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Capital Market Integration in ASEAN Countries: Special Investigation of Indonesian Towards the Big Four

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ABSTRACT

ASEAN already proposed financial integration through capital market integration based on ASEAN Economics Community (AEC) 2020 treaty in order to aim comprehensive ASEAN economic integration. The objective of this study is to occur the capacity of Indonesian in terms of integrating its capital market towards the big four i.e., Singaporean, Malaysian, Philippines, and Thailand. Vector Auto-regression (VAR) analysis is utilized to investigate Indonesian market returns co-movement and dynamic link with ASEAN 4. The conclusion of this study, there is neither co-movement nor strong dynamic link between Indonesian capital market with those of Singaporean, Malaysian, Philippines, and Thailand.

Keywords: ASEAN Capital market integration, Indonesian Capital Market, ASEAN 4 Capital Market, VAR Framework.

1. Introduction

Financial integration through 'Free Flows of Capital' that one of urgent point is bolstering ASEAN capital market development and Integration agenda. The ultimate goal of capital market integration is to reduce uncertainty because by capital market integration between Indonesia Investment and the big four (Singaporean, Malaysian, Philippines, and Thailand), especially the investors around ASEAN may predict the future of assets movement of ASEAN 5 (Indonesian, Singaporean, Malaysian, Philippines, and Thailand) market returns optimally. This is supposed to be rational motive for Indonesia to integrate its capital market with other ASEAN 4 major members.

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2. The Theoretical of Financial Integration and Capital market Integration

Free flow of capital encourages countries to follow more disciplined macroeconomic policies (Obstfeld, 1998). Finally, integration may broaden and deepen financial markets and improve the functioning and efficiency of countries' financial systems. Hardouvelis *et al*. (2001), in related with this issue in different perspective, showed that a fundamental condition for a reduction in the cost of equity capital in Europe is satisfied. They estimated that this cost falls by between 0.5 and 3 per cent during the 1990s. Giannetti *et al*. (2002) provided indirect estimates of the effects of financial integration on growth.

They argued that further integration will encourage the adoption of best financial structures and particularly benefit firms dependent on

external financing. They concluded that economic growth in the European Union (EU) could thereby increase by up to 1 per cent.

In another paper, Hartmann *et al*. (2003) noted that financial integration does not necessarily result in the adoption of similar financial structures across countries. As in other industries, financial integration could promote specialization in the provision of particular services, resulting in quite diverse structures. Nevertheless, in the process of promoting financial development and modernization, integration is likely to have significant effects on growth and welfare.

According to Freixas et al. (2004), there are four effects that are considered: on risk sharing for consumption smoothing, domestic investment and growth, macroeconomic discipline, and efficiency. International capital markets provide firms with access to sources of financing that increase capital and raise growth rates and living standards. The macroeconomic implications of financial integration are, therefore, contentious. The emphasis on the microeconomic side has been on portfolio allocations, the opportunities available to savers and borrowers, and the impact on individual components of the financial sector.

It is generally believed that capital market integration has such an important role in international and development economics. Capital market integration provides the opportunity for better diversification as investors shift to higher risk and expected return projects because they are able to diversify their overall risk (Obstfeld, 1994). In this context, Rajan and Zingales (1998), among others, find that development of capital markets facilitates economic growth by reducing the cost of capital. By the elimination of investment barriers, Stulz (1999) shows that equity market integration allows for international risk diversification which affects long term economic growth by altering resource allocation and savings rates.

Capital market integration entails that the markets are exposed to similar risk factors and thus, common risk premium (Ahlgren and Antell, 2002). Why is capital market integration so compulsory? It may improve the global allocation of capital and help countries share risk better by minimizing consumption volatility (Kose, Prasad and Terrones, 2003).

3. Method of Analysis

1.1. The Data

This study utilizes the data of capital market returns of five major ASEAN members in a daily basis, i.e. Indonesian capital market (JKSE or IDX), Singaporean Capital market (STI), Malaysian capital market (KLSE), Philippines capital market (PSE), and Thailand capital market (SET). The time period of the observation of the indices is from 1 January 2004 to 30 December 2009. After five major ASEAN countries formally signed The ASEAN Bali Concord II of November 2003 which established The ASEAN Economic Community 2020 (AEC). One of the urgent agenda of AEC is to implement financial integration through capital market integration.

1.2. VAR Analysis

Step 1. Augmented Dickey-Fuller (ADF) Test

ADF test is applied in context of checking the data is stationary or non stationary. It must avoid the unit roots problem, it means the data is non stationary.

Step 2. VAR Model in Standard Form

A VAR system of order k, denoted as VAR (k), with n variables can be expressed in the following form:

$$y_t = a + \Theta_1 y_{t-1} + \ldots\ldots + \Theta_k y_{t-k} + e_{nt} \qquad [1]$$

Where $\Theta_k = \begin{bmatrix} \theta_{11,k} \ldots\ldots\ldots\ldots \theta_{1n,k} \\ \theta_{n1,k} \ldots\ldots\ldots\ldots \theta_{nn,k} \end{bmatrix}$

and $y_t = (y1_{t,} y2_{t,} \ldots\ldots\ldots, y_{nt})$

In this study induced a five-variable (n=5) case with number of lags (k) equal to one, then based on equation (7), the VAR model can be performed and simplified with different notation.

y_{nt} with n=5 will be replaced to be different notation as $R_{I,t}; R_{S,t}; R_{M,t}; R_{P,t}; R_{T,t}$, are the market returns series of Indonesian, Singaporean, Malaysian, Philippines, and Thailand respectively, or as the dependent variables. α_n with n=5 will be replaced to be another notation as $\alpha_{I,}\alpha_S, \alpha_{M,}\alpha_{P,}\alpha_T$. $\theta_{nn,k} y_{nt-1}$ $t-1$ will be replaced to be different notation as 5x1 vector:

$$\begin{bmatrix} \alpha_{II}R_{I,t-1} + \alpha_{IS}R_{S,t-1} + \alpha_{IM}R_{M,t-1} + \alpha_{IP}R_{P,t-1} + \alpha_{IT}R_{T,t-1} \\ \alpha_{IS}R_{S,t-1} + \alpha_{SS}R_{S,t-1} + \alpha_{SM}R_{M,t-1} + \alpha_{SP}R_{p,t-1} + \alpha_{ST}R_{T,t-1} \\ \alpha_{IM}R_{M,t-1} + \alpha_{MS}R_{S,t-1} + \alpha_{MM}R_{M,t-1} + \alpha_{MP}R_{P,t-1} + \alpha_{MT}R_{T,t-1} \\ \alpha_{IP}R_{P,t-1} + \alpha_{PS}R_{S,t-1} + \alpha_{PM}R_{M,t-1} + \alpha_{PP}R_{P,t-1} + \alpha_{PT}R_{T,t-1} \\ \alpha_{IT}R_{T,t-1} + \alpha_{TS}R_{S,t-1} + \alpha_{TM}R_{M,t-1} + \alpha_{TP}R_{T,t-1} + \alpha_{TT}R_{T,t-1} \end{bmatrix}$$

Where the equations above are the independent variables those have own past returns and past returns of other markets lagged a certain number of times. e_{nt} will be $e_{I,t}; e_{S,t}; e_{M,t}; e_{P,t}; e_{T,t}$, are the residual series of $R_{I,t}; R_{S,t}; R_{M,t}; R_{P,t}; R_{T,t}$ respectively. Now, from points above create VAR model 5 x 1 vector as following equation [2]:

$$\begin{bmatrix} R_{I,t} = \alpha_I + \alpha_{I,I}R_{I,t-1} + \alpha_{I,S}R_{S,t-1} + \alpha_{I,M}R_{M,t-1} + \alpha_{I,P}R_{P,t-1} + \alpha_{I,T}R_{T,t-1} + e_{I,t} \\ R_{S,t} = \alpha_S + \alpha_{I,S}R_{S,t-1} + \alpha_{S,S}R_{S,t-1} + \alpha_{S,M}R_{M,t-1} + \alpha_{S,P}R_{p,t-1} + \alpha_{S,T}R_{T,t-1} + e_{S,t} \\ R_{M,t} = \alpha_M + \alpha_{I,M}R_{M,t-1} + \alpha_{M,S}R_{S,t-1} + \alpha_{M,M}R_{M,t-1} + \alpha_{M,P}R_{P,t-1} + \alpha_{M,T}R_{T,t-1} + e_{M,t} \\ R_{P,t} = \alpha_P + \alpha_{I,P}R_{P,t-1} + \alpha_{P,S}R_{S,t-1} + \alpha_{P,M}R_{M,t-1} + \alpha_{P,P}R_{P,t-1} + \alpha_{P,T}R_{T,t-1} + e_{P,t} \\ R_{T,t} = \alpha_T + \alpha_{I,T}R_{T,t-1} + \alpha_{T,S}R_{S,t-1} + \alpha_{T,M}R_{M,t-1} + \alpha_{T,P}R_{T,t-1} + \alpha_{T,T}R_{T,t-1} + e_{T,t} \end{bmatrix} \quad [2]$$

The Step 3. Akaike Information Criteria (AIC)

Fabozzy et al.,(2007) informed that the purpose of the AIC is to avoid excess fitting of the model by selecting the minimum of AIC value.

The Step 4. Innovation Accounting

The innovation accounting will consist of the impulse response function and variance decomposition. The impulse response function is a practical way to visually represent the behavior of $R_{I,t}; R_{S,t}; R_{M,t}; R_{P,t}; R_{T,t}$ series in response to the impulse various shocks (Enders, 2004). Then, the variance decomposition or the forecast error variance decomposition tells us the proportion of the movements in a sequence due to its own shocks versus shocks to the other variable (Enders, 2004).

4. Findings and Discussions

Table 1. Unit Root Tests of Market Returns

	ADF test statistic
JKSE market returns	-33.63723 (-3.434325)**
STI market returns	-10.09452 (-3.434357)**
KLSE market returns	-39.08771 (-3.434325)**
PSE market returns	-37.88534 (-3.434325)**
SET market returns	-43.77289 (-3.434325)**

***Test critical values at 1 % level*

Table 1 is related to Augmented Dickey-Fuller (ADF) test statistics for all market returns at 1 % level of test critical values which reject the null hypothesis because all values are greater than its test critical value. These are called stationary, i.e. the data are not indicated to have a unit root

problem, then the data may be proceed as inputs for VAR model in its standard form. And the best appropriate model regarding AIC is VAR (1) or VAR order 1 that has minimum value at 7.185741.

Table 2. Co-Movement Market Returns Estimation between JKSE and ASEAN 4 Based on VAR (1)

	STI	KLSE	PSE	SET
JKSE	-0.018167*	-0.022670*	-0.016894*	-0.000814*

**Coefficients from regression VAR order 1 or VAR (1)*

The table 2 will explain that there are no co-movements between JKSE and STI, KLSE, PSE, or SET. Why is that happened? Because of the negative signs of STI, KLSE, PSE, and SET are signaling that JKSE to others have opposing market returns movement. These findings reveal that when JKSE market returns is bullish, the others are bearish or vice versa. This implies that there are market inefficiencies which related to unpredictable of market returns, not similar risks factors, and JKSE over others will be asset substitution. This is good for investors who love arbitrage and abnormal market returns but worse for attaining ASEAN capital market integration.

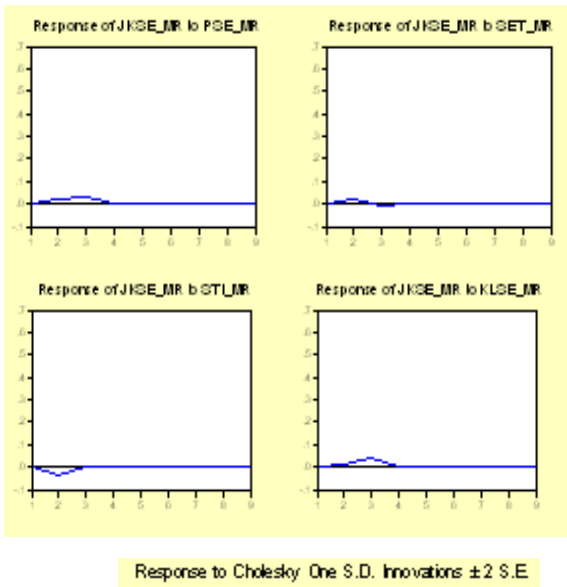

Figure 1. The JKSE Market Returns Impulse Response Function

The impulse response function has related to the mechanism of the regional transmission of capital market movements (Maghyereh, 2006). The speed with which innovations is a particular market are transmitted to the other markets in the system indicate the responsiveness of markets and the efficiency with which *'new information' or innovation* is transmitted among markets. In another word, '*new information or innovation*' can be called as '*a shock'*. Figure 1 is composed of vertical and horizontal axis. The vertical axis is percentages points and the horizontal axis is period. The period will be 9 periods that each period consist of 1565-days divided by 9 periods. So each period in this term is 174-day steps ahead. The figure 1 presents that response of JKSE market returns over STI market returns has range along 0 % which is a few above at 0 % and a few below at 0 %.

Consider first period which has 174-days lag, this study indicates that there are no positive shocks of STI to influence the JKSE. And shortly, during the second period (348-days lag) until the ninth period (1563-days lag), the shocks are very small. The amount of shocks fluctuation is around

0 %. In this context obviously the shocks from the STI market returns can not determine the JKSE market returns in any periods. Therefore, there is almost no dynamics response from the JKSE over behavior of STI market returns. The previous situation will be alike with others where JKSE certainly can not be determined by the dynamics shocks of KLSE, PSE, and SET.

Table 3. Variance Decomposition of JKSE Market Returns to ASEAN 4

Variance Decomposition of JKSE_MR:						
Period	**S.E.**	**JKSE_MR**	**STI_MR**	**KLSE_MR**	**PSE_MR**	**SET_MR**
1	0.652534	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.663308	99.44163	0.340311	0.045236	0.066609	0.106210
3	0.665093	98.90923	0.345970	0.366248	0.258005	0.120550
4	0.665197	98.89303	0.348183	0.371665	0.264982	0.122145
5	0.665210	98.88998	0.350378	0.371674	0.265252	0.122717
6	0.665210	98.88985	0.350408	0.371735	0.265276	0.122730
7	0.665210	98.88984	0.350411	0.371737	0.265277	0.122731
8	0.665210	98.88984	0.350411	0.371737	0.265277	0.122731
9	0.665210	98.88984	0.350411	0.371737	0.265277	0.122731

Recall from Enders (2004) about the variance decomposition or the forecast error variance decomposition that he told the proportion of the movements in a sequence due to its own shocks versus shocks to the other variables. The forecast error variance decomposition allows the relative importance of each market in generating unexpected variations in the returns on its own market and the other markets to be measured over different time horizons (Maghyereh, 2006).

The values from the table 3 are given in the 9 periods that 1 period compose of 174-day steps ahead and each row displays the percentage of variance decomposition that will be explained by the JKSE market returns in the column heading. In period of 2, JKSE market returns have percentage of error variance at 99.44163 and then in sequence amount of 0.340311, 0.106210, 0.066609 ,and 0.045236 explained by STI, the second one is SET, the third is PSE and the fourth is KLSE market returns. But the situation changed in period 3 (522-day), the JKSE market returns percentage of error variance explained in sequenced by KLSE (0.371665), followed by STI (0.348183), PSE (0.264982), and SET (0.122145). This condition was going stable until 9 periods of lags.

6. Conclusion

This study concludes: first, there are no co-movements between JKSE and STI, KLSE, PSE, or SET. Why does it happen? Because the negative signs of STI, KLSE, PSE, and SET signify that JKSE have an opposite market returns movement to others. These findings impose that when JKSE market returns is bullish, the others are bearish and vice versa. These imply that there are market inefficiencies which related to the unpredictability of market returns, disparate risk factors, and JKSE over others can be an asset substitution. This is good for investors who love arbitrage and abnormal market returns but bad for aiming capital market integration in line with ASEAN purpose in accordance AEC 2020 scheme.

Second, the behavior some particular shocks from the KLSE, PSE, and SET is not rigorous and by that, no significant responses given by JKSE on their shocks. The variance decomposition shows three sub-parameters as proposed by Maghyereh (2006), i.e. *first*, the past information of market returns in the four major ASEAN countries (STI, KLSE, PSE and SET) are useless to predict JKSE market returns. The second, none from the STI or KLSE or PSE or SET play a dominant role as innovations or new information manufacturing

to predict JKSE market returns. *The third*, the domestic factors of the fluctuation of JKSE market returns are much significant than its external factors (from STI, KLSE, PSE, and SET) in context of explaining innovations or new information or shocks to JKSE market returns. Ultimately, the third, Indonesian does not capacity yet to integrate its capital market with ASEAN 4. In another statement, there is co-movement and no market interdependence between Indonesian and Singaporean, Indonesian and Malaysian, Indonesian and Philippines, and also Indonesian and Malaysian.

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