Islamic Capital Market Interconnection: An Evidence From Jakarta Islamic Index To The Regional Islamic Market And Global Islamic Market

EKA SISKAWATI
Jurusan Akuntansi, Politeknik Negeri Padang

Abstract

The paper empirically investigates market cointegration among Jakarta Islamic capital market (Jakisl), Kuala Lumpur Syariah Index (KLSI) and Dow Jones Islamic Market index (DJIM). This paper is using Johansen methodology to test cointegration among the markets, period of study from 2005 until 2007. The result shows that there is cointegration (long term equilibrium) between Jakisl, KLSI and DJIM. Granger causality test shows that there is a bidirectional result between Jakisl and KLSI (we call it regional Islamic market), and a unidirectional result between DJIM and Jakisl, DJIM and KLSI (we call it global market), it implies that DJIM affects both Jakisl. This paper also found that both Jakisl and KLSI have significant coefficient of ec t(error correction term), which implies that there is an adjustment for every disequilibrium in the short run.

Key Words: stock market cointegration, Islamic Capital Market, Jakisl, KLSI, DJIM

1. Introduction

A common belief is that a portfolio should be well diversified to maximize potential risk adjusted performance. At given of two individual stock markets that significantly independent, it will provide a diversification benefit to the international investors. Otherwise, integrated stock markets will increase the efficiency of individual stock market and it reduces the individual event risk at a cost of taking away the diversification benefit of international investment. The previous studies found that there is market cointegration of some developing and developed countries, namely Indonesia, Malaysia and US (Majid et al, 2008. Dunnish et al, 2005). Majid et al (2008) found that Indonesian market and US market are cointegrated at pre and post crisis period, while Dunnis et al (2005) assert that emerging market like Indonesia is considered to offer beneficial international diversification for a US investor during 1999 to 2003.

Unlike the studies of market cointegration in conventional stock markets, there is little empirical research
that study the long run equilibrium among developing and developed market using stock data from Islamic stock market. The objective of this paper is to investigate interconnection of Jakarta Islamic Index (Jakisl), Kuala Lumpur Syariah Index (KLSI) and Dow Jones Islamic Market index (DJIM). We follow Aktar (2009) paper in this study.

The Islamic financial industry has grown from beginning 1970s, until now it has already spread in more than 75 countries. The need for Islamic finance grows from increasing amounts of wealth in the muslim, especially in the oil-rich countries. The biggest momentum was on 1997 when Asian market crashed, the demand to change western system markets into Islamic system markets was increasing. Until now, scholars either in muslim countries or non muslim countries are interested to study and develop efficient Islamic financial systems. In response, many large western financial institutions have established Islamic subsidiaries and offered Islamic financial instruments (Hakim and Rashidian, -).

Jakarta Islamic index (JAKISL) is market index for syariah line equities listed in Indonesia stock exchange, Kuala Lumpur Syariah Index (KLSI) represents the Islamic market index in regional market, whereas Dow Jones Islamic Market (DJIM) will be a benchmark of global Islamic index. JAKISL was launched on 1 January 1995, this is a weighted average index which represents 30 stocks that comply to the syariah principles. The index is treated as a benchmark to measure the performance of syariah based investment in Indonesia. The index consists of 30 companies selected by Dewan Syariah Nasional, stocks listed in this market will be screened based on several criteria such as: (1) the main activity must comply to the syariah principle, (2) having good perception and good image in public (3) high market capitalization and high liquidity.

KLSI is an average price of Islamic compliant stocks of Bursa Malaysia Stock Exchange. KLSI was launched on 17 April 1999. KLSI was initially comprised of 279 companies and it has grown to 826 company on April 2005, comprising 84% of the listed companies in Bursa Malaysia. DJIM is an average price of global Islamic compliant stocks of Dow Jones Index, consist of syariah compliant stocks from 34 countries. DJIM which was launched its global index in 1999, is the first benchmark of investment performance for the global of Shari'ah-compliant equities.
We perform Johansen method to test the existence of interconnection of selected Islamic capital markets. The result shows that there is a cointegration or interconnection market among Jakisl, KLSI and DJIM. Granger causality test shows that there is a bidirectional result between Jakisl and KLSI (we call it regional Islamic market), and a unidirectional result between DJIM and Jakisl, DJIM and KLSI (we call it global market), it implies that DJIM affects both Jakisl and KLSI but not vice versa. We also found that both Jakisl and KLSI have significant coefficient of ect (error correction coefficient), which implies that there is an adjustment for every disequilibrium in the short run.

2. Literature Reviews

Grubel (1968) studied the possible gains to American investors from international diversification of their portfolios, from 1959 until 1966. He compared two group of portfolio combination, group A consists of 11 countries and group B only consists of 8 countries. He found that more countries portfolio diversified, investors attain higher rates of return and lower variance of portfolios. In addition, he explained that the lower correlation of foreign stocks with US stocks, the higher rates of return US investors could achieve.

Majid et al (2008) studied the integration among ASEAN-5 emerging stock markets and their interdependencies from the US and Japan. They use a two-step estimation, cointegration and Generalized Method of Moments (GMM). The data obtained is closing daily stock indices, period of study from 1 January 1988 to 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 1997. Furthermore, they also found the Granger causal relations among the market in the region kept changing over the period.

Dunis and Shannon (2005) examine whether emerging markets still offer international investors a valuable diversification benefit. The study covers emerging markets from Southeast Asia and Central Asia with the U.S and U.K markets. From their correlation analysis, they found that U.S market and Southeast Asia are decreasing correlation during 31st august, 1999 to 29th august 2003. They also found that
the overall results indicate that international diversification into the emerging equity markets considered was beneficial for a US investor during the period under study. In addition, they explained international portfolio diversification can contribute to reduction in systematic risks since it reduces domestic market exposure that cannot be diversified.

3. Data and Methodology

Data for this paper is obtained from Bloomberg, period of study is from 2000-2007. The sample is weekly stock price of each Islamic capital markets. The methodology for this paper consists of: (1) unit root test (2) Johansen test for cointegration (3) Short run and long run fluctuation (4) Granger causality test.

Table 1: Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>JAKISL</th>
<th>KLSI</th>
<th>DJIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.00246</td>
<td>0.000162</td>
<td>0.00478</td>
</tr>
<tr>
<td>Median</td>
<td>0.00017</td>
<td>-</td>
<td>0.00232</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.13324</td>
<td>0.084484</td>
<td>0.095598</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.11501</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Std.</td>
<td>0.03874</td>
<td>0.021167</td>
<td>0.024569</td>
</tr>
</tbody>
</table>

Table 1 shows an examination of the daily return for each market. It indicates that mean returns are varied from -0.0478% for DJIM to 0.2462% for JAKISL. Compared to other market indexes, JAKISL return is very high and it also has the highest volatility 3.8747% which is commensurate to its return. The smallest risk is experienced by KLSI 2.1167%. The positive and negative value of skewness indicate that the series' distributions are skewed to the right and to the left respectively. The Jarque-Bera test rejects normality for all distributions.

Before we test the interconnection which applying Johansen and Jusellius (1990) method, we must check whether the series are stationary or not. To test the stationary series, we perform Augmented Dickey-Fuller Test (ADF) Test.

1. Augmented Dickey-Fuller Test (ADF) Test

The formula is:
Islamic Capital Market Interconnection: An Evidence From Jakarta Islamic Index To The Regional Islamic Market And Global Islamic Market

\[ \Delta y_t = \alpha + \beta y_{t-1} + \sum_{k=1}^{p} \gamma \Delta y_{t-k} + \epsilon_t \]  

Where \( \Delta y \) is the first difference of \( y \) series, \( \alpha \) is a constant term, \( u \) is the residual term and \( k \) is the lagged values of \( \Delta y_t \) which are included to allow for serial correlation in the residuals. In the context of ADF test, null hypothesis states that \( \beta = 0 \). If the absolute value of the computed t-statistics for \( \beta \) exceeds the absolute of critical value, then the null hypothesis that the log level of series is not stationary must be rejected. If on the other hand, it is less than the critical value, it is concluded that the log level of \( y \) is nonstationary. In this case, the same regression must be repeated for the first difference of the logarithmic value of the series.

Table 2 gives the ADF test results. First, we fail to reject the null hypothesis at level which contain the unit root in each variable. However, once we take the first difference, we reject the null hypothesis at 1% and conclude that all the series are stationary and integrated in the same order, namely \( I(1) \).

Since we have confirmed that the data is stationary at the same order, now we can investigate: (1) interconnection among the variables by perform cointegration methodology, (2) short run and long run fluctuations in stock markets via vector error correction model (VECM), and (3) causality among the stock markets applying to the Granger methodology. First we will discuss about cointegration and VECM approach.

<table>
<thead>
<tr>
<th>Table 2: ADF test results.</th>
<th>LnJAKISL</th>
<th>LnKLSI</th>
<th>LnDJIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.119</td>
<td>-1.424</td>
<td>-1.751</td>
</tr>
<tr>
<td>Trend&amp;Incept</td>
<td>-3.088</td>
<td>-1.671</td>
<td>-1.050</td>
</tr>
<tr>
<td>None</td>
<td>0.793</td>
<td>-0.091</td>
<td>-0.606</td>
</tr>
<tr>
<td>1\textsuperscript{st} differen t</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>17.200**</td>
<td>-15.780**</td>
<td>-17.576**</td>
</tr>
<tr>
<td>Trend&amp;Incept</td>
<td>17.531**</td>
<td>-15.828**</td>
<td>-17.794**</td>
</tr>
<tr>
<td>None</td>
<td>17.195**</td>
<td>-15.803**</td>
<td>-17.583**</td>
</tr>
</tbody>
</table>

**significant at 1%
Islamic Capital Market Interconnection: An Evidence From Jakarta Islamic Index To The Regional Islamic Market And Global Islamic Market

Where \( A_i \) is an \( n \times n \) matrix of coefficients, \( \mu \) is a constant, \( D_t \) is seasonal dummies orthogonal to constant term \( \mu \), and \( \epsilon_t \) is assumed to be an independent and identically distributed Gaussian process.

By subtracting \( Z_{t-1} \) from both sides, equation (2) can be converted into Vector Error Correction Model (VECM).

Where,

\[
\Delta Z_t = \Gamma_1 \Delta Z_{t-1} + \cdots + \Gamma_{k-1} \Delta Z_{t-k} + \Pi \Delta Z_{t-k} + \Phi D_t + \mu + \epsilon_t
\]

VECM provides information about short run and long run adjustment of changes in \( Z_t \).

Table 3. Johansen Test of cointegration

<table>
<thead>
<tr>
<th>Hypothesized No. of CE</th>
<th>Eigen Value</th>
<th>Trace stat (( \lambda ))</th>
<th>0.05 Critical value</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>None ((r = 0)^*)</td>
<td>0.097</td>
<td>51.58127</td>
<td>42.91525</td>
<td>0.005</td>
</tr>
<tr>
<td>At most 1 ((r \leq 1))</td>
<td>0.039</td>
<td>19.859</td>
<td>25.871</td>
<td>0.233</td>
</tr>
<tr>
<td>At most 2 ((r \leq 2))</td>
<td>0.024</td>
<td>7.5852</td>
<td>12.517</td>
<td>0.287</td>
</tr>
</tbody>
</table>

*denotes rejection of the hypothesis of no cointegration at the 5% level.

Table 3 shows that there is a cointegration among the markets index. The null hypothesis of no cointegration \((r = 0)\), is rejected at 5% level because the trace statistics \((\lambda = 51.58127)\) exceeds the critical value \((\lambda = 42.91525)\). Thus, it conclude that there is one long run relationship among the Islamic capital market namely Jakisl, KLSI, and DJIM.

3. Vector Error Correction Model (VECM)

If it has been proved that there is a cointegration among the market index of Jakisl, KLSI and DJIM. Next, it can be checked the price differential among the market index based on VECM. The model is:

\[
\Delta X_t = \Gamma_1 \Delta X_{t-1} + \cdots + \Gamma_{k-1} \Delta X_{t-k} + \Pi \Delta X_{t-k} + \mu + \epsilon_t
\]

Equation (4) measures how quick the market index adjust to their long run equilibrium.
Islamic Capital Market Interconnection: An Evidence From Jakarta Islamic Index To The Regional Islamic Market And Global Islamic Market

Cointegrating Eq: cointEq1

<table>
<thead>
<tr>
<th>Cointegrating Eq</th>
<th>cointEq1</th>
<th>cointEq2</th>
<th>D(LN_JAKL)</th>
<th>D(LN_KLSI)</th>
<th>D(LN_DJIM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN_JAKIS L (-1)</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LN_KLSI (-1)</td>
<td>-4.184934 (0.78092)</td>
<td>-5.35897</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LN_DJIM (-1)</td>
<td>0.571587 (0.52068)</td>
<td>1.09778</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>11.17138</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Error correction

| D(LN_JAKSL (-1))          | 0.016001 (0.00712) | 0.012016 (0.00383) | 0.005945 (0.00471) | 0.002353 (0.00213) | -0.000728 (0.00140) |
| D(LN_JAKSL (-2))          | 0.034630 (0.05825) | 0.045278 (0.03129) | 0.017802 (0.03849) | 0.002353 (0.00213) | -0.000728 (0.00140) |
| D(LN_KLSI (-1))           | 0.027070 (0.11039) | 0.069073 (0.05931) | -0.001237 (0.07295) | -0.000728 (0.00140) | -0.000728 (0.00140) |
| D(LN_KLSI (-2))           | 0.020556 (0.10653) | 0.057595 (0.05723) | 0.0152430 (0.07040) | -0.000728 (0.00140) | -0.000728 (0.00140) |
| D(LN_DJIM M(-1))          | 0.362763 (0.08908) | 0.118637 (0.04786) | 0.004392 (0.05887) | 0.079645 (0.05996) | 0.0152430 (0.07040) |
| D(LN_DJIM M(-2))          | 0.164561 (0.09073) | 0.021571 (0.04874) | 0.045278 (0.03129) | 0.0152430 (0.07040) | 0.045278 (0.03129) |

Table 4 shows the VECM results. The optimum lag length which is 2, follows the AIC. In the Jakisl index, 1 period lagged changes in DJIM is significant. In the KLSI index, 1 period lagged changes in DJIM is also significant. It indicates that DJIM affects both Jakisl and KLSI.

The coefficient of the error term (ect) measures the speed of correction to the long run equilibrium. Both Jakisl and KLSI coefficient of ect are positive and significant. It is meaning that disequilibrium in the short run will be...
corrected by Jakisl as 1.6%, while KLSI’s short run disequilibrium will be corrected as 1.2%.

4. Granger Causality Test

Causality test is defined as if the past values of the variable X predicts the variable Y better, then it concludes that X causes Y (Granger et al, 1986). The formula is:

\[ X_t = a_0 + \sum_{i=1}^{\tau} a_i X_{t-i} + \sum_{j=1}^{\tau} b_j Y_{t-j} + u_{Xt} \]  

(5)

\[ Y_t = b_0 + \sum_{i=1}^{\tau} a_i X_{t-i} + \sum_{j=1}^{\tau} b_j Y_{t-j} + u_{Yt} \]  

(6)

Table 5 shows the Pairwise Granger Causality Tests for the log series of Jakisl, KLSI and DJIM. There is a bidirectional result between Jakisl and KLSI (we call it regional Islamic market), since there is Granger causality among them. Whereas there is a unidirectional result between DJIM and Jakisl, DJIM and KLSI (we call it global Islamic market), it implies that DJIM affects both Jakisl and KLSI but not vice versa.

4. Conclusion and Implication

The objective of this paper is to investigate interconnection of Jakarta Islamic Index (Jakisl), Kuala Lumpur Syariah Index (KLSI) and Dow Jones Islamic Market index (DJIM). Using Johansen estimation technique, this paper find that there is cointegration between the considered Islamic indices. The series in each Islamic market (Jakisl, KLSI and DJIM) will tend to trend together in the long term. It implies that
investors who diversified their portfolio investment in syariah compliant stocks, either it is in Jakisl and KLSI (regional market) or in Jakisl, KLSI and DJIM (global market), they could gain limited benefits during the period of study.

Since the cointegration exists, theoretically there must be Granger causality at least one (or bidirectional) result, which implies that there is a short run relationship and causality among the market index. Grange causality test shows that there is a bidirectional result between Jakisl and KLSI (we call it regional Islamic market), since there is Granger causality among them. Whereas there is a unidirectional result between DJIM and Jakisl, DJIM and KLSI (we call it global Islamic market), it implies that DJIM affects both Jakisl and KLSI but not vice versa.

Conclusively, these empirical results provide evidence that there is long run equilibrium between Jakarta Islamic capital market to Kuala Lumpur Syariah market and Dow Jones Islamic market, which implies there is no benefit for investor who seek the syariah line investment to diversified its international portfolio in these market. However, the existence of cointegration among these markets still provide the chances of arbitrage profits in portfolio diversification in the short term.

More researches in this field need to be done. Future research should include the other global Islamic indices as a benchmark of Islamic investments. Other tools to test the long run equilibrium existence should be implemented to get more information about international Islamic portfolio diversification benefit.

References


