



Multivariate market risk evaluation between Malaysian Islamic stock index and sectoral indices

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Abstract

Without an efficient financial risk management, it may cause massive consequences to a financial institution as well as individual. Therefore, developing a methodology which gives precise estimates to reduce the exposure of risk to a minimum is of great importance. This paper uses an asymmetric BEKK-GARCH model to examine the return and volatility linkages between the FTSE Bursa Malaysia Emas *Shariah* (FBMS) index and the sectoral indices under a normal market. The findings suggest that the FBMS plays a leading role in the mean return spillover effect. There is a strong evidence of significant transmission of past shocks, volatilities and leverage effects are observed on the current conditional variance-covariance in all the pair-wise models. These empirical results are helpful in quantifying the cross-market risk evaluation, risk minimizing weight and cross-market hedge ratio for strategizing appropriate portfolio selection.

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1. Introduction

According to Bloom, Kose, and Marco (2013), the global uncertainty index in the world markets due to stock volatility has elevated over time. The past financial crises had witnessed huge losses of capital and collapsed of large financial institutions. The chief common lesson learned in these crises is due to poor system in measurement, management and control of financial risks. An understanding of modern financial risk management techniques to quantify uncertainty and comprehend risk is of great concern to mitigate the unpleasant effects of the next financial crisis. Therefore, this has highlighted the need for an improved value-at-risk (VaR) in order to produce reliable and robust estimates in measuring market risk.

Over the past decade, the liberalization of capital movements and reformation of national financial systems have resulted in greater linkages of financial markets worldwide. Besides, the development of the information technology has also allowed information to spread unreservedly. These developments thus have lessened the segmentation of domestic markets and increased the likelihood a market being affected by news and shocks originated from other financial markets. Hence, it is vital for market players to understand the dynamics of the contagion effects across the markets over time in order to mitigate the market risk.

Risk-averse investors may leave a stock market that behaves with extreme swings in stock prices. They tend to move funds from stocks in accordance with the degree of volatility linkages between markets. Hence a desired level of volatility is demanded by the individuals and institutional investors. If the volatility is highly correlated across markets, investors tend to search for relative independent assets in order to

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sustain the optimal portfolio selection. In times of financial crisis, investors experienced sharp drop in the stock returns coupled with higher volatility in equity markets. The scenario of no market is completely resistant from the destructive impact of major financial crises has revealed the vulnerability of the conventional financial system. Furthermore, in times of financial crises and contagion, volatility of returns may behave randomly for different assets. Consequently, portfolio managers may have tough times in choosing appropriate assets that generate stable returns with nominal risk.

In this context, the emergence of the Islamic equity market that is rooted in the *Shariah* (Islamic laws) principles may provide a viable alternative (Rizvi & Arshad, 2014) for investors who seek to shield their investments from the financial vagaries. The advocates of Islamic investment claim that the return and volatility movements in Islamic stock markets are more secure and resilient to a financial crisis compared to the conventional stock markets (Al-Khazali, Lean, & Samet, 2014; Karim, Kassim, & Arip, 2010; Majdoub & Mansour, 2013; Saiti, Bacha, & Masih, 2015) due to its salient features such as risk sharing principle, prohibition of interest (*riba*), gambling/speculation (*maysir/qimar*) and excessive uncertainty (*gharar*), financial ratio screenings and exclusion of highly leveraged firms. Hence, given the distinct characteristics of Islamic equity markets, it is interesting to study the behavior of its return and volatility. However, some studies (Dania & Malhotra, 2013; Dewandaru, Rizvi, Masih, Masih, & Alhabshi, 2014; Hammoudeh, Mensi, Reboredo, & Nguyen, 2014; Kabir, Bacha, & Masih, 2013; Salina, 2013) contrasted with the previous findings which indicated positive significant return and volatility spillovers in Islamic stock indices from their corresponding conventional indices.

Investors would be interested to know whether the Islamic equity market is insulated from the global financial turmoil so that they could diversify their portfolio to hedge against unforeseen risks. Therefore, this study is aimed at providing recent empirical evidence on shock and volatility transmission in the Islamic equity market specifically in Malaysian context. The parameters obtained from the volatility modeling are then used to estimate the market risk. The following of this study is organized as such: Section 2 briefs a review of existing empirical literature on Islamic and sectoral stock markets as well as Islamic finance in Malaysia; Section 3 discusses the data, model estimation and economic implication of the study; Section 4 presents the descriptive statistics, analysis of the empirical estimates and application and Section 5 concluding the study.

2. Literature review

Compared to the studies on spillover effects in the conventional equity markets, the volatility transmission mechanism of the Islamic equity market and its related issues have remained greatly unexplored. There is extensive of existing literature investigating in the conventional equity markets on the return and volatility linkages between the developed markets (Bae & Karolyi, 1994; Engle, Ito, & Lin, 1990),

developed and emerging markets (Lean & Ghosh, 2010; Li & Giles, 2015; Singh, Kumar, & Pandey, 2010; Syllignakis & Kouretas, 2011) and also among emerging markets (Chin & Isa, 2011; Duncan & Kabundi, 2013; Jouini & Harrathi, 2014; Korkmaz, Cevik, & Atukeren, 2012). Therefore, it is appealing to explore the linkages of the Islamic equity market that has been rapidly growing worldwide in the recent decades.

2.1. Past empirical studies on Islamic equity market

Karim et al. (2010) examined the effects of the United States (U.S.) subprime mortgage crisis on the integration and co-movements of Islamic stock markets (Malaysia, Indonesia, the U.S., United Kingdom (U.K.) and Japan) using co-integration techniques. The empirical results showed no co-integration among the Islamic stock markets in the pre-crisis and crisis period. Al-Khazali et al. (2014) examined the performance between nine Dow Jones Islamic indices and their conventional counterparts (Asia Pacific, Canadian, Developed Country, Emerging Markets, European, Global, Japanese, U.K., and the U.S.) employing stochastic dominance analysis. The findings showed that all conventional indices stochastically dominated the Islamic indices from 2001 to 2006 in all markets except the European market. However, during the period from 2007 to 2012, the U.S., European and Global Islamic stock indices dominated their conventional counterparts. The results demonstrated that Islamic indices outperformed their conventional counterparts in the recent global financial crisis. This is consistent with the study of Saiti et al. (2015) who used wavelet correlation analysis to show that the MSCI conventional stock indices of non-Islamic countries (Japan, China, Korea, Taiwan and Hong Kong) displayed contagion effects while their corresponding Islamic stock markets and the MSCI conventional and Islamic stock markets of the Islamic countries (Malaysia, Indonesia, Turkey, GCC ex-Saudi) did not suffer from contagion effects during the collapse of Lehman Brothers. Saiti, Bacha, and Masih (2014) suggested that stock markets of Islamic countries tend to provide better diversification benefits compared to the non-Islamic countries. Majdoub and Mansour (2013) investigated the volatility spillover effects between the U.S. Islamic and five Islamic emerging (Turkey, Indonesia, Pakistan, Qatar and Malaysia) stock markets using three Multivariate Generalized Autoregressive Conditional Heteroskedasticity (MGARCH) models, namely BEKK (taking the first letter of Baba, Engle, Kraft, and Kroner), Constant Conditional Correlation (CCC) and Dynamic Conditional Correlation (DCC). All paired countries exhibited weak conditional correlations over time and showed no evidence of volatility spillover from the U.S. Islamic market into the Islamic emerging equity markets. Rizvi and Arshad (2014) investigated the volatility transmission and correlation of Dow Jones indices with five Islamic and four conventional global indices using MGARCH DCC model. The findings suggested the Islamic equity markets follow a similar return pattern as conventional markets in times of economic growth, but showed a negative trend during

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