

Capital Market Integration of ASEAN Countries: An Empirical Analysis

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Abstract

The financial integration of Southeast Asian markets is an important research topic. The behavior of these emerging economies is gaining great interest due to the recent global evolution of financial markets. This research article empirically analyzes the exchange rate integration of international portfolio diversification in Southeast Asian countries Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The Augmented Dickey-Fuller unit root test was used to test the static properties of the market performance of ASEAN countries. An analysis of the cointegration between the market returns of these countries was carried out using the Johansen cointegration approach. Movements between ASEAN economies were analyzed using the Granger causality test. The results of the Granger causality tests show the interdependence between the returns of the ASEAN Market-5. This suggests a common movement of the ASEAN capital markets, but not all of these ASEAN capital markets were fully integrated. This study also found that the Malaysian Stock Exchange, the Thailand Stock Exchange, the Singapore Stock Exchange, and the Philippine Stock Exchange were fully integrated, but the Indonesian Stock Exchange was not. This study provides information for policymakers, portfolio managers, national and international investors, risk analysts, and financial researchers to diversify their investment portfolios by combining assets from each ASEAN country.

Keywords: capital market integration, ASEAN, emerging market, market risk

1. INTRODUCTION

The integration of capital markets is an interesting topic for stock market researchers. So, it is not surprising if there are many pieces of research on the same. The phenomenon of financial integration is closely linked together with the financial markets in neighboring, 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 of 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, Philippines, Singapore, and Thailand. Then later joined by other countries as well. Being an inter-governmental organization of the South-East Asian countries, it 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 is an essential feature of ASEAN. Now considered a regional and international player, cooperation is the key ingredient to make the ASEAN successful. It is not about signing treaties or agreements but about the people who fulfill the dreams of the 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 neighbors. 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 prevailing socio-political instability within many of its member countries. Globalization was the main cause of the 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

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heavy competition, financial incapability, foreign investments, etc. Insecurity caused by neighbors or non-ASEAN countries was severe. Neighboring 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 it comes 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 basic principles.

The ASEAN Capital Markets Forum (ACMF) is a forum comprising of capital market regulators from 10 ASEAN jurisdictions - Brunei Darussalam, Cambodia, Indonesia, Laos PDR, Malaysia, Myanmar, 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 is 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 6 ASEAN country exchanges - Indonesia, Malaysia, Singapore, Philippines, Thailand, and Vietnam, was formed on 18 th September 2012. These exchanges aim 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 in 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 across the international capital markets to firms. The higher the degree of interdependence and integration, the higher is the accessibility to international capital markets to firms with a lower cost of equity. It also provides exposure to local markets from global and regional shocks. The degree of market co-movements is a critical factor for 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 and Rose, 1998) and financial market integration (Baltzer et al., 2004).

The debate of equity market integration in ASEAN-5 emerging equity markets is yet not settled, thereby justifying the need for re-examining the issue over a different time scale, and de-

plying a different method of observation. This study focuses on an analysis carried out to establish the stock market return of ASEAN countries and the relationship between each other. 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.

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 platform. To promote financial integration in the ASEAN capital market forum, the capital experts and regulators from 10 countries generated an implementation plan. This step will place the ASEAN exchange within the top 10 market capital among the World Federation of Exchange (WFE). Despite its appearance as a positive goal, many issues are to be dealt with, especially financial deregulation. The Asian financial crisis of 1997 was because of financial deregulation. So, the 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 towards diversification of markets, high returns, easy access to capital market etc. Therefore, it is crucial to find out the dynamic linkages among the stock market returns of the countries. Objectives of the study are to analyze the market return and volatility of ASEAN stock markets, to explore the causal relationship and co-integration among ASEAN stock markets, and to investigate the short-run relationship among ASEAN stock Markets.

The study will help to understand better the association between well-established ASEAN stock markets -Malaysian Stock Exchange, Stock Exchange of Thailand, Singapore Stock Exchange, 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.

2. LITERATURE REVIEW

Various finance theories suggest that investors should hold a well-diversified portfolio to reduce risk. According to Markowitz's Portfolio Theory (Markowitz, 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 generate any gain. So, global investors can reach a better decision through the analysis of the relationship between stock markets. Different studies examined the interdependence among the world stock exchanges. The stock markets linkages of five ASEAN members - Indonesia, Malaysia, Thailand, Philippines, and Singapore, were examined by Palac-McMiken (1997). This research concentrates on price indices

from Indonesia, Malaysia, the Philippines, Singapore, and Thailand from 1987 to 1995. For testing the ASEAN stock markets' integration, this study adopted the cointegration approach, and it was identified that all markets are linked with each other, except Indonesia.

To assess the feasibility of policy initiatives in increasing the ASEAN stock market integration, [Click and Plummer \(2005\)](#) focused on the degree to which five ASEAN stock markets are correlated. For extracting long-run relationships, what's mainly considered here is whether the ASEAN-5 markets are integrated employing the time series technique of cointegration. The empirical suggestion is that the ASEAN-5 stock markets are cointegrated, and there exists a long-run relationship between the ASEAN markets. 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). This study found that stock market integration in the ASEAN region happened throughout the pre- post-1997. From the much 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 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. The capital markets - Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Thailand Stock Exchange, Singapore Stock Exchange, and Philippines Stock Exchange - were studied from 2001 to 2006. The result of this study was 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 there was integration of Indonesia Stock Exchange, Kuala Lumpur Stock Exchange, Stock Exchange Thailand, and Singapore Stock Exchange but not of the Philippines Stock Exchange. 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, Philippines, Singapore, and Thailand. Towards meeting the goal, a gravity model is estimated, based on the information from 1980 to 1995, for every one of these five ASEAN international locations. 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 extend in alternate

occurred with individuals of a wider APEC group.

[Phuan et al. \(2009\)](#) 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 are covered. There was no long-run relationship during the first period of the Singapore stock market liberalization. This analysis is 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, the ASEAN-5 stock markets established long-run relationships. After the financial liberalization, both the long-run integration relationships and the short-run causality relationships among ASEAN-5 markets have increased. In the wake of financial liberalization, Thailand, Malaysia, Indonesia, and the Philippines have received increased influences from other stock markets. On the other hand, Singapore remains unaffected by others. Stock markets that liberalize earlier will have a greater influence on other stock markets.

[Jakpar et al. \(2013\)](#) found out about targets to look at 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 the different countries. The result suggests two-way relations: bidirectional causality between china and Indonesia; China and Thailand; and China and Singapore. Meanwhile, there is no relation of causality between China and Malaysia and China and the Philippines. However, one can conclude that there are relationships between regions in the inventory market volatility.

[Lim \(2009\)](#) explained the rapid boom and low correlations between rising markets in the South-East Asian region. It could offer higher returns and a decrease in portfolio hazard for international investors. This paper examines the linkages between the inventory markets of ASEANS' 5 original members - Indonesia, Malaysia, the Philippines, Singapore, and Thailand over a period from 1990 to 2008. Primarily, the focus is to highlight the correlations and long-run relationships among the ASEAN-5 market indices. Where through, evaluation of any symptoms of converging or extended cross-market integration after the 1997 Asian economic crisis can be possible. 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 the dynamic sample of stock market family members between the ASEAN Economic Community (AEC) and two essential stock markets - China and the United States. For replicating the time-varying market integration, a GARCH threat decomposition mannequin was developed. The primary findings are 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.

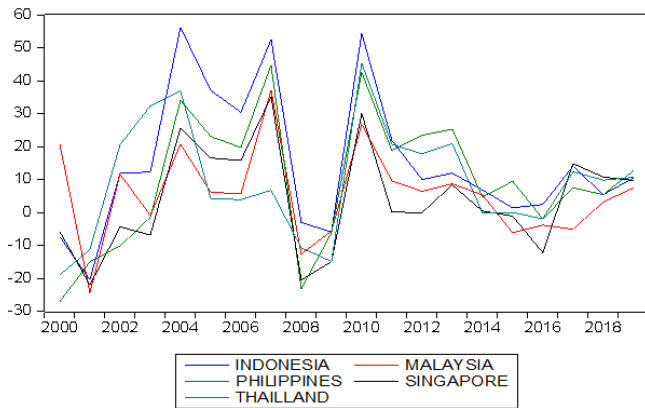


Figure 1: Stock Market Return of ASEAN Countries

3. Exterior shocks solely affect the stage of integration of the AEC temporarily.
4. International investors can considerably minimize unsystematic hazards by adding an AEC market portfolio into their existing portfolios.

Jiang et al. (2017) attempted to learn about the co-movement and volatility fluctuation between the ASEAN stock markets from a new perspective. This analysis delves more deeply into the effect of ASEAN buying and selling hyperlink institutions on temporary interdependency. The interdependence level and lag-lead relationship among ASEAN trading hyperlink contributors 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 1 shows the capital market and indices of five major ASEAN countries – the Indonesian capital market (JKSE or JIC), the Singaporean capital market (STI), the Malaysian capital market (KLCI), the Philippines capital market (PSEI) and the Thailand capital market (SETI).

It is necessary to test for stationarity of time series before proceeding the co-integration and long-run relationship of the model. The results of both the Augment Dickey-Fuller (ADF) test and Phillips Peron (PP) test (Refer Table 2) show that all variables are stationary at level.

3. RESULTS AND DISCUSSION

The Johansen maximum likelihood method is used to test for the existence of long-run co-integrating relationships between the ASEAN-5 market indices. The Table 3 explains the Trace Statistic and Maximum-eigenvalue statistic point out two co-integrating equation at five percent level. That means all capital market return are co-integrated. If variables are co-integrated that leads to there is a long run relationship between Thailand and other ASEAN Capital Markets.

The Descriptive Statistics of stock market returns are summarized in Table 1. It exhibits to know the level of risk and return relationship among the ASEAN stock market performance.

Indonesia and Thailand are shown to have the highest market return (15 percent and 10 percent, respectively). It is observed that the market which has the highest return is that of Indonesia (15 percent) and the lowest return is that of Singapore (4 percent). Moreover, the standard deviations and time-series plots of ASEAN-5 stock market returns are relatively volatile. A high standard deviation indicates high risk or volatility and a low standard deviation indicates less risk similarly a high coefficient of variation indicates that the greater the level of dispersion around the mean. The market which has the highest risk is that of Indonesia (21.44) and the lowest 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. It is observed that the coefficient of variation is lowest in Thailand (185.53) and the highest coefficient of variation is of Singapore (396.70). therefore the trade-off between the risk-return relationships Thailand is the best market compared to other ASEAN Stock markets.

4. RESEARCH METHODS

4.1. 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, Philippines, Malaysia, Singapore and Thailand.

4.2. Data Analysis

Unit Root Test check the stationary time series data. The Augmented Dickey-Fuller Test (ADFT) by Fuller and the Phillip Peron Test by Peron are the two tests used for stationary data. The long-run relationship among the ASEAN capital market returns has been explored by employing Johansen's cointegration technique. Granger Causality test by Granger is to resolve the causality concerning variables in the internal relation. Hence, this technique was used to detect the actual causal relationship between ASEAN countries' market returns.

The results of the Granger Causality test are summarized in Table 4. In other words, Granger Causality test results reveal a bidirectional or unidirectional causal relationship among the member countries of the ASEAN economy. These tests are conducted to know the significance and direction of causality between the market returns and it is performed in pair-form between two countries of ASEAN Countries.

The result shows that there is a unidirectional causality effect of the Philippines and Thailand, Singapore, and Thailand. In this period, the null hypothesis of no Granger causality is rejected in the case of the above country's market return. It means there is a unidirectional causality between these two stock markets in the study period. It also shows that there is a bidirectional causality effect between Thailand and Malaysia. That means the Thailand stock market influences the stock market of Malaysia. At the same time, the Malaysian stock market has an influence or significant effect on Thailand's stock market. At the same time, this study concludes that there are no co-movements between the Indonesian and Thailand market.

Table 1: 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

Source: World Bank Database 2020

Table 2: Unit Root Test Results

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

Source: author's calculation

5. CONCLUSION

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

There was a co-movement among ASEAN capital markets, but not all these ASEAN capital markets were fully integrated. This study also found that Malaysia Stock Exchange, Stock Exchange of Thailand, Singapore Stock Exchange, Philippines Stock Exchange were fully integrated but Indonesia Stock Exchange was not. It has been found that the equity market integration in these economies has not yet been complete, thereby providing certain degrees of portfolio diversification opportuni-

ties for making abnormal gains in these markets. More specifically, the ASEAN stock markets provide more portfolio diversification opportunities for long-term investors compared to 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 by the others.

Understanding the information linkages and correlations between markets are important for policymakers and fund managers in their financial decisions with investment and risk management. Incomplete or partial capital market integration carries with it the opportunities for portfolio diversification in new and emerging markets for maximizing excess returns.

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Table 3: Johansen Co integration Approach

Trend assumption: Linear deterministic trend
 Series: THAILAND INDONESIA MALAYSIA PHILIPPINES SINGAPORE
 Lags interval (in first differences): 1 to 1
 Unrestricted Co integration 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 Co integration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace 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

Source: Calculation

Table 4: Granger Causality Test: Impact of Thailand on other ASEAN countries

Null Hypothesis	F Statistic	Prob.
Thailand does not Granger Philippines.	145.628	0.268
Philippines does not granger cause Thailand	679.296	0.009
Thailand does not Granger Indonesia.	0.06088	0.941
Indonesia does not granger cause Thailand	218.881	0.151
Thailand does not Granger Malaysia.	.38105	0.069
Malaysia does not granger cause Thailand	318.446	0.074
Thailand does not Granger Singapore.	120.577	0.330
Singapore does not granger cause Thailand	6.58888	0.010

Source: author's calculation

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