u}_t^2 = \phi_0 + \phi_1 S_{t-1}^- + \phi_2 S_{t-1}^- \mu_{t-1} + \phi_3 S_{t-1}^+ \mu_{t-1} + v_t \dots\dots\dots (4)$$

Significance of ϕ_1 indicates the presence of sign bias, where positive and negative shocks have differing impacts upon future volatility, compared with the symmetric response required by the standard GARCH formulation. On the other hand, the significance of ϕ_2 or ϕ_3 would suggest the presence of size bias, where not only the sign but the magnitude of the shock is important. A joint test statistic is formulated in a standard fashion by calculating TR2 from regression equation (4), which asymptotically follows a χ^2 distribution with three degrees of freedom under the null hypothesis of no asymmetric effects.

The Day of Week Effect can be seen from whether the difference in returns Monday to Friday or the regression coefficient is not equal to zero (Asarowati, 2009). The Monday Effect is detected if the regression coefficient on Monday is significantly negative, while the other days are positive (Cahyaningdyah & Faidah, 2017).

Model 2 for estimating Week Four Effects

$$RJII_t = \beta_o + \beta_1 Monw1_t + \beta_2 Monw2_t + \beta_3 Monw3_t + \beta_4 Monw4_t + \beta_5 Covid_t + \sum_{i=1}^p \gamma_i RJII_{t-i} + \varepsilon_i \dots\dots (5)$$

where Monw1t, Monw2t, Monw3t, and Monw4t are dummy variables for Monday Week1, Monday Week2, Monday Week3 and Monday Week4.

Results and Discussion

Time series data often have an average and variance that are not constant over time, making predictions difficult. To overcome this problem, stationarity testing was performed. The result is:

Table 1. JII Stationarity Return Test

Test	Exogenous	t-Statistic	Probability	Significance
ADF Test	None	-58.4948	0.0001	***
PP Test	None	-58.481	0.0001	***

Table 1 shows the stationarity test of JII returns using the ADF and PP tests. The results of JII's descriptive statistical returns during the observation period were divided into three periods: before the Covid-19 crisis, namely: January 3, 2008, to 28 February 2020, and March 1, 2020, to December 30, 2022 (the period of the Covid-19 crisis).

Table 2. JII Return Trading Days Before, During and Before – During Covid

Day	Mean	Minimum	Maximum	Standard Deviation
Monday	COVID	Before	-0.0015	-0.1538
		During	-0.0023	0.0817
		Before - During	-0.0016	0.1538
Tuesday	COVID	Before	0.0005	0.0662
		During	0.0002	-0.0729
		Before - During	0.0002	-0.0729
Wednesday	COVID	Before	-0.0003	0.0991
		During	0.0000	0.0401
		Before - During	0.0001	0.1085
Thursday	COVID	Before	0.0004	0.0817
		During	0.0008	0.0666
		Before - During	-0.0001	0.0991
Friday	COVID	Before	0.0006	0.0817
		During	0.0015	0.0269

Table 2 shows that the average JII daily return for Monday Before, During, or Before – During Covid is consistently negative, while the average returns for Tuesday, Wednesday, and Friday are consistently positive. Tuesday before and before – during is negative, while during the crisis it is positive. These results are in line with research conducted by using stocks that are members of LQ45 for the period January - December 2005, Suryandari & Wirawan (2018), LQ45 for the period February 2015 to August 2016; Afrilianto & Daryanto (2019) LQ45 companies for the 2013 to 2018 period, showed similar results, namely the average return on Monday was negative, while other days tended to be positive. After it is known that JII's daily returns are stationary and data descriptions, the next step is to model JII's returns using dummy variables

on trading days and COVID. The first step is to use the Box–Jenkins method and then test for white noise.

The results of the White test on the Jenkins Box model using the Box and Pierce Test or the Q Test (Portmanteau Test) with a lag of 36 obtained Q equal to 29,667, while the probability was 0.483. Because the probability value was greater than the significance level, it was concluded that the ARMA/ARIMA model contained white noise.

The next step is to test for an ARCH effect using the LM test. LM Test results using F-statistics and Chi-Square, the probability is significant at the 1 percent level, while the Box and Pierce Test or Q Test (Portmanteau Test) with a lag of 36 on the Quadratic Residual Correlogram obtained Q equal to 2240.8 while the probability is 0.000, so it is concluded that there is an ARCH Effect problem.

The next step is modeling using ARCH-GARCH. ARCH-GARCH modeling is considered appropriate if there are no ARCH Effect problems. The LM Test results using F-statistics and Chi-Square have a probability that is not significant at the 5 percent level, while the Box and Pierce Test or Q Test (Portmanteau Test) with a lag of 36 on the Quadratic Residual Correlogram obtains a Q value equal to 26,193 while the probability is 0,665, so it is concluded that there is no ARCH Effect problem.

The ARCH-GARCH model, which no longer has an ARCH effect, is then analyzed to see whether there is a leverage effect, as recommended by Brooks (2019). Leverage testing: Band Brooks (2019). The result is :

Table 5. Engle and Ng Test Model 1

Bias Type	t-Statistic	Probability	Significance
Sign-Bias	1.548246	0.1216	
Negative-Bias	-4.832361	0.0000	***
Positive-Bias	1.196450	0.2316	
Joint-Bias	44.52617	0.0000	***

The Engle and Ng test in Table 5 shows that of ϕ_1 and ϕ_2 are not significant, while negative-bias and joint-bias are significant at the 1 percent level, these results indicate that there is a difference in response if there is good news with bad news or in other words there is a problem leverage effect. Because there is a leverage effect, it is modeled with an asymmetric model, namely EGARCH (1,1), TAR(1,1), and PAR(1,1). The result is :

Table 6. Analysis Results of Model 1 The Day of Week Effect

Variable	Coefficient	Std. Error	z-Statistic	Probability	Significance
FRI	0.0007	0.0004	1.7429	0.0814	*
MON	-0.0015	0.0005	-3.4171	0.0006	***
TUES	-0.0018	0.0005	-3.4167	0.0007	***
WED	0.0006	0.0004	0.9405	0.3469	
THUR	-0.0003	0.0005	-0.7617	0.4472	
COVID	-0.0005	0.0005	-1.4211	0.1553	
AR(3)	-0.0003	0.0005	-0.6736	0.5000	
AR(2)	0.0687	0.0157	4.3650	0.0000	***
C(9)	-0.2700	0.0918	-2.9400	0.0033	**
C(10)	-0.1555	0.0112	-14.1689	0.0000	***
C(11)	0.0223	0.0063	3.5394	0.0004	***
C(12)	0.0067	0.0067	-9.4937	0.0000	***

C(13)	0.0272	0.0021	13.0457	0.0000	***
GED	1.3419	0.0377	35.5610	0.0000	***

The results of the analysis of Model 1 in Table 6 show that the appropriate model is EGARCH(1,1), which does not follow the normal distribution, but follows the Generalized Error Distribution (GED). To see the existence of the leverage effect, see equation (11). These results are consistent with Shamsir & Mustafa's (2014) research, where Karawachi Stock Market returns are modeled by the GARCH model with a non-normal distribution. Coefficient C(11) shows a negative and significant sign; therefore, the existence of a leverage effect is confirmed (Brooks, 2019). In addition, it can be seen that the Covid variable is not significant, meaning that the Covid-19 crisis does not affect the pattern of JII's daily returns. These results confirm the existence of the day-of-week effect in this study. These results are in accordance with the research conducted by Susianti and Rahmawati (2020) and Sodik (2022), while Ambarwati (2016) and Dharmawan et al. (2020) show that there is no day-of-week effect in JII.

The next test determines whether there is a Monday Effect. The results of the Wald test show that the difference in Monday's coefficient is smaller than the average regression coefficient on the other days because the value is negative and statistically significant because the probability is less than 1%. These results indicate that the Monday effect is found in the JII return pattern. The same result was obtained by Mardila (2020), while Kusherawati (2022) did not show a Monday Effect on JII.

The next test is to determine whether there is a weekend or Friday effect. The results of the Wald test prove the existence of the Weekend Effect, in which it is hypothesized that the Monday Regression coefficient should be greater than the average regression coefficient on other days. The results show that the t-statistics, F-Statistics and Chi-square are not significant; therefore, it can be concluded that the Weekend Effect is not found in the JII return pattern. Mardila (2020) obtained similar results.

Table 9. Week Four Effect Descriptive Statistics

Monday	COVID	Mean	Standard Deviation	Maximum	Minimum
Mon-Week1	Before	0.0004	0.587	-0.0622	0.0137
	During	0.0039	0.4999	-0.0268	0.0139
Mon-Week2	Before	0.0001	0.587	-0.0622	0.0137
	During	-0.0007	0.4355	-0.0153	0.0155
Mon-Week3	Before	0.0003	0.786	-0.0153	0.0159
	During	0.0008	0.765	-0.0159	0.0157
Mon-Week4	Before	-0.0001	0.785	-0.0168	0.0016
	During	-0.0008	0.748	-0.0099	0.0183
Mon-Week5	Before	0.0003	0.1208	-0.0068	0.0161
	During	0.0006	0.1208	-0.0089	0.0156

Table 9 shows that the average return on Monday of the 1st week and Monday of the 5th week Before, During and Before – During Covid is consistently positive, Monday the 2nd week is negative, while Monday the 3rd week and Monday the 4th week are inconsistent.

The results of the White test on the Jenkins Box model using the Box and Pierce Test or the Q Test (Portmanteau Test) with a lag of 36 obtained Q equal to 35,487, while the probability was 0.225. Because the probability value was greater than the significance level, it was concluded that Model II ARMA/ARIMA had white noise.

The next step is to test whether there is an ARCH effect using the LM test and squared residual correlation. The LM test shows that the probability of the F-statistic and Probability Chi Square

is less than 1%; therefore, it is concluded that there is an ARCH effect problem. Then, the authors modeled with ARCH-GARCH (1,1) and tested again using the LM test to ensure the existence of the ARCH Effect no longer exists in model II. The results of the LM show that the probability of the F-statistics and the probability of Chi Square are greater than the level of significance, so it can be concluded that Model II has no problem with the ARCH Effect. Leverage Effect, as recommended by Brooks (2019). Leverage testing: Engle and Ng. The result is

Table 11. Engle and Ng Test Model II

Test	t-Statistic	Probability	Significance
Sign-Bias	-2.557052	0.0106	**
Negative-Bias	-1.848796	0.0646	*
Positive-Bias	-1.256443	0.2090	
Joint-Bias	36.31591	0.0000	***

The Engle and Ng test in Table 11 shows that of ϕ_1 is significant and the joint-bias is significant at the 1 percent level, meaning that there is a difference in response if there is good news and bad news or in other words there is a leverage effect problem. Because there is a leverage effect, it is modeled with an asymmetric model, namely EGARCH (1,1), TARCH(1,1), and PARCH(1,1). The result is :

Table 12. Results of Analysis of Model II The Week Four Effect

Variable	Coefficient	Std. Error	z-Statistic	Probability	Significance
SEN^M5	0.000457	0.000250	2.3431	0.0191	**
SEN^M1	0.001947	0.001644	1.1379	0.1836	
SEN^M2	0.004041	0.000675	-5.8585	0.0000	***
SEN^M3	0.002295	0.000818	2.5058	0.0080	**
SEN^M4	0.002482	0.000509	4.0952	0.0000	***
COVID	-0.000322	0.000355	-0.9075	0.0790	
MAG	0.005613	0.002616	2.1460	0.0320	**
AR(2)	0.06868	0.01574	4.3650	0.0000	***
C(9)	-0.304229	0.031705	-9.6341	0.0000	***
C(10)	-0.015588	0.003091	-5.0393	0.0000	***
C(11)	0.979732	0.003551	275.5610	0.0000	***

The results of the analysis of model II in Table 12 show that the appropriate model is EGARCH(1,1) but does not follow the normal distribution, namely the Student's t distribution. To see the existence of the leverage effect, see equation (10). It can be seen in table 12 if the coefficient C (10) is negative and significant so it is concluded that the existence of the leverage effect is confirmed. Other results show that the Covid variable is not significant, which indicates that the Covid-19 crisis does not affect the pattern of JII's daily returns.

The existence of the four-week effect is detected if the first Monday of the week is positive but not significant, while the second Monday and third Monday are negative and significant. In addition, Monday the fifth week was significantly positive, the fifth week was significantly positive. Table 11 shows what is expected of the week four effect to be fulfilled, because the regression coefficient for Monday 1st week is not significantly positive, Mondays 2nd and 3rd weeks are negatively significant, and Monday's 5th week is positively significant; in other words, the research is able to detect the existence of the Week four effect.

Sharia shares are securities in the form of shares that do not conflict with Sharia principles in the capital market, which refers to the general definition of shares regulated in laws and OJK regulations. All Sharia stocks in the Indonesian Sharia capital market are periodically included in the DES, which is the criterion for selecting Sharia shares by the OJK; namely, the issuer does not carry out gambling business activities and is prohibited according to Sharia; non-ribawi financial services; buying and selling risks that contain elements of uncertainty (gharar); not produce, distribute, trade illicit goods or services, goods/services that damage morale and/or are harmful, risywah transactions; and issuers comply with interest-based financial ratios compared to total assets of no more than 45% or total non-halal income of more than 10%. Sharia issuers or public companies are required to have a Sharia Supervisory Board (DPS). DPS members are required to have a Capital Market Sharia Expert license (ASPM) from the OJK, and must be appointed by the General Meeting of Shareholders (GMS) (Iswadi et al., 2022).

The results of this study indicate that Covid-19 did not affect the presence of the EMH anomaly, because neither before, during nor during Covid did not affect the prior and whereabouts of the EMH anomaly, while the results of Iswadi et al.'s research. (2022) concluded that there was a significant difference before and during Covid-19. The Covid pandemic event was initially considered bad news by investors and caused the Composite Stock Index (JCI) to reach its lowest level in March 2020 (the lowest since the last eight years starting from 2020). However, at the beginning of the first month of the year 2021, which was the first January in the era of the covid pandemic, investors began to feel optimistic about buying back shares (Maruli, 2022). This phenomenon shows that the high enthusiasm of investors in Indonesia in buying and selling shares after the previous month Indonesia experienced an unstable and declining economic condition caused by the Covid-19 virus which spread widely worldwide, including Indonesia, which became one of the countries with the highest number of the spread of covid was the highest, thus making stock trading activities and capital market conditions unfavorable also weakened; everyone, especially the government, was focused on dealing with the spreading virus so that it would recover quickly from the pandemic. Research conducted by Susianti & Rahmawati (2020) show that there is no difference in abnormal returns for stocks belonging to the JII group both before and during Covid-19. Apriani & Komariah (2022), based on research using stock exchanges in Indonesia, America, and Japan, concluded that there was no significant difference in stock returns both before and during Covid for the EMH anomaly.

A different result is Alam et al. 's (2020) research on the Indian Stock Exchange concluded that government-imposed lockdown had a positive effect on stock market performance. Iswadi et al. (2022), who used company returns that were included in JII, the Covid Crisis period, and during the Covid crisis, concluded that there were significant differences in the pattern of return on stocks in the JII group before and during the crisis.

This research reveals the existence of the day-of-week effect and the Monday and Friday effects on JII daily returns. Research conducted by King et al. (2011) studied the day of the week effect on the Malaysian Sharia-compliant stock market using three indices: the KLSI for the period from August 19, 1999, to November 2, 2007, the FBM Emas Shariah between January 22, 2007, and September 29, 2008; and finally, FBM Hijrah Shariah for the period between May 21, 2007, and September 19, 2008. Using the standard OLS method, a dynamic model with dummy variables indicating the days of the week was estimated. The findings suggest the presence of Monday and Friday effects in the KLSI, while no day-of-the-week effect was found for both FBM Emas Shariah and FBM Hijrah Shariah. Abdullah et al. (2011) studied the existence of the DOW effect on three indices of the Malaysian market (Kuala Lumpur Shariah Index-KLSI-, FBM Emas Shariah, and FBM Hijrah Emas Shariah). The findings of the study

presented significant negative Monday and positive Friday for KLSI and no DOW effect for other indexes. In a similar study, Lean & Tan (2010) explored the DOW effect in the FTSE Bursa Malaysia index family, including Shariah indexes for the 2006-2008 period (2007-2008 for some indices). The DOW effect could not be found for all indices, except the MESDAQ index.

Iswadi & Hafni (2018) used daily JII returns from December to 2017-May 2017 period. Dharmawan (2020) used the JII for the 2015-2019 period. Used JII for the June 2018-May 2019 period. Supriadi (2021) The Jakarta Islamic Index for the 2009 to 2019 period concludes that there is a day of the week at JII.

According to Suryandari & Wirawan (2018), The Day of Week Effect occurs because of high trading activity on Mondays caused by pressure on the capital market, where demand and supply are unequal. Investors, especially individual investors, are likely to have a higher desire to sell shares due to liquidity demands from weekend holidays, while individual investors' desire to buy shares is less. As a result, stock prices are depressed and tend to be lower for trading on Mondays than on other trading days. From the perspective of Behavior Finance, the Monday effect phenomenon is related to decision making, which tends to be irrational. The cause of the Monday effect can be seen from the psychological side of investors, where investment decisions are made through rational, economic considerations, and objective data. However, it can also be influenced by several factors, such as emotions, psychological conditions, and investor mood. Monday is considered the worst day compared to other days throughout the week because it is the first day of work and vice versa, while Friday is the best day because it is the last working day before holidays. This causes investors to feel pessimistic on Mondays and optimistic on Friday. This tendency for irrational behavior makes the Monday return negative, on average. Another factor of issuers announcing bad news on the last day of stock trading also makes stock returns on Mondays tend to be negative. Investors will immediately sell their shares on Monday when they discover bad news about the company. This includes investors' overreaction behavior towards the latest information. This condition is also inseparable from psychological factors because, psychologically, investors react more dramatically (overreaction).

According to Cahyaningdyah & Faidah (2017), the Monday effect is driven only by the negative returns that occurred on the previous Friday (bad Friday). In addition, several researchers found that selling pressure from individual investors would be higher if unwanted information (bad news) was proxied by a negative return on the previous Friday (bad Friday).

This research proves the existence of the week four effect in the JII. From the test results, it can be concluded that the Monday effect phenomenon on the IDX is not only driven by negative returns in the fourth and fifth weeks but also by negative returns in the second and third weeks. This can happen because the problem of liquidity demand is not related to investment in the stock exchange, meaning that funds invested in the stock exchange are not used to meet liquidity demands at the end of each month. This condition is different from the condition of the US capital market, where many small investors participate in investing in the capital market and demand for liquidity at the end of the month are important factors that can move their trading activities on the stock exchange, so that at the end of the month, selling pressure by individual investors will be greater. Selling activity by individual investors increases on Monday because of the psychological aspects of investors who do not like Monday as the first day of trading, so selling pressure on Monday will be greater at the end of the month, namely, in the fourth and fifth weeks. This causes negative Monday returns to occur only in the fourth and fifth weeks.

Conclusion

This study examines the efficiency of the Jakarta Islamic Index (JII) by analyzing the presence of market anomalies, such as the day of the week, Monday, Friday, and Week Four effects, both before and during the Covid-19 pandemic. The findings reveal that the Covid-19 crisis did not significantly alter the pattern of JII returns, indicating that the pandemic's impact on the Islamic stock market was short-lived, likely because of effective government interventions that restored investor confidence. The study concluded that the return patterns of JII stocks remained consistent across different periods, suggesting that the market's reaction to the crisis was temporary.

The research identifies several anomalies in JII returns, confirming the existence of the day of the week, Monday, and Week four effects. Notably, Mondays consistently exhibited negative returns, while other weekdays showed positive returns, aligning with behavioral finance theories that attribute these patterns to investor psychology and liquidity demands. The Week Four Effect was also observed, with negative returns concentrated in the second and third weeks of the month, in contrast to the traditional expectation that such effects occur only in the fourth and fifth weeks. This deviation suggests unique liquidity dynamics in the Indonesian market compared with Western markets.

This study contributes to the ongoing debate on market efficiency in Islamic finance, demonstrating that JII exhibits anomalies that are consistent with behavioral biases. These findings underscore the importance of considering psychological and liquidity factors in investment strategies, particularly in Islamic markets. Future research could explore these effects in other Islamic indices or during different crisis periods to validate the findings further.

Author Contributions

Purwanto Widodo: Conceptualization, Methodology, Formal Analysis, Writing – Original Draft, Supervision. Faizi: Data Curation, Investigation, Validation, Writing – Review & Editing. Airlangga Surya Kusuma: Software, Visualization, Resources, Project Administration.

References

- Abdalla, S. Z. S. (2012). *Day-of-the-week effect on returns and conditional volatility: Empirical evidence from Sudanese stock market. Middle Eastern Finance and Economics*, (16). EuroJournals Publishing.
- Abdullah, R. N. J. R., Baharuddin, N. S., Shamsudin, N., Mahmood, W. M. W., & Sahudin, Z. (2011). The day of the week effect on Bursa (Bourse) Malaysia Shariah-compliant market. *Interdisciplinary Journal of Research in Business*, 1(4), 29–36.
- Aditiya, R. O. (2022). *Rogalski effect pada return saham perbankan di Bursa Efek Indonesia (Skripsi)*. Fakultas Ekonomi, Universitas Sriwijaya.
- Afrilianto, A., & Daryanto, W. M. (2019). Market anomaly testing: The day of the week effect on LQ45 stocks in Indonesia Stock Exchange. *International Journal of Business, Economics and Law*, 19(1).
- Agrawal, A., & Tandon, K. (1994). Anomalies or illusions? Evidence from stock markets in eighteen countries. *Journal of International Money and Finance*, 13, 83–108.

- Alam, M. N., Alam, M. S., & Chavali, K. (2020). Stock market response during COVID-19 lockdown period in India: An event study. *Journal of Asian Finance, Economics and Business*, 7(7), 131–137. <https://doi.org/10.13106/jafeb.2020.vol7.no7.131>
- Ambarwati, A. (2016). *Pengujian the day of the week effect, week four effect, dan Rogalsky effect terhadap return saham Jakarta Islamic Index di Bursa Efek Indonesia* (Skripsi). Universitas Muhammadiyah Surakarta.
- Apriani, S. S., & Komariah, S. (2022). Holiday effect di Bursa Efek Indonesia, di Bursa Efek Amerika dan di Bursa Efek Jepang sebelum, sesaat dan sesudah pandemi COVID-19. *Fair Value: Jurnal Ilmiah Akuntansi dan Keuangan*, 5(5). <https://doi.org/10.32670/fairvalue.v5i5.2702>
- Asarowati, S. (2009). *Pengujian anomali pasar day of the week effect pada pasar valuta asing Indonesia periode 2001–2007* (Skripsi). Universitas Indonesia.
- Baret, S., Celner, A., O'Reilly, M., & Shilling, M. (2020). *COVID-19: Potential implications for the banking and capital markets sectors. Maintaining business and operational resilience*. Deloitte Insight.
- Batool, M., Ghulam, H., Hayat, M. A., Naeem, M. Z., Ejaz, A., Imran, Z. A., Spulbar, C., Birau, R., & Gorun, T. H. (2020). How COVID-19 has shaken the sharing economy? An analysis using Google trends data. *Economic Research–Ekonomika Istraživanja*. <https://doi.org/10.1080/1331677X.2020.1863830>
- Brooks, C. (2019). *Introductory econometrics for finance* (4th ed.). Cambridge University Press.
- Brooks, C., & Persaud, G. (2001). Seasonality in Southeast Asian stock markets: Some new evidence on day-of-the-week effects. *Applied Economics Letters*, 8(3), 155–158. <https://doi.org/10.1080/13504850150504504>
- Cahyaningdyah, D., & Faidah, F. (2017). Analisis pengaruh hari perdagangan terhadap return saham di Bursa Efek Indonesia: Pengujian menggunakan GARCH (Generalized Autoregressive Conditional Heteroskedasticity). *Ekspektra: Jurnal Manajemen dan Bisnis*, 1(1), 1–10. <https://doi.org/10.25139/ekt.v1i1.84>
- Cross, F. (1973). The behavior of stock returns on Fridays and Mondays. *Financial Analysts Journal*, 29(6), 67–69. <https://doi.org/10.2469/faj.v29.n6.67>
- Dharmawan, A., Khairunnisa, & Kurnia. (2020). Analisis anomali pasar: Pengujian the day of the week effect dan Rogalsky effect di Bursa Efek Indonesia (Studi pada perusahaan yang termasuk dalam JII tahun 2015–2019). *e-Proceeding of Management*, 7(2), 5671.
- Gardeazabal, J., & Regulez, M. (2002). *The weekend-dividend effect in the Spanish market*. Paper presented at the European Finance Management Association Annual Conference, London, UK.
- Harris, L. (1986). A transaction data study of weekly and intraday patterns in stock returns. *Journal of Financial Economics*, 16, 99–117.
- Hendrawaty, E., & Hazaimah, R. A. F. (2019). Testing of January effect, the day of the week effect, and size effect: A study of LQ45 stocks in Indonesia Stock Exchange. *Jurnal Dinamika Manajemen*, 10(2), 173–184. <https://doi.org/10.15294/jdm.v10i2.20620>

- Herni Ali, H. T. (2013). Analisis efisiensi pasar modal dan pengujian terhadap pengaruh hari perdagangan di Jakarta Islamic Index (JII). *Jurnal Bisnis dan Manajemen*, 4(2).
- Huna, N., Rini, N., Setianingrum, A., & Zulihar. (2022). Is there any effect of Covid-19 on the performance of the sharia stock index? *Share: Jurnal Ekonomi dan Keuangan Islam*, 11(1), 171–185. <https://doi.org/10.22373/share.v11i1.10726>
- Iramani, R. R., & Mahdi, A. (2005). Studi tentang pengaruh hari perdagangan terhadap return saham pada BEJ. *Jurnal Akuntansi dan Keuangan*, 8(2), 63–70. <https://doi.org/10.9744/jak.8.2.pp.%2063-70>
- Iswadi, & Hafni, H. (2018). Pengaruh day of the week effect terhadap return saham pada perusahaan yang tergabung dalam Jakarta Islamic Index (JII). *Jurnal Akuntansi dan Keuangan*, 6(2), 95–104. <https://doi.org/10.29103/jak.v6i2.1828>
- Iswadi, T., Nada, T. S., Adif, R. M., & Welhendra. (2022). Pengujian Monday effect dan weekend effect terhadap return saham perusahaan di Jakarta Islamic Indeks (JII) periode sebelum dan sesudah Covid-19. *Jurnal Informatika Ekonomi dan Bisnis*, 4(4), 239–243. <https://doi.org/10.37034/infeb.v4i4.182>
- Kafou, A., & Chakir, A. (2015). The day of the week effect on Islamic stock market returns: Evidence from Dow Jones Islamic Market Index. *Journal of Islamic Economics, Banking and Finance*, 11(3). <https://doi.org/10.12816/0024439>
- Kendall, M., & Bradford, H. (1953). The analysis of economic time series, Part 1: Prices. *Journal of the Royal Statistical Society*, 116(1), 11–34. <https://doi.org/10.2307/2980947>
- Kurherawati, U. (2022). *Analisis Monday effect, weekend effect, dan hari perdagangan pada perusahaan Jakarta Islamic Indeks (JII) yang terdaftar di BEI* (Skripsi). Fakultas Ekonomi dan Bisnis, Universitas PGRI Adibuana Surabaya.
- Lean, H. H., & Tan, V. K. M. (2010). Existence of the day-of-the-week effect in FTSE Bursa Malaysia. *Jurnal Pengurusan*, 31, 3–11.
- Lone, A., & Bashir, F. (2018). Day of the week impact on the stock returns of G5 countries stock index (Germany, Japan, Canada, United Kingdom and USA). *Science International (Lahore)*, 30(1), 45–51.
- Mardila, D. B. (2020). *Day of the week effect dan pengukuran value at risk di Jakarta Islamic Index Bursa Efek Indonesia periode Juni 2018–Mei 2019* (Skripsi). Fakultas Ekonomi, Universitas Andalas, Padang.
- Maruli, S. H. (2022). Analisis anomali January effect di era pandemi Covid-19 pada saham yang terdaftar pada Bursa Efek Indonesia (BEI). *Jurnal Ilmiah Mahasiswa FEB Universitas Brawijaya*, 10(2).
- Musthafa, & Soritaon. (2019). Efek minggu keempat terhadap return saham. *Almana: Jurnal Manajemen dan Bisnis*, 3(3). <https://doi.org/10.36555/almana.v3i3.1244>
- Nassar, S. (2016). The day of the week effect of stock returns: Empirical evidence from five selected Arab countries. *Eurasian Journal of Business and Management*, 4(2), 55–64. <https://doi.org/10.15604/ejbm.2016.04.02.00>
- Nasution, Y. S. J. (2015). Hypothesis pasar efisien/Efficient Market Hypothesis (Pasar Modal menurut teori Fama dan pandangan Islam), 1(1).

- Noor, R., Syuhada, B. N., Norazidah, S., Abdullah, J. R., W. Mahmood Wan, M., & Sahudin, Z. (2011). The day of the week effect on Bursa Malaysia Shariah-compliant market. *Interdisciplinary Journal of Research in Business*, 1(2), 29–36. <https://doi.org/10.12816/0024439>
- Nur, T., & Dewangkara, N. (2020). The day of the week effect in return of the five cryptocurrencies market. *Advances in Social Science, Education and Humanities Research*, 585. (Proceedings of the 1st UMGESHIC International Seminar on Health, Social Science and Humanities 2020).
- Pratiwi, A. R. (2017). *Analisis pengaruh hari perdagangan terhadap return saham perusahaan LQ45 di Bursa Efek Indonesia* (Skripsi). Fakultas Ekonomi, Universitas Islam Indonesia, Yogyakarta.
- Rida, R., & Berlian, D. M. (2020). The impacts of the week effect on the JII returns and risks. *Jurnal Ilmiah Poli Bisnis*, 12(1). <https://doi.org/10.30630/jipb.12.1.410>
- Sansa, N. A. (2020). The impact of the Covid-19 on the financial markets: Evidence from China and USA. *Electronic Research Journal of Social Sciences and Humanities*, 2(2), 29–33. <http://dx.doi.org/10.2139/ssrn.3567901>
- Saraswati, Y. R., Setiorini, C., & Cornelia, D. A. (2015). Pengaruh the day of the week effect, week four effect dan Rogalsky effect terhadap return saham LQ45 di Bursa Efek Indonesia. *Jurnal Riset Akuntansi dan Perpajakan (JRAP)*, 2(1), 43–54. <https://doi.org/10.35838/jrap.v2i01.93>
- Shamsir, M., & Mustafa, K. (2014). Presence of day-of-the-week effect in the Karachi Stock Market. *Research Journal of Finance and Accounting*, 5(19).
- Siahaya, S. L., & Jacomina, L. V. (2021). Analisis return before dan sesudah kebijakan pembatasan sosial berskala besar pada perusahaan sektor perbankan BUMN yang terdaftar di Bursa Efek Indonesia. *Jurnal Ekonomi, Sosial & Humaniora*, 2(6).
- Sodiq, M. N. (2022). *Analisis pasar anomali January effect, the day of the week effect, Rogalski effect, dan size effect terhadap return portofolio saham syariah yang terdaftar di Jakarta Islamic Index (JII) periode 2017–2020* (Skripsi). Fakultas Ekonomi dan Bisnis Islam, Universitas Islam Negeri Kiai Haji Achmad Siddiq Jember.
- Solnik, B., & Bousquet, L. (1990). Day-of-the-week effect on the Paris Bourse. *Journal of Banking & Finance*, 14, 461–468. [https://doi.org/10.1016/0378-4266\(90\)90059-B](https://doi.org/10.1016/0378-4266(90)90059-B)
- Spulbar, C. (2021). A critical survey on Efficient Market Hypothesis (EMH), Adaptive Market Hypothesis (AMH) and Fractal Markets Hypothesis (FMH) considering their implication on stock markets behavior. *Ovidius University Annals, Economic Sciences Series*, 21(2). <https://doi.org/10.61801/OUAESS.2021.2.156>
- Supriadi, B. (2021). *Analisis day of the week di Jakarta Islamic Index (JII)* (Skripsi). Fakultas Ekonomi dan Bisnis Islam, Universitas Islam Negeri Alauddin Makassar.
- Suryandari, N. N. A., & Wirawan, I. M. C. (2018). The day of the week effect dan the month of the year effect dalam perolehan return saham. *Jurnal Ilmiah Manajemen & Akuntansi*, 24(1), 47–65. <https://doi.org/10.47532/jis.v1i2.49>
- Susianti, N., & Rahmawati, N. (2020). Abnormal return saham JII pra-pasca PSBB Covid-19. *Journal of Enterprise and Development*, 2(2). <https://doi.org/10.20414/jed.v2i2.2664>

- Syed, F., & Khan, N. U. (2017). Islamic calendar anomalies: Evidence from Pakistan. *Business & Economic Review*, 9(3), 1–30. <https://doi.org/10.22547/BER/9.3.1>
- Wakhidah, N., & Rafik, A. (2019). Fenomena the day of the week effect di Bursa Efek Indonesia. *Call for Papers FMI 2019*, Samarinda.
- Wenhui, D., Yusof, Z., & Sieng, C. C. (2009). Calendar effect in Shariah-compliant stock return: Evidence from FTSE Bursa Malaysia Hijrah Shariah Index. In *Proceedings of the 2009 International Conference on Economics, Business Management and Marketing* (pp. 270–274). Singapore, 9–11 October 2009.
- Werastuti, D. N. S. (2012). Anomali pasar pada return saham: The day of week effect, week four effect, Rogalsky effect, dan January effect. *Jurnal Ilmiah Akuntansi dan Humanika (JINAH)*, 2(1).
- Wicaksono, C. A., & Adyaksana, R. I. (2020). Analisis reaksi investor sebagai dampak Covid-19 pada sektor perbankan di Indonesia. *Jurnal Ilmiah Akuntansi Fakultas Ekonomi*, 6(2), 129–138. <https://doi.org/10.34204/jiafe.v6i2.2227>
- Widodo, P. (2022). Is the volatility of the Islamic stock index lower than the conventional stock index during Covid-19 pandemic? Empirical evidence in Indonesia Stock Exchange. *Journal of Islamic Economics and Finance Studies (JIEFeS)*, 3(1), 24–42. <https://doi.org/10.47700/jiefes.v3i1.4364>