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Malaysia Stock Market Integration: The Effect of Leader and Emerging Market

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Abstract – *A significant change in Gross Domestic Product (GDP) usually has a significant effect on the stock market. Recently, China, South Korea and Malaysia are listed as the best of emerging markets countries with the average growth of GDP's of 5% and above (Bloomberg, 2014). For the year 2015 and 2016, India's GDP is expected to grow roughly 8% to 9%, which is one of the highest growth rates worldwide (Goldman Sachs, 2015). Despite the increasing growth in the emerging countries, however, for the past few years, United States (U.S), Europe and Japan had indeed been recognized as a leader in the global stock market. With the existence of these leaders, it is in fact indirectly gives the idea that the world's stock markets to some extent are influenced by them. Thus, due to this scenario, this paper aims to shed lights on the real integration and relationship between market leaders with Malaysian stock market. Based on the empirical analysis from 1994 to 2014, results shows that the US stock market (DJIA) and the Indian stock market (BSE) are financially integrated with Malaysian stock market. However, Japan stock market (NIK) and China stock market (SHCI) are not financially integrated with Malaysian stock market (KLCI).*

Keywords: Index terms, Co-integration, Causality, Stock market indices, Financial integration

1.0 INTRODUCTION

At present, the global equity market outlook for second quarter, shed light the new global economy nears several inflections points. Besides, there have a new equity market leaders will be emerged. In viewing of macroeconomics matter, such as low oil prices, the strong US dollar, diverging of monetary policies and restructuring companies be able to influence on company's earnings and stock price in a unique way. Until today, the emerging of the new market leaders creates a new environment in world of stock market investment. Today's trading, Europe economics, India and Japan, demonstrate a good sign in a bullish market. Furthermore, Japan's economy shows an improvement and stock of companies are embracing reform efforts could significantly outperform those that resist change Though Europe economic still fragile, but the corporate earnings and European equities are expected an upward swing [1]. For the past few years, Europe and Japan has been known as a leader in the global stock market where these leaders effect indirectly to the world's stock market to some extent are influence by them.

Recently, China, South Korea and Malaysia are listed as the best of emerging market countries with the average growth of GDP's of 5% and above [2]. Moreover, the trade interdependence

between Malaysia and India has been progressively depending. At present, India is Malaysia's largest trading partner in South Asia while Malaysia is India's second largest trading partner in the ASEAN. Thus, it is importance in investigate the level of integration between India's stock market and the Malaysian stock market [3]. Besides, U.S and Japan stock market are known as the dependent stock market to the countries in the Asia- Pacific region. Thus, this shows that U.S and Japan are the world leaders in the stock market according to a several analysis.

However, on the other study shows that for the emerging market China and India, they have the advantage on the stock market integration with their neighboring countries as their economic position is strategic enough to influence other nearby countries [3]. This can be shown in the previous research where Malaysia is more integrated with China and India rather than U.S and Japan [4]. Stock market integration can be seen when each stock market of different countries moves together and shows equal expected risk adjusted returns. Besides that, investors who are able to pass through from one market to another without viable to pay any extra cost and could spot the existence of arbitrage activities depicts that the two market is perfectly integrated. The possibilities of arbitration in both markets are guaranteed by the equivalence of stock prices [5].

The stock market integration of China and India are said to be strong with the neighboring countries because the region proximity had confirmed contribute to the economy interdependences [6]. This finding is consistent with [7], [8] and [9], where they showed that the region proximity gives effect to the cross market linkages. Besides that, in general condition, when U.S stock market starts to shaky or experiencing sudden shock, others market will definitely gets serious affected. However, after 27 February 2007, U.S, Australia, Japan and some of the ASEAN countries had experienced financial turmoil in one day due to the crashed of Shanghai stock exchange [3]. Thus, this shows that, even though most of the countries depend on U.S and Japan stock market condition and known as the market leader, it does not means that the emerging market has any potential to shake the world. There are possibilities that those emerging market could bring impacts to other countries as well. Besides, during the financial crisis in Asia, China had sheltered their country from being impacted. Therefore, it shows that China is the economic superpower in the Asian countries.

On the other hand, the condition for India in term of the stock market integration is still inconsistent due to lack of literature. However as at present time, the trade interdependences between Malaysia and India are deepening step by step [10]. Therefore, it shows that India stock market only has a positive relationship with their neighbour countries instead of known as the superpower emerging market such as China. It is strongly showed that, the emerging market is now gradually taking place the economic standing of market leader position in Malaysia [3].Hence, it is important to identify the stock market integration of these four countries into Malaysian stock market where it can provide an impact to investor's portfolio diversification and international asset management inside or outside Malaysia.

The reminder of the paper is structured as follows. The next section reviews the literature on stock market integration. Section 3 covers the methodology employed, while Section 4 shows the empirical evidence. Section 5 concludes the paper.

2.0 REVIEWS ON LITERATURE

There are plenty studies in empirical finance that have endeavored to test the integration of stock markets. On the earlier studies, Asian market integration seems to indicate the non-existence of co-integration. For example, [11] did not found any stable relationships between the developed markets and the Asian-Pacific. Their results was supported by [12] which examine the relationship among the stock markets of the US, Japan, Hong Kong, South Korea, Singapore and Taiwan, using daily and weekly data. Besides that, [13] examine the long-run diversification potential of 13 emerging capital markets and the US market also report no evidence of co-integration with the US and these emerging markets.

However, the recent results on these studies are varied, inconsistent and controvert each other. The study by [14-20] found an evidence of strengthened market integration among the Asian markets and among US and Asian markets. The studies also indicate that the US market is becoming more influential in leading the Asian markets. Nevertheless, [21] and [22] failed to show any co-integration between the markets.

The recent study of [3] examine the financial integration of two world leaders and two emerging powers into the Malaysian stock market by using DCC-MGARCH approach. Their results that the financial integration between Malaysia and China started to evolve in April 2004 and strong financial integration between the stock markets in India and Malaysia was observed. Besides that, the study proposes that investors in Malaysia could gain by diversifying their portfolios in China and Japan relative to India and the U.S in the long run only.

On the other hand, co-integration between Islamic stock market also was investigated [23] to find co-integration between Islamic stock market in Malaysia, Indonesia and the world by applying the Vector Auto Regression (VAR) method. The monthly data from January 2007 to May 2012 show 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). Therefore, the study concludes that the Islamic stock market of Malaysia does not integrate with Indonesia's, as well as with the world markets in the long run. This situation gives an opportunity for investors to diversify their investment portfolios, which puts Malaysia as one of their favored investment destinations.

The study on Islamic stock markets also has been done and the study shows a volatility of Islamic stock returns is influenced by the regional market conditions [24]. For example, emerging Islamic stock market as Malaysia is highly correlated with Chinese Islamic stock return but poorly correlated with the US Islamic stock return.

Similarly, [25] also found that co-integration is strongest in the Malaysian and European market groups but weak in the group involving Malaysia and its neighboring emerging markets. Their results on causality and variance decomposition demonstrate that Malaysia is largely unrelated with other markets.

3.0 METHODOLOGY

Data concerning on the world market leaders and emerging powers as the independent variables such as U.S stock market (DJIA), Japan stock market (NIK), China stock market (SHCI), India stock market (BSE) respectively were gathered to see whether there are any relationship

between the dependent and the independent variables as it is being the main objective of this study. In order to achieve good and relevant data, this study tested on hypothesis of the integration between these four markets and Malaysia stock market. In term of basis of the analysis, secondary data and hypothesis testing was conducted in order to determine the stock market integration between the world market leaders and emerging powers towards Malaysia stock market.

3.1 Dependent Variable

Empirical analyses were carried out to test the relationship between dependent and independent variable. Dependent variable refers to Malaysia stock market which is Kuala Lumpur Stock Index (KLCI). The indicator of KLCI has been used by [3]on the Malaysia case where changes in the direction and degree of the financial integration of Malaysia stock market with Japan stock market gives implications to the international asset diversification.

3.2 Independent Variable

The study on the stock market integration between Malaysia, Indonesia, U.K and Japan stock market with U,S stock market, they used time series techniques of co integration , impulse response functions (IFRs) and variance decompositions (VDCs) to regress [26]. They states that Malaysia had affected the most during the U.S global crisis as Malaysia has strong bilateral trade ties with U.S compared to other ASEAN countries such as Indonesia. They also found that the emerging market such as Malaysia is more financial integrated with the major stock market which is U.S stock market during the financial crisis in U.S. [3] states that U.S stock market more influential towards Malaysian stock market compared to Japan stock market even though U.S is suffering with the financial and economic crises.

During the financial crisis, the integration between Malaysia stock market and its trading partners which is one of the countries is Japan, had significantly increased [27]. Therefore, this shows that Japan stock market and Malaysia stock is financially integrated with each other. This is also can be prove by the previous study, where Malaysia stock market become more integrated with Japanese stock market rather than U.S stock market during the hit of financial crisis 1997 [28].

In this case of China, the stock market had shows its powers toward the world [3]. More surprisingly is when China stock market not affected from the Asian financial crisis like other markets does. Moreover, the previous researcher claims that China had become the natural stabiliser during the Asian financial crisis on 1997 [6]. During the hits of Asian financial crisis, sub-prime crisis, and bankruptcy of Lehman Brothers, the relationship between Malaysia stock market and China stock market moves upward as it shows that both market had experienced sudden shocked. Since 2004, the level of the correlation that represent financial integration of Malaysia stock market and China's that has gradually increasing. However, they also state that Malaysia and China experience the lowest conditional correlation compared to others market such as U.S, Japan and India [3].

Past study prove that the Malaysia and India stock market integrated starting November 2003 [4]. However, they found that on January 1991 until March 2004, India's conditional correlation with Malaysia stock market is significant [3]. Likewise, on the second sub period which is from April 2004 until June 2010, they found that there are highly significant relationship between Malaysia stock market and India stock market. Therefore, this shows that

between the period of their findings, it shows that India stock market continuously give significant result towards Malaysia stock market. Previous study has been stated that both Malaysia and India stock market were fully integrated after their liberalization dates as they were also be segmented in the world capital market [29]. On the other hand, others had found that India stock market were integrated with the rest of Asian market and developed market since the incident of Asian crisis [30].

3.3 Data and Methods

In conducting this research, time series data were used in this study. The sample data were taken in monthly basis from January 1994 to December 2014. The observation numbers is 252 for this study. As to complete the regression, these research rates Dow Jones Industrial Average (DJIA) for U.S stock market, NIKKEI 225 Stock Average Price Index (NIK) for Japan stock market, Shanghai Stock Exchange Composite Index (SHCI) for China stock market, and Bombay Stock Exchange National Index (S&P BSE SENSEX) for India stock market as the independent variables data as well as Kuala Lumpur Composite Index (FBMKLCI) for Malaysia stock market as dependent variable data.

The cointegration study depends on the non-stationarity of the stock markets prices of the sample. The first exercise is to test for a unit root in each index series, the second is to test for the cointegration between variables of the system of stock markets indices and finally causality test were used to test whether the contagion effects within the market.

To test for a unit root, the method employed was that of [31] where the basic objective is to examine the null hypothesis that Ø=1 in the following equation:

$$Y_t = ØY_{t-1} + \varepsilon_t \quad (1)$$

against the one-side alternative Ø<1. Thus the hypotheses of interest are H0: series contains a unit root versus H1:series is stationary. In practice however, the following regression is employed rather than (1):

$$\Delta Y_t = \pi Y_{t-1} + \varepsilon_t \quad (2)$$

So that a test of Ø =1 is equivalent to a test of $\pi = 0$ (Ø – 1 = π).

To test for the cointegration between stock market indices variables, the method based on Vectors Autocorrelations (VAR) is used [32]. Consider a set of g variables (g ≥2) that are I(1) and which are assumed to be cointegrated. A VAR with *k* lags containing these variables could be set-up:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + ... + \beta_k Y_{t-k} + \varepsilon_t \quad (3)$$

In order to use the Johansen test, the VAR (3) above needs to be turned into a vector error correction model (VECM) of the form:

$$\Delta Y_t = \Pi Y_{t-1} + \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + ... + \Gamma_{k-1} \Delta Y_{t-(k-1)} + \varepsilon_t \quad (4)$$

The test for cointegration between the Ys is calculated by looking at the rank of the Π matrix via its eigenvalues.The eigenvalues, denoted λi are put in ascending order $\lambda 1 \geqq \lambda 2 \geqq \ldots \lambda g$. If λs are unit roots, in this context theymust be less than 1 in absolute value and positive and λ1 will be the largest i.e the closest to one while λg will be thesmallest. If the variables are not

cointegrated, the rank of Π will not be significantly different from zero, so λi ≈ 1 forany i. There are two tests statistics for the cointegration under the Johansen approach which is trace test and max-eigenvalue test.

4.0 EMPIRICAL EVIDENCE

The Augmented Dickey-Fuller (ADF) test shows that all indices in the model were non-stationary at their level; this means that they all contained a unit root since the absolute values of their test statistics is less than their critical values at levels at 1% level of significance. However, stationarity was reached after the first difference as shown in Table I. As discussed in the methodology section, this means that all the indices are integrated of order one I(1), a requirement for Johansen's co-integration analysis [33] and [34].

Table 1: Unit Root Tests

Market	Level I(0)	First Difference I(1)
FBMKLCI	-1.4154	-13.62440*
NIK	-1.7925	-14.0398*
SCHI	-1.7230	-11.0536*
S&P BSE SENSEX	-0.0269	-15.2898*
DJIA	-1.6945	-15.1369*

*Rejection of the null with 99% confidence

The unit root tests suggest that all stock indexes are I(1) and therefore co-integration tests may be used to assess whether these indexes share common effects. This study use Akaike information criteria to determine the appropriate lag length.

The Johansen's multiple results for market indices are shown in Table 2. Both the Trace tests and Maximum Eigenvalue statistics indicate five (5) co-integrating equations at the 5% level and 1% level, indicating that there are five co-integrating relationship existing in all market indices. This, according to Johansen procedure means that, there are five linear combinations that exist among the variables over the entire period of study.

Table 2: Multiple co-integration results

Null hypothesis	Traces Statistics	95% Critical Value	Maximum Eigenvalue	95% Critical Value
h=0	254.1173**	69.8189	77.3194**	33.8769
h=1	176.7979**	47.8561	59.9125**	27.5843
h=2	119.8854**	29.7971	50.8718**	21.1316
h=3	69.0136**	15.4947	37.8605**	14.2646
h=4	31.1532**	3.8415	31.1532**	3.84145

**Rejection of the null with 95% confidence
**MacKinnon-Haug-Michelis (1999) p-values
Both Trace and Maximum Eigenvalue Tests indicate 5 co-integrating eqn(s) at the 0.05 level

The results from Table 2 indicated that the emerging stock markets and world leader stock market were co-integrating with Malaysian stock market. Therefore, it can be seen that they are moving together which shows the fact that asset allocation across the markets may not provide great opportunities to gain more on the diversification of fund. This also suggests that

there are long runequilibrium relationships between the stock market indices of these countries. Trace and Max-eigenvalue test statistics indicate five cointegrating vectors at 5% level.

The result of VEC Granger causality test for market indices is shown in Table 3. Seven market pairs out of the twenty market pairs tested rejected the null hypothesis of no causality. Two market links of the seven displayed bi-directional (two-way) Granger causality. The remaining five pairs exhibited uni-directional (one-way) causality.

Table 3: Vec Granger causality tests

Null hypothesis	χ^2 statistic	Probability
FBMKLCI → S&P BSE SENSEX	5.5392	0.0627***
S&P BSE SENSEX → FBMKLCI	6.3375	0.0421**
SCHI → S&P BSE SENSEX	7.1371	0.0282**
S&P BSE SENSEX → SCHI	23.4868	0.0000*
S&P BSE SENSEX → NIK	7.6916	0.0214**
SCHI → FBMKLCI	7.7951	0.0203**
SCHI → DJIA	7.3425	0.0025**

*Rejection of the null with 99% confidence
**Rejection of the null with 95% confidence
***Rejection of the null with 90% confidence

S&P BSE SENSEX market was stronger as it Granger-caused FBMKLCI prices at 5% level while the latter Granger-caused the former at 10% level. S&P BSE SENSEX was also stronger in the market as it Granger caused SCHI prices at 1% level of significance while SCHI prices Granger-caused S&P BSE SENSEX prices at 5% level. In the other market pairs, the markets shown in the link demonstrated equal strength as they Granger themselves at 5% level. This means that they influence one another in terms of market price trend and probably from the relation of influencing to the other stock market.

Worthy of note is the case of S&P BSE SENSEX that displayed bi-directional causality with FBMKLCI and also exhibited uni-directional causality with NIK. Based on these results, S&P BSE SENSEX(India's Stock Market) could be said to be occupying leadership positions in the emerging stock market. Surprisingly only S&P BSE SENSEX (emerging market) granger cause to Japan stock market (NIK) in 5% significant level which shows that the world leader market (DJIA) does not granger cause NIK.

5.0 DISCUSSION AND CONCLUDING REMARKS

The co-integration test shows that these four markets were integrated with Malaysia stock market. Therefore, it can be said that they had long term relationship with Malaysia stock market. This result would lead to the conclusion that Malaysia investors could less benefit from diversification by investing in these countries as it will affect the market. For the Granger Causality Test, it can be shown that Indian market (S&P BSE SENSEX) was playing a dominant role to influence the other markets, especially the Malaysia (FBMKLCI) and China (SCHI) market. This result parallel to the expectation on the India future economy would be in favorable condition for the year 2015 and 2016 [1]. Besides, it also can be seen that US market was unable to cause an impact to Malaysia, Japan, China and India. If the results of this study regarding the influence of US markets towards these four markets are contrasted with previous

researchers, it can be concluded that the stock market integration and causation have changed over time.

In conclusion, as the financial integration is important for diversification of portfolio, it can be concluded that China and India stock market were financially integrated with Malaysia stock market.

It is recommended for other researchers to concentrate more on developing or emerging economies rather than developed economies such as US, UK and Australia as it will give more information on the condition of the world market integration for future research. Besides that, it is also recommended for other researcher to study on the implications of the stock market integration in short-run rather than seek for the interdependency and degree of long-run co-integration of the stock market. Therefore, it is important to know the implication of the financial integration as it will give a better picture for the investors or the policy maker to make an investment decision. Lastly, in order to see a better result, more variables should be added in the independent variables. Besides, by adding more variables such as stock market of developing countries, the researcher could see various investment opportunities for investor in Malaysia or vice versa to diversify their funds.

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