INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ECONOMICS & MANAGEMENT SCIENCES

OPEN ACCESS JOURNAL

Vol 15, Issue 1, (2026) E-ISSN: 2226-3624

Islamic Holidays and Asymmetric Volatility in the Malaysian Stock Market: Evidence from Conventional and Shariah-Compliant Indices

Ariqah Nabila Binti Adam, Ricky Chee Jiun Chia

Labuan Faculty of International Finance, Universiti Malaysia Sabah, Labuan F.T., Malaysia

*Corresponding Authors Email: ricky_82@ums.edu.my

DOI Link: http://dx.doi.org/10.6007/IJAREMS/v15-i1/27678

Published Online: 17 March 2026

Abstract

This study examines whether Islamic holidays generate asymmetric volatility and leverage effects in the Malaysian stock market, with particular attention to differences between conventional and Shariah-compliant equity indices. Using daily data from 2018 to 2023, the analysis covers the FTSE Bursa Malaysia KLCI and three Shariah compliant indices, Hijrah Shariah, Emas Shariah, and Small Cap Shariah. A structured event-window approach is employed, distinguishing between two trading days before and two trading days after Islamic holidays to capture short-term anticipation and post-holiday adjustment effects. Preliminary Ordinary Least Squares results suggest that return effects around Islamic holidays are generally weak and short-lived. To assess risk dynamics more rigorously, the study applies asymmetric volatility models that allow negative and positive shocks to affect volatility differently. The findings provide strong evidence of volatility asymmetry and leverage effects around Islamic holidays, particularly in the immediate pre- and post-holiday windows. Negative shocks are shown to exert a disproportionately larger impact on conditional volatility than positive shocks of similar magnitude. Importantly, asymmetric volatility effects are more pronounced in Shariah-compliant indices, especially among smaller-capitalization stocks, indicating heightened downside-risk sensitivity in Islamic market segments. These results highlight the importance of accounting for volatility asymmetry when evaluating religious calendar effects and offer practical implications for short-horizon risk management, portfolio allocation, and trading strategies around Islamic holidays.

Keywords: Islamic Holidays, Stock Returns, Asymmetric Volatility, Leverage Effect, Calendar Anomalies

Introduction

Volatility volatility in the financial system is common enough to be both time and information shock sensitive. More than just volatility levels, empirical evidence is increasingly emerging that the markets in a given situation, not only when the information shock applies tend to behave asymmetrically due to positive and negative shocks and they tend to suffer more in terms of volatility from the adverse information supply (Engle & Ng, 1993). This observation also known as volatility asymmetry or the leverage effect greatly affects the risk assessment,

the asset pricing, the portfolio management, and in particular, the asset allocation during the high uncertainty times (Bollerslev et al., 1992). Calendar events impact not only returns, but volatility dynamics as well, since they correlate with changes in investor attention, trading behavior, and sentiment (Baker & Wurgler, 2007). There is a lack of research on holiday effects, which primarily studies average return behavior to an extent, but also explicitly studies how such events influence asymmetric volatility responses to market shocks. This limitation is especially salient on religious holidays rooted in social and cultural practices and often magnifying behavioral responses to uncertainty (Nofsinger, 2017; Shiller, 2003). The case of Islamic holidays is particularly interesting for considering asymmetric volatility behaviors. Under the lunar Hijri calendar, these events take place in varying times of year and under various macroeconomic conditions, and the timing of these events is frequently closely related to trade intensity, liquidity and investors' engagement (Białkowski et al., 2012; Derigs & Marzban, 2008) Prior studies confirm that Islamic religious occasions will affect market volatility and calm, especially in Muslim countries where religion is at the centre of daily life. These types of circumstances could increase investors' fear of negative news and cause them to react to religious news asymmetrically with volatility. The empirical research on Islamic holidays mostly focuses on return effects, and abnormal behavior tends to be observed with major holidays such as Eid ul-Fitr and as, to some extent, Eid ul-Adha (Bley & Saad, 2010; Majeed et al., 2015). Yet results tend to be mixed, market-driven, and little emphasis has been placed on the direction of volatility shocks during this window of the times (Ali et al., 2017).

Volatility modeling studies show that religious phenomena or events might coincide with increased uncertainty and an altered risk perception and indicate that this asymmetry is critical to focus on (Wasiuzzaman, 2017). Such an investigation is particularly applicable in Malaysia. Its stock market is two-sided, using a standard benchmark market index – the FTSE Bursa Malaysia KLCI – as well as several Shariah-compliant indices with varying sectoral exposure, liquidity, and investor bases. Before now, it is believed that religious and cultural influence impacts the financial decisions of Malaysian investors, and thus, market response to religious occurrences may differ between conventional and Islamic market segments (Albaity & Rahman, 2012; Siddiqui & Narula, 2013). The two-market environment permits a direct comparison of asymmetric volatility responses across the different investment models in the same institutional setting.

This paper investigates whether Islamic holidays induce asymmetric volatility and leverage effects in the Malaysian stock market through a direct simulation of the conditional volatility around religious events associated with positive and negative shocks. Analysing daily data from 2018 to 2023, the study is based on a structured event-window structure which separates trading days prior to Islamic holidays from two days after. The anticipation and adjustment effects can be determined independently. First, Ordinary Least Squares estimation is used to understand the baseline return behaviour, and then a non-linear volatility model adapted for the non-linear dynamics of risk. There are three important contributions of this study to the literature. Firstly, it continues research related to Islamic holiday impacts that go beyond average return behaviour to address volatility asymmetry effects and leverage effects. Second, it offers new evidence on whether negative shocks to return of religious holidays have an amplified impact on market risk relative to positive shocks of comparable magnitude. Thirdly, the examination comparing conventional and Shariah-compliant indices at the intersection of Malaysia's dual-market structure contributes novel

findings about how religiously inflected uncertainty differentiates among diverse groups of investors.

Such contributions contribute to knowledge concerning downside-risk dynamics in Islamic financial markets and should help with risk management during religious holiday seasons. In the light of the mentioned discussion, the following research questions are formulated in this study:

1. Do Islamic holidays produce asymmetric volatility responses in the Malaysian stock market?
2. Do negative shocks weigh more heavily on the impact of volatility than positive shocks in the period of Islamic holidays, in line with leverage effects?
3. Do Shariah-compliant indices exhibit more pronounced asymmetric volatility effects than traditional markets?

Specifically addressing such questions, this study aims to better define how religious calendar events shape both downside risk and volatility behavior for various slices of Malaysia's equity market.

Literature Review

Calendar Effects and Market Behavior

Indeed, empirical research on calendar-related anomalies consistently shows that such stock market behavior is affected by time-specific phenomena, such as holidays, days of trading, and seasonality. Studies of public holidays have documented abnormal return behavior around events where negative market effects of holiday time were recorded, mainly as a result of decreased trading volume, reduced liquidity, and changing attitudes of investors (Ariel, 1990; Lakonishok & Smidt, 1988). In recent years, it has emerged from research that holiday-related anomalies are not homogeneous across markets and tend to be more pronounced in developing countries, and informational and behavioral trading are more common in these economies (Arumugam, 1999; Bhana, 1994; Vergin & McGinnis, 1999). In certain emerging markets, these calendar effects are associated with investor psychology and institutional attributes example low market depth and high retail involvement (Baker & Wurgler, 2007) and holiday-related behaviors may stick around longer, with more volatility than in developed markets. These results contradict the Efficient Market Hypothesis in that predictable return and risk rates can develop during calendar events for reasons of nonfundamental causes (Fama, 1970).

Volatility Dynamics and Asymmetric Responses

In addition to return anomalies, more recent and increasingly prominent work has shown that the calendars also lead to volatility. Studies with conditional heteroskedasticity models reveal that volatility tends to rise around calendar events, as uncertainty and trading intensity is increased. But early models mostly assume symmetric responses, making the implicit assumption that positive and negative shocks induce the same level of volatility in the future. However, in addition to a plethora of empirical evidence on volatility asymmetry that is, negative returns produce much larger upsides in volatility than positive returns of equivalent magnitude this assumption have been publicly debunked (Connolly, 1989; Engle & Ng, 1993). This is what is mostly known as the leverage effect, and it has significant implications for risk management and asset pricing. In order to capture these dynamics, asymmetric volatility models have become popular. The Threshold GARCH (TGARCH) framework allows volatility to respond differently depending on the sign of previous shocks, making it suitable for detecting threshold type asymmetry (Zakoian, 1994). The Exponential

GARCH (EGARCH) model also supports leverage effects: It models volatility logarithmically based and allows negative shocks to dominate future ones without non-negativity constraints imposed upon any effects on volatility (Nelson, 1991). Such asymmetric models become especially significant in event-based scenarios, where the timing and direction of shocks are strongly different over short horizons. Religious and calendar events, typically leading to market closures and lower liquidity, create a natural setting in which asymmetric volatility effects may emerge more.

Islamic Financial Markets and Religious Holidays

Religious holidays religious holidays fall to one of the groups of calendar events apart from other kinds in virtue of their deep connection to social, culture and behavior activities related to the calendar. Religious observance may have an effect on the level of investment, volume and attitude in Islamic markets of traders. There is also empirical evidence emerging that Islamic religious events can appear in conjunction with different market environment, including changes in volatility and liquidity (Białkowski & Yaghoubi, 2021; Shah et al., 2017). Studies of Ramadan and other major Islamic festivals, namely Eid ul-Fitr and Eid ul-Adha, offer conflicting evidence on return behavior but more homogeneous evidence suggest more consistent evidence that differences in the volatility profiles during religious holidays do occur (Bley & Saad, 2010; Majeed et al., 2015). Lower trade patterns on holiday days, anticipatory trading before market closures and pre-closing adjustment behavior before and after the normal closing have contributed to greater uncertainty and downside tendency. Notwithstanding the theoretical considerations, most work on Islamic holidays has focused on average return reactions and generally ignored the directional nature of the volatility shocks of the period, although a number of papers have also taken one another.

Evidence from Malaysia and other Shariah-Compliant Markets

Given the dual-market structure a conventional benchmark index combined with multiple Shariah-compliant indices, Malaysia presents a particularly suitable opportunity for investigating the Islamic holiday effects. Previous studies have shown some religious and ethical sentiment among Malaysian investors, which indicates that response of markets towards Islamic events is varied between the conventional and Islamic market categories (Albaity & Rahman, 2012; Siddiqui & Narula, 2013). The empirical evidence has mixed results on Islamic holiday impact in Malaysia. Preliminary research has pointed to weak or no return effects and have generally ascribed these results to lower trading frequency during festive seasons (Chan et al., 1996; Wong et al., 1990). Later studies also report restricted overall market effects, indicating that Islamic holidays do not always produce abnormal return at the macroeconomic level (Har & Chih, 2016; McGowan, Jr. & Jakob, 2010). These inconsistent results suggests that whole aggregate analysis can mask relevant heterogeneity across indices with differing liquidity structure, firms and investment participants. Shariah-compliant indices, especially those which are composed of smaller-capitalization companies, may be more susceptible to sentiment-driven trading and downside risk. Yet, comparative research, and explicit analyses of asymmetric volatility responses, between mainstream and Shariah-compliant market indices, are limited.

Event Window Design and Study Gaps

One last limitation found in the literature is the handling of holiday timing. Most of these studies use an aggregation of holiday indicators which do not differentiate between

anticipation effects prior to holidays and adjustment effects following market reopening (Pettengil, 1989). A more granular event-window design, separating trading days directly before and after holidays enables one to identify sooner when response to return and volatility occurs. Short-term windows represent a key parameter for asymmetric volatility models, given that leverage effects and thresholds will be magnified during rapid information adjustment. On the whole, the literature depicts three principal shortcomings. For one thing, there has been an extensive study of Islamic holiday effects in terms of average returns, and the asymmetric nature of responsiveness to volatility in connection with religious holidays still underexplored. Second, there are very few studies that combine finely structured event windows with asymmetric volatility models to account for leverage effects. Third, there is relatively little comparative evidence regarding whether Shariah-compliant indices present stronger asymmetric volatility responses than conventional benchmarks, especially in markets characterized by dual investment arrangements such as Malaysia. This article contributes to fill these gaps by combining the short-horizon event-window framework with asymmetric volatility models for the purpose of investigating how Islamic holidays affect the downside risk dynamics across standard and Shariah compliant stock indices in Malaysia.

Methodology

Research Design and Empirical Framework

In this regard, asymmetric volatility responses on Islamic holidays in the Malaysian stock market are investigated under an organized event-based econometric framework. This study aims to assess if not only volatility shifts around holy holidays, but negative and positive shocks to the market affect it differently, as expected from leverage effects. To fulfill this, the analysis combines short-horizon event-window design with asymmetric conditional heteroskedasticity models (Bollerslev et al., 1992). The empirical approach happens in three sections. First, OLS regressions are used to model initial return behaviour of pre- and post-holiday trading days. Second, it is estimated to account for asymmetric volatility curves and leverage relationships to capture non-linear volatility dynamics. Third, to verify model adequacy and strength, diagnostic tests are performed. This step-by-step process, such that return effects are separated from risk dynamics and we ensure that volatility asymmetry is the contribution of the study.

Data and Index Selection

The analysis utilizes daily closing prices from January 2018 to December 2023, corresponding to Islamic years 1439H–1445H, and considers four Bursa Malaysia index options: FTSE Bursa Malaysia KLCI, FTSE Bursa Malaysia Hijrah Shariah Index, FTSE Bursa Malaysia Emas Shariah Index, and FTSE Bursa Malaysia Small Cap Shariah Index. These indices are chosen to reflect differences in market capitalization, liquidity and investors' composition (Albaity & Rahman, 2012). The KLCI is usually known as the benchmark standard market. The Hijrah Shariah Index covers high-cap, liquid companies which satisfy a range of Shariah screening requirements that are in line with national and international Shariah criteria and are favoured by institutional investors. The Emas Shariah Index is the broader universe of Shariah compliant stocks, and the Small Cap Shariah index is made up of firms with wider retailer exposure and potentially a higher sensitivity to sentiment (Har & Chih, 2016). It enables a useful comparison of volatility dynamics between conventional and Islamic market segments in the same institutional environment. The study examines four Islamic holidays that are recognized as public holidays in Malaysia, Eid ul-Fitr, Eid ul-Adha, the Islamic New Year (Maal Hijrah), and

Prophet Muhammad SAW. Holiday dates are sourced from the official Hijri calendar, that is consistent with Bursa Malaysia's trading calendar to have accurate recognition of market closures and adjacent trading days.

Return Measurement and Event Window Specification

Daily stock returns are computed using continuously compounded logarithmic returns, defined as:

$$R_t = 100 \times (\ln I_t - \ln I_{t-1}),$$

where R_t denotes daily stock returns and I_t presents the index closing price. This change helps reduce the effects of extreme changes in prices, and it is the norm for volatility modeling (Nelson, 1991). When a non-trading day precedes a trading session, returns are calculated with respect to the latest closing prices (Chia et al., 2015). To investigate timing of Islamic holiday impacts; a four-day event window is constructed for each holiday. This window comprises two pre-holiday trading days (Pre−2 and Pre−1) and two post-holiday trading days (Post+1 and Post+2). The pre-holiday window covers anticipation effects of sentiment and positioning anticipation before market closure, and the post-holiday window captures adjustment and re-pricing behavior once the trade activity resume. The remaining trading days are labelled as non-event trading days. Such granular event-window structure enables a distinction between early anticipation, immediately pre-holiday behavior, post-holiday correction, and normalization effects.

Preliminary Return Analysis: OLS Specification

In an exploratory stage, OLS regressions are estimated to investigate if mean returns differ systematically across holiday-related trading days. To differentiate pre- and post-holiday behaviors, dummy variables are added for each event-window day. Several control variables are included in order to control for other calendar-related trends and external risk conditions, such as a January dummy, a Monday dummy, and the natural logarithm of the U.S. implied volatility index (LVIX), used as a proxy for global market uncertainty (Connolly, 1989). The equations are as below:

$$R_t = a_0 + a_1 D_{PRE^2} + a_2 D_{PRE^1} + a_3 D_{POST^1} + a_4 D_{POST^2} + a_5 D_{Jan} + \epsilon_t,$$
$$R_t = a_0 + a_1 D_{PRE^2} + a_2 D_{PRE^1} + a_3 D_{POST^1} + a_4 D_{POST^2} + a_5 D_M + \epsilon_t,$$
$$R_t = a_0 + a_1 D_{PRE^2} + a_2 D_{PRE^1} + a_3 D_{POST^1} + a_4 D_{POST^2} + a_5 LVIX + \epsilon_t,$$

The OLS analysis is intended to provide baseline evidence on return behavior and to confirm whether any observed holiday effects are short-lived and window specific. Importantly, OLS results are not interpreted as the main contribution of the study, but rather as a preliminary step that motivates the subsequent focus on volatility dynamics.

Asymmetric Volatility Modeling Strategy

Given the presence of volatility clustering and potential non-linear dynamics in stock returns, the analysis proceeds by estimating asymmetric conditional heteroskedasticity models. Two complementary specifications are employed: the Threshold GARCH-in-Mean (TGARCH-M) model and the Exponential GARCH-in-Mean (EGARCH-M) model. Both models allow volatility to respond asymmetrically to positive and negative shocks, while also permitting volatility to enter the mean equation as a measure of time-varying risk. Return equation as below:

$$R_t = a_0 + a_1 D_{PRE^2} + a_2 D_{PRE^1} + a_3 D_{POST^1} + a_4 D_{POST^2} + a_5 D_{Jan} + a_6 \sigma_t^2 + \xi_t$$
$$R_t = a_0 + a_1 D_{PRE^2} + a_2 D_{PRE^1} + a_3 D_{POST^1} + a_4 D_{POST^2} + a_5 D_{Mon} + a_6 \sigma_t^2 + \xi_t$$

$$R_t = a_0 + a_1 D_{PRE^2} + a_2 D_{PRE^1} + a_3 D_{POST^1} + a_4 D_{POST^2} + a_5 D_{LVIX} + a_6 \sigma_t^2 + \xi_t$$

TGARCH-M Model

The corresponding TGARCH variance equation follows:

$$\sigma_t^2 = \beta_0 + \sum_{j=1}^{p} \gamma_j \sigma_{t-j}^2 + \sum_{i=1}^{q} \beta_i \xi_{t-i}^2 + \psi \xi_{t-1}^2 N_{t-1} + a_1^* D_{PRE^2} + a_2^* D_{PRE^1} + a_3^* D_{POST^1} + a_4^* D_{POST^2}.$$

N_{t-1} for good news ($\xi_t < 0$), and 0 otherwise. The parameter ψ is used to capture the asymmetrical impact of good news and bad news on the conditional variance, which is reflected in the differential effects on the volatility. Specifically, good news has an impact of β_i, while bad news has an impact of ($\beta_i + \psi$). If $\psi \neq 0$, then the news impact is asymmetric. Additionally, if is positive, there is evidence of the existence of a leverage effect, meaning that bad news increases volatility. The parameters a_1^*, a_2^*, a_3^*, a_4^*, which differentiate this specification from the original TGARCH-M model, are employed to capture the pre- and post-Islamic Holiday effects. he TGARCH-M model captures volatility asymmetry by allowing negative shocks to exert a different impact on conditional variance than positive shocks of the same magnitude. In this framework, volatility responds not only to the size of past shocks but also to their sign, making the model suitable for identifying threshold-type leverage effects.

The mean equation incorporates event-window dummies, calendar controls, and conditional variance to see whether volatility is factored into expected returns. The variance equation includes lagged volatility, lagged squared shocks, and an asymmetry term to differentiate between good and bad news. One major finding of the present study is the inclusion of Islamic holiday event-window dummies directly in the variance equation. This specification allows volatility to change during pre- and post-holiday timescales, hence making it possible to quantify if religious events magnify or mitigate conditional volatility beyond typical GARCH dynamics. A positive and statistically significant asymmetry parameter indicates leverage effects where a negative shock generates a larger increase in volatility than a positive shock.

EGARCH-M Model

We also estimate an EGARCH-M model for leverage effects and robustness. In contrast to TGARCH, the EGARCH framework models the logarithm of conditional variance, ensuring non-negativity without imposing parameter restrictions. That negative shocks could have an exponential effect on volatility in this model makes it well-suited for capturing sharp downside-risk responses. Similar to the TGARCH-M specification, Islamic holiday event-window dummies are added to the variance equation to capture shifts in volatility during anticipation and adjustment periods. The EGARCH model's asymmetry parameter directly tests whether negative shocks have a disproportionate influence on volatility relative to positive shocks. Estimating both TGARCH-M and EGARCH-M models allows for a comparison of threshold-based and exponential leverage mechanisms, strengthening confidence in the robustness of the results. The variance equation is expressed as:

$$\log \sigma_t^2 = \beta_0 + \sum_{j=1}^{p} \gamma_j \log \sigma_{t-j}^2 + \sum_{i=11}^{q} \left(\beta_i \left| \frac{\xi_{t-i}}{\sigma_{t-i}} - \sqrt{2/\pi} \right| + \psi_i \frac{\xi_{t-i}}{\sigma_{t-i}} \right) + a_1^* D_{PRE^2} + a_2^* D_{PRE^1} + a_3^* D_{POST^1} + a_4^* D_{POST^2}.$$

In this model, the leverage effect is exponential, rather than quadratic and that forecasts of the conditional variance are guaranteed to be non-negative. In this case, the presence of leverage effects can be tested by the hypothesis that $\psi_i > 0$, whereas the impact is asymmetric if $\psi_i \neq 0$. The EGARCH model allows negative shocks (bad news) to affect volatility more than positive shocks (good news), which aligns with investor behavior during uncertain periods like religious holidays. Standard diagnostic tests are conducted to assess model adequacy, including checks for residual autocorrelation and remaining heteroskedasticity.

Model Diagnostics and Robustness Checks

Standard diagnostic tests are conducted to assess model adequacy and specification validity. These include the ARCH-LM test for remaining conditional heteroskedasticity and the Ljung–Box Q^2 statistic for residual autocorrelation in squared standardized residuals. Insignificant test statistics indicate that the estimated models adequately capture volatility clustering and asymmetry. Together, the TGARCH-M and EGARCH-M frameworks provide a comprehensive assessment of asymmetric volatility dynamics around Islamic holidays, allowing the study to identify whether religious calendar events systematically influence downside risk in Malaysia's conventional and Shariah-compliant stock markets.

Results and Discussions

Descriptive Statistics

Table 1

Descriptive Statistics

KLCI

	Pre^2, a_1	Pre^1, a_2	Post^1, a_3	Post^2, a_4	Others
Mean	0.2489	-0.03394	-0.37509	-0.08438	-0.01038
Std. Dev.	0.5131	0.49462	0.849687	0.692706	0.745305
Minimum	-0.5102	-1.06271	-1.9608	-1.62315	-5.40473
Maximum	1.3836	1.057591	1.036537	1.38574	6.626284
Jarque-Bera	1.3013	0.128707	1.381242	0.299181	5368.28
Probability	0.5217	0.937674	0.501265	0.861061	0

Hijrah Shariah

	Pre^2, a_1	Pre^1, a_2	Post^1, a_3	Post$^2 a_4$	Others
Mean	0.468568	-0.08087	-0.20568	-0.08486	-0.01584
Std. Dev.	0.951084	0.626351	0.967546	0.74218	0.839566
Minimum	-0.77899	-1.61551	-1.9313	-1.30063	-5.02104
Maximum	3.785762	1.329255	2.166571	1.323589	5.942768
Jarque-Bera	35.19128	1.92076	0.422668	1.044701	1309.913
Probability	0	0.382747	0.809504	0.593125	0

Emas Shariah

	Pre^2, a_1	Pre^1, a_2	Post^1, a_3	Post$^2a_4$	Others
Mean	11867.79	-0.03853	-0.261	-0.09144	-0.0132
Std. Dev.	987.9852	0.503095	0.944337	0.739327	0.798577
Minimum	10152.57	-1.24165	-1.84041	-1.27975	-5.33429
Maximum	13465.35	1.127211	1.989401	1.145706	5.78986
Jarque-Bera	1.295876	1.719279	0.432763	1.288917	2731.248
Probability	0.523123	0.423315	0.805428	0.524947	0

Small Cap Shariah

	Pre^2, a_1	Pre^1, a_2	Post^1, a_3	Post$^2a_4$	Others
Mean	0.230726	0.085086	-0.40027	0.134675	-0.00164
Std. Dev.	0.96222	0.626855	1.297309	1.063413	1.204384
Minimum	-2.2584	-1.48547	-2.94111	-1.96108	-11.2598
Maximum	3.019887	1.60192	2.151144	2.818047	8.986586
Jarque-Bera	6.590233	1.379717	0.323881	0.76237	14665.71
Probability	0.037064	0.501647	0.850492	0.683051	0

Table 1 reports summary statistics for daily returns across Islamic holiday event windows—two trading days before (Pre−2, Pre−1), two trading days after (Post+1, Post+2), and non-holiday trading days—for the KLCI and three Shariah-compliant indices. The descriptive evidence highlights systematic differences in both return behavior and volatility around Islamic holidays, providing preliminary motivation for asymmetric volatility modeling.

Across all indices, mean returns are generally higher during the Pre−2 window relative to other event days. This pattern is most pronounced for the Hijrah Shariah and Small Cap Shariah indices, suggesting that positive sentiment or anticipatory positioning may emerge ahead of Islamic holidays. In contrast, mean returns during Post+1 are consistently negative across indices, indicating a short-term correction once trading resumes after the holiday.

Volatility patterns further distinguish pre- and post-holiday behavior. Standard deviations are comparatively lower during pre-holiday windows but increase substantially in the immediate post-holiday period, particularly for Shariah-compliant indices. The Small Cap Shariah index exhibits the highest post-holiday volatility, reflecting heightened uncertainty and re-pricing among smaller, less liquid firms. These descriptive patterns suggest the presence of non-linear volatility dynamics and motivate the use of asymmetric conditional heteroskedasticity models.

Return Effects across Event Windows (OLS Results)

Table 2

Ordinary Least Square Results

OLS						
Index	KLCI			Hijrah Shariah		
Parameter (p,q)	2.a	2.b	2.c	2.a	2.b	2.c
Constant, a_0	-0.0054 (0.7911)	0.0289 (0.1768)	0.4120 (0.0160)**	-0.0113 (0.6228)	0.0257 (0.2891)	0.29734 (0.1249)
Pre[2], a_1	0.2552 (0.0945)***	0.2453 (0.1059)	0.2582 (0.0899)*	0.4812 (0.0055)*	0.4695 (0.0064)*	0.4843 (0.0051)*
Pre[1], a_2	-0.0252 (0.8690)	-0.0193 (0.8987)	-0.0177 (0.9077)	-0.0643 (0.7107)	-0.0607 (0.7250)	-0.0578 (0.7387)
Post[1], a_3	-0.3697 (0.0155)**	-0.3629 (0.0168)**	-0.3672 (0.0159)**	-0.1944 (0.2613)	-0.1880 (0.2745)	-0.1917 (0.2673)
Post[2], a_4	-0.0841 (0.5821)	-0.0761 (0.6166)	-0.0814 (0.5933)	-0.0758 (0.6612)	-0.0683 (0.6913)	-0.0723 (0.6758)
Jan, a_5	-0.0579 (0.3919)	--	--	-0.0531 (0.4888)	--	--
Mon, a_6	--	-0.1968 (0.0000)*	--	--	-0.2083 (0.0001)*	--
LVIX, a_7	--	--	-0.3282 (0.0129)**	--	--	-0.2434 (0.1036)
RT(-1)	-0.0136 (0.5913)	-0.0101 (0.6885)	-0.0171 (0.4991)	-0.0111 (0.6605)	-0.0054 (0.8299)	-0.0127 (0.6166)
Arch-LM Statistics (p-value)						
1 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ljung-box Q^2 statistics (p-value)						
1 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

OLS						
Index	Emas Shariah			Small Cap Shariah		
Parameter (p,q)	2.a	2.b	2.c	2.a	2.b	2.c
Constant, a_0	-0.0015 (0.9210)	0.0317 (0.1692)	0.4533 (0.0138)**	-0.0098 (0.6824)	0.0541 (0.1158)	1.1622 (0.0000)*
Pre[2]. a_1	0.3427 (0.0045)*	0.3961 (0.0153)**	0.4113 (0.0122)**	0.4284 (0.0211)**	0.2145 (0.3799)	0.2280 (0.3497)
Pre[1], a_2	-0.0339 (0.7785)	-0.0332 (0.8391)	-0.0295 (0.8576)	-0.0380 (0.8380)	0.0699 (0.7746)	0.0747 (0.7593)
Post[1], a_3	-0.1038 (0.3881)	-0.2467 (0.1307)	-0.2513 (0.1251)	-0.1361 (0.4637)	-0.3997 (0.1017)	-0.4092 (0.0934)***
Post[2], a_4	0.0180 (0.8834)	-0.0708 (0.6644)	-0.0763 (0.6416)	0.0046 (0.9805)	0.1721 (0.4812)	0.1608 (0.5099)
Jan, a_5	-0.0213 (0.6820)	--	--	0.0403 (0.6152)	--	--
Mon, a_6	--	-0.2221 (0.0000)*	--	--	-0.2795 (0.0002)*	--

LVIX, a_7	--	--	-0.3620 (0.0108)**	--	--	-0.9039 (0.0000)*
RT(-1)	0.1186 (0.0000)*	0.0230 (0.3615)	0.0136 (0.5929)	0.1856 (0.0000)*	0.0834 (0.0009)*	0.0694 (0.0061)*
Arch-LM Statistics (p-value)						
1 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ljung-box Q^2 statistics (p-value)						
1 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 Lags	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: *, ** and *** denote significant at 1%, 5% and 10% levels respectively.

The Ordinary Least Squares (OLS) results serve as baseline evidence for return behavior over the event windows of Islamic holidays. In general, this shows that Islamic holidays do not beget any abnormal return that remains long term or that is widespread across markets, especially in the conventional market. The returns are usually not statistically significant on the aggregated market level, as seen from KLCI estimates that were small across pre-holiday and post-holiday windows. In contrast to this, Shariah-compliant indices exhibit more heterogeneous and window-specific behaviour. In several specifications, positive and statistically significant coefficients are found within the Pre−2 window while Pre−1 effect are weak or insignificant.

This indicates that anticipatory return effects—which sometimes result from pre-holiday returns—are likely stronger earlier before the holiday rather than immediately before. Post-holiday adjustment performance is also not very long-lasting and negative return effects are seen in the Post+1 window, but they dissipate by Post+2. Of note, these return effects are not homogeneous and remain transient between indices or specifications. Accordingly, the OLS findings indicate that Islamic holiday return behavior is modest in response period and length of time. This strengthens the importance of examining volatility dynamics rather than mean returns, especially for those risk-response behaviors that continue to persist without average returns. Then as a result, the OLS analysis is seen as confirmatory, rather than a central part, allowing the next round of studies to focus on asymmetric volatility effects.

Asymmetric Volatility Effects: TGARCH-M Results

Table 3

TGARCH-M Return and Variance Results

TGARCH-M (return equation)						
Index	KLCI			Hijrah Shariah		
Parameter (p,q)	3.a (2,1)	3.b (1,1)	3.c (1,1)	3.a (1,1)	3.b (1,1)	3.c (1,1)
GARCH	0.0672 (0.2261)	0.0716 (0.2077)	0.1551 (0.0092)*	0.0990 (0.0572)***	0.0987 (0.0611)***	0.1782 (0.0042)*
Constant, a_0	-0.0469 (0.0882)***	-0.0345 (0.2242)	0.4798 (0.0019)*	-0.0729 (0.0283)**	-0.0555 (0.1095)	0.4734 (0.0073)*
Pre^2, a_1	0.1643 (0.0932)***	0.1699 (0.0825)***	0.1695 (0.0824)***	0.1585 (0.1384)	0.1696 (0.0788)***	0.1798 (0.1033)
Pre^1, a_2	-0.0079 (0.9065)	-0.0070 (0.9188)	0.0222 (0.7337)	-0.0621 (0.4889)	-0.0415 (0.6542)	-0.0206 (0.8348)
Post^1, a_3	-0.3104 (0.0463)**	-0.3144 (0.0428)**	-0.3128 (0.0302)**	-0.2784 (0.1071)	-0.2800 (0.1100)	-0.2886 (0.0797)***
Post^2, a_4	0.0003 (0.9977)	0.0024 (0.9841)	0.0018 (0.9882)	0.0380 (0.7964)	0.0494 (0.7323)	0.0504 (0.7331)
Jan, a_5	-0.0452 (0.4475)	--	--	-0.0916 (0.1861)	--	--
Mon, a_5	--	-0.0948 (0.0185)**	--	--	-0.1249 (0.0060)*	--
LVIX, a_5	--	--	-0.4513 (0.0003)*	--	--	-0.4766 (0.0014)*
RT(-1)	0.0075 (0.7912)	0.0086 (0.7479)	-0.0025 (0.9247)	-0.0038 (0.8838)	-0.0005 (0.9859)	-0.0129 (0.6232)
TGARCH-M (variance equation)						
Index	KLCI			Hijrah Shariah		
Parameter (p,q)	3.a (2,1)	3.b (1,1)	3.c (1,1)	3.a (1,1)	3.b (1,1)	3.c (1,1)
Constant, β_0	0.0066 (0.0009)*	0.0072 (0.0005)*	0.0065 (0.0015)*	0.0059 (0.0033)*	0.0056 (0.0044)*	0.0046 (0.0165)*
γ_1	0.0370 (0.1428)	0.0200 (0.0078)*	0.0308 (0.0001)*	0.0039 (0.5191)	0.0036 (0.5351)	0.0116 (0.0515)***
γ_2	-0.0183 (0.4509)	--	--	--	--	--
ψ_1	0.0567 (0.0000)*	0.0584 (0.0000)*	0.0455 (0.0000)*	0.0636 (0.0000)*	0.061450 (0.0000)*	0.0530 (0.0000)*
β_1	0.9372 (0.0000)*	0.9334 (0.0000)*	0.9316 (0.0000)*	0.9538 (0.0000)*	0.9556 (0.0000)*	0.9543 (0.0000)*
Pre^2, a_1	-0.1282 (0.1129)	-0.1304 (0.0918)***	-0.1083 (0.1987)	-0.1940 (0.0041)*	-0.2129 (0.0000)*	-0.1739 (0.0115)**
Pre^1, a_2	-0.0483 (0.5307)	-0.0466 (0.5270)	-0.0682 (0.3898)	-0.0214 (0.7540)	0.0100 (0.8547)	-0.0170 (0.8095)

Post[1], a_3	0.3841 (0.2226)	0.3894 (0.2315)	0.3668 (0.2553)	0.3343 (0.1041)	0.3355 (0.1056)	0.2953 (0.1381)
Post[2], a_4	-0.1650 (0.5816)	-0.1654 (0.5915)	-0.1404 (0.6454)	-0.1068 (0.5959)	-0.1170 (0.5641)	-0.0866 (0.6552)
Arch-LM Statistics (p-value)						
1 Lags	0.4800	0.2357	0.2231	0.6902	0.7034	0.6710
3 Lags	0.8721	0.6376	0.2231	0.9786	0.9819	0.9787
Ljung-box Q^2 statistics (p-value)						
1 Lags	0.4790	0.2350	0.2230	0.6900	0.7030	0.6710
3 Lags	0.8750	0.6460	0.6080	0.9790	0.9820	0.9790

TGARCH-M (return equation)						
Index	Emas Shariah			Small Cap Shariah		
Parameter (p,q)	3.a (1,3)	3.b (1,1)	3.c (3,5)	3.a (1,1)	3.b (1,1)	3.c (1,1)
GARCH	0.0420 (0.5733)	0.0743 (0.1128)	0.1542 (0.0025)*	0.0076 (0.8683)	0.0052 (0.8717)	0.0313 (0.3379)
Constant, a_0	-0.0070 (0.7351)	-0.0285 (0.2935)	0.6060 (0.0001)*	-0.0057 (0.8380)	0.0352 (0.3446)	0.6498 (0.0034)*
Pre[2] a_1	0.2627 (0.0007)*	0.1092 (0.1942)	0.1249 (0.0677)***	0.3847 (0.0077)*	-0.0296 (0.8440)	-0.0140 (0.9227)
Pre[1], a_2	-0.1734 (0.0087)*	-0.0587 (0.4230)	-0.0578 (0.4584)	-0.2378 (0.0141)**	0.0148 (0.8583)	0.0244 (0.7658)
Post[1], a_3	-0.0393 (0.7770)	-0.3115 (0.0465)***	-0.3068 (0.0233)***	-0.2589 (0.0536)***	-0.5894 (0.0075)*	-0.5680 (0.0081)*
Post[2], a_4	0.0652 (0.4068)	0.0633 (0.5937)	0.0505 (0.6977)	-0.0427 (0.6587)	0.0296 (0.8255)	0.0352 (0.7990)
Jan, a_5	-0.0149 (0.6963)	--	--	0.1093 (0.0674)***	--	--
Mon, a_5	--	-0.1454 (0.0002)*	--	--	-0.1608 (0.0007)*	--
LVIX, a_5	--	--	-0.5596 (0.0000)*	--	--	-0.5338 (0.0026)*
RT(-1)	0.1213 (0.0000)*	0.0236 (0.3430)	0.0135 (0.6256)	0.2329 (0.0000)*	0.1261 (0.0000)*	0.1202 (0.0000)*
TGARCH-M (variance equation)						
Index	Emas Shariah			Small Cap Shariah		
Parameter (p,q)	3.a (1,3)	3.b (1,1)	3.c (3,5)	3.a (1,1)	3.b (1,1)	3.c (1,1)
Constant, β_0	0.0153 (0.0000)*	0.0047 (0.0010)*	0.0047 (0.0528)***	0.0282 (0.0000)*	0.0545 (0.0000)*	0.0511 (0.0000)*
γ_1	0.0538 (0.0002)*	-0.0127 (0.0107)**	0.0159 (0.5403)	0.0506 (0.0006)*	0.0429 (0.0006)*	0.0505 (0.0001)*

γ_2	--	--	-0.0220 (0.4231)	--	--	--
γ_3	--	--	0.0038 (0.8839)	--	--	--
ψ_1	0.2223 (0.0000)*	0.0740 (0.0000)*	0.1002 (0.0009)*	0.1854 (0.0000)*	0.1483 (0.0000)*	0.1336 (0.0000)**
β_1	0.6215 (0.0000)*	0.9654 (0.0000)*	0.5543 (0.0000)*	0.8255 (0.0000)*	0.8336 (0.0000)*	0.8383 (0.0000)*
β_2	-0.1910 (0.1283)	--	0.1297 (0.6084)	--	--	--
β_3	0.3652 (0.0000)*	--	0.2219 (0.3550)	--	--	--
β_4	--	--	0.0215 (0.9294)	--	--	--
β_5	--	--	0.0155 (0.9405)	--	--	--
Pre^2, a_1	-0.0826 (0.0102)**	-0.1625 (0.0015)*	-0.1773 (0.0000)*	-0.0949 (0.1306)	-0.1783 (0.2552)	-0.1964 (0.1654)
Pre^1, a_2	-0.0520 (0.0387)**	-0.0125 (0.8033)	-0.0506 (0.0553)***	-0.0690 (0.2035)	-0.2261 (0.0868)***	-0.2200 (0.0692)***
Post^1, a_3	0.1899 (0.0556)***	0.2829 (0.2141)	0.1718 (0.2123)	0.1109 (0.3866)	0.8209 (0.0230)**	0.7694 (0.0260)**
Post^2, a_4	-0.1131 (0.1565)	-0.1289 (0.5638)	0.0242 (0.8593)	-0.0831 (0.4655)	-0.5428 (0.0879)***	-0.5106 (0.0958)***
Arch-LM Statistics (p-value)						
1 Lags	0.6402	0.4262	0.7074	0.8796	0.8581	0.8512
3 Lags	0.9618	0.8789	0.9553	0.8757	0.8664	0.8615
Ljung-box Q^2 statistics (p-value)						
1 Lags	0.6400	0.4260	0.7070	0.8790	0.8580	0.8510
3 Lags	0.96000	0.8790	0.9530	0.8750	0.8660	0.8610

Note: *, ** and *** denote significant at 1%, 5% and 10% levels respectively.

Return Equation

The TGARCH-M return equations indicate that pre-holiday anticipation effects persist after controlling for time-varying risk, although their strength varies across indices. The Pre−2 dummy is positive and statistically significant in several specifications, particularly for the Emas Shariah and Small Cap Shariah indices. This suggests that returns tend to increase two trading days prior to Islamic holidays, consistent with early-stage optimism or anticipatory positioning.

In contrast, Pre−1 effects are generally weak or negative, implying that any early optimism stabilizes or reverses on the final trading day before market closure. This behavior is consistent with short-term profit-taking or increased caution as the holiday approaches. Post-holiday behavior is more pronounced. The Post+1 dummy is consistently negative across indices and statistically significant in many specifications, particularly for Shariah-compliant indices. The magnitude of post-holiday declines is largest for the Small Cap Shariah index,

indicating sharper corrections in segments characterized by higher retail participation and lower liquidity. By Post+2, coefficients are largely insignificant, suggesting that return adjustments are rapid and short-lived.

Variance Equation and Volatility Asymmetry

The TGARCH-M variance equations provide strong evidence of asymmetric volatility dynamics around Islamic holidays. Across all indices, the asymmetry parameter is positive and statistically significant, confirming the presence of leverage effects. This indicates that negative shocks generate a disproportionately larger increase in conditional volatility than positive shocks of comparable magnitude.

The magnitude of volatility asymmetry is notably stronger for Shariah-compliant indices, particularly the Emas Shariah and Small Cap Shariah indices. This finding suggests that Islamic market segments are more vulnerable to adverse shocks, potentially due to higher retail participation, lower liquidity, or heightened sentiment sensitivity during religious events.

Event-window effects further reinforce these dynamics. Pre-holiday periods are often associated with lower conditional volatility, indicating a temporary calming effect as trading activity declines ahead of holidays. In contrast, Post+1 volatility effects are frequently positive especially for the Small Cap Shariah index—reflecting heightened uncertainty and re-pricing when the market reopens. These post-holiday volatility increases tend to dissipate quickly, as Post+2 coefficients are generally insignificant. Diagnostic tests indicate no remaining ARCH effects or serial correlation in the standardized residuals, confirming that the TGARCH-M specification adequately captures volatility clustering and asymmetry.

Asymmetric Volatility Effects: EGARCH-M Results

Table 4

EGARCH-M Return and Variance Results

EGARCH-M (return equation)						
Index	KLCI			Hijrah Shariah		
Parameter (p,q)	3.a (2,1)	3.b (1,4)	3.c (1,4)	3.a (4,3)	3.b (2,1)	3.c (2,1)
GARCH	0.0934 (0.1026)	0.0748 (0.2278)	0.0184 (0.7329)	0.0142 (0.7611)	0.0990 (0.0744)***	0.1822 (0.0043)*
Constant, a_0	-0.0609 (0.0273)**	-0.0442 (0.1299)	0.24934 (0.0315)**	-0.0031 (0.9066)	-0.0596 (0.0962)***	0.4453 (0.0086)*
Pre^2, a_1	0.1699 (0.0777)***	0.1837 (0.2379)	0.1045 (0.8202)	0.0519 (0.9562)	0.2396 (0.1841)	0.2236 (0.2377)
Pre^1, a_2	0.0111 (0.8297)	0.0243 (0.6513)	-0.0053 (0.9023)	-0.0686 (0.2078)	-0.0105 (0.8695)	0.0307 (0.6399)
Post^1, a_3	-0.3433 (0.0186)**	-0.2559 (0.0384)**	-0.3713 (0.0003)*	-0.3378 (0.0054)*	-0.2930 (0.1010)	-0.3057 (0.0854)***
Post^2, a_4	0.0286 (0.8088)	0.0127 (0.9194)	-0.0074 (0.9773)	0.0267 (0.9281)	0.0140 (0.9194)	0.0327 (0.8166)
Jan, a_5	-0.0381 (0.4445)	--	--	-0.0848 (0.1555)	--	--
Mon, a_5	--	-0.0751 (0.0527)***	--	--	-0.1161 (0.0093)*	--

LVIX, a_5	--	--	-0.2112 (0.0253)**	--	--	-0.4555 (0.0015)*
RT(-1)	0.0139 (0.6250)	0.0182 (0.4799)	0.0057 (0.8015)	-0.0104 (0.6408)	0.0004 (0.9880)	-0.0112 (0.6507)
EGARCHM (variance equation)						
Index	KLCI			Hijrah Shariah		
Parameter (p,q)	3.a (2,1)	3.b (1,4)	3.c (1,4)	3.a (4,3)	3.b (2,1)	3.c (2,1)
Constant, β_0	-0.0763 (0.0000)*	-0.0930 (0.0000)*	-0.0478 (0.0000)*	-0.0312 (0.0000)*	-0.0866 (0.0000)*	-0.0920 (0.0000)*
γ_1	0.9894 (0.0000)*	0.9763 (0.0000)*	1.7052 (0.0000)*	1.7704 (0.0000)*	0.9865 (0.0000)*	0.9887 (0.0000)*
γ_2	--	-0.5709 (0.0000)*	-1.0238 (0.0000)*	-0.994137 (0.0000)*	--	--
γ_3	--	0.9830 (0.0000)*	0.4278 (0.0158)**	0.220588 (0.0000)*-	--	--
γ_4	--	-0.4010 (0.0000)*	-0.1143 (0.1499)	--	--	--
β_1	0.1725 (0.0000)*	0.1071 (0.0000)*	0.0581 (0.0000)*	0.0245 (0.5470)	0.0812 (0.0563)***	0.0840 (0.0524)***
β_2	-0.0835 (0.0388)**	--	--	0.0810 (0.3089)	0.0243 (0.5635)	0.0305 (0.4782)
β_3	--	--	--	0.0614 (0.4977)	--	--
β_4	--	--	--	-0.1280 (0.0057)*	--	--
ψ_1	-0.0636 (0.0000)*	-0.0755 (0.0000)*	-0.0261 (0.0000)*	-0.0273 (0.0000)*	-0.0631 (0.0000)*	-0.0522 (0.0000)*
Pre^2, a_1	-0.5800 (0.1190)	-0.0128 (0.9648)	1.2223 (0.0031)*	1.8947 (0.0000)*	-0.0049 (0.9849)	0.0449 (0.8674)
Pre^1, a_2	-0.7162 (0.0607)***	-1.0818 (0.0002)*	-3.5705 (0.0000)*	-4.8556 (0.0000)*	-1.1135 (0.0000)*	-1.1855 (0.0000)*
Post^1, a_3	1.6843 (0.0009)*	0.8427 (0.0028)*	4.3823 (0.0000)*	6.0414 (0.0000)*	1.4448 (0.0001)*	1.4325 (0.0001)*
Post^2, a_4	-0.2979 (0.5313)	0.4273 (0.1020)	-2.0149 (0.0001)*	-3.0968 (0.0000)*	-0.3005 (0.3842)	-0.2795 (0.4235)
Arch-LM Statistics (p-value)						
1 Lags	0.3250	0.0759	0.0015	0.3645	0.4878	0.4533
3 Lags	0.7654	0.3020	0.0165	0.6062	0.8997	0.8971
Ljung-box Q^2 statistics (p-value)						
1 Lags	0.3240	0.0750	0.0010	0.3640	0.4870	0.4530
3 Lags	0.7610	0.2960	0.0150	0.6070	0.9010	0.8980

EGARCH-M (return equation)						
Index	Emas Shariah			Small Cap Shariah		
Parameter (p,q)	3.a (1,1)	3.b (1,1)	3.c (1,2)	3.a (1,1)	3.b (1,5)	3.c (1,3)
GARCH	0.06010 (0.4404)	0.0801 (0.1386)	0.0955 (0.0924)	0.0115 (0.7957)	0.0018 (0.9448)	0.0087 (0.7501)
Constant, a_0	-0.0161 (0.4622)	-0.0382 (0.2035)	0.4392 (0.0002)*	-0.0084 (0.7631)	0.0115 (0.6089)	0.1316 (0.4122)

Pre^2, a_1	0.2911 (0.0000)*	0.1865 (0.2587)	0.1084 (0.6829)	0.3733 (0.0000)*	0.1521 (0.8243)	0.1431 (0.8234)
Pre^1, a_2	-0.1348 (0.0048)*	0.0105 (0.8299)	0.0107 (0.8192)	-0.2091 (0.0000)*	0.0496 (0.3365)	0.0517 (0.2858)
Post^1, a_3	-0.0886 (0.3590)	-0.3121 (0.0686)***	-0.3238 (0.0384)**	-0.2666 (0.0549)***	-0.4418 (0.0045)*	-0.4389 (0.0042)*
Post^2, a_4	0.0384 (0.6815)	-0.0038 (0.9744)	0.0048 (0.9713)	-0.0348 (0.7472)	0.1902 (0.6407)	0.1855 (0.5814)
Jan, a_5	0.0354 (0.2572)	--	--	0.1773 (0.0000)*	--	--
Mon, a_5	--	-0.1161 (0.0028)*	--	--	-0.0390 (0.3063)	--
LVIX, a_5	--	--	-0.4017 (0.0000)*	--	--	-0.1072 (0.4003)
RT(-1)	0.1374 (0.0000)*	0.0303 (0.2324)	0.01521 (0.5204)	0.2133 (0.0000)*	0.0735 (0.0003)*	0.0803 (0.0001)*
EGARCHM (variance equation)						
Index	Emas Shariah			Small Cap Shariah		
Parameter (p,q)	3.a (1,1)	3.b (1,1)	3.c (1,2)	3.a (1,1)	3.b (1,5)	3.c (1,3)
Constant, β_0	-0.1878 (0.0000)*	-0.0674 (0.0000)*	-0.0380 (0.0000)*	-0.1868 (0.0000)*	-0.0705 (0.0000)*	-0.0713 (0.0000)*
γ_1	0.9620 (0.0000)*	0.9903 (0.0000)*	1.4276 (0.0000)*	0.9573 (0.0000)*	1.7751 (0.0000)*	1.7316 (0.0000)*
γ_2	--	--	-0.4299 (0.0004)*	--	-1.1750 (0.0000)*	-0.9934 (0.0000)*
γ_3	--	--	--	--	0.5544 (0.0042)*	0.2406 (0.0000)*
γ_4	--	--	--	--	-0.3045 (0.0145)**	--
γ_5	--	--	--	--	0.1287 (0.0018)*	--
β_1	0.1892 (0.0000)*	0.0801 (0.0000)*	0.0485 (0.0000)*	0.0210 (0.0000)*	0.1016 (0.0000)*	0.1021 (0.0000)*
ψ_1	-0.1201 (0.0000)*	-0.0813 (0.0000)*	-0.0413 (0.0000)*	-0.1249 (0.0000)*	-0.0526 (0.0000)*	-0.0476 (0.0000)*
Pre^2, a_1	-1.1149 (0.0019)*	0.0049 (0.9863)	0.5304 (0.1630)	-0.8851 (0.0012)*	1.2348 (0.0009)*	1.1875 (0.0017)*
Pre^1, a_2	-0.1445 (0.6766)	-1.5059 (0.0000)*	-2.4507 (0.0000)*	-0.7846 (0.0041)*	-4.2434 (0.0000)*	-4.1762 (0.0000)*
Post^1, a_3	1.0930 (0.0013)*	1.8823 (0.0000)*	3.3075 (0.0000)*	1.4021 (0.0001)*	5.7063 (0.0000)*	5.7330 (0.0000)*
Post^2, a_4	-0.1091 (0.7294)	-0.390 (0.3452)	-1.4079 (0.0125)**	-0.2917 (0.3788)	-3.1597 (0.0000)*	-3.1548 (0.0000)*
Arch-LM Statistics (p-value)						
1 Lags	0.5988	0.4714	0.1913	0.7162	0.5770	0.5592
3 Lags	0.7047	0.8786	0.5079	0.9448	0.8822	0.8940
Ljung-box Q^2 statistics (p-value)						
1 Lags	0.5980	0.4710	0.1910	0.7160	0.5770	0.5590
3 Lags	0.7000	0.8750	0.4930	0.9450	0.8800	0.8910

Note: *, ** and *** denote significant at 1%, 5% and 10% levels respectively.

Return Equation

In the return equations, holiday-related patterns are concentrated in specific windows rather than persisting across the entire event period. The Pre−2 dummy remains positive in most specifications, and it is strongest for the Shariah indices—particularly Emas Shariah and Small Cap Shariah—suggesting that price increases tend to occur earlier in the pre-holiday window rather than immediately before the trading break. In contrast, Pre−1 effects are generally weak and inconsistent, often switching sign across specifications, indicating that returns on the day immediately before the holiday are not systematically different from normal trading days once conditional volatility. The clearest return regularity appears after the holiday. The Post+1 dummy is negative and frequently significant, especially for the KLCI and Small Cap Shariah indices. This indicates a short-lived post-holiday correction, consistent with the reversal of pre-holiday optimism when trading resumes. By Post+2, coefficients are largely insignificant, suggesting that the market adjustment is concentrated on the first trading day after reopening. Control variables behave in expected directions. Where included, the Monday effect is negative and significant, while LVIX is negative and significant in several specifications, indicating that heightened global uncertainty tends to depress local returns. Lagged returns are more influential for Emas Shariah and Small Cap Shariah, consistent with stronger short-term dependence or momentum in these segments. Evidence of a January effect is limited and appears mainly in the Small Cap Shariah index, aligning with the broader pattern that seasonal anomalies are more pronounced among smaller firms.

Variance Equation and Leverage Effect

The most important contribution of the EGARCH-M estimates lies in the variance equations. Across all indices, the leverage/asymmetry parameter (ψ) is negative and highly significant, confirming that negative shocks raise conditional volatility more than positive shocks of equal magnitude. This result provides robust evidence of volatility asymmetry in the Malaysian market and indicates that downside risk dominates volatility dynamics around Islamic holiday periods. Event-window effects in the variance equations also show a clear timing structure. Volatility tends to be lower during pre-holiday trading days, especially around Pre−1, suggesting a calming or thin-trading effect as market participants reduce activity before the closure.

In contrast, volatility increases sharply on Post+1, with strong positive coefficients across indices—most prominently for the Shariah indices and Small Cap Shariah—indicating heightened uncertainty and re-pricing when the market reopens. This pattern is consistent with post-holiday information assimilation, position adjustment, and liquidity restoration effects. For Post+2, variance effects are generally weaker or negative, implying that the volatility spike is concentrated in the first reopening session and dissipates quickly thereafter. Volatility persistence is substantial across specifications, indicating that volatility shocks decay slowly, a typical feature of emerging equity markets. Overall, the EGARCH structure captures both clustering and asymmetry effectively, and the diagnostic statistics generally support model adequacy.

Asymmetric Volatility Effects: EGARCH-M Results and Model Comparison

The EGARCH-M results corroborate and strengthen the findings obtained from the TGARCH-M model. Across all indices, the leverage parameters are statistically significant, confirming that negative shocks exert a stronger influence on volatility than positive shocks. The

exponential structure of the EGARCH model suggests that downside shocks around Islamic holidays can trigger sharp increases in volatility, particularly during immediate pre- and post-holiday windows. Consistent with the TGARCH-M findings, asymmetric volatility effects are more pronounced in Shariah-compliant indices. The Small Cap Shariah index again exhibits the strongest response, indicating heightened downside-risk sensitivity among smaller firms during religious events.

While both models provide consistent evidence of volatility asymmetry, the EGARCH-M model offers several advantages. First, it captures leverage effects more flexibly by allowing volatility to respond exponentially to negative shocks. Second, it avoids non-negativity constraints on variance parameters, improving estimation stability. Third, EGARCH-M results exhibit stronger statistical significance and clearer event-window effects in several specifications. Taken together, these findings suggest that EGARCH-M provides a more robust representation of asymmetric volatility dynamics around Islamic holidays, although TGARCH-M results remain valuable for identifying threshold-based asymmetry.

Discussion and Interpretation

The results collectively indicate that Islamic holidays influence stock market behavior primarily through risk dynamics rather than average returns. While return effects are weak and short-lived, volatility responses—particularly to negative shocks—are substantial and asymmetric. The stronger asymmetry observed in Shariah-compliant indices suggests that religious events amplify downside-risk sensitivity within Islamic market segments. This may reflect behavioral factors, including heightened sentiment, reduced liquidity, and increased uncertainty around market reopening. Smaller-cap Shariah firms appear especially vulnerable, highlighting the role of market microstructure and investor composition in shaping volatility responses.

These findings underscore the importance of accounting for asymmetric volatility when evaluating religious calendar effects. Ignoring leverage effects may lead to an underestimation of downside risk during Islamic holidays, particularly in markets with significant Shariah-compliant segments.

Conclusions and Implications

Conclusion

We assess the contribution of Islamic holidays in creating asymmetric volatility and leverage impacts on the Malaysian stock market by utilizing both short-horizon event-window and asymmetric volatility analysis models. Based on the daily data for FTSE Bursa Malaysia KLCI and three Shariah-compliant indices from 2018 through 2023, these papers distinguish between periods of pre-holiday anticipation and post-holiday adjustment periods in order to capture short-term market reactions to religious events during holidays. These empirical results suggest there are weak or even no abnormal return effects for Islamic holidays across the Malaysian equity market. Return effects that are present in practice are transient, lasting only on the trading days immediately surrounding the holiday. So Islamic holidays do not affect expected returns systematically, in aggregate terms.

In contrast, the results exhibit strong evidence of asymmetric volatility and leverage effects in the vicinity of Islamic holidays. Negative shocks have a disproportionately more

significant effect on conditional volatility than positive shocks of relatively similar sizes during the immediate pre- and post-holiday windows. These asymmetric effects are robust results between specifications TGARCH-M and EGARCH-M and thus support the robustness of the findings. It is particularly important that volatility asymmetry is pronounced in Shariah-compliant indices and particularly among smaller capitalized stocks, suggesting higher downside risk sensitivity of Islamic market segments. The study results show that the effect of Islamic holidays is primarily due to the risk dynamics, rather than return predictability. Religious calendar events heighten uncertainty and downside risk, especially when the market returns following holiday closures, emphasizing the need to incorporate volatility asymmetry in a general assessment of Islamic calendar impacts.

Implications for Investors and Risk Management

The conclusions may be crucial for investors, portfolio managers, and risk managers in markets with high Islamic trading activity. First, because there is no evidence of continued return anomalies, it cannot be concluded that Islamic holidays should be considered as a methodical use return trading. But the evidence of a significant volatility asymmetry reveals that downside risk increases appreciably more around religious holidays in the short term, especially following a holiday. For portfolio managers, this may mean that taking a proactive approach to risk exposure in periods of Islamic holidays, such as Shariah-compliant portfolios or small-cap segments. Models for dynamic volatility forecasting that incorporate leverage effects may yield more robust risk estimates than models built using a symmetrical model, although during these times. Additionally, risk managers may want to adopt temporary hedging or position scaling tactics in order to deal with post-holiday increased volatility. The greater asymmetric volatility of Shariah-compliant indices, thus, suggests that Islamic investment strategies exhibit a more sensitivity to negative shocks arising from information in Islamic investment transactions. This highlights the necessity to adapt risks in the management of Shariah-compliant assets by considering behaviour and liquidity.

Policy and Market Implications

From a regulatory and policy perspective, results provide further evidence that religious calendars help in the stability of markets. More volatile after holiday closures makes it possible that lower liquidity and later-processing information might worsen risk when we get back onto trading. Regulators on the exchanges and exchange leaders might consider measures to enhance market transparency and liquidity with regard to post-holiday reopening periods especially for categories that are heavily skewed toward retail investors. For Bursa Malaysia's operations, and for intermediaries who serve the market, awareness of increased post-holiday volatility will feed into the planning of trading infrastructure, market monitoring and investor communication strategies. Better communication and provision of liquidity of information around major holidays and to strengthen liquidity levels during festive holidays can be themeans to minimize excessive volatility and ensure that the markets operate in an orderly manner.

Contributions of Study

This study contributes to the literature on calendar anomalies and Islamic financial markets in several important ways. First, the results show that Islamic holidays influence market behavior primarily through asymmetric volatility rather than persistent return effects. The OLS estimations indicate that return effects around Islamic holidays are generally weak and

short-lived, with positive returns appearing mainly in the Pre−2 window and negative corrections occurring in Post+1, while most effects disappear by Post+2. In contrast, both the TGARCH-M and EGARCH-M models reveal statistically significant leverage effects, where negative shocks increase volatility more than positive shocks. This finding implies that Islamic holiday periods primarily affect market risk rather than average returns, suggesting that researchers should focus more on volatility and downside risk dynamics when studying religious calendar effects.

Second, the structured event-window analysis provides evidence of distinct anticipation and adjustment patterns around Islamic holidays. The results show that returns tend to increase two trading days before holidays (Pre−2) but weaken or turn negative closer to the holiday (Pre−1), while Post+1 returns are significantly negative, indicating a short-term correction when the market reopens. At the same time, volatility increases sharply on Post+1, reflecting information assimilation and market re-pricing after the holiday break. This pattern implies that investors tend to engage in early anticipatory trading before holidays and adjust positions immediately after the market reopens, which can inform short-horizon trading and portfolio timing strategies.

Third, the empirical results reveal that asymmetric volatility responses are stronger in Shariah-compliant indices, particularly the Emas Shariah and Small Cap Shariah indices. The TGARCH-M and EGARCH-M estimations show larger and more significant asymmetry parameters for these indices, indicating that negative shocks generate disproportionately larger increases in volatility within Islamic market segments. This suggests that Shariah-compliant markets—especially those with smaller-capitalization firms—are more sensitive to downside shocks during religious holiday periods, possibly due to lower liquidity and higher retail investor participation. For investors and portfolio managers, this implies that risk exposure may be higher in Shariah and small-cap segments during holiday periods, requiring more cautious portfolio allocation and volatility management.

Finally, the results highlight clear post-holiday volatility spikes, particularly on Post+1, where conditional volatility rises significantly across several model specifications before stabilizing by Post+2. This indicates that market reopening after Islamic holidays is associated with temporary uncertainty and price re-adjustment. For market regulators and policymakers, this finding suggests the importance of monitoring liquidity and volatility conditions during immediate post-holiday trading sessions, as these periods may experience short-term instability due to delayed information processing and position adjustments.

Limitations and Recommendations for Future Research

While this research contributes highly, limitations of this study remain. First, the analysis centres on index-level data, which could obscure firm-specific heterogeneity in volatility responses. Future research could extend the framework to firm level analysis--looking at how the characteristics of a company, such as size, sector or liquidity, determine asymmetric volatility around Islamic holidays. Second, the study focuses explicitly on Islamic holidays which are officially recognized in Malaysia. Future studies might even be able to conduct cross-country comparisons or follow-up at other religious and cultural events in order to see whether the asymmetry is specific to the Malaysian context or a more general one for other Islamic financial markets. Third, although the models used in this study are TGARCH-M and

EGARCH-M, other nonlinear volatility models, such as regime-switching or stochastic volatility models, may also contribute to understanding the behaviour of downside risk under the impact of religious events. Intraday data also could help clarify what volatility looks like when market reopening sessions taking place. The contribution of this study is to add to existing literature that explains the effect of Islamic holidays on financial markets through asymmetric volatility and downside-risk patterns, rather than through stable return patterns. Through the analysis of Shariah-compliant indices, showing that leverage effects are even stronger on Islamic assets, the results accentuate the need to consider the impact of the religious calendars when modeling risk when creating risk and maintaining portfolio. In light of the fast enlargement of Islamic financing markets internationally, knowing the influence of religious events on volatility behavior is crucial for investors, policymakers and researchers.

References

Albaity, M., & Rahman, M. (2012). Behavioural Finance and Malaysian Culture. *International Business Research*, *5*(11), 66–76. https://doi.org/http://dx.doi.org/10.5539/ibr.v5n11p65

Ali, I., Akhter, W., & Ashraf, N. (2017). Impact of Muslim Holy Days on Asian Stock Markets: An Empirical Evidence. *Cogent Economics and Finance*, *5*(1), 1–10. https://doi.org/10.1080/23322039.2017.1311096

Ariel, R. A. (1990). High Stock Returns before Holidays: Existence and Evidence on Possible Causes. *The Journal of Finance*, *45*(5), 1611–1626. https://doi.org/10.1111/j.1540-6261.1990.tb03731.x

Arumugam, S. (1999). Focus On High Stock Returns Before Holidays New Evidence from India. *Journal of Financial Management & Analysis*, *12*(2), 69–84.

Baker, M., & Wurgler, J. (2007). Investor Sentiment in the Stock Market. *The Journal of Economic Perspectives*, *21*(2), 129–151.

Bhana, N. (1994). Public Holiday Share Price Behaviour on the Johannesburg Stock Exchange. *Investment Analysts Journal*, *23*(39), 45–49. https://doi.org/10.1080/10293523.1994.11082332

Białkowski, J., Etebari, A., & Wisniewski, T. P. (2012). Fast profits: Investor sentiment and stock returns during Ramadan. *Journal of Banking and Finance*, *36*(3), 835–845. https://doi.org/10.1016/j.jbankfin.2011.09.014

Białkowski, J., & Yaghoubi, M. (2021). The Ramadan effect: A standalone anomaly or just a compensation for low liquidity? *Journal of Behavioral and Experimental Finance*, *30*. https://doi.org/10.1016/j.jbef.2021.100480

Bley, J., & Saad, M. (2010). Cross-Cultural Differences in Seasonality. *International Review of Financial Analysis*, *19*(4), 306–312. https://doi.org/10.1016/j.irfa.2010.08.004

Bollerslev, T., Chou, R. Y., & Kroner, K. F. (1992). ARCH Modeling in Finance A Review of the Theory and Empirical Evidence. *Journal of Econometrics*, *52*(1–2), 5–59. https://doi.org/https://doi.org/10.1016/0304-4076(92)90064-X

Chan, M. W. L., Khanthavit, A., & Thomas, H. (1996). Seasonality and Cultural Influences on Four Asian Stock Markets. *Asia Pacific Journal of Management*, *13*, 1–24. https://doi.org/https://doi.org/10.1007/BF01733814

Chia, R. C. J., Lim, S. Y., Ong, P. K., & Teh, S. F. (2015). Pre and Post Chinese New Year Holiday Effects: Evidence from Hong Kong Stock Market. *Singapore Economic Review*, *60*(4), 1–14. https://doi.org/10.1142/S021759081550023X

Connolly, R. A. (1989). An Examination of the Robustness of the Weekend Effect. *Journal of Financial and Quantitative Analysis*, *24*(2), 133–169. https://doi.org/https://doi.org/10.2307/2330769

Derigs, U., & Marzban, S. (2008). Review and Analysis of Current Shariah-Compliant Equity Screening Practices. *International Journal of Islamic and Middle Eastern Finance and Management*, *1*(4), 285–303. https://doi.org/10.1108/17538390810919600

Engle, R. F., & Ng, V. K. (1993). Measuring and Testing the Impact of News on Volatility. *The Journal of Finance*, *48*(5), 1749–1778. https://doi.org/10.1111/j.1540-6261.1993.tb05127.x

Fama, E. F. (1970). American Finance Association Efficient Capital Markets: A Review of Theory and Empirical Work. *Source: The Journal of Finance*, *25*(2), 383–417. https://doi.org/https://doi.org/10.2307/2325486

Har, W. P., & Chih, L. W. (2016). Effects of Holidays on the Malaysian Stock Exchange. *International Journal of Business and Management*, *11*(2), 274–298. https://doi.org/10.5539/ijbm.v11n2p274

Lakonishok, J., & Smidt, S. (1988). Are Seasonal Anomalies Real? A Ninety-Year Perspectives. *The Review of Financial Studies*, *1*(4), 403–425. https://doi.org/https://doi.org/10.1093/rfs/1.4.403

Majeed, U., Raheman, A., Sohail, M. K., Bhatti, G. A., & Zulfiqar, B. (2015). Islamic Calendar Events and Stock market Reaction: Evidence from Pakistan. *Sci.Int.(Lahore)*, *27*(3), 2559–2567.

McGowan, Jr., C. B., & Jakob, N. A. (2010). Is There an Eid al-Fitr Effect In Malaysia? *International Business & Economics Research Journal (IBER)*, *9*(4), 11–16. https://doi.org/https://doi.org/10.19030/iber.v9i4.549

Nelson, D. B. (1991). Conditional Heteroskedasticity in Asset Returns: A New Approach. *Econometrica*, *59*(2), 347–370. https://doi.org/https://doi.org/10.2307/2938260

Nofsinger, J. R. (2017). *The Psychology of Investing* (6th ed.). Routledge. https://doi.org/https://doi.org/10.4324/9781315230856

Pettengil, G. N. (1989). Holiday Closings and Security Returns. *Journal of Financial Research*, *12*(1), 57–67. https://doi.org/https://doi.org/10.1111/j.1475-6803.1989.tb00101.x

Shah, N., Qureshi, M. N., & Aslam, Y. (2017). An Empirical Investigation of Islamic Calendar Effect in Global Islamic Equity Indices. *International Journal of Economics and Finance*, *9*(6), 57. https://doi.org/https://doi.org/10.5539/ijef.v9n6p57

Shiller, R. J. (2003). From Efficient Markets Theory to Behavioral Finance. *Journal of Economic of Perspectives*, *17*(1), 83–104.

Siddiqui, T. A., & Narula, I. (2013). Market Efficiency and Anomalies: Evidence from S&P CNX NIFTY. *Vision: The Journal of Business Perspective*, *17*(3), 233–245. https://doi.org/https://doi.org/10.1177/0972262913496728

Vergin, R. C., & McGinnis, J. (1999). Revisiting the Holiday Effect: Is It on Holiday? *Applied Financial Economics*, *9*(5), 477–482. https://doi.org/10.1080/096031099332131

Wasiuzzaman, S. (2017). Religious Anomalies in Islamic Stock Markets: The Hajj Effect in Saudi Arabia. *Journal of Asset Management*, *18*(3), 157–162. https://doi.org/10.1057/s41260-016-0028-1

Wong, P. L., Neoh, S. K., Lee, K. H., & Thong, T. S. (1990). Seasonality In The Malaysian Stock Market. *Asia Pacific Journal of Management*, *7*, 43–62. https://doi.org/https://doi.org/10.1007/s10690-022-09370-y

Zakoian, J. M. (1994). Threshold Heteroskedastic Models. *Journal of Economic Dynamics and Control*, *18*(5), 931–955. https://doi.org/https://doi.org/10.1016/0165-1889(94)90039-6