THE INTEGRATION OF ISLAMIC STOCK MARKETS: DOES A PROBLEM FOR INVESTORS?

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ABSTRACT

This paper empirically investigates co-integration between Islamic stock market in Malaysia, Indonesia and the world by applying the Vector Auto Regression (VAR) method. This research used monthly data from January 2007 to May 2012 taken from authorized sources. The finding shows that there is no long-run or equilibrium relationship exists between FTSE Bursa Malaysia Emas Shariah (FBMES), Jakarta Islamic Index (JAKISL), and Dow Jones Islamic Market index (DJIM). Based on the result, hence, it can be concluded that the Islamic stock markets of Malaysia does not integrate with Indonesia's, as well as with the world markets in the long run. This will create rooms for investors to diversify their investment portfolios, which puts Malaysia as one of their favoured investment destinations. From the Granger causality view, the return of JAKISL and DJIM is driven by the return of FBMES in the short run.

1. Introduction

The study of stock markets integration has received substantial interests from various stakeholders particularly after the 1987 stock market crash and the 1997-1998 Asian financial crises (Phuan *et al.,* 2009; Marashdeh and Shrestha, 2010). There are several reasons that establish the importance of stock markets integration. First, it provides further opportunities in risk sharing among integrated markets at a cost of taking away

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the diversification benefit of international investment (Siskawati, 2011). Second, the information about stock market integration is then used by investors to set investment strategies based on the potential benefit that can be gained by diversifying in different stock markets (Kassim, 2010). Third, it promotes a vital condition for a country's financial sector to develop as a center for international financial sector (Reddy, 2003). Fourth, stock market integration could generate a higher productivity and economic growth across the economy by stimulating domestic savings and investments (Mohan, 2005). Fifth, it leads to financial stability by promoting effective operation of financial intermediaries and resource allocation (Trichet, 2005). Sixth, market liberalization reduces the cost of capital within the integrated markets due to risk sharing between the country's resident and foreign investors in the domestic economic activities (Tai, 2007).

Numerous researches have studied the conventional stock market integration among countries (see, for examples, Ratanapakorn and Sharma (2002), Yang *et al.* (2003), Narayan *et al.* (2004), Floros *et al.* (2005), and Majid *et al.* (2008). In comparison to the studies of market cointegration in conventional stock markets, there is little empirical research that examines the long run equilibrium among Islamic stock markets. Thus, this paper will contribute significantly to the literature by providing new evidence on Islamic stock market integration nexus in the specific context of FTSE Bursa Malaysia Emas Shariah Index (FBMES), Jakarta Islamic Index (JAKISL) and Dow Jones Islamic Market Index (DJIM). The structure of this paper is as followed: section 2 overview of Islamic stock Markets, section 3 presents literature review pertaining to previous researches on the stock market integration. Section 4 describes the data and variables used in this study. Section 5 discusses research methodology while Section 6 presents and analyses the empirical results. Section 7 concludes the findings.

2.   Islamic Stock market

The Asian Financial Crisis 1997 is the turning point for the Islamic finance industry, as the investors have started to lose confidence in the existing conventional market systems and demand to switch to the Islamic markets. The growing demands for the Islamic investment products are evident in both developed countries, particularly in the UK, the US and Japan, and in developing countries such as Malaysia, Egypt and Sudan. Impressively, there are more than 600 Islamic financial institutions operating in more than 75 countries nowadays. Islamic banking and finance industry is no longer seen as competitor to its counterpart, instead it is recognized as a viable alternative to the conventional financial system as it has high potential to be developed further (Kassim, 2011).

Basically, the function of the Islamic stock market is similar to the conventional which is to provide a benchmark or performance indicator for a group of companies stocks' in a particular market. On the 22 January 2007, Bursa Malaysia Berhad, in collaboration with FTSE Group (FTSE) the global index provider, launched the FTSE Bursa Malaysia EMAS Shariah Index (FBMES) and become a single broad Shariah benchmark index for Malaysia Shariah-compliant investments. FBM Emas Shariah index design is in accordance with FTSE internationally accepted index methodology by taking the constituents of the FTSE Bursa Malaysia EMAS Index, which has been free float weighted and liquidity screened, and overlays the Securities Commission's Shariah Advisory Council's (SAC) screening methodology to obtain a highly transparent and

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investable Shariah-compliant index.

As in the case of Indonesia, the Shariah-compliant based investments' performance is measured by the Jakarta Islamic Index (JAKISL). JAKISL was launched on 1 January 1995 which consists of 30 listed companies, approved by the Shariah Supervisory Board of Danareksa Investment Management. Formally, the trading index commenced on July 3, 2000 using a base value of 100 and January 1, 1995 as the base year (Rahim *et al.,* 2009). While FBMES and JAKISL represent the Islamic market indexes for Malaysia and Indonesia Shariah-compliant investments respectively, the Dow Jones Islamic Market (DJIM) is referred to the first benchmark investment performance for the global Islamic index (Siskawati, 2011). Commencing in 1999, the DJIM include the Shariah-compliant stocks from 34 countries.

3.   Literature Review

There have been few studies focusing on the integration of Islamic and conventional stock markets both regionally and globally, for examples, Roca *et al.* (1998), Wongbangpo (2000), Hee (2002), Azman-Saini *et al.* (2002), Dunis and Shannon (2005), Majid *et al.* (2007), Yusof and Majid (2007), Karim, Kassim and Arip (2010), Majid *et al.* (2008), and Siskawati (2011).

Roca *et al.* (1998) investigate the price linkage among five ASEAN markets (*i.e.* Indonesia, Malaysia, Singapore, Thailand and Philippines) both in long-run and short-run using cointegration technique based on Johansen procedure (1998), Granger Causality, Variance Decomposition and Impulse Response function for 1988-1995 period. They conclude that with an exception of Indonesia, ASEAN-5 markets were closely linked in the short-run but not in the long-run. Furthermore, the study shows that Malaysia is the most influential market while Singapore and Thailand are the markets with the most linkages with other markets. However, Indonesia has no linked at all with any other ASEAN markets. This indicates that there exist long run benefits for investors from diversifying their portfolio investments in these five countries, particularly in Indonesia.

Dunis and Shannon (2005) examine whether emerging markets still offer international investors a valuable diversification benefit. The study covers emerging markets from Southeast Asia (i.e. Indonesia, Malaysia and Philippine) and Central Asia (*i.e.* Korea, Taiwan, China and India) with the US and UK markets (as the reference of established markets). They found that the overall results indicate that international diversification into the emerging equity markets considered is beneficial for US investors during the period under study. In addition they explain the international portfolio diversification can contribute to a reduction in systematic risks since it reduces domestic market exposure that cannot be diversified. On the other hand, Middleton *et al.* (2008) showed that the beneficial opportunities from investing in Central and Eastern European emerging markets are still enormous, even during the financial crisis.

Another study about market integration in ASEAN region is conducted by Wongbangpo (2000). The study reveals that ASEAN stock markets, except for the Philippines, have long-run co-movement during the period 1985-1996. This means that an effective long-term diversification of an investor's portfolio among these stock markets cannot be achieved. By employing correlation and co-integration analysis, Hee (2002) uses monthly data from December 1987 to December 1997 and finds no evidence of long-run

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relationship among ASEAN stock markets (*i.e.* the Philippines, Singapore, Malaysia, Indonesia and Thailand). However, the correlation analysis indicates that the markets are becoming more integrated. Similarly, Worthington *et al.* (2003) investigate the price linkage among ASEAN stock market in the period of January 1988 to February 2000. Six emerging markets (*i.e.* Taiwan, Indonesia, Malaysia, Korea, Thailand and the Philippines) and the three developed markets (Singapore, Hong Kong and Japan) are included to the study. The result shows that the lower casual relationship exists between these emerging and developed stock markets. Again, both studies have established the fact that regional portfolio diversification in ASEAN region is proved fruitful.

Furthermore, Azman-Saini *et al.* (2002) examine the existence of long-run relationship among the ASEAN-5 (*i.e.* Indonesia, Malaysia, Singapore, Thailand and Philippines) equity markets. Using weekly Morgan Stanley Composite Index (MSCI) indices obtained from Kuala Lumpur Stock Exchange (KLSE) for period January 1988 - August 1999, the study finds that there is co-integration among the ASEAN-5 equity market even though not all markets share the common stochastic trends. The results also show that Singapore stock market is not affected by other markets except from Philippines in the long-run, whereas Indonesian stock market does not have long-run relationship with any other markets. This implies that there exist opportunities for beneficial international portfolio diversification within the context of the ASEAN-5 equity markets.

Departed from previous studies, Majid *et al.* (2007) focus on analysing the financial integration among eight stock markets in the Organization of the Islamic Conference (OIC) countries. Of these stock markets, four are from Middle East and North Africa (MENA) region (*i.e.* Turkey, Egypt, Oman, and Kuwait) and four are from Asian region (*i.e.* Malaysia, Indonesia, Bangladesh and Pakistan). The study also explores the integration between these stock markets and the three largest stock markets in the world namely, US, UK and Japan. Using Vector Autoregression (VAR) approach for the period January 2002 to March 2006, the results evidence that while there is no cointegration exists among the MENA stock markets, the four Asian OIC stock markets are found to be cointegrated in the long run.

Nevertheless, these eight OIC stock markets are found to be co-integrated with the US, Japan and the UK stock markets, implying that investors can gain long-run risk reduction through portfolio diversifying in the MENA region but not in the Asian region.

Yusof and Majid (2007) employ the Generalized Autoregressive Conditional Hereoskedasticity (GARCH) along with VAR analysis to estimate the responses of both conventional and Islamic stock markets in Malaysia to the conditional volatility of monetary policy variables. Conforming to the Islamic principles, the study finds that, from January 1992 to December 2000, interest rate is significant for Malaysia's conventional stock market, while insignificant for the Islamic counterpart.

Similarly, Majid *et al.* (2008) study the integration among ASEAN-5 emerging stock markets and their interdependencies from the US and Japan. Employing a two-step estimation, cointegration and Generalized Method of Moments (GMM for period 1 January 1988 - 31 December 2006, they found that ASEAN-5 (*i.e.* Malaysia, Thailand, Indonesia, The Philippines, and Singapore) stock markets are moving towards more integration among themselves or with the US and Japan, especially after financial crisis

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1997. Furthermore, the results show that the Granger causal relations among the market in the region kept changing over the period. The degrees of short and long-run relationship have increased significantly. The study also reveals that each ASEAN market is found to be interrelated with the US and Japan in different ways.

In the more recent researches, Karim, Kassim and Arip (2010) examined the effects of the US Subprime Crisis on the integration of selected Islamic stock markets (*i.e.* Malaysia, Indonesia, US, UK and Japan). Employing Johansen-Juselius (JJ) cointegration approach, the study failed to prove the existence of cointegration among these Islamic stock market for both pre-crisis period (February 15, 2006 July 25, 2007) and during crisis period (July 26, 2007 - December, 2008). In contrast, Siskawati (2011), founds the existence of long term equilibrium relationship among Islamic Stock Market in Malaysia, Indonesia and World during 2005 to 2007.

4. Data Description

The monthly data for this study is retrieved from Bloomberg Database, spanning from January 2007 to May 2012. The logarithmic values of monthly market indices have been used as the proxy of selected market. The definitions of each variable and the time-series transformation are presented in Table 1.

Table 1: Definitions and Transformation of Variables

No	Variable	Description	Duration	Time Series Data Transformation Variable	Source
1	FBMES	The FTSE Bursa Malaysia Emas Shariah Index is a comprehensive range of real-time indices, which cover all eligible companies listed on the Bursa Malaysia	Monthly stock price (Jan 2007-May 2012)	$\Delta LNFBMES = Log\left[\dfrac{FBMES_{(t)}}{FBMES_{(t-1)}}\right]$	Bloomberg
2	JAKISL	Jakarta Islamic Index (Jakisl) is market index for syariah line equities listed in Indonesian stock exchange	Monthly stock price (Jan 2007-May 2012)	$\Delta LNJAKISL = Log\left[\dfrac{JAKISL_{(t)}}{JAKISL_{(t-1)}}\right]$	Bloomberg
3	DJIM	Dow Jones Islamic Market (DJIM) will be a benchmark of global Islamic index	Monthly stock price (Jan 2007-May 2012)	$\Delta LNDJIM = Log\left[\dfrac{DJIM_{(t)}}{DJIM_{(t-1)}}\right]$	Bloomberg

5. Methodology

We adopted a Vector Autoregressive (VAR) model to examine the integration of Islamic stock market index between FBMES, JAKISL and DJIM, in which can be written as follow:

$$FBMES_t : \alpha_0 + \alpha_1 JAKISL_t + \alpha_2 DJIM_t + \mu_t \qquad (1)$$

Our aim is to investigate the market co-integration among FBM Emas Syariah Index (FBMES), Jakarta Islamic Index (JAKISL) and Dow Jones Islamic Market index (DJIM). Deriving from equation 1, the estimation of expanded model of the integration of these Islamic stock market indexes is:

$$\begin{bmatrix} FBMES_t \\ JAKISL_t \\ DJIM_t \end{bmatrix} = \begin{bmatrix} A_1 \\ A_2 \\ A_3 \end{bmatrix} + R(L) \begin{bmatrix} FBMES_{t-1} \\ JAKISL_{t-1} \\ DJIM_{t-1} \end{bmatrix} + \begin{bmatrix} et_1 \\ et_2 \\ et_3 \end{bmatrix} \qquad (2)$$

where R is 3 x 3 matrix polynomial parameter estimators, (L) is lag length operators, A is an intercept, and *et* is a Gaussian error vector with mean zero and Ω is a Varian matrix.

To properly specify the VAR model, we follow the standard procedure of time series analyses. First, we apply the commonly used augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests to determine the variables' stationarity properties or integration order. Briefly stated, a variable is said to be integrated of order d, written 1(d), if it requires differencing d times to achieve stationarity. Thus, the variable is non-stationary if it is integrated of order 1 or higher. Classification of the variables into stationary and non-stationary variables is crucial since standard statistical procedures can handle only stationary series. Moreover, there also exists a possible long-run co-movement, termed cointegration, among non-stationary variables having the same integration order. In this study, the lag is determined based on Akaike Information Criterion (AIC) which is commonly used for the VAR model.

Second, we apply a VAR-based approach of the cointegration test suggested by Johansen (1988) and Johansen and Juselius (1990) to investigate the long run relationships among these variables. The cointegration test is based on the maximum likelihood estimation of the VAR model. If these variables were not cointegrated, the standard Granger causality test would be applied on the first difference of these variables. If these variables were cointegrated, a Granger causality test would be conducted based on a VAR with the introduction of an error correction term following the suggestion of Granger (1986). Granger causality tests are performed to identify the existence and nature of the causality relationship between the variables.

Finally, the Variance Decomposition (VDC) is performed to obtain the degree of exogeneity between variables outside of the sampling period. The VDC shows the percentage of forecast error variance for each variable that is attributed to its own shocks and to fluctuations in the other variables in the system.

6.   Empirical Results

Table 2 provides the summary statistic of the Islamic stock returns (*i.e.* stock prices in first difference). FBMES has been the most active and profitable, showing the highest average daily returns of 9.071. This is followed by DJIM at 7.308 and JAKISL at 6.017. However, compared to other market indexes, JAKISL return (as reflected by the standard deviation) is very high and it also has the highest volatility 0.286 which is commensurate to its return. The smallest risk is experienced by FBMES 0.181. The negative value of skewness indicates that the series distributions are skewed to the left. All stock markets have positive kurtosis value with the highest value is DJIM at 3.840. This indicates that the distribution of stock market is leptokurtic than the normal distribution. The Jarque-Bera test rejects normality for all distribution.

Table 2: Descriptive Statistics

	LNFBMES	LNJAKISL	LNDJIM
Mean	9.071	6.017	7.308
Median	9.104	6.095	7.364
Maximum	9.291	6.3700	7.583
Minimum	8.642	5.266	6.702
Std. Dev.	0.181	0.286	0.217
Skewness	-0.971	-1.088	-1.267
Kurtosis	3.240	3.421	3.840
Jarque-Bera	10.382	13.308	19.323

Table 3 summarizes the results of both Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) tests for all variables. As shown below, the null hypothesis of non-stationarity for the ADF and PP tests is accepted for all variables, indicating that all variables are non-stationary in level but become stationary after first differencing. Thus, they are integrated of order 1, or I(1).

Table 3: Unit Root Test Results

Test	ADF				PP			
Variables	Level		First Difference		Level		First Difference	
	Trend	Trend & Intercept	Trend	Trend & Intercept	Trend	Trend & Intercept	Trend	Trend & Intercept
LNFBMES	-1.611 (3)	-2.317 (3)	-6.173 (0)*	-6.145 (0)*	-1.237 (4)	-1.612 (4)	-6.332 (4)*	-6.294 (4)*
LNJAKISL	-2.222 (3)	-2.777 (3)	-5.673 (0)*	-5.628 (0)*	-1.734 (4)	-2.015 (4)	-5.802 (4)*	-5.763 (4)*
LNDJIM	-1.784 (1)	-1.881 (3)	-5.591 (0)*	-5.539 (0)*	-1.686 (2)	-1.799 (4)	-5.545 (2)*	-5.491 (4)*

Note: *denote significant at 1%

Having established that the variables are stationary and have the same order of

integration, we proceeded to test whether they were co-integrated. To achieve this, the Johansen Multivariate Co-integration test was employed. The results of the Johansen's Trace and Max Eigen-value tests are shown in Table 4, where it is found that there is no co integration among variables. This can be observed from the values of trace statistic and Max Eigen value, which are smaller than their critical values, respectively. Therefore, it can be concluded that there is no long-run or equilibrium relationship between FBMES, JAKISL and DJIM. Based on the result, hence, it can be concluded that the Islamic stock markets of Malaysia does not integrate with Indonesia's, as well as with the world markets in the long run. This will create rooms for investors to diversify their investment portfolios, which puts Malaysia as one of their favoured investment destinations.

Table 4: Johansen Test of Cointegration

Model	Null Hypothesis	Statistical Trace	Critical Value (5%)	Maximum Eigen Statistical Trace	Critical Value (5%)	Variables	Results
Lag Length=2#	r ≤ 0	29.013	29.797	19.462	21.131	LNFBMES	Trace and Max Eigen statistics showed no cointegration vectors
	r ≤ 1	9.551	15.494	8.196	14.264	LNJAKISL	
	r ≤ 2	1.354	3.841	1.354	3.841	LNDJIM	
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* :Denote significance at 5% respectively
: Critical Value obtained from Osterwald-Lenum (1992)
#: lag length based on Akaike Information Criterion (AIC)

Table 5: Granger Causality Test Result

Null Hypothesis:	F-Statistic	P-Value
LNJAKIS does not Granger Cause LNFBMES	0.910	0.343
LNFBMES does not Granger Cause LNJAKIS	4.449	0.039**
LNDJIM does not Granger Cause LNFBMES	5.666	0.020**
LNFBMES does not Granger Cause LNDJIM	11.264	0.001*
LNDJIM does not Granger Cause LNJAKIS	0.760	0.386
LNJAKIS does not Granger Cause LNDJIM	2.724	0.103

Note: * significant at 1% **significant at 5% *** significant at 10%

Table 5 shows the Pairwise Granger Causality Test for the log series of FBMES, JAKISL and DJIM. The results of the Granger causality test show two significant causal relationships. First, there is a bi-directional causality result between global Islamic stock market and Malaysian Islamic stock market (DJIM and FBMES). Second, there is a significant uni-directional causality relationship between FBMES and JAKISL suggesting that the return of Islamic stock market in Indonesia significantly affected by the return of Islamic stock market in Malaysia. This result leads to a conclusion that the return of JAKISL and DJIM is driven by the return of FBMES. The pattern of this causal relationship can be simplified as in figure 1.

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Figure 1: Analysis on Short Term Granger Causal Relationship
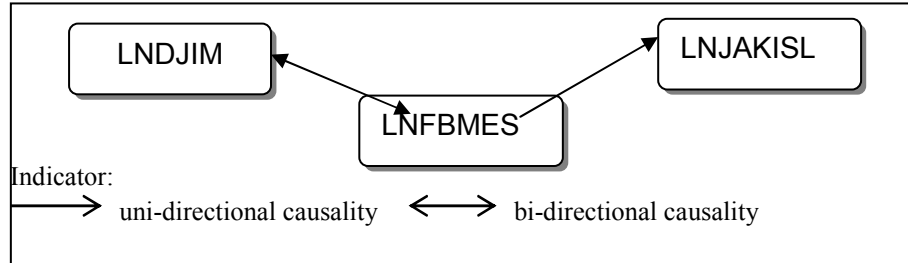
The results of the VDC analysis are presented in Table 6 for a 24-month horizon. It is clear that FBMES is explained by its own shock over 86 percent. Only 10.4 percent and 3.4 percent of the variations are contributed by DJIM and JAKISL respectively. For JAKISL return, over 87 percent of the variations are contributed by FBMES and DJIM. Among both the variations, FBMES is the most significant variable, explaining about 73.7 percent of the JAKISL forecast error variance. Furthermore, over 76 percent of the variations of DJIM return are explained by variations of FBMES while only 0.8 percent is explained by JAKISL. This result is consistently with finding of Granger causality test.

Table 6: Results Of Variance Decompositions Analysis

Variance Decomposition of	Period (Months)	Innovations in		
		LNFBMES	LNJAKISL	LNDJIM
LNFBMES	1	41.077	15.390	43.531
	4	63.271	8.424	28.303
	8	82.786	5.088	12.124
	12	85.868	4.039	10.091
	24	86.096	3.496	10.407
LNJAKISL	1	0.000	45.081	54.918
	4	27.218	38.629	34.151
	8	61.473	22.368	16.158
	12	70.010	16.172	13.817
	24	73.736	12.525	13.737
LNDJIM	1	0.000	0.000	100.000
	4	19.160	0.040	80.799
	8	56.861	0.269	42.868
	12	70.306	0.509	29.183
	24	76.582	0.889	22.527

7. Conclusions

The objective of this paper is to investigate the integration among Islamic stock markets in Malaysia, Indonesia and World. Using VAR estimation technique, this paper found

that there is no co-integration relationship (long term equilibrium) between these Islamic indices implying that the Malaysian Islamic stock markets does not integrated with Indonesian Islamic stock market as well as with the Islamic world stock markets in the long run. This will create rooms for both local and international investors to diversify their Islamic investment portfolios, which will put Malaysia as one of their investment destination. On the other hand, the results of the Granger causality test show a significant bi-directional causality between global Islamic stock market and Malaysian Islamic stock market (DJIM and FBMES) and a significant uni-directional causality relationship between FBMES and JAKISL. Therefore, these scenario suggesting that the return of Islamic stock market in Indonesia is significantly affected by the return of Islamic stock market in Malaysia. This result, hence leads to a conclusion that the return of JAKISL and DJIM is driven by the return of FBMES in the short run.

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