Stock market integration: Malaysia and its major trading partners

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Abstract

This study examines the stock market integration among Malaysia and its major trading partners by employing Johansen (1988) and Johansen and Juselius (1990) cointegration tests and VECM approach in investigating the dynamic linkages between markets. By using a weekly data, the results indicate that Malaysia stock market is significantly influenced by the stock market development from the major trading partners. The empirical findings are consistent with the view that stronger the bilateral trade ties between two countries, the higher the degree of comovements (Masih and Masih, 1999; Bracker et al., 1999). Since the markets move towards a greater integration, there are no opportunities for international portfolio diversification. In addition, any development in the stock market from major trading partners can not be ignored and should be taken into consideration by the Malaysian government in designing an appropriate policy in the domestic stock market.

Keywords: Cointegration; VECM; major trading partners; stock market integration

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1. INTRODUCTION

The purpose of the present paper is to shed some light about the international stock market linkages between Malaysia and its major trading partners such as the United States, Japan, Singapore and China. The main reason to choose these countries is that the share of exports and imports from Malaysia to these four countries were relatively high. For example, in 2007, the total volume of Malaysian exports and imports to four major countries are about 51.15% (RM273, 032.46 million) and 50.71% (RM220, 086.42 million) respectively (Bank Negara Malaysia). Given the Malaysian economy is highly trade dependent to the major trading partners, therefore it is expected that the Malaysian stock market will be affected to the stock market development from the major trading partners.

According to international capital goods trade hypothesis, the presence of international trade in real output leads to a reallocation of these goods such that the real marginal product of capital would be equated internationally. Because stock prices are related to the real marginal product of capital, the stock prices in the different countries would tend to exhibit a common trend movement in the long run (Bachman et al., 1996). Stronger the bilateral trade ties between two countries, the higher of comovements (Masih and Masih, 1999; Bracker et. al, 1999).

Although numerous empirical studies have been devoted on the issue pertaining of international stock markets integration[1], however no previous research has focused on whether the Malaysia stock market is integrated with its major trading partners (the U.S, Japan, Singapore, and China). None of the existing studies except Yusof and Majid (2006), focus on Malaysia market, although some studies include Malaysia in their sample as part of broader studies of stock market integration in Asia Pacific markets (e.g., Janakiraman and Lamba,1998; Masih and Masih,1999; Ghosh et al., 1999; Ng , 2002; Daly, 2003; Ibrahim, 2005).

Essentially, the degree of stock market integration has major implications on potential benefits of international portfolio diversification and on financial stability of a country (Ibrahim, 2005). In the context of Asian stock markets, previous empirical findings are mixed.

[1] For example, Grubel (1968), Levy (1970), Solnik (1974), Eun and Shim (1989), Arshanapalli and Doukas (1993), Lee and Kim (1993), Arshanapalli et al. (1995), Choudhry (1996), Masih and Masih (1997), Saini et al. (2002), Daly (2003), Yang et al. (2003) and Ibrahim (2005).

For example, Yang et al. (2003) and Chung and Liu (1994) find two cointegrating vectors exist both in the crisis and post crisis period. On the other hand, Arshanapalli et al. (1995) and Masih and Masih (1999) documented only one cointegrating vector among several major Asian markets and developed markets. In contrast, Chan et al.(1992), De Fusco et al. (1996), Roca et al. (1998) and Ibrahim (2005) find evidence indicating non cointegrating vector.

This paper contributes to literature in several ways. First, none of the existing studies have examined the international stock market linkages between Malaysia and its major trading partners. It would appear that no previous work has addressed the role of trading partners on Malaysian stock markets. However Yusof and Majid (2006) have examined the long-run comovements between Malaysia stock market and two largest stock markets in the world (the US and Japan). The results indicate that Japanese stock market is found to significantly move the Malaysian stock market compared to the US stock market for the post crisis period. Second this paper differs from previous studies because it includes China which has not been documented in the previous literature. Malaysia's exports to China expanded 21.2% to RM42.66 billion in 2006. As the fourth largest trading partners, we seek to answer the question; can China influence the Malaysian stock market? Third and last, while the previous studies focus most on the earliest 1980s, 1990s and up to earlier 2003 sample periods for examples Arshanapalli et al. (1995), Choudhry (1996), Masih and Masih (1997), Saini et al. (2002), Daly (2003), Yang et al (2003) and Ibrahim (2005), this study utilise recent weekly data from July 1998 to July 2007. We attempt to assess the recent evidence of long-run relationships and short-run dynamic interactions between Malaysia stock market and its major trading partner's stock markets.

The finding of this paper has stated that in the long-run Malaysia stock market is significantly influenced by the development in the stock market from the major trading partners. This is consistent with the view that stronger the bilateral trade ties between two countries, the higher the degree of co movements between markets.

The paper is organised as follow. In the next section, we briefly review of previous empirical studies. Section 3 outlines the methodology followed by data preliminaries in section 4. Section 5 documents empirical results and the last section gives the summary and some concluding remarks.

2. LITERATURE REVIEW

There is a significant volume of research has studied on international stock market linkages and integration. Early studies on stock market integration and international portfolio diversification can be found in Grubel (1968), Levy and Sarnat (1970) and Solnik (1974). Grubel (1968) and Solnik (1974) have documented evidence that the correlations among national stock returns are low. This result implies that investors can gain benefits from international portfolio diversification. Eun and Shim (1989), Koch and Koch (1991) and Chowdury (1994) investigated the interrelationship among the national stock indexes utilizing data from 1980s. They consistently found evidence that the stock markets are significantly short-run interrelated. In contrast, Park and Fatemi (1993) found a weak linkage between the Pacific markets and the US, UK and Japanese equity markets.

In addition, the impact of the turmoil (October 1987 stock market crash and the 1997 Asian financial crisis) on stock market integration has drawn much attention among economists and practitioners. Lee and Kim (1993) and Arshanapalli and Doukas (1993), have noted that the degree of integration among national stock markets have been increased after the October 1987 stock market crash. Recently, Francis et al. (2002) and Yang et al. (2003) indicate that the long-run and short-run relationship among equity markets were strengthened during the financial crisis 1997 and become more integrated after the crisis. In addition, Hwahsin et al. (2006) investigated the stock market linkages between the United States and China, Hong Kong and Taiwan. They found evidence that stock markets became more cointegrated after the 1997 Asian financial crisis.

Stock market integration in emerging market especially in Asia, Latin America and African has also attracted researchers for instance Palac-McMiken (1997), Roca et al. (1998), Fatzaz and Ayaz (2001), Ng (2002), Francis et al. (2002), Saini et al. (2003), Daly (2003), Yang et al. (2003), Brailsford (2005), Phylaktis et al. (2005) and Mitchell (2006). Palac-McMiken (1997) examined long run relations of five ASEAN stock markets (Indonesia, Malaysia, the Philippines, Singapore and Thailand). Employing pairwise cointegration test, he indicates that these markets, except Indonesia are cointegrated in the long run. In contrast, for the same sample, Roca et al. (1998) found evidence indicating non-cointegration vector among the markets. However, in the short run, these markets show significant interactions. Besides that, Fatzaz and Ayaz (2001) examined the stock prices comovements in emerging markets. They found evidence that the emerging stock markets of Asia and Latin America are closely inter-linked. Furthermore, the stock markets linkages in the short-run are stronger. On the other hand, Ng (2002) found no evidence to indicate a long-run relationship among the South East Asian stock markets over the period 1988-1997. However, correlation analysis showed that these markets are becoming more integrated. Chen et al. (2002) investigated stock markets linkages in Latin America. They argued that the potential for diversifying risk by investing in different Latin America market is limited.

More recent study, Brailsford et al. (2005), investigate the relationship between six East and Southeast Asian markets and three global markets (the US, Japan and UK) in the framework of zero-non-zero (ZNZ) patterned vector error-correction modelling (VECM). The analysis focuses upon market relations both before and after the Asian currency crisis. The strength of integration between markets is also evaluated by extending Geweke's measurement approach within this ZNZ framework. The results indicate that, since the crisis, the degrees of integration strengths have become more powerful between the Asian and global markets, with the US market leading both the Asian markets and the markets of Japan and the UK.

3. METHODOLOGY

3.1 Unit Root Tests

In order to avoid the spurious regression, the stationarity of the time series is first determined. A time series is stationary in level, $I(0)$, if it does not contain a unit root. However, many macroeconomic and financial time series, including stock prices series, contain unit roots dominated by stochastic trends (Nelson and Plosser, 1982). Any time series containing a unit root requires first-differencing in order to be stationary, I(1). Thus, a time series is integrated in order k if it achieves stationarity after being differenced k times. We conduct standard Augmented Dickey-Fuller (ADF) (Said and Dickey, 1984) unit root tests to determine the order of integration for each stock price. The ADF test is based on the regression:

$$\Delta Y_t = a_0 + a_1 t + \partial Y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-1} + \varepsilon_t \tag{1}$$

where, Y_t is the logarithm of the variable in period t, *t* is time period, ΔY_{t-1} is $Y_{t-1} - Y_{t-2}$ and ε_t is white noise error term .The appropriate lag length is determined by Akaike Information Criterion (AIC) model.

3.2 Cointegration Tests

There are two most widely used cointegration tests namely Engle-Granger (1987) two model approaches and the Johansen (1998) and Johansen and Juselius (JJ) (1990) maximum likelihood estimator. Gonzalo (1994) provide empirical evidence to support the Johansen's method is superior over other methods (ordinary least squares, nonlinear least squares, principal components and canonical correlations) for testing the number of so integrating relationship. Therefore, we employ the maximum likelihood method of Johansen (1988 and Johansen (1988) and Johansen and Juselius (1990) to test the cointegration. The JJ test is based on vector autoregressive model:

$$Y_t = \alpha + \prod_1 Y_{t-1} + \prod_2 Y_{t-2} + ... + \prod_{k-1} Y_{t-(k-1)} + \varepsilon_t \qquad (2)$$

where Y_t is an *n x 1* vector of non-stationary variables integrated of the same order, α is an *n x 1* vector of intercept terms, $\prod_i$ is an *n x n* matrix of coefficients and ε_t is an *n x 1* of error terms. The equation (2) can be expressed by its first different ECM as:

$$\Delta Y_t = \alpha + \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + ... + \Gamma_{k-1} \Delta Y_{t-(k-1)} + \prod Y_{t-1} + \varepsilon_t \qquad (3)$$

The existence of a long-run relationship among Malaysian stock market and its trading partners is examined based on the rank of an *n x n* matrix of coefficients of lagged level variables $(\prod)$, in equation (2). If the rank (π) = 0, the variables are not cointegrated. On the other hand, if rank (π) = r, therefore the variables share cointegrating vectors. JJ (1990) develop two test statistic to determine the number of cointegrating vectors namely the trace statistic and the maximal eigenvalue statistic. Since, the cointegration tests are very sensitive to the choice of lag length, Hall (1989) and Johansen (1992), recommend VAR specification that renders the error term serially uncorrelated by including sufficient lags. Therefore, we use the VAR specification to select the number of lags required in the cointegration test.

3.2 Granger Causality Tests Based on VECM

Granger (1988) concludes that if there is a cointegration vector among time series, there must be causality among these time series as least one direction. In order to examine the short-run dynamic and long-run relation between Malaysia stock market and its trading partner's stock markets, the vector error correction model (VECM) is employed. According to Granger representation theorem, for cointegrated series CI (1,1), error correction term must be included in the model. Engle and Granger (1987) and Toda and Phillips (1993) specify that failure to incorporate this error correction term in the model leads to model misspecification. Therefore, this model referred to the literature as a VECM:

$$\Delta Y_{it} = \alpha + \xi' Z_{t-1} + \sum_{t=1}^{m} a_i \Delta Y_{1,t-i} + \sum_{t=1}^{m} b_i \Delta Y_{2,t-i} + \sum_{t=1}^{m} c_i \Delta Y_{3,t-i} + \sum_{t=1}^{m} d_i \Delta Y_{4,t-i} + \sum_{t=1}^{m} e_i \Delta Y_{5,t-1} + \varepsilon_t \tag{4}$$

where, Y_{it} denotes stock price index series for Malaysia, and its trading partners, the US, Japan, Singapore and China, and the $\xi' Z_{t-1}$ contains r cointegrating terms, reflecting the long run equilibrium relationship among these five stock markets. The Granger-causality tests are examined by testing whether the coefficients of $\Delta Y_{1,t-1}$, $\Delta Y_{2,t-1}$, $\Delta Y_{3,t-1}$, $\Delta Y_{4,t-1}$ and $\Delta Y_{5,t-1}$ are statistically different from zero based on a standard F-test. The significance of error correction term is tested based on a standard T-test. If the variables are cointegrated, an OLS regression yields "super-consistent" estimators of the cointegrating parameters (Enders, 1995). Stock (1987) also proves that the OLS estimates of parameters converge faster than in OLS models using stationary variables.

4. DATA PRELIMINARIES

The data utilized in the analysis are weekly data spanning from July 1998 to July 2007. We employed weekly data instead of higher daily frequency data to avoid the problem of non-synchronous trading. The daily data contain too much noise and are subject to the problem of non-synchronous infrequent trading (Ibrahim, 2005). Thus, this might lead to erroneous conclusion in the lead-lags relationship among the variables. In addition, the transmission of shocks may take place within few days and thus, cannot be fully captured by utilizing monthly data. Roca et al. (1998) and Brailsford et al (2005) have employed weekly data in their study on stock market integration as well.

The following indexes are used to represent the markets: Malaysia Kuala Lumpur Composite Index (MAL), Singapore Straight Time Index (SPORE), US Standard and Poor 500 Index (US), Japan Nikkei 225 Index (JPN) and the China Shanghai Composite Index

(CHN). All indexes are based on local currency and are collected from the www.econstats.com database. The total number of observations for each country is 474 and all series are measured in natural logs. Causal observation implies that each stock price series appears to be non-stationary and that these five national stock price indexes tend to move more or less together over time, a result which is later confirmed through the use of cointegration technique (Chang and Nieh, 2001).

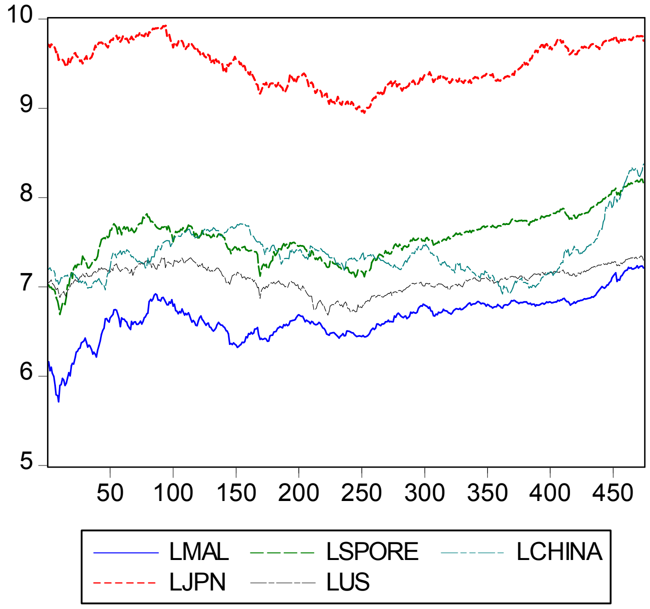

Figure 1: Stock Price Indexes for Five Countries: 1 January 1998 – 27 July 2007

5. RESULTS

5.1 Correlation coefficients among stock market index returns

Table 2 reports the summary statistics and correlation matrices for these five stock market index returns (or the log price changes). The market's average weekly index returns are 0.22%, 0.010%, 0.24%, 0.053% and 0.249% respectively, for Malaysia, Japan, Singapore, the US and China. These results show that the China market has the highest average weekly returns of 0.25% and the Japan market has the lowest average daily returns of 0.010% over this sample period. Regarding the standard deviation, the results indicate that the China market has the highest weekly standard deviation of 3.09%. On the other hand, the U.S. market has the lowest standard deviation of 2.37% over this sample period. We find that the index returns for each country are leptokurtic (heavily tailed and sharply peaked about the mean when compared with the normal distribution). The Jarque-Bera also indicates the rejection of normality on these five markets' weekly return data set.

The correlation matrix indicates that all the correlations are positive and significant. The highest contemporaneous correlation with markets is shown by the US and Singapore, while the lowest is shown by the China and U.S. markets.

5.2 Unit Root Analysis

Table 3 reports the unit root tests based on the commonly Augmented Dickey Fuller (ADF) procedure. The lag length for each series of stock market indices is also documented. We conduct both tests with and without time trend. The first two column presents the results for the log levels of the data series and the last two column represents the result for their first differences. The results show that for ADF, unit root test are at log level, except for Malaysia, all series contain unit roots. However, the ADF suggests that all data are stationary at first difference and thus indicating that all the variables are *I* (1).

Table 2: Summary Statistics and Correlation Coefficients

Panel A: Summary Statistics of Stock Price Index Returns

	ΔMAL	ΔJPN	ΔSPORE	ΔUS	ΔCHN
Mean	0.002222	0.000097	0.002400	0.000530	0.002495
Median	0.002589	0.002551	0.002526	0.001679	0.000072
Maximum	0.182178	0.094688	0.136598	0.074923	0.132407
Minimum	-0.114483	-0.112921	-0.120535	-0.123304	-0.084540
Std. Dev.	0.029193	0.027663	0.029199	0.023724	0.030909
Skewness	0.395068	-0.322909	0.075596	-0.521170	0.448718
Kurtosis	8.608848	3.479066	5.820564	5.881017	4.587846
Jarque-Bera	632.3122*	12.74312*	157.2417*	184.9968*	65.56266*

Panel B: Correlation Matrix of Stock Price Index Returns

	ΔMAL	ΔJPN	ΔSPORE	ΔUS	ΔCHN
ΔMAL	1				
ΔJPN	0.2868	1			
ΔSPORE	0.3079	0.4430	1		
ΔUS	0.2343	0.37714	0.4489	1	
ΔCHN	0.0778	0.0869	0.1313	0.0199	1

Note:

1. MAL, JPN, SPORE, US and CHN are the abbreviation for Malaysia, Japan, , Singapore, the United States and China respectively.
2. Δ indicates the first differencing.
3. * indicates significance at the 5% level.

Table 3: Unit Root Tests

	Level		First Difference	
Variables	Intercept	Intercept and Trend	Intercept	Intercept and Trend
Malaysia	-3.415 (7)*	-4.089 (7)*	-12.409 (1)***	-12.395 (1)***
Singapore	-1.345 (13)	-2.250 (13)	-11.124 (16)***	-11.110 (16)***
Japan	-1.165 (0)	-1.015 (0)	-22.149 (0)***	-22.217 (0)***
US	-1.271 (1)	-1.292 (1)	-23.697 (0)***	-23.693 (0)***
China	0.715 (3)	0.421 (3)	-10.3038 (2)***	-10.471 (2)***

Note: ***and * denote significance at 1 percent and 5 percent respectively. The lag lengths included in the models are based on the Akaike Information Criteria (AIC). The optimum lag length is shown in bracket. The tests of ADF (Augmented Dickey-Fuller) are based on (1) with constant and (2) with constant and trend.

5.3 Cointegration Analysis

Having noted that all share prices can be characterized as integrated series with order of integration equals to 1, I(1), we first examine their long run relations using cointegration analysis. A VAR model indicates that the appropriate lag structure is two for five-market VAR model. The results of Johansen (1988) and Johansen and Juselius (1990) multivariate cointegration test are reported in Table 4. Trace statistics and max statistics both suggest that there exists one cointegrating vector among these five equity markets. The finding of one cointegrating vector is compatible with the findings of Lee and Jeon (1995), Arshanapalli, Dukas and Lang (1995), Hassan and Naka (1996), and Masih and Masih (1997).

Table 4: Johansen Maximum Likelihood Cointegrating Tests

	λ_{trace}	Critical Value	λ_{max}	Critical Value
H0: r = 0	83.62242*	69.81889	34.76044*	33.87687
H0: r ≤ 1	48.86198*	47.85613	21.21153	27.58434
H0: r ≤ 2	27.65045	29.79707	17.16035	21.13162
H0: r ≤ 3	10.49010	15.49471	8.167111	14.26460
H0: r ≤ 4	2.322988	3.841466	2.322988	3.841466

Note:
1. The computed Ljung-Box Q-statistics indicate that the residuals are white noise.
2. * indicates significance at the 5% level.
3. Akaike Information Criteria (AIC) was used to select the number of lags required in the cointegrating test. The lag length is found to be 2 for all the five stock indices.

5.4 Granger Causality Tests Based on VECM

Given the results of the cointegration tests, the causality tests are conducted by using VECMs to test for intertemporal causality among five stock markets considered. The VECMs permit us to make a distinction between the short-run and long-run forms of causality. Since the variables are cointegrated, in the short run, deviations from this equilibrium will response on the changes in the dependent variable in order to force movements towards long-run equilibrium. The lag structure of the system variables is determined by using the AIC. Up to two weeks lags are used for the specification of optimal lags. Wald F-statistics are conducted to examine the joint significant of each of the independent variables.

Table 5: Granger Causality Tests Based on VECM

Short run Lagged Differences						Lagged ECT
	ΔMAL	ΔSPORE	ΔJPN	ΔUS	ΔCHN	ε_{t-1}
Dep. Var	F-Statistics					t-statistics
ΔMAL	-	0.1043 (2.6086)**	-0.2198 (4.8152)*	0.0843 (0.3491)	0.0528 (0.3995)	-0.0659 (-4.3)***
ΔSPORE	0.2601 (7.262)***	-	0.0089 (0.8178)	0.3128 (7.151)***	0.0754 (1.5948)	0.0122 (0.7961)
ΔJPN	0.0167 (0.3285)	-0.1692 (2.2531)	-	0.3688 (11.177)***	0.1415 (3.4238)*	-0.0203 (-2.43)*
ΔUS	0.0145 (1.3849)	0.0214 (0.3214)	-0.0425 (0.2342)	-	0.0133 (0.7897)	-0.0003 (-0.1000)
ΔCHN	0.0857 (1.0397)	-0.0509 (0.2488)	-0.0345 (0.0839)	0.1138 (0.5074)	-	0.0039 (2.714)*

Note: ***,* *and * indicates significance at the 1, 5 and 10% levels.
The test values are in parentheses.

Based on Table 5, several short-run and long-run causalities can be observed. At the 5 percent significance level, there seems to be short-run causalities relationship running between the Japanese and Malaysian stock markets and China and Japanese stock markets. Meanwhile at 1 percent significance level, there are short-run causalities relationship running between Malaysia and Singapore, the US and Japan and the US and Singapore. In addition, at 10 percent significance level, there is a short-run causality between Singapore and Malaysia. The causality results also reveal that in the long-run, Malaysian stock market is influenced by the US, Singapore, Japan and China markets. At this point, we can therefore conclude that the Malaysian stock market seems to be affected by Singapore and Japan in both short-run and long-run. The results are consistent with Yang et al. (2003) and Yusof and Majid (2006).

Recently, there seems to be a growing proportion of bilateral trade between Malaysia-Japan and Malaysia-Singapore. Total trade between Malaysia and Japan has increased by 10.3% from US$24.7 billion in 2002 to US$27.2 billion in 2005. Interestingly, total trade between Malaysia and Singapore expanded more than 128% from US$25.5 billion in 2002 to US$58.3 billion in 2005. As a small open economy, Malaysia depends profoundly on the US, Japan, Singapore and China for its export and imports. The character of the relationships amongst national equity markets can be explained by both trade and financial reason (Ibrahim 2003). In addition, Masih and Masih (1999) and Bracker et al. (1999) note that the stronger the bilateral trade ties between two countries, the higher the degree of comovements should be between their stock markets. Interestingly, there is a long-run bidirectional relationship running between China and Malaysia which has not been documented in the previous literature.

The role of Japan as the leader in the Asian region has been a contentious issue (Yang et al., 2003). However, Ghosh et al. (1999) and Masih and Masih (2001) indicate that Japan is a market leader in the Asian region. From the results, Japan seems to be fairly endogenous market. Its market is influenced by the US and China in both short-run and long-run. The US and China are the two major trading partners for Japan. In 2005, the total volume of exports and imports are about 40% (US$216 billion) and 35% (US$173.9 billion) respectively. It is found that there are long-run bidirectional relationships running between Malaysia and Japan and China and Japan. Thus, Japan is not a relatively isolated market under normal market condition as previously documented (Dekker et al., 2001; Bessler and Yang, 2003; Yang et al., 2003).

The leadership of The US is further confirmed influencing Japan, Malaysia, Singapore and China. Conversely, the US market is not affected by other markets in both short-run and long-run. The results are consistent with Masih and Masih (1999), Sheng and Tu (2000), Yang et al. (2003) and Brailsford et al. (2005). The US is the top export market for Malaysia, Singapore, Japan and China. In 2005, exports to the US were US$31.5 billion or 23.02% of Malaysia's total exports, US$30.4 billion or 12.11% of Singapore's total exports, US$13.6 billion or 24.73% of Japan's total export and US$16.3 billion or 23.11% of China's total exports.

The findings show that the Singapore market is an influential market in the Asian region. It is found that Malaysia, Japan and China are affected by the Singapore market in the long run. In addition, Malaysia is also affected by Singapore in the short-run. The results are consistent with Roca et al. (1998), Azman-Saini (2002) and Yang et al. (2003). Interestingly, in the long-run Singapore is unaffected by other markets. In this regard, Singapore appears to be a market leader in the Asian region. However, the results indicate that Malaysia and the US seem to influence Singapore in the short-run. In terms of bilateral trade, Malaysia and the US are the two major trading partners for Singapore. In 2005, the total volume of exports and imports are about 27.5% (US$54.3 billion) and 28.9% (US$50.8 billion) respectively.

We also note that China market is influenced by the US, Japan, Singapore and Malaysia in the long-run. However the results in the short-run are not significant. The influence of the US to China is consistent with Laurence et al. (1997). Only Japan is affected by China in both short-run and long-run. On the other hand, consistent with Huang et al. (2003) it is found that Japan does not influence China in short-run. There are long-run bidirectional relationships running between China and Japan and China and Malaysia which has not yet been reported in the previous literature.

In summary, we document evidence that the Malaysian stock market is influenced by its major trading partners namely the US, Japan, Singapore and China. There are long-run bidirectional relationships running between Malaysia and Japan and Malaysia and China. Only Japan influences Malaysia in both short-run and long-run. Figure 2 shows the long-run causal channel summarized from the VECM results.

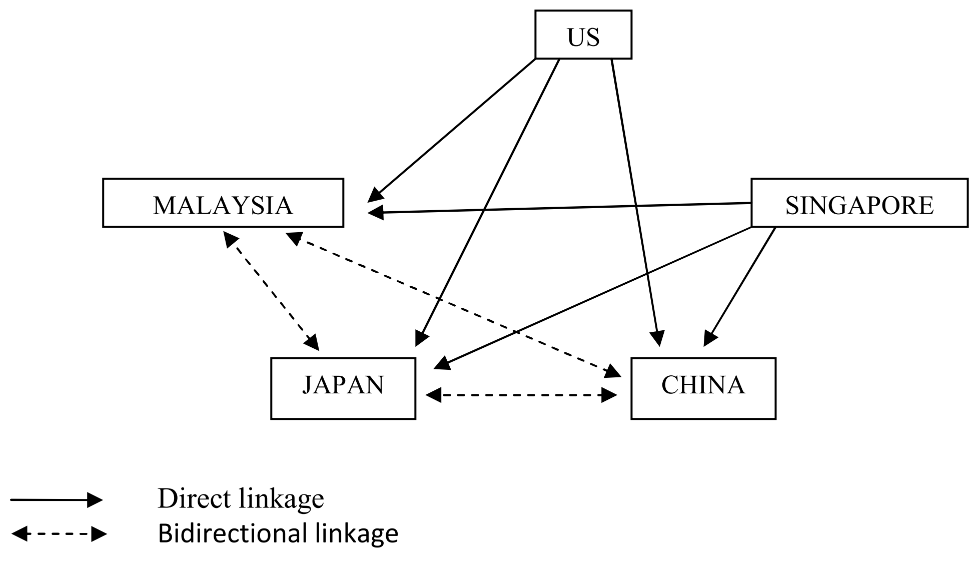

Figure 2: The long-run causal channels summarized from the VECM results

6. SUMMARY AND CONCLUSION

This study examines the long-run relationship and short run dynamic among Malaysia and its major trading partners namely the US, Japan, Singapore and China. We employ Johansen (1988) and Johansen and Juselius (JJ) (1990) and Granger Causality Tests based on VECM to estimate long-run relationships and short-run dynamic causal linkages between markets.

In general, the empirical results reveal that, in the long-run Malaysia market is significantly influenced by its major trading partners namely the US, Japan, Singapore and China. Masih and Masih (1999) and Bracker et al. (1999) note that the stronger the bilateral trade ties between two countries, the higher the degree of comovements should be between their stock markets. There are two long-run bidirectional relationships running from the Japanese and Malaysian stock market and the China and Malaysian stock market. Only Singapore and Japan seems to influence Malaysia in both short-run and long-run. Recently, there seems to be a growing proportion of bilateral trade between Malaysia and Japan. The character of the relationships amongst national equity markets can be explained by both trade and financial reasons (Ibrahim, 2003). The leadership of the US is confirmed influencing other markets but almost unaffected by those markets. The results are consistent with Masih and Masih (1999), Sheng and Tu (2000), Yang et al. (2003) and Brailsford et al. (2005). The findings show the dominance of Singapore market in the Asian region agree with previous studies (e.g., Roca et al., 1998; Azman-Saini, 2002; Yang et al., 2003). Unlike prior studies (e.g., Dekker et al., 2001; Bessler and Yang, 2003; Yang et al., 2003), it is found that Japan is as interactive market in normal market condition rather than being isolated. China market is found to be fairly endogenous market. There is a bidirectional relationship running between China and Japan which has not been reported in the previous literature.

Due to its important implication on international portfolio diversification, the issue of integration or segmentation of national equity markets has received wide empirical attention (Ibrahim, 2005). In the context of Malaysia, we note substantial long-run interactions with its trading partners. Thus, the Malaysia market cannot serve as potential market for international portfolio diversification for those who have long-run investment interest. However, in the short-run especially for the US investors, they can gain benefits from diversification in Malaysia. Moreover, within the Asian market, investors are interested in short-run investments (Ibrahim, 2005). The results also indicate that the development in Malaysia's trading partners cannot be ignored as the may result in contagion effect. There are also potential benefits of international diversification in Singapore in the long-run and China in the short-run. Based on evidence gathered, the linkages among national stock market are significantly influenced by the bilateral trade ties between countries.

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