

RESEARCH ARTICLE

Stability and Resilience of Equity Markets Amidst the 2008 Global Financial Crisis: Islamic Versus Conventional Markets

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Abstract: The objective of this study is to empirically explore the impacts of the 2008 global financial crisis on both Islamic and conventional equity markets of Malaysia, Indonesia, Japan, the UK, and the US. Daily closing indices, spanning from July 2007 to July 2011, were utilized and analyzed using cointegration technique and impulse response functions. The study found that the conventional equity markets performed marginally poorer than their Islamic counterparts during the 2008 global financial crisis. This finding implied that the Islamic equity markets were more stable and resilient than the conventional equity markets amidst the crisis period.

Keywords: Islamic equity markets, stability, resilience, time series technique, diversification benefits.

JEL Classification: C32; F21; F36; G01; G15.

The global financial crisis that started in August 2007 has been claimed by Joseph Stiglitz, George Soros, and the International Monetary Fund (Tong & Wei, 2008; Jaffee, 2008) as the most unpleasant financial catastrophe ever since the 1930s Great Depression. The crisis has expanded into the prime financial instability, causing serious shocks on financial markets at the center of the worldwide financial structure (International Monetary Fund, 2008). As a consequence of the borderless landscape of the worldwide economy, the US 2008 global financial crisis has caused an entire instability that spread over

the global economies, including the Islamic stock market. This study empirically assesses the impacts of the 2008 global financial turmoil on both Islamic and conventional stock markets' integration.

Researches on the integration of equity markets provide noteworthy implication for financial steadiness of a nation and prospective opportunities for international diversification to the investors (Ibrahim, 2005; Majid & Kassim, 2010). Buying stocks in the markets, which are highly integrated, offer restricted diversification benefits to the investors as a result of highly correlated markets. Moreover, these integrated

equity markets tend to move jointly and encompass steady long-term equilibrium. Equity markets of different countries might be moving simultaneously because of closed financial and economic linkages among the countries. Thus, a tied trade connection among the economies might be used to predict the economic trends of those countries (Karim & Majid, 2009; Yusof & Majid, 2007; Kearney & Lucey, 2004; Masih & Masih, 1999). Equity markets among the countries might also be closely linked if there are resemblances in implementing economic policy among the countries. For instance, countries that engage in harmonizing their economic policy would discover that their equity markets are inclined to move together.

Ample studies have explored the topic of equity market integration. However, the bulk of the studies have focused on the equity markets in the advanced economies. Taylor and Tonk (1989), for example, explored the interrelationships among the UK, US, Netherlands, Germany, and Japan stock markets and documented that the markets were getting more integrated. Campbell and Hamao (1992) studied the equity markets of Japan and the US and found greater integration as a result of multi-factor asset pricing. There has also been an increasing bulk of studies on the integration of equity markets within the developing economies such as in Latin America and Asia (Ibrahim, 2000, 2005; Jang & Sul, 2002; Yusof & Majid, 2006; Majid, Meera, & Omar, 2008; Karim & Majid, 2009; Majid, Meera, Omar, & Abdul Aziz, 2009; and Kassim, Majid, & Hamid, 2011).

Recently, there is growing interest in empirically exploring the integration among the equity markets in Muslim countries. A number of studies investigated the equity markets of a certain region, for instance, in the Middle East and North Africa (MENA) regions. In his study, Marashdeh (2005) documented that there was no integration among selected equity markets of MENA (Jordan, Egypt, Turkey, and Morocco) and those of the most advanced economies (the UK, Germany, and the US). This finding implied potential benefits diversification for investors from the developed equity markets to the MENA's equity markets. Bley and Chen (2006) found that the equity markets of Saudi Arabia, Kuwait, Bahrain, Qatar, Oman, and the United Arab Emirates offered international diversification benefits; however, these benefits tend to diminish as these markets have been closely integrated because of the

ongoing endeavors to harmonize the markets with the introduction of single currency area and economic unification. Nevertheless, some other studies provided conflicting empirical evidence. For instance, Darrat, Elkhal, and Hakim (2000) documented that the equity markets of Morocco, Egypt, and Jordan were integrated either among themselves or with the world markets.

On the other hand, empirical studies on the Islamic equity markets (concentrated on the organization of Islamic countries [OIC]) that focus on a wider geographical region have been very few. Earlier attempts to explore the OIC stock markets comprise that of Hassan (2003), Zeinelabdin (1991) and Ceylan and Doğan (2004). However, these researches were more descriptive in nature. In their study, Majid, Yusof, and Razali (2007) analyzed the level of interdependencies among Islamic equity markets of Malaysia, Kuwait, Bangladesh, Indonesia, Egypt, Oman, Turkey, Pakistan and the world's biggest equity markets of the UK, Japan, and the US. The study found that the equity markets of Bangladesh, Pakistan, Indonesia, and Malaysia (Islamic countries in the Asian area) were integrated either among themselves or with the major developed equity markets, whereas equity markets in Oman, Turkey, Kuwait, and Egypt (Islamic countries in MENA region) were not. These findings provided the implication that investors who look for portfolio diversification might benefit by buying stocks in the region of MENA countries, but not in the Asian region.

While there have been pervasive researches on integration amongst conventional equity markets either in the western or Muslim countries, similar researches on Islamic equity markets globally have been scarce. Studies to analyze the integration among the Islamic equity markets worldwide have been somewhat new phenomena, simply as a result of increased attention to the Islamic finance issues. Nevertheless, generally, these studies documented that various Islamic equity markets still offer the benefits of investment diversification. For instance, Achسانی, Effendi, and Abidin (2007) found that the Indonesian Islamic equity markets strongly correlated with Malaysia, Canada with the US, and Japan with the Asia Pacific. Additionally, the study documented that while the US Islamic equity market has strong pressure on other Islamic equity markets, the reverse was not the case. Particularly, the Canadian, Malaysian, Indonesian, and other Asia Pacific equity markets have slighter

influences on the Islamic equity market of the US. Unlike the previous study, Aziz and Kurniawan (2007) and Majid and Kassim (2010) provided evidence that there were prospective diversification benefits available for the investor who invests their monies in the Islamic equity markets of Malaysia and Indonesia.

Investors need information about the level of integration of the equity markets for them to diversify their investment in the Islamic equity markets in both the western and Islamic countries. Thus, this topic offers a prospective niche area for investigation. The rapid development of the Islamic equity market has caused an increasing call for more studies to be conducted in this area. Moreover, the 2008 global financial turmoil resulting from financial transactions based on conventional financial markets has changed the interest in the Islamic financial markets. Hence, this study aims to provide investment diversification strategy for the investors during a turbulent financial situation.

Given the above background, this study aims to empirically and comparatively explore the integration of five main conventional and Islamic equity markets, comprising of Malaysia, Indonesia, Japan, the United Kingdom, and the United States during the 2008 global financial crisis. Distinctively, the study seeks to explore the impacts of the 2008 global financial crisis on both conventional and Islamic stock market. The study also attempts to assess the extent to which the Islamic equity markets are more resilient than the conventional equity markets amidst the 2008 global financial crisis. To accomplish these objectives, the study adopts cointegration and impulse response functions (IRFs) techniques.

Thus, the novelty of this study is that it compares, empirically, the integration of Islamic and conventional equity markets during the 2008 global financial crisis. This study provides more comprehensive evidence as it covers the three largest Islamic stock indices of the UK, Japan, and the US. In addition, an accurate estimation of the level of integration among the equity markets is vital for numerous reasons. In designing a well-diversified investment, the investors essentially rely on an accurate prediction of how intercontinental stock returns are closely related. Changes in the patterns of correlation among the global markets call for a modification of portfolios. The global correlation trends among the stock markets provide policymakers a signal

for the steadiness of the worldwide financial structure. In designing economic policies, policymakers should also consider the developments of global stock markets that resulted from foreign transmitting shocks through stock markets, the confidence, and wealth channel effects. The increasing role of the equity market in the national economic development has become a more important kind of spill-over.

The rest of this study is structured in the following sequences. Section 2 presents a brief overview of the principles of Islamic equity market. Section 3 reviews selected relevant literature on the performances and volatilities of Islamic equity markets and their comparison with the conventional counterparts. Section 4 highlights the data utilized and empirical model of analysis. Section 5 provides the findings and discussions. Last, Section 6 provides the conclusion and implications of the study.

Essential Principles of Islamic Stocks

All financial transactions in the Islamic framework must adhere to the fundamental trading rules outlined by the *Shari'ah* with the aim of ensuring fairness and justice (Majid, 2016). Specifically, the *Shari'ah* offers a clear parameter to those financial transactions that contain the elements of *gharar* (excessive uncertainties), *riba* (interest), and *maysir* (gambling), which are firmly forbidden. The transaction is also not permissible for commodities, which are forbidden (*haram*). Islamic tax (*zakat*) should also be observed in Islamic trading.

Based on these principles, the transactions in Islamic stock market are restrained to these essential tenets. Particularly, in investing money in the equity market, Muslims are merely permitted to buy stocks that are *Shari'ah*-compliant. There has been a range of screening process and criteria that should be fulfilled by a particular stock to be categorized as the *Shari'ah*-compliant stock. The screening criteria of the Islamic stock practiced by the Malaysian Securities Commission, for example, are decided at the central level by the *Shari'ah* Advisory Council, which are based on *Shari'ah* compliance of the main business and tolerance level benchmarking for varied activities. The screening criteria of Dow Jones Islamic Index is the second kind of screening criteria that are determined on the basis of permissible business activities and tolerable financial ratios (liquid asset to

total assets, debt to asset, and receivables to assets). Finally, the Meezan Islamic Fund screening criteria, which is widely being exercised in Pakistan, are based on the investee company's businesses, such as net illiquid to total asset, debt to total assets, income from investments of *Shari'ah* non-compliance and share price versus net liquid (Ali, 2005; Yusof, Kassim, Majid, & Hamid, 2011).

With the differing criteria used by various stock markets, it is apparent that there has been no unique standardization in identifying the *Shari'ah* compliance of Islamic stocks. The diverse measures and guiding principles for categorizing the *Shari'ah* compliance of an investment being adopted portray the intricacy of the contemporary capital markets with the reality of multifaceted investment mechanisms and various businesses of global companies (Ulrich & Shehab, 2008). Thus, an institution for worldwide standardization is necessary to differentiate the sets of *Shari'ah*-compliant stocks from those that are not *Shari'ah*-compliant (DeLorenzo, 2000). The presence of an internationally acceptable screening standard for the Islamic equity market might contribute to enhancing the confidence of investors and sustainable development of the Islamic equity markets.

Literature Review

Lately, there is growing interest in the extent the Islamic stock markets are impacted by the economic crises as compared to their conventional counterparts, both in terms of their performances and volatilities in different markets worldwide. The findings of the previous studies on this issue could be categorized into two major empirical pieces of evidence. Firstly, the Islamic and conventional stock markets showed the similar risk-return trade-off and diversification benefits with their conventional counterparts during the crises period (Alam & Rajjaque, 2010; Hassan & Girard, 2010; El Khamlichi, Kabir, Arouri, & Teulon, 2014; and Miniaoui, Syani, & Chaibi, 2015). Secondly, the Islamic stocks showed better performance and lower systematic risk over their conventional counterparts during the crises period (Arshad & Rizvi, 2013; Ashraf & Mohammad, 2014; Ho, Rahman, Yusof, & Zamzamin, 2014; Jawadi, Jawadi, & Louhichi, 2014; and Rizvi, Arshad, & Alam, 2015).

For instance, Hassan and Girard (2010) compared the performances of Islamic and non-Islamic stocks over the 1996–2005 period and found no significant difference between them. Specifically, the Islamic indices outperformed their conventional counterparts over the 1996–2000 period, but underperformed them during the 2001–2005 period. In their study on the Islamic and conventional stock markets of the Gulf Cooperation Council (GCC) countries, Miniaoui et al. (2015) documented that the 2008 global crisis adversely impacted to returns and volatilities of the stock markets of Kuwait, Bahrain, and the UAE, but did not cause the changes in returns and volatilities of the Saudi Arabian, Omani, and Islamic stock markets.

In a similar vein, Alam and Rajjaque (2010) also found that the portfolio of Islamic equities outperformed the conventional equities during the downward period, but slightly underperformed them during the upward period. Overall, the Islamic stocks exhibited similar returns and volatilities to their conventional counterparts. These further imply that both Islamic and conventional stock markets showed the similar risk-return trade-off and diversification benefits (El Khamlichi et al., 2014).

On the other hand, there has been a bulk of studies that found a superior performance of the Islamic stock markets over the conventional counterparts during the period of the higher level of market's volatility. For example, Ho et al. (2014) and Jawadi et al. (2014) empirically compared risk-adjusted performance between Islamic and conventional stock markets during the crisis and non-crisis periods. The Islamic stocks are found to outperform the conventional stocks during the crisis periods, but the indecisive evidence was found for the non-crisis period.

The above empirical evidence is also supported by Arshad and Rizvi (2013), Ashraf and Mohammad (2014), and Rizvi et al. (2015) who revealed that, in general, the Islamic stocks performed better and exhibited lower systematic risk than their conventional counterparts during the downturn phase of the economy. The emerging Asia-Pacific Islamic stocks were documented to be partially immune to speculative shocks (Rizvi et al., 2015), testifying that the Islamic stocks are more stable over their conventional counterparts during the turbulent financial period. The outperformance and lower systematic risk of Islamic stocks over their conventional counterparts

were simply due to their composition and the strict nature of *Shari'ah* screening criteria that specifically forbids investment in the riba-, gharar-, and maysir-based activities.

I noticed that many empirical studies had focused their analysis on the developed and emerging markets, but little assessment of this topic is done in the emerging Indonesian Islamic stock market and its comparison with the rest of Islamic global markets. Thus, this study explores the extent to which the resilience and stability of the Islamic stock market of Indonesia and its comparison with the largest global stock markets, both Islamic and conventional.

Empirical Framework

In analyzing the data, the standardized time series methods consisting of cointegration and impulse response functions (IRFs) are adopted in this study for several reasons. Firstly, it is a simple method where one does not have to be bothered with the formulation of a priori difference between dependent and independent variables. Its characteristic is often prejudiced so that it is wise to regard them alike (Sims, 1980). Secondly, the method requires no limitations on the structural associations of the economic determinants so that the misspecification of the model might be evaded. Lastly, the IRFs, which are derived from Vector Autoregressive (VAR) framework, allow the model to weigh up the direction and strength of variables in explaining other variables in the system.

In analyzing the data using this empirical model, several steps were involved. Firstly, the unit root was tested to ensure the stationarity of every series using both Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests (Perron, 1988; Phillips & Perron, 1988). Secondly, the cointegrations among the stock markets are examined using the Johansen and Juselius (1990) approach. Finally, the IRFs are used to empirically assess the impacts of the 2008 global financial crisis on both Islamic and conventional equity markets as well as and their short-run causal relationships.

Cointegration Test

To explore the cointegration among conventional equity markets, the Johansen and Juselius (1990)

approach that based on the VAR is adopted. In the matrix form, it could be written as follows:

$$\begin{bmatrix} \Delta ID \\ \Delta MY \\ \Delta JP \\ \Delta US \\ \Delta UK \end{bmatrix} = \begin{bmatrix} \delta_0 \\ \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_6 \end{bmatrix} + \sum_{i=1}^k \Gamma_i \begin{bmatrix} \Delta ID \\ \Delta MY \\ \Delta JP \\ \Delta US \\ \Delta UK \end{bmatrix}_{t-k} + \Pi \begin{bmatrix} ID \\ MY \\ JP \\ US \\ UK \end{bmatrix}_{t-1} + \begin{bmatrix} \varepsilon_{t0} \\ \varepsilon_{t1} \\ \varepsilon_{t2} \\ \varepsilon_{t3} \\ \varepsilon_{t4} \end{bmatrix} \quad (1)$$

Likewise, to assess the presence of cointegration among the Islamic equity markets, the study adopted the following equation:

$$\begin{bmatrix} \Delta i-ID \\ \Delta i-MY \\ \Delta i-JP \\ \Delta i-US \\ \Delta i-UK \end{bmatrix} = \begin{bmatrix} \delta_0 \\ \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_6 \end{bmatrix} + \sum_{i=1}^k \Gamma_i \begin{bmatrix} \Delta i-ID \\ \Delta i-MY \\ \Delta i-JP \\ \Delta i-US \\ \Delta i-UK \end{bmatrix}_{t-k} + \Pi \begin{bmatrix} i-ID \\ i-MY \\ i-JP \\ i-US \\ i-UK \end{bmatrix}_{t-1} + \begin{bmatrix} \varepsilon_{t0} \\ \varepsilon_{t1} \\ \varepsilon_{t2} \\ \varepsilon_{t3} \\ \varepsilon_{t4} \end{bmatrix} \quad (2)$$

where *ID*, *MY*, *JP*, *US*, and *UK* designates the indices of conventional stock of Indonesia, Malaysia, Japan, the US, and the UK; whereas *i-ID*, *i-MY*, *i-JP*, *i-US*, and *i-UK* signifies the Islamic equity indices of Indonesia, Malaysia, Japan, the US, and the UK, respectively.

As Equations (1) and (2) take into account likelihood of the past level of series to affect the present changes in other series, the lagged values of the series must be included in the models. For that purpose, the present study used the Akaike (1974) Information Criterion (AIC) to decide the number of lag inclusion in all models of the study.

The presence of a long-run relation among equity markets is examined based on the rank of an $n \times n$ coefficient of the matrix of variables of lagged level of Π in Equations (1) and (2). The Π in those equations is the central point of cointegration analysis since its rank r specifies the cointegrating vectors' number. If $\text{rank}(\Pi) = \mathbf{0}$ in Equations (1) and (2), the stock returns to a VAR framework are found to be non-cointegrated. Conversely, if Π is in a full rank n , all series are stationary. Commonly, when $1 < \text{rank}(\Pi) < n$, the cointegrating vectors' number is similar to r , the matrix Π rank. Because of the matrix rank is equivalent to the eigenvalues λ_i number, which is significantly different from zero, Johansen and Juselius (1990) used two tests of statistics to identify

the long-run information Π rank, namely:

$$\Delta_{trace}(r) = -T \sum_{i=r+1}^n \ln(1 - \Delta_i) \quad (3)$$

$$\Delta_{max}(r; r+1) = -T \ln(1 - \Delta_{r+1}) \quad (4)$$

where Δ_i are approximated eigenvalues ranked from the largest to smallest. The Δ_{trace} in Equation (3) is named the Trace statistics that is a probability ratio statistic test for the hypotheses, which are at most r cointegrating vectors. Meanwhile, the Δ_{max} in Equation (4) is the Maximal Eigenvalue statistic that examines the hypothesis of r cointegrating vectors in opposition to the hypothesis of $r - 1$ cointegrating vectors. The Π rank is similar to the eigenvalues number that is dissimilar from zero. If eigenvalues are all zero, then the Δ_{trace} and Δ_{max} would also be zero. To measure the cointegrating vectors number, this study adopted the λ_{trace} and λ_{max} statistics of Osterwald-Lenum (1992).

Impulse Response Functions (IRFs)

Normally, the studies based on the VAR model use log level variables (Sims, 1980). If the log level variables are non-stationary, the problem might arise resulting from such a specification so that the findings would be spurious and misleading. Taking first differences of the variables at the log level to fulfill the stationary requirement for the VAR model, nonetheless, produces misspecification problem if the estimated variables are cointegrated. Thus, to avoid the misspecification problem and for a proper VAR model specification, the tests of stationarity and cointegration delineated in the previous stage are extremely necessary to be conducted. Specifically, if the study found that the stock prices are non-stationary and they are non-cointegrated, it suggests the adoption of VAR model in first differences. On the other hand, if the stock prices are cointegrated, a Vector Error Correction Model (VECM) or the VAR model at the level should be utilized (Engle & Granger, 1987). Taking all the above into consideration, this study utilized the VAR model both in level and first differences non-cointegrated and cointegrated equity markets, respectively, in the IRFs analysis.

The IRF is utilized to evaluate the dynamic relations among equity markets. The changes in a market might be contemporaneously linked to the other markets.

This implies that shocks in one equity market might work throughout the contemporaneous connection to shocks in other markets. As an isolated innovation in one equity market could not be recognized as caused by contemporaneous connection, the responses of an equity market to innovations in other markets could not be satisfactorily signified (Lutkepohl, 1991). The general approach to resolving the problem of identification is to adopt Sims' (1980) empirical approach by orthogonalizing the innovations utilizing the Cholesky factorization. However, the approach necessitates a pre-specified causal ordering of the variables that turn out to be its main shortcomings. That is to say, the findings from the IRFs analysis might be sensitive to the variables' ordering, particularly once the error terms of contemporaneous correlations in the VAR are found to be high. To resolve this drawback, this study adopted the generalized IRFs proposed by Pesaran and Shin (1998). The generalized IRFs entirely take into consideration the correlation among different historical shocks (Pesaran & Shin, 1998). Consequently, they are invariant and unique to different orderings of the equity markets. Another superiority of the generalized IRFs according to Ewing, Forbes, and Payne (2003) is that as the error configuration is not orthogonalized, the early impact reaction of a market to various shocks could be explored. This characteristic of the generalized IRFs is predominantly handy for examining equity markets that are commonly characterized by rapid price transmissions and corrections.

Data

This study used daily closing indices of five selected Islamic and conventional stocks (i.e., Indonesia, Malaysia, Japan, the US, and the UK), covering the period of the US global financial crisis, which started from July 26, 2007 to July 26, 2011. The starting period of this study is determined following Dungey, Fry, Hermosillo, Martin, and Tang (2008) who identified that the US sub-prime mortgage crisis began on July 26, 2007. Since the crisis has prolonged for a few years later, the study covered five years data until July 26, 2011 to explore the entire impact on the equity markets.

The selected indices of daily stocks were denominated in domestic currency units, downloaded from the Bloomberg database. The equity returns

for the conventional markets are computed from the subsequent indices: (i) Jakarta Composite Index (JCI) for Indonesia; (ii) Kuala Lumpur Stock Index (KLCI) for Malaysia; (iii) Nikkei 225 Index for Japan; (iv) S&P500 for the US; and (v) FTSE 100 for the UK. In the interim, the equity returns for Islamic markets are measured from the next indices: (i) Jakarta Islamic Stock Index (JAKIS) for Indonesia; (ii) Dow Jones Islamic Index of Malaysia (DJIM) for Malaysia; (iii) Dow Jones Islamic Index of Japan (DJIJ) for Japan; (iv) Dow Jones Islamic Index of America (IMUS) for the US; and (v) Dow Jones Islamic Index of the UK (DJIUK) for the UK.

In exploring the equity markets across the globe, two problems do generally arise. Firstly, the problem of missing observations of the stocks is caused by their markets' different holidays. Since the study used VAR-based model, which extensively incorporated lags in its analysis, missing data would lead to misleading estimations. Accordingly, to avoid this problem, the study adopted Occam's razor method, following studies by Jeon and Von (1990), Hirayama and Tsutsui (1998), Majid and Kassim (2009), and Kassim et al. (2011). This method simply included the missing data by filling in data from the previous day. Secondly, the problem of trading hour differences among the global equity markets. To overcome this problem, the study adjusted for the trading hours differences, for example, by analyzing today's equity

indices of Indonesia, Malaysia, Japan with previous day (lag=1) of the US index.

Empirical Findings and Discussion

In this section, the finding of the study is provided and discussed. It started by highlighting the descriptive statistics of the equity returns, followed by the presentation on the coefficient of correlation and stationarity tests of equity returns. Subsequently, the findings of the cointegration and impulse response functions are presented and discussed.

Descriptive Statistics of the Equity Returns

Table 1 presents the summary of statistics of the equity returns for both Islamic and conventional equity markets amidst the 2008 global financial crisis. It showed that throughout the period, all equity markets witnessed negative daily returns as a result of the higher instability of the markets. Out of five investigated markets, Islamic equity markets of Malaysia (*i-MY*), Japan (*i-JP*), and the US (*i-US*) received lower daily losses comparing to their conventional counterparts (i.e., MY, JP, the US, and the UK). These results indicate that the Islamic equity markets have, to some extent, a superiority performance amidst the 2008 financial crisis period as compared to their conventional counterparts.

Table 1. *Descriptive Statistics of the Conventional and Islamic Equity Returns*

Conventional	ID	MY	UK	JP	US
Mean	-0.132	-0.079	-0.068	-0.121	-0.089
Minimum	-10.821	-9.876	-9.134	-12.010	-9.321
Maximum	7.543	4.138	9.203	13.321	10.865
Standard Deviation	2.765	1.504	2.678	2.065	1.752
Kurtosis	9.845	18.002	10.034	12.100	11.321
Skewness	-0.698	-1.499	0.103	-0.394	-0.176
Islamic	<i>i-ID</i>	<i>i-MY</i>	<i>i-UK</i>	<i>i-JP</i>	<i>i-US</i>
Mean	-0.129	-0.065	-0.066	-0.088	-0.078
Minimum	-13.766	-12.786	-9.654	-9.487	-9.543
Maximum	7.543	8.328	11.543	10.587	11.542
Standard Deviation	2.299	1.487	2.123	1.782	1.643
Kurtosis	9.489	20.111	11.321	9.123	13.121
Skewness	-0.786	-1.432	0.076	-0.148	0.072

Amidst the 2008 global financial crisis, the UK conventional equity market recorded the tiniest losses of -6.8%, followed by Malaysia (-7.9%), the US (-8.9%), Japan (-12.1%), and Indonesia (-13.2%). In contrast, the Malaysian Islamic equity market is found to have the smallest losses of -6.5%, followed by the UK (-6.6%), the US (-7.8%), Japan (-8.8%), and Indonesia (-12.9%).

Figures 1 and 2 portrayed co-movements of the conventional and Islamic stock returns of the US, the UK, Japan, Indonesia, and Malaysia from January 2006 to December 2008. The stock returns of the US, both conventional and Islamic, started to decline from July 26, 2007 and dropped to its lowest point of more than -3.0% in the middle of August 2007. Afterward, the conventional and Islamic stock returns of the US started to increase and reached the highest point of 2.0% and 3.0%, in the middle of November 2007, respectively, and then again declined to the negative returns. Both conventional and Islamic stock returns of Indonesia, Japan, Malaysia, and the UK were also adversely impacted by the 2008 global financial crisis,

indicated by the decline of their stock returns following the crisis. Both conventional and Islamic stock returns of Indonesia recorded the highest losses, while the UK conventional stock market and the Malaysian Islamic stock market recorded the lowest losses during the crisis period. The changes in stock returns illustrated in Figures 1 and 2 confirmed the findings from Table 1.

Compared to other markets, the Indonesian market is documented to be somewhat isolated since its average daily returns were lower than the other equity markets. In addition, of all investigated markets, the Indonesian markets emerged to be the most unstable markets with the highest losses. This could be partially due to the prevalent economic and political instability of the country before the crisis period, and with the presence of 2008 global crisis, the economic condition of the country has been exacerbated.

Furthermore, as observed from Table 1, Figure 1, and Figure 2, compared to the pre-crisis period, both conventional and Islamic stock markets became more volatile at the start of the crisis period and afterward. The Malaysian equity market appeared to be the least

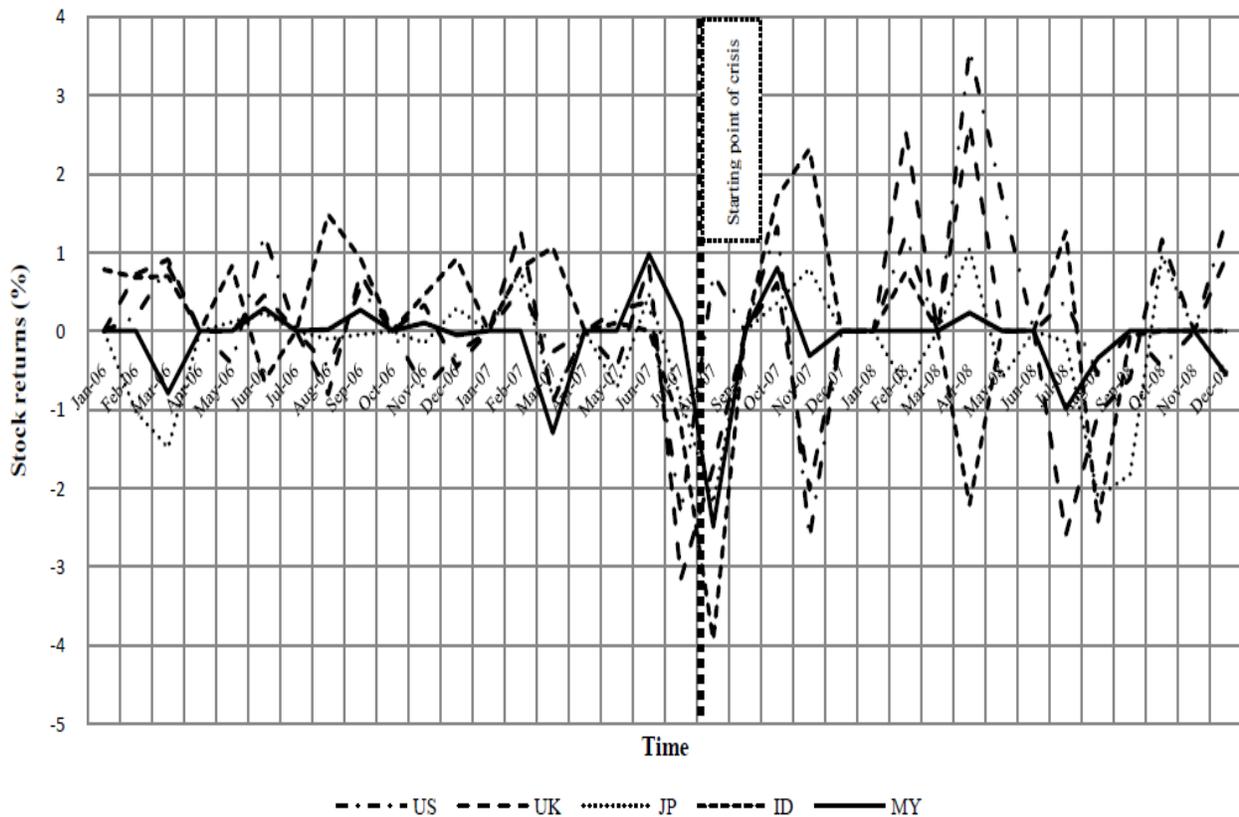


Figure 1. Conventional equity returns amidst the 2008 global crisis.

volatile, followed by Japan, the UK, the US, and Indonesia, as shown by their standard deviation values (Table 1) and up- and down-trends in their stock returns (Figures 1 and 2). Moreover, it is important to note that, during the period of analysis, all Islamic equity markets recorded lower volatilities comparing to their conventional counterparts.

The findings of the study provided empirical evidence that investing in Islamic stocks, which adhere to the *Shari'ah* principles, fared better as compared to investing monies in conventional stocks during a financial crisis. This could be partially due to the Islamic financial principles that prohibit the involvement in collateralized debt obligations and other deleterious assets, which resulted in the

carnage in conventional monetary circles. Besides, the speculative action in the stock markets, which is comprising elements of gambling (*maysir*), interest rate (*riba*), and that their price movements are difficult to predict (*gharar*) are prohibited under Islamic rules (*Shari'ah*).

Coefficients of Correlation of the Stock Returns

Table 2 shows the coefficients of correlation of the short-run relationships between the price movements of the equity markets. The correlation of coefficients is exercised to gauge the extent of association between the equity markets. Amidst the 2008 global financial catastrophe period, the conventional equity markets of Malaysia and Indonesia are documented to be the

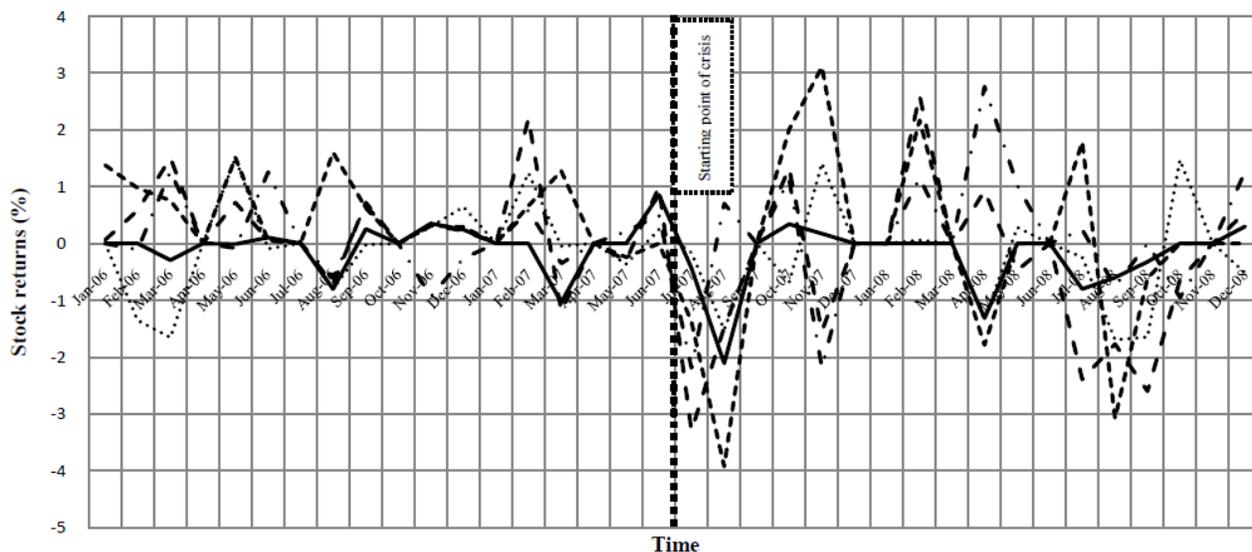


Figure 2. Islamic equity returns amidst the 2008 global crisis.--

Table 2. Coefficients of Correlation of the Equity Returns

Conventional	ID	MY	UK	JP	US
ID	-				
MY	0.595	-			
UK	0.362	0.357	-		
JP	0.504	0.476	0.452	-	
US	0.134	0.069	0.528	0.116	-
Islamic	i-ID	i-MY	i-UK	i-JP	i-US
i-ID	-				
i-MY	0.550	-			
i-UK	0.387	0.352	-		
i-JP	0.394	0.329	0.278	-	
i-US	0.149	0.059	0.498	0.002	-

most correlated markets, while the US and Malaysia are appeared to be the lowest correlated markets.

As for the Islamic equity markets, Malaysia and Indonesia are the most correlated market, whereas the US and Japan are found to be the least correlated markets. These findings showed that, to some extent, the geographical proximity of the country contributed to the higher correlation between the markets.

Stationarity Tests

To provide reliable and robust empirical findings for regression analysis, the data to be estimated should be in the stationary form (Pankratz, 1983; Harvey, 1990; and Gujarati, 1995). For this reason, the Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) tests are adopted and performed for the model with constant and trend. Table 3 provided the ADF and PP statistic tests that evaluate the presence of unit roots for the entire equity indices.

As shown in Table 3, the study found that all the equity indices, both conventional and Islamic, contained unit root at the level, signifying that the null-hypothesis of the existence of unit root could not be rejected at the 1% level of significance. Because of this, the first differences for all indices are then further tested using similar stationarity tests of the ADF and PP. The study found that, after taking first differencing, all the indices turn out to be stationary. These findings indicate that all indices at levels are integrated at order one, $I(1)$ and, hence, the analysis of cointegration might be conducted due to the similarity of integration order to examine the presence of long-

run equilibrium among both Islamic and conventional equity markets.

Cointegration Analysis

After ensuring that all stock indices have a similar order of integration, the study proceeded to tests for the cointegration among the markets, and their results are reported in Table 4. Captivatingly, the conventional equity markets are found to be cointegrated at 5% significance level amidst the 2008 crisis period, based on the Maximum Eigenvalue Statistics (MES) and Trace Statistics tests. On the contrary, the Islamic equity markets appeared to be non-cointegrated; indicating that its residual was not in the process of stationarity. These findings implied that the long-run equilibrium relationship only existed among the conventional equity markets, but not among the Islamic equity markets, amidst the 2008 global financial crisis period.

As pointed out previously, the cointegration findings suggested that the conventional equity markets have to move towards a greater integration during the 2008 financial crisis period. This empirical evidence concurred well with the study by Goldstein and Michael (1993) who documented that the global linkages among the advanced and emerging markets have been escalating over the last decade. This further indicated that, in the long-run period, the worldwide benefits of investment diversification gained by investors in the conventional markets have declined as a result of a crisis. However, to obtain a greater diversification benefit during the period of economic

Table 3. Results of Stationarity Tests

Equity Market	Level		First-Difference	
	ADF	PP	ADF	PP
ID	-1.753	-1.639	-20.861***	-20.870***
MY	-1.629	-1.725	-21.809***	-21.811***
UK	-2.177	-2.589	-9.554***	-24.841***
JP	-2.319	-2.205	-23.091***	-23.281***
US	-1.859	-2.026	-13.117***	-27.908***
i-ID	-1.772	-1.579	-21.141***	-21.147***
i-MY	-1.541	-1.489	-14.557***	-20.309***
i-UK	-1.522	-1.682	-9.548***	-25.840***
i-JP	-1.867	-2.220	-13.969***	-27.927***
i-US	-1.569	-1.676	-12.749***	-27.765***

Notes: *** indicates significance at the 1% level.

Table 4. Results of Cointegration Tests (Lag Lengths = 2)

Model:	Null Hypothesis	Trace Statistic	Max-Eigen Statistic
Conventional Stocks	$r \leq 0$	93.684**	9.193**
	$r \leq 1$	54.491	27.332
	$r \leq 2$	27.158	16.380
	$r \leq 3$	10.778	7.321
	$r \leq 4$	3.457	3.457
Islamic Stocks	$r \leq 0$	82.249	35.441
	$r \leq 1$	46.807	20.905
	$r \leq 2$	25.903	15.439
	$r \leq 3$	10.464	6.792
	$r \leq 4$	3.672	3.671

Notes: ** indicates 5% significance level, and r indicates cointegrating vectors' number. The Akaike Information Criteria (AIC) is adopted to determine optimal lag length. As the study used daily data, the optimal lag-length incorporated in the study was 30.

crisis, investors have to allow their investments into the Islamic equity markets due to their non-cointegration advantage during the crisis. In a nutshell, throughout the bearish economic period, it is advisable for the investors to buy the *Shari'ah*-compliant equities more willingly than the conventional equities.

Moreover, it should be noted here that the presence of cointegration among the conventional markets did not rule out the likelihood of gaining arbitrage profits in the short-run all the way through the portfolios' diversification among these markets that might last for a short time (Dwyer & Wallace, 1992; and Yang & Siregar, 2001). Although the benefits of diversification among integrated markets in the long-run might be lessened, in practice, the benefits of diversification are not likely to be completely diminished. This is simply due to the varying financial risks of different stocks, different scales of business, and various cash flows of the stocks that are co-varying imperfectly, not only among the global markets, but also within the same country.

Impulse Response Functions (IRFs) Analysis

The findings from cointegration analysis, thus far, only suggested the presence of long-run equilibrium among the markets. To empirically explore the relative strength of the 2008 global financial turmoil in the US and their impacts on the other markets, the VAR model is adopted. From the VAR model, the IRF is then generated with the aim at capturing the relative strength of the US crisis and their impacts

to the other Islamic and conventional equity markets under this study.

Figure 3 shows that, generally, the overall findings were very much in line with our previous findings. The conventional equity markets were found to respond instantaneously and significantly to the US 2008 financial crisis. The crisis affected directly and positively the Islamic markets and lasted for about one and half-two days horizon, and then slowly, within three-day period, subside to zero. When the shocks occurred in the US Islamic equity market, it has marginally impacted the other Islamic equity markets of Indonesia, Malaysia, Indonesia, Japan, and the UK. The innovations in the US markets were felt instantly by the other Islamic equity markets within the two-day horizon. In comparison, the conventional equity markets appeared to be more receptive to the US shocks than their Islamic counterparts amidst the crisis period. These findings further proved that the Islamic equity markets are more resilient and stable during the crisis period comparing to the conventional markets. These empirical findings highlighted the nuisances of the modern finance beliefs on which the financial structure is built upon globally. The conventional financial system allowed debt creation on a certain asset without having real underlying transactions, which is possibly made by credit default (Kassim & Majid, 2010). Moreover, the modern financial system that mainly focused on debt-based financing has caused the wealth to merely concentrate and

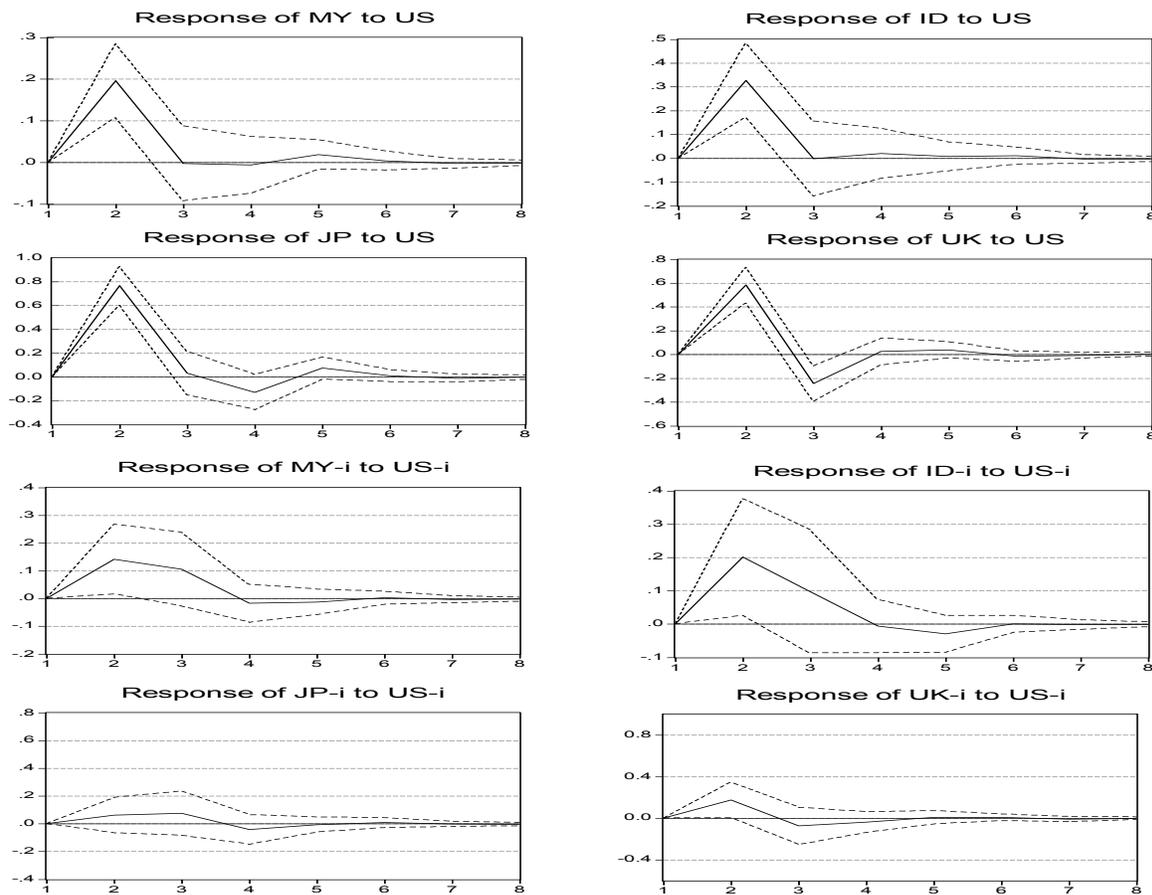


Figure 3. Findings of the generalized impulse responses functions.

circulate among the deemed credit-worthy persons and conglomerates.

Conversely, the stability of Islamic equity markets amidst the 2008 global financial turmoil was merely due to their characteristics that are free from speculation, interest (*riba*), gambling (*maysir*), and uncertainty (*gharar*) components. Islam provides a distinctive system that shields investors from possible risks of investing in toxic assets and specifies that income should be earned from creative economic actions of profit and loss-sharing principles. Islam does not only discourage, but it also prohibits Muslims to invest their monies in economic activities involving unlawful conducts. The resilience of Islamic stock markets demonstrated that Islamic finance could offer a solution to the existing financial and economic turmoil and be a viable alternative to the episodes of turbulent economic system worldwide.

Conclusion

This study empirically and comparatively assessed the impacts of the 2008 global financial catastrophe on both the conventional and Islamic stock markets, utilizing the technique of time series and VAR structure during the period July 26, 2007 to July 26, 2011. The study also attempted to empirically discover the relative strength of the 2008 global financial shocks between the US markets on the other markets—Indonesian, Malaysian, Japanese, and the UK stock markets. The study documented that the Islamic equity markets outperformed the conventional stock markets. Amidst the 2008 global crisis, to some degree, the Islamic equity markets were found to be more resilience compared to the conventional equity markets. In terms of market cointegration, the study only found the presence of a long-run equilibrium relationship among the

conventional equity markets throughout the crisis period, implying that the benefits of global investment diversification the investors could earn among these markets tended to diminish. If the investors intended to enjoy more diversification benefits amidst the global financial crisis period, they should consider investing their monies in the Islamic equity markets.

Evaluating the dominant roles of the most developed markets worldwide—Japan, the UK, and the US—on the Islamic equity markets of Indonesia and Malaysia amidst the 2008 global crisis period, the study documented that the US global crisis impacted more the conventional equity markets of Malaysia than Indonesia. Additionally, the changes in Islamic equity market of Malaysia were caused more by the shocks in the Indonesian Islamic equity market, and vice versa. Comparatively, the Islamic equity markets were found to be less responsive to the 2008 financial shocks as compared to their conventional counterparts. This further implied that the Islamic equity markets were documented to be more resilient as compared to the conventional equity markets. Differently put, the Islamic equity markets were more stable amidst the 2008 global economic downturn due to the Islamic stocks' characteristics that are free from speculation, interest (*riba*), gambling (*maysir*), and uncertainty (*gharar*) elements as well as from toxic assets. Taken as a whole, the findings on the resilience of the Islamic equity markets amidst the 2008 global financial crisis well coincided with the common beliefs that the Islamic equity markets are in healthier shape comparing to their conventional counterparts.

The findings of this study have offered an extensive range of potential areas that deserve attention for further researches. As this study merely explored the effects of the 2008 global financial crisis on selected Islamic and conventional stock markets, future studies should focus on potential factors that relate to efficient equity market, capital market restriction, economic growth-diversification, and stage of capital market development. Future researches could explore a wider geographical area to arrive at more convincing empirical findings. Yet importantly, it might be extremely pertinent if future studies on this issue to compare the effects of more series of economic cyclical events on both Islamic and conventional stock markets. Such efforts might provide essential policy commendations as well as

a handy repercussion for investors, policymakers, and other stakeholders.

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