

Capital Market Integration of ASEAN - 5 Countries: An Empirical Analysis

Tom Jacob★ Rincy Raphael★★ Stebiya M.V.★★★

Abstract

The financial integration of Southeast Asian markets has been an important research topic. Due to recent global developments in financial markets, the behaviours of these emerging markets are gaining much interest. This research paper empirically analyses stock market integration of international portfolio diversification across some Southeast Asian countries, namely, Indonesia, Malaysia, the Philippines, Singapore and Thailand (ASEAN-5). The augmented Dickey-Fuller unit root test has been used to verify the static properties of market return of ASEAN-5 countries. An analysis of cointegration among these countries' market returns has been done using the Johansen Cointegration Approach. The co-movements among ASEAN-5 economies were analyzed through the Granger Causality test. Results of the Granger causality tests indicate interdependence among ASEAN-5 market returns. This suggests a co-movement among ASEAN-5 capital markets, but not all of these ASEAN-5 capital markets were fully integrated. This study also found that the Malaysia Stock Exchange, the Stock Exchange of Thailand, the Singapore Stock Exchange and the Philippines Stock Exchange were fully integrated, but Indonesia Stock Exchange was not. Essentially, this study provides insight for policymakers, portfolio managers, domestic and international investors, risk analysts and financial researchers to diversify their investment portfolios by combining assets from each ASEAN-5 country.

Keywords: Capital Market Integration, ASEAN-5, Emerging Market, Market Risk

Introduction

The integration of capital markets is an interesting topic for stock market researchers. So, it is not surprising there are many pieces of research on the same. The phenomenon of financial integration closely linked together with the financial markets in neighbouring, regional and global economies. Various forms of financial integration include information sharing among financial institutions, direct fund borrowing and fundraising in the international capital markets by firms, selling and

buying newly engineered financial products in the international capital market that is domestically originated and innovated, direct investment in the international capital market, etc. Founded on August 8 of 1967, the Association of South-East Asian Nations (ASEAN) had five member countries: Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Other Southeast Asian countries also joined it later. Being an inter-governmental organization, ASEAN promotes cooperation among its member countries in the economy. The ASEAN countries contain a total population of 650 million and a combined GDP of \$ 2.8 trillion. Security and socio-cultural integration are essential features of ASEAN. Now considered both a regional and international player, cooperation is the key ingredient to make the ASEAN successful.

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- ★ Mr. Tom Jacob, Assistant Professor, Dept. of Commerce, Christ College, Irinjalakuda, Kerala, India.
 - ★★ Ms. Rincy Raphael, Research Scholar, Sri Ramakrishna Engineering College, Coimbatore, Tamilnadu, India.
 - ★★★ Ms. Stebiya M.V., Research Scholar, Christ College, Irinjalakuda, Kerala, India.

It is not about signing treaties or agreements but about the people who fulfil the dreams of ASEAN founders. Once this is achieved, it will extend beyond borders, giving impetus to national security, international trade, poverty reduction and economic competitiveness.

Despite facing many internal and external challenges, ASEAN seeks to build a more effective mechanism to facilitate cooperation and coordination among member countries. Coordination is required because of the pressure of globalization and the acts of non-ASEAN neighbours. One of ASEAN's internal challenges was the serious obstacle of unresolved territorial disputes between member countries, and it is not straightforward to solve. This difficulty is compounded by the prevailing socio-political instability within many of the member countries. Globalization was the main cause of external challenges faced by ASEAN. Regional imbalances and a lack of proper decision-making mechanisms also existed along with globalization. Due to globalization, ASEAN countries faced many challenges like heavy competition, financial incapability, foreign investments, etc. Insecurity caused by neighbours or non-ASEAN countries were severe. Neighbouring countries' huge investments in their military and economies made ASEAN hopeless. Another external challenge was ASEAN's inability to co-operate regionally and internationally. Then comes the ASEAN Charter.

The ASEAN Charter defines itself as a legal entity and inter-governmental organization with proper authority over its members. It thus stresses unity and integration. ASEAN's adoption of the new motto of 'one vision, one identity, one community' led to an improved decision-making system. It has three implementing bodies: the ASEAN summit, the ASEAN Coordinating Council, and the ASEAN Community Council. Without such regulatory bodies, ASEAN may continue with instability and

inefficacy. The highest decision-making body is the ASEAN summit. It has the authority to issue a resolution to member countries upon finding out any serious breach of the Charter or its basic principles.

The ASEAN Capital Markets Forum (ACMF) is a forum comprising capital market regulators from 10 ASEAN jurisdictions: Brunei Darussalam, Cambodia, Indonesia, Laos PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. Established in 2004, under the auspices of the ASEAN Finance Ministers, it initially focused on harmonizing rules and regulations before shifting towards more strategic issues. This move was meant to achieve greater integration of the region's capital markets under the ASEAN Economic Community Blueprint 2015. The main objective was to solve the problem of linkages among ASEAN stock markets and the establishment effect of ASEAN exchanges on the co-movement level. ASEAN Exchanges, a collaboration of six ASEAN country exchanges – Indonesia, Malaysia, Singapore, the Philippines, Thailand, and Vietnam – was formed on 18 September 2012, aiming to improve the efficiency and liquidity among the members in the region. Exchange integration is also meant to promote growth and enable cross-border transactions. According to financial analysts, such integration will significantly improve the interdependency level among the ASEAN countries.

Financial development and globalization are majorly dependent on integrated stock markets across the globe. A vital role played in the development of emerging markets is by stock market integration. The degree of stock market interdependence and integration can explain the accessibility of capital flows to firms across the international capital markets. The higher the degree of interdependence and integration, the higher the accessibility for international capital markets to firms with a lower cost of equity. It also opens

up local markets to global and regional shocks. The degree of market co-movements is critical in assessing the diversification opportunities across national and international financial markets. A few studies revealed that market co-movements are strongly influenced by the international trade channel (Frankel & Rose, 1998) and financial market integration (Baele et al., 2004; Lee, 2011).

The debate of equity market integration in ASEAN-5 emerging equity markets is yet not settled, justifying the need to re-examine the issue over a different time scale and deploying a different observation method. This study focuses on an analysis carried out to establish stock market returns of ASEAN-5 countries and their interrelationships. Most of the member countries understand integration as a means of enhancing their internal stability. They believe that it should provide a foundation for future regional partnerships.

Statement of the Problem

The ASEAN Economic Community (AEC) Blueprint 2015 aims to transform ASEAN into a single market and production base, including the free flow of investment and capital. An important motive behind this cooperation is to boost the competitiveness of the ASEAN financial market in the global market. To promote financial integration in the ASEAN capital market forum, capital experts and regulators from 10 countries generated an implementation plan. This step will place the ASEAN exchange within the top 10 market capitals among the World Federation of Exchange (WFE). Despite its appearance as a positive goal, many issues are to be dealt with, especially that of financial deregulation. The Asian financial crisis of 1997 was due to financial deregulation. So, complete capital market integration has been postponed to 2025 because it is necessary to be careful about the side effects of derestricted policies.

Investors have to select from plenty of opportunities available in the market. However, the financial integration of different stock markets will benefit diversification of markets, high returns, easy access to the capital market, etc. Therefore, it is crucial to find the dynamic linkages among stock market returns of countries.

Objectives of the Study

- To analyze market returns and volatility of ASEAN-5 stock markets.
- To explore the causal relationship and cointegration among ASEAN-5 stock markets.
- To investigate the short-run relationship among ASEAN-5 stock markets.

Significance of the Study

The study will help better understand the association between well-established ASEAN-5 stock markets – Malaysian Stock Exchange, Stock Exchange of Thailand, Singapore Stock Exchange, the Philippines Stock Exchange and Indonesia Stock Exchange. The research will benefit shareholders, management, stakeholders, investors, financial institutions and portfolio managers to utilize their capital across borders optimally.

Research Methodology

Sources of Data

This study was furnished based on secondary data. Stock market returns from 2000 to 2020 are taken from the World Bank Data Base for the following ASEAN countries: Indonesia, the Philippines, Malaysia, Singapore and Thailand.

Data Analysis

E-Views was used to analyze time-series data; Unit Root Test to check the stationary data. Augmented Dickey-Fuller Test (ADFT) by Fuller and the Phillip–Peron Test by Peron are used for stationary

data. The long-run relationship among the ASEAN-5 capital market returns has been explored by employing Johansen's cointegration technique. Granger Causality test by Granger is used to resolve the causality concerning variables in the internal relation. Hence, this technique was used to detect the actual causal relationship between ASEAN-5 countries' market returns.

Table 1: ASEAN-5 Capital Markets Stock Exchange and Indices

Country	Stock Exchange	Index	Symbol
Indonesia	Indonesia Stock Exchange	Jakarta Composite Index	JCI
Malaysia	Malaysia Stock Exchange	Kuala Lumpur Composite Index	KLCI
Singapore	Singapore Stock Exchange	Straits Times index	STI
The Philippines	The Philippines Stock Exchange	PSE composite index	PSEI
Thailand	Stock Exchange of Thailand	SET Index	SETI

Source: World Bank Database 2020

Table-1 shows the capital market and indices of the five major ASEAN countries used in the current research.

Review of Literature

Various finance theories suggest that investors should hold a well-diversified portfolio to reduce risk. According to Markowitz's Portfolio Theory (1952), when the assets' correlation is negative, it benefits portfolio diversification. An interpretation of diversification, whether it can result in a gain or not, is the area of interest of international investors.

If the stock markets move together, investing in various national stock markets would not have any gain. So, global investors can reach a better decision through the analysis of the relationship between stock markets. Different studies have examined the interdependence among stock exchanges across the world. The stock market linkages of five ASEAN members – Indonesia, Malaysia, Thailand, the Philippines, and Singapore – were examined by Palac-McMiken (1997), concentrating on price indices from these countries between 1987 and 1995. To test the ASEAN stock markets' integration, Palac-McMiken (1997) adopted the cointegration approach, and found that all markets except Indonesia were linked with each other.

To assess the feasibility of policy initiatives in increasing the ASEAN stock market integration, Click and Plummer (2005) focused on the degree to which ASEAN stock markets of Indonesia, Malaysia, Singapore, the Philippines and Thailand are correlated. An empirical suggestion is that the ASEAN-5 stock markets are cointegrated. There exists a long-run relationship among the ASEAN markets. For extracting long-run relationships, what is mainly considered here is whether the ASEAN-5 markets are integrated employing the time series technique of cointegration. National borders do not completely segment these. Therefore, this study concludes that ASEAN-5 stock markets are integrated in the economic sense, but that integration is far from complete. Initiatives are there for further integration of the stock markets, which are feasible and desirable.

Based on Auto-Regressive Distributed Lag (ARDL), Karim and Karim (2012) examined the integration amongst five selected ASEAN emerging inventory markets (Malaysia, Thailand, Indonesia, the Philippines and Singapore). They found that stock market integration in the ASEAN region happened throughout the pre- and post- 1997.

From the research on worldwide interdependences of stock markets, one finds that they are shifting toward more integration amongst themselves, particularly after the global financial crisis. This implies that the long-run diversification advantages, possibly earned through buyers throughout the ASEAN markets, tend to diminish. Additionally, as the inventory markets are interdependent, there is a need for coverage coordination among the ASEAN locations to mitigate economic fluctuations.

Robiyanto (2017) used the Orthogonal Generalized Autoregressive Conditional Heteroscedasticity (OGARCH) method to investigate the capital markets integration in ASEAN. This method could quantitatively provide the degree of integration. Capital markets from Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Thailand Stock Exchange, Singapore Stock Exchange and The Philippines Stock Exchange were studied from 2001 to 2006. It was found that there was a co-movement among the examined ASEAN capital markets, but not all these ASEAN capital markets were fully integrated. This study also found that Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Stock Exchange Thailand, and Singapore Stock Exchange were integrated, but the Philippines Stock Exchange was not. The Philippines Stock Exchange tended to be more segmented than integrated.

Sharma and Chua (2000) reflected on the financial integration and intra-regional change in the following ASEAN countries: Indonesia, Malaysia, the Philippines, Singapore and Thailand. To meet the goal, a gravity model was estimated, based on the information from 1980 to 1995, for every one of these five ASEAN countries. The analysis revealed that the alternate in ASEAN countries increases with the dimension of the economy. The ASEAN integration scheme did not enlarge the intra-ASEAN trade, but an extension in alternate occurred with individuals of a wider APEC group.

Phuan, Lim, and Ooi (2009) examined the relationship between stock markets integration and financial liberalization among ASEAN-5 stock markets. Based on the progress of economic liberalization, three sample periods were covered. The results show that there was no long-run relationship during the first period of the Singapore Stock Market liberalization. This analysis was made using the Johansen and Juselius multivariate cointegration procedures, Granger Causality tests and variances decomposition analysis. However, in the second period of liberalization of stock markets by Thailand, Malaysia and Indonesia and during the third period following the Philippines' liberalization, ASEAN-5 stock markets established long-run relationships. After the financial liberalization, both long-run integration relationships and short-run causality relationships among the ASEAN-5 markets increased. In the wake of financial liberalization, Thailand, Malaysia, Indonesia and the Philippines received increased influences from other stock markets. On the other hand, Singapore remained unaffected by others. Stock markets that liberalize earlier will have a greater influence on other stock markets.

Jakpar, Vejayan, Johari (2013) analyzed the co-movement of stock market volatility from 2000 to 2009 between China and the ASEAN-5 nations. They used the ADF unit root test, JJ cointegration test, Granger Causality test, GARCH (1, 1), etc., to analyze the cointegration among different countries. The result suggested the existence of two-way relations: bidirectional causality between China and Indonesia, China and Thailand and China and Singapore. Meanwhile, there was no relation of causality between China and Malaysia and China and the Philippines. However, one can conclude that there were relationships between regions in the inventory market volatility.

Lim (2009) explained the rapid boom and low

correlations between rising markets in the Southeast Asian region, which could offer higher returns and a decrease in portfolio hazard for international investors. This paper examines the linkages between the inventory markets of ASEAN's original members Indonesia, Malaysia, the Philippines, Singapore and Thailand over the period from 1990 to 2008. Primarily, the focus was to highlight the correlations and long-run relationships among the ASEAN-5 market indices. It is possible to assess the symptoms of convergent or extended integration between markets after the 1997 Asian Economic Crisis. However, some evidence suggests an increase in the integration and interdependence stage between the ASEAN-5 markets after the financial crisis. Additionally, in all ASEAN-5 markets, the US market has a full-size influence.

Lee and Jeong (2016) investigated stock markets like China and the US and their relationship or cointegration with the ASEAN Economic Community (AEC). For replicating the time-varying market integration, a GARCH threat decomposition mannequin was developed. The primary findings were as follows:

1. The AEC has a greater built-in with the regional

stock market than with the international stock market.

2. Usually, the domestic financial situations navigate the motion in the AEC inventory market.
3. Exterior shocks solely affect the stage of integration of the AEC temporarily.
4. International investors can considerably minimize unsystematic hazard by adding an AEC market portfolio into their existing portfolios.

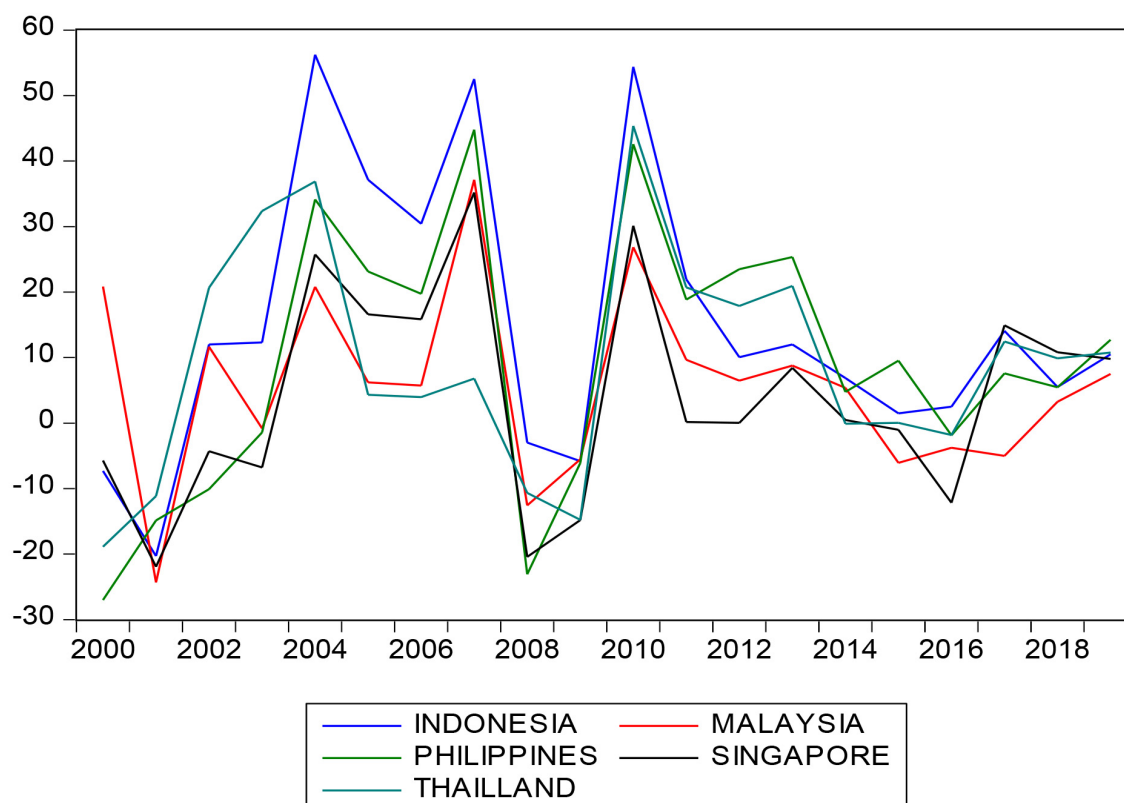
Jiang, Nie, and Monginsidi (2017) attempted to learn about the co-movement and volatility fluctuation between the ASEAN stock markets from a new perspective. Their analysis delved more deeply into the effect of ASEAN buying and selling hyperlink institutions on temporary interdependency. The interdependence level and lag-lead relationship among ASEAN capital market returns are estimated by applying three-dimensional non-stop wavelet change (CWT) on daily returns of stock markets for the duration of 2009 to 2016. The degree of interdependence in ASEAN inventory markets is determined to be more desirable in the short term, particularly unique external shocks.

Table 2: Stock Market Returns of ASEAN Countries

Year	Indonesia	Malaysia	Philippines	Singapore	Thailand
2000-01	-7.3	20.83	-27.02	-5.73	-18.88
2001-02	-20.29	-24.33	-14.86	-21.94	-11.14
2002-03	11.98	11.63	-10.1	-4.32	20.66
2003-04	12.3	-0.81	-1.43	-6.76	32.35
2004-05	56.24	20.79	34.14	25.74	36.87
2005-06	37.12	6.22	23.11	16.58	4.31
2006-07	30.43	5.73	19.72	15.82	3.94
2007-08	52.5	37.15	44.77	35.21	6.79
2008-09	-2.99	-12.57	-23.07	-20.44	-10.66
2009-10	-5.79	-5.53	-6.12	-14.83	-14.8

2010-11	54.35	26.84	42.58	30.13	45.37
2011-12	21.92	9.65	18.86	0.15	20.68
2012-13	10.04	6.47	23.49	0.03	17.87
2013-14	11.99	8.75	25.34	8.4	20.91
2014-15	6.87	5.36	4.77	0.48	-0.1
2015-16	1.5	-6.07	9.53	-1.05	0.02
2016-17	2.5	-3.78	-1.89	-12.18	-1.84
2017-18	14.07	-5.02	7.59	14.91	12.44
2018-19	5.5	3.25	5.45	10.8	9.87
2019-20	10.5	7.5	12.7	9.8	10.75
S. D	21.14	13.97	20.11	16.02	17.20
Mean	15.17	5.60	9.378	4.04	9.27
Co-efficient of Variation	139.36	249.40	214.48	396.70	185.53

Figure 1: Stock Market Return of ASEAN Countries



The descriptive statistics of stock market returns are summarized in Table-2. It also shows a detailed analysis of the risk and return of all ASEAN stock market performance. Indonesia and Thailand have the highest market return (15 percent and 10 percent, respectively). The market with the highest return is Indonesia (15 percent), while the one with the lowest return is Singapore (4 percent). Moreover, the standard deviations and time-series plots of ASEAN-5 stock market returns are relatively volatile. High standard deviation indicates high risk or volatility, and a low standard deviation indicates less risk; similarly, a high coefficient of variation indicates a greater level of risk. The market with the highest risk is Indonesia (21.44), and the lowest risk is that of Malaysia (13.97). The coefficient of variation is the ratio of the standard deviation to the mean. The higher the coefficient of variation, the greater the level of dispersion around the mean. The coefficient of variation is lowest in Thailand (185.53) and the highest in Singapore (396.70).

Therefore, comparing the risk- return relationships of ASEAN market, Thailand is the best market in terms of return and risk.

Unit Root Test

It is necessary to test for the stationarity of the time series before proceeding to the cointegration and long-run relationship of the model. The results of both the Augment Dickey Fuller (ADF) test and Phillips Peron (PP) test (Table 3) show that all variables are stationary at level.

Table 3: Unit Root Test Results

Stock market return	Stationary
Indonesia	I(0)
Malaysia	I(0)
The Philippines	I(0)
Singapore	I(0)
Thailand	I(0)

Source: Author's calculation

Table 4: Johansen Cointegration Approach

Trend assumption: Linear deterministic trend

Series: THAILAND INDONESIA MALAYSIA THE PHILIPPINES SINGAPORE

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.926600	100.8749	69.81889	0.0000
At most 1 *	0.789100	53.86194	47.85613	0.0123
At most 2	0.568289	25.84723	29.79707	0.1334
At most 3	0.349098	10.72724	15.49471	0.2288
At most 4	0.153430	2.998117	3.841466	0.0834

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* Denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.926600	47.01295	33.87687	0.0008
At most 1 *	0.789100	28.01470	27.58434	0.0441
At most 2	0.568289	15.11999	21.13162	0.2806
At most 3	0.349098	7.729121	14.26460	0.4069
At most 4	0.153430	2.998117	3.841466	0.0834

Max-eigenvalue test indicates 2 Cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The Johansen maximum likelihood method is used to test for the existence of long-run cointegrating relationships among the ASEAN-5 market indices. Table 3 explains the trace statistic and maximum eigenvalue statistic points out two cointegrating equations at 5% level (Table-4). This means that all capital market returns are cointegrated. If variables are cointegrated, this means that there is a long-run relationship between Thailand and other ASEAN capital markets.

Table 5: Granger Causality Test: Impact of Thailand on Other ASEAN Countries

Null Hypothesis	F Statistic	Prob.
Thailand does not Granger-cause the Philippines.	1.45628	0.268
The Philippines does not Granger-cause Thailand	6.79296	0.009
Thailand does not Granger-cause Indonesia.	0.6088	0.941
Indonesia does not Granger-cause Thailand	2.18881	0.151

Thailand does not Granger-cause Malaysia.	.38105	0.069
Malaysia does not Granger-cause Thailand	3.18446	0.074
Thailand does not Granger-cause Singapore.	1.20577	0.330
Singapore does not Granger-cause Thailand	6.58888	0.010

The results of the Granger causality test are summarized in Table-5 and reveals reveal a bidirectional or unidirectional causal relationship among the member countries of the ASEAN economy. This test was conducted to determine the significance and direction of causality between market returns and was performed pair-wise between two countries. The result shows that there is a unidirectional causality effect of the Philippines and Thailand and Singapore and Thailand. In this period, the null hypothesis of no Granger causality is rejected in the case of the above countries' market returns. It means that there is a unidirectional causality between the two stock markets during the study period. It also shows that there is a bidirectional causality effect between Thailand and Malaysia. That means that the Thailand Stock

Market influences the stock market of Malaysia and vice versa. This study concludes that there are no co-movements between Indonesian and Thailand markets.

Conclusion

This research paper examined the dynamic interdependence of the five founding members of ASEAN, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. Understanding the information linkages and correlations between markets is important for policy makers and fund managers for their financial decisions regarding investment and risk management. An examination of the ASEAN-5 stock market returns indicates that the highest return comes from Indonesia (15.172) and the lowest from Singapore (4.040), whereas the highest risk is that of Indonesia (21.44) and the lowest is that of Malaysia (13.97).

The main purpose of this study was to measure the dynamic linkages among Asian stock markets, and the results indicate that there is a co-movement among the ASEAN-5 capital markets, but not all ASEAN-5 capital markets are fully integrated. This study also found that Malaysia Stock Exchange, Stock Exchange of Thailand, Singapore Stock Exchange and the Philippines Stock Exchange were fully integrated, but Indonesia Stock Exchange was not. It has been found that equity market integration in these economies is not yet complete, allowing certain degrees of portfolio diversification opportunities for gains in these markets. More specifically, the ASEAN-5 stock markets provide more portfolio diversification opportunities for long-term investors than short-term investors. In short, Thailand, Malaysia, Singapore and the Philippines markets have received increased influences from other stock markets in the progress of financial liberalization, whereas Indonesia remains unaffected.

Research Limitations

The study only focuses on capital markets integration of the five founding member countries of ASEAN, i.e., Malaysia, Indonesia, Thailand, Singapore and the Philippines.

Policy Implication

Understanding the information linkages and correlations between markets is important for policy makers and fund managers for their financial decisions regarding investment and risk management. Incomplete or partial capital market integration offers opportunities for portfolio diversification in new and emerging markets for maximizing returns.

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