



USAID
FROM THE AMERICAN PEOPLE



Impact of ASEAN Capital Market Integration on Indonesia's Capital Market and Economy

January 2013

This publication was produced by the DAI-Nathan Group for review by the United States Agency for International Development.

Impact of ASEAN Capital Market Integration on Indonesia's Capital Market and Economy

January 2013

This publication was produced by DAI/Nathan Group for review by the United States Agency for International Development (USAID). It is made possible by the support of the American people. Its contents are the sole responsibility of the author or authors and do not necessarily reflect the views of USAID or the United States

Contents

Executive Summary	vii
1. Background	1
2. Initiatives for ASEAN Capital Market Integration	3
Working Group A—Mutual Recognition Framework	4
Working Group B—Collective Investment Schemes and Debt Securities	5
Working Group C and DREM	6
Working Group D	6
Working Group E	7
3. Macroeconomic Indicators of ASEAN Countries	9
General Macroeconomic Indicators	9
Structure of Financial System in ASEAN Countries	21
Macroeconomic Indicators Related to Potential Investors	23
4. ASEAN Stock Exchanges	27
5. Integration of ASEAN Capital Markets	33
Liquidity Profile	33
Volatility Profile	35
Dynamic Correlation	37
Volatility Spillover	44
Dynamic Cointegration	45
6. Impact of Integration on Macroeconomic Variables	47
7. Stakeholders Perceptions of ACMI Plan	53
Stakeholders' Awareness of ACMI Plan	53
Preparation (of policies, legal Framework, hardware, software) for ACMI	53
Exit Policy	54
Distribution of Benefits of Capital Market Integration	54
Activities and Professions Affected Negatively by ACMI	54

Mechanism for risk sharing and risk mitigation in ACMI	55
8. SWOT Analysis	56
Strengths	56
Weaknesses	57
Opportunities	59
Threats	60
9. Concluding Remarks	61
Bibliography	64
Appendix A. Literature Review	1
Definition of Capital Market Integration	1
Capital Market Integration	1
Contagion and Spillover	1
Evidence on Capital Market Integration	1
Risk Sharing	2
Impact of Integration on Macroeconomy	4
Summary of Other Previous Studies on Impact of Capital Market Integration	10
Appendix B. Data and Research Methodology	1
Data	1
Research Methodology	2
Dynamic Conditional Correlation	3
Cointegration	5
GARCH-in-Mean	6
Panel Data Regression	6
Focus Group Discussions and In-Depth-Interviews	8
Appendix C. E-Views Output	10
Appendix D. Microstructures of ASEAN Stock Exchanges	1

Illustrations

Figures

Figure 3-1 <i>Annual GDP Growth, ASEAN Countries and China, 2005–2012</i>	9
Figure 3-2 <i>Ratio of Investment to GDP of ASEAN Countries and China, 2005–2012</i>	11
Figure 3-3 <i>Inflation Rate of ASEAN Countries and China, 2005–2012 (%)</i>	12
Figure 3-4 <i>Current Account Balance of ASEAN Countries and China, 2005–2012</i>	13
Figure 3-5 <i>Current Account Balance of ASEAN Countries, 2005–2012</i>	13

Figure 3-6	<i>Government Budget Surplus or Deficit for ASEAN Countries and China, 2005–2011</i>	14
Figure 3-7	<i>Net Inflows of Foreign Direct Investment for ASEAN Countries and China, 2005–2011 (% of GDP)</i>	15
Figure 3-8	<i>Net Inflows of FDI for ASEAN Countries and China, 2005–2011</i>	16
Figure 3-9	<i>Growth of Net FDI Inflows in ASEAN Countries and China, 2005–2011</i>	17
Figure 3-10	<i>Regional Comparison of Ease of Doing Business Index, 2011–2012</i>	17
Figure 3-11	<i>Regional Comparisons of Trade as a Fraction of GDP, 2005–2011</i>	18
Figure 3-12	<i>ASEAN Countries' Financial Structures (Percent of GDP), 2009</i>	21
Figure 3-13	<i>Ratio of Market Capitalization to GDP of ASEAN-5 Countries, 2000–2011</i>	22
Figure 3-14	<i>Structure of Indonesian Financial System, 2012</i>	23
Figure 3-15	<i>Economic Integration Score among Asian Countries in 2012 (Pre-AFC, post-AFC, and global crisis)</i>	26
Figure 4-1	<i>Quarterly ASEAN Stock Returns 2010–2012</i>	29
Figure 4-2	<i>Market Capitalization as Percentage of GDP of ASEAN in 2011</i>	30
Figure 4-3	<i>Market Capitalization as Percentage Among ASEAN Countries</i>	32
Figure 5-1	<i>Liquidity Dynamics in the ASEAN Region and United States.</i>	33
Figure 5-2	<i>Firm Level Liquidity and Volatility of ASEAN Stock Market</i>	36
Figure 5-3	<i>Dynamic Conditional Correlation of the Indonesia Stock Market with other Stock Markets in the ASEAN Region.</i>	38
Figure 5-4	<i>Dynamic Conditional Correlation of the Thailand Stock Market with other Stock Markets in the ASEAN Region</i>	40
Figure 5-5	<i>Dynamic Conditional Correlation of the Malaysian Stock Market with other Stock Markets in the ASEAN Region</i>	41
Figure 5-6	<i>Dynamic Conditional Correlation of the Philippines Stock Market with other Stock Markets in the ASEAN Region</i>	42
Figure 5-7	<i>Dynamic Cointegration Analysis</i>	46
Figure 8-1	<i>Credit and Deposit to GDP Ratio</i>	57
Tables		
Table 3-1	<i>GDP Growth in Asia (%)</i>	10
Table 3-2	<i>Exchange Rate Arrangement and Year of ITF Adoption</i>	20
Table 3-3	<i>Demographic Comparison of ASEAN Countries in 2009</i>	24
Table 3-4	<i>Gross National Savings in ASEAN Countries, 2010</i>	24
Table 3-5	<i>GDP per Capita ASEAN-6 (USD)</i>	25
Table 3-6	<i>GDP per Capita ASEAN-3 (Cambodia, Laos, Vietnam) (USD)</i>	25
Table 4-1	<i>Trading Mechanisms of ASEAN+3 Stock Markets.</i>	27
Table 4-2	<i>Pre-trade Transparency</i>	28
Table 4-3	<i>Order Types—Continuous Auction</i>	28
Table 4-4	<i>Number of Listed Companies and Market Capitalization</i>	31
Table 5-1	<i>Firm-level, Zero-return Incidence in ASEAN Equity Market from 2000–2012.</i>	34
Table 5-2	<i>Firm Level Annual Range-based Volatility</i>	37
Table 5-3	<i>Illiquidity Regression Analysis</i>	44
Table 5-4	<i>Volatility Spillover Estimation</i>	45
Table 6-1	<i>Impact of Capital Market Integration on Market Capitalization in ASEAN-4 (Dependent Variable: Market Capitalization)</i>	47

Table 6-2	<i>Impact of Capital Market Integration on Investment (Dependent Variable: Log of Total Investment)</i>	48
Table 6-3	<i>Impact of Capital Market Integration on GDP (Dependent Variable: Log GDP)</i>	49
Table 6-4	<i>Impact of Capital Market Integration on Total Investment [Dependent Variable: d (Log Total Investment in Indonesia)]</i>	49
Table 6-5	<i>Impact of Capital Market Integration on Market Capitalization (Dependent Variable: Market Capitalization Indonesia)</i>	50
Table 6-6	<i>Impact of Investment, Employment, and Market Capitalization on GDP in Indonesia [Dependent Variable: d(Log GDP Indonesia)]</i>	50
Exhibit		
Exhibit 2-1	<i>Strategic Components of ACMF Implementation Plan for Integrating Capital Markets</i>	4
Exhibit 4-1	<i>Description of Order Types</i>	29

Executive Summary

We analyze the ASEAN key macroeconomic performance related to stock market development. There is a wide gap of GDP per capita between ASEAN countries. Except for Brunei, GDP per capita is highly correlated with capital market development. Singapore, which has the highest GDP per capita, is a financial center with the best capital market in ASEAN. Indonesia is in the middle to low position compared to other ASEAN members. Indonesia, however, has the greatest potential for developing a stock market and facilitating ASEAN stock market integration. Indonesia has the greatest number of potential investors, with its large population aged 20–64 years old— the largest among ASEAN countries. Moreover, Indonesia also has many medium-sized companies that are potentially growing and are not yet listed as public companies.

After discussing the macroeconomic indicators, we analyze the ASEAN stock markets from a market microstructure perspective, focusing on two measures: liquidity and volatility. We find that ASEAN stock exchanges vary in liquidity and volatility. Indonesia and Thailand share similar patterns and magnitude of liquidity and volatility, indicating partial integration happens naturally for these two countries. We found similar evidence for Malaysia and the Philippines.

Further analysis of the sensitivity of stock exchange performance to international information reveals that, again, Indonesia and Thailand are the most sensitive to international financial market information. This finding indicates that Indonesia and Thailand may have substantial foreign investors' presence in their stock markets.

We analyzed the possibility of improving liquidity if ASEAN stock markets are integrated. The empirical evidence shows that while integration would provide greater liquidity in ASEAN stock markets, the liquidity risk is also transmitted among them. As we analyze daily stock price data to measure liquidity, we find the transmission of liquidity risk could happen in only one day. Hence, the integration of ASEAN stock markets may increase liquidity but may also trigger a systemic liquidity risk in the region.

Our analysis of dynamic integration reveals time-varying integration in the ASEAN region from 2000 to 2012. Without government intervention, ASEAN capital markets show the most stable integration during 2005–2007. Unfortunately, natural integration does not hold in the long-term or it is short term in nature.

In our macroeconomic analysis we found that capital market integration measured by a decrease in spread and money market rate differential will increase market capitalization significantly. Moreover, capital market integration measured by a decrease in money market rate differential will also increase total investment. In turn, both market capitalization and total investment have positive and significant effects on GDP growth.

Besides quantitative analysis, we also complement our analysis with in-depth interviews and focus group discussions. In-depth interviews were conducted with the Indonesian task force joining all five working groups of the ASEAN Capital Market Forum (ACMF). Focus group discussions were conducted with capital market regulators, the central bank, Ministry of Finance fiscal policy agency, SROs, and capital market professional associations. Interview results show that each ASEAN capital market is at a different level of development. ACMF currently agrees to adopt expedited review instead of mutual recognition framework, due to the differences and complexity of regulations in each ASEAN country.

Based on focus group discussion results and other analysis, this study finds that the following prominent issues should be addressed.

- First, most market participants are not fully aware of the integration plan. Some have heard about the plan from the IDX as the Indonesian representative in the ASEAN Exchange Linkage (Working Group E). Not knowing the direction and the extent of the plan makes them unable to prepare themselves.
- Second, market participants indicate that they are not ready to face the fully integrated ASEAN capital market, due to their limited capacity (capital, human capital, system, and experience) to compete head on with more advanced counterparts.
- Third, some market participants indicate that capital market regulators, central bank, and the Ministry of Finance should coordinate better, especially before they issue a new policy that may affect the capital market.
- Fourth, the number of Indonesian capital market investors is still very small. The Indonesian financial system is still bank-dominated, and most people invest their money in the banking system. We deduce that this is partly affected by the low level of financial literacy of Indonesians compared to their ASEAN peers. Furthermore, a previous study indicates that more than 80 percent of Indonesia's upper-middle socioeconomic classes still show very negative views of the capital market.
- Fifth, if more advanced countries are allowed to offer financial products to Indonesian investors directly, due to the limited financial literacy and the shrewdness of international marketers, Indonesian investors may invest in financial products that are not suitable for their investment goals and risk appetite.

1. Background

In November 2007, leaders of ASEAN countries agreed on the ASEAN Economic Community Blueprint. The ASEAN Economic Community (AEC), which is targeted for 2015, is intended to establish a single market and production base in the region. The proposals cover wide areas in trade, investment, and economics. One component of this blueprint is a proposal to develop an integrated capital market in the ASEAN region. The argument is that intraregional financial integration is still behind increases in trade (Asian Development Bank 2012).

Several initiatives support the establishment of a single capital market in the region. In early 2008, ASEAN finance ministers met in Vietnam to discuss the capital market integration plan. They proposed to develop an implementation plan for promoting an integrated capital market to achieve the objectives of the AEC Blueprint 2015. The implementation plan was approved at the 13th ASEAN foreign ministers meeting in Pattaya, Thailand in 2009.

According to Phuvanatanarubala (2009), the implementation plan covers six principles that were agreed by ASEAN Capital Market Forum (ACMF):

1. Adoption of international standards to the extent possible
2. Progressive liberalization to facilitate more open access and cost reduction through greater competition
3. Sequencing of regional integration initiatives, with ease of implementation, market preferences, and technical linkages taken into account
4. Engage the ASEAN secretariat as the main coordinator
5. Consistent implementation of policies to support regional integration at country level, with effective monitoring mechanisms
6. Strong communications plan and consultative processes to build consensus and set priorities for integration initiatives.

The establishment of an integrated capital market is expected to result in freer international capital market movement, easier capital raise for companies, regional expansion of financial institutions, and wider choice of assets for investors.

Studies of capital market integration have had diverging results. Most studies on ASEAN integration focus on the macroeconomic policies facilitating integration possibilities. Previous studies reached different conclusions in the level of integration in ASEAN countries.

Danareksa Research Institute (2004) finds that financial integration in the region is still far behind that in Europe before its integration in 1990s. By estimating the gravity model of bilateral financial asset holdings and the consumption risk-sharing model, Kim et al. (2006) conclude that East Asian financial markets are less integrated with each other than with the

global market. Cavoli et al. (2004) show evidence of limited financial market integration, while Lee (2008) shows that the degree of regional financial integration in East Asia lags behind real (trade) integration.

Nevertheless, some studies find a higher degree of financial integration in East Asia. Jeon et al. (2006) show that the degree of financial integration in East Asia has increased recently—because of its integration with the global market rather than with regional counterparts. Kawai (2005) notes that the rise in newly industrialized Asian economies' investments contribute to the integration of the East Asian economies through foreign direct investment (FDI) and FDI-driven trade. McCauley et al. (2002) show that East Asian investors and banks have on average allocated half of the funds in bonds underwritten and loans syndicated to borrowers in East Asia. According to this measure, they assert that the financial markets of East Asia are more integrated than is often suggested. Chi et al. (2006) show that financial efficiency and the integration of East Asian equity markets are advanced and improved significantly during 1991–2005. More recently, Guillaumin (2009) reveals a high degree of financial integration for selected East Asian countries based on a modified Feldstein–Horioka model. Overall, the empirical evidence on financial integration in East Asia is mixed.

This empirical study is part of Bapepam and LK's¹ preparation to respond to the ASEAN capital market 2015 integration plan. This study is supported by the Support for Economic Analysis Development Indonesia (SEADI) project.

¹During this study period, BAPEPAM-LK is Indonesia's capital market and financial institutions supervisory agency.

2. Initiatives for ASEAN Capital Market Integration

ASEAN capital market authorities have piloted initiatives to support the establishment of an integrated capital markets. Supposedly integration is important to strengthen financial intermediation capacity and risk management and to reduce the region's vulnerability to external shocks and market volatility. Achieving an integrated market is not easy because of significant differences in the level of development of capital markets in the region. Some countries have more advanced capital markets in terms of system, number of investors, number of issuers, variety of products, product restrictions, legal frameworks, and other factors. The authority in each country also has responsibility for keeping the capital market fair and sound, ensuring that market participants follow capital market law and regulation, and maintaining financial stability.

To address challenges in integrating ASEAN capital market and to meet the diverse needs and interests of capital market stakeholders, the ASEAN Capital Market Forum (ACMF) assigned a group of experts to develop guidance for the development of the implementation plan. The ASEAN Secretariat, responsible for coordinating with financial regulators on assessing and implementing financial liberalization initiatives and tax system reform, was also involved in developing the plan. The ACMF identified six strategic components for the plan, shown in Exhibit 2-1. To implement the strategic plan, capital market authorities then established five working groups to address capital market liberalization issues. Each group has been working concurrently, and the progress has been reported to ACMF. The following section discusses the achievements and progress of each working group, especially those related to the Indonesian capital market.

Exhibit 2-1

Strategic Components of ACMF Implementation Plan for Integrating Capital Markets

<p style="text-align: center;">Strategic Component 1</p> <p>Development of a mutual recognition framework to facilitate</p> <ul style="list-style-type: none"> • Cross-border fundraising • Product distribution • Cross-border investment within ASEAN • Market access by intermediaries 	<p style="text-align: center;">Strategic Component 4</p> <ul style="list-style-type: none"> • Strengthen bond markets • Accelerate reform in bond issuance, listing, and distribution • Design a regional strategy for ratings comparability • Improve market liquidity and clearing and settlement of linkages
<p style="text-align: center;">Strategic Component 2</p> <p>ASEAN exchange alliance and governance framework</p> <ul style="list-style-type: none"> • Build trading linkages and setup ASEAN Board • Enhance governance, trading efficiency, and cost reduction • Clearing, depository, and settlement linkage • Marketing and investor education 	<p style="text-align: center;">Strategic Component 5</p> <ul style="list-style-type: none"> • Align domestic CMPD to support regional integration • Align national development initiatives to support cross-border integration • Adopt phased approach to liberalization to ensure domestic market readiness
<p style="text-align: center;">Strategic Component 3</p> <ul style="list-style-type: none"> • Promote new products and build ASEAN as an asset class • Promote private sector-led regional sector development • Promote ASEAN star companies under the ASEAN Board 	<p style="text-align: center;">Strategic Component 6</p> <ul style="list-style-type: none"> • Reinforce ASEAN working process • Establish ASEAN coordinating team, composed of dedicated resources from ASEC and dedicated point persons from ACMF members to monitor, coordinate, report on, and raise issues on the implementation plan.

Source: *ASEAN Capital Market Implementation Plan (2009)*

WORKING GROUP A—MUTUAL RECOGNITION FRAMEWORK

Working group A focuses on the issues listed in strategic component 1, the development of a mutual recognition framework. Its main task is to eliminate barriers to facilitate cross-border fundraising, product distribution, investment, and market access for financial intermediaries.

For Indonesia this process is not straightforward, because there are issues with its capital market law and other related regulations. When a foreign company wants to list shares in Indonesia, it must hire Indonesian professionals or firms, such as Indonesian law firms and accounting firms. Another example is when a selling agent from other ASEAN jurisdictions plans to sell financial products in the Indonesian market it must apply for an operational license from the Indonesian regulator. Furthermore, Bahasa Indonesia must be used for the presentations of prospectuses.

The task of the Indonesian team in this working group is crucial, because mutual recognition is key to integration. The team, however, feels a lack of guidance from the top, such as to what extent Indonesia is willing to integrate its capital market with the regional market. The team realizes that after the door is open there is no turning back.

After many discussions and meetings, this working group realizes that even to “mutually recognize” prospectuses from different jurisdictions is problematic. There are still too many differences in rules and regulations among countries. The group has reached agreement on an expedited review framework, in which if a company from one ASEAN member country (home country) plans to offer shares or other financial products to other ASEAN country (host country), the host-country regulator will expedite the review of the prospectus according to the host-country rules and regulations.

WORKING GROUP B—COLLECTIVE INVESTMENT SCHEMES AND DEBT SECURITIES

Working Group B focuses on strategic initiatives 1 and 4, specifically cross-border offerings of debt securities and collective investment schemes among ASEAN member countries. With regards to cross-border offerings of debt securities, there are three main issues in this working group: adoption and harmonization of ASEAN disclosure standard, coverage of debt securities definition, and credit ratings issues. Singapore, Malaysia, and Thailand are the three countries that are most advanced in adopting the common disclosure standard, in which they were able to remove the “pluses”. The pluses refer to rules or regulations that are not standardized. The disclosure standard covers issues such as corporate governance mechanism, description of the securities, risk factors, markets, information about public offerings, taxation, and issuers’ information. The working group B is currently working with working group A for mutual recognition of debt prospectus. The aim is that there is no need for a capital market authority to review debt offer prospectus if the same prospectus has been reviewed by other ASEAN countries’ capital market authority. Currently, Indonesia has the most strict debt issuance standards compared to Singapore, Malaysia, and Thailand. In other countries the requirements to issue bonds is less strict than stocks, but Indonesia has the same requirements for both bonds and stocks issuance.

The other main big issue discussed in working group B is cross-border offerings of collective investment scheme. This means that collective investment schemes issued and managed in ASEAN countries, meeting the qualification standards in terms of operators, trustee and custodian, offering process, and product restrictions, can be offered and sold in the region. As prerequisites, countries should have equivalence in terms of regulatory regime, being a signatory of IOSCO Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU), agree to share information on supervision and investigation, rated “broadly implemented” in relevant IOSCO principles, and not listed as non-cooperative countries by FATF. Specifically for collective investment schemes offered to nonretail investors, countries should provide exemption or fast track regime for those that meet the host country’s requirements. Working Group B currently is finalizing the products’ standard requirements and restrictions.

There are several points of working group B discussion results that may put Indonesia in disadvantaged position. One of the suggested requirements for collective investment scheme products to be offered in ASEAN region freely is the minimum assets under management (AUM) of US\$500 million. Currently, only a few Indonesian collective investment schemes products can comply with this requirement. Hence, Indonesia has suggested that the minimum requirement on AUM should be altered from “a minimum of US\$500 million” to “listed in the top 20 collective investment scheme products based on AUM in the home country”. However, there are objections from other ASEAN countries because it will imply that there should be more frequent review on collective investment scheme products to ensure that they are able to maintain their position as the top 20. The other problem is that Indonesia is not yet the signatory of IOSCO MMoU (not yet listed in the Appendix A of the MMoU), due to the local capital market regulation that do not meet some criteria, which one of them is regarding investigation cooperation among capital market authorities. Indonesia should review its capital market law in order to be able to sign the MMoU.

WORKING GROUP C AND DREM

The main task of working group C is to develop guidelines for enforcement and dispute resolution mechanisms, focusing on how to protect retail investors and to develop guidelines for cooperation and information sharing in enforcement and supervision to administer the mutual recognition. To support its first task, which is developing guidelines for dispute resolution mechanism, this working group has administered a survey to identify important aspects of law and regulation system in each ACMF members related to dispute resolution. Although there are similarities in the dispute resolution system, when it comes to the technical aspects, each ASEAN country has its unique system which is different from each other. The diversity is partly caused by the basic legal framework, such as whether the country's legal system is the derivative of civil law versus common law. Even countries with legal frameworks derived from similar law system have divergent dispute resolution techniques. Moreover, legal decision in a certain country is not automatically accepted by the other jurisdiction. Based on the survey findings, working group C developed the guidelines that serve as a general framework for dispute resolution mechanisms. Since the implementation of the guidelines itself is beyond the authority of capital market regulators, as a follow up, a taskforce known as working group DREM (for dispute resolution and enforcement mechanism) that also involves ministry of justice and attorney general's chamber of ASEAN countries was established. The work of this group is financially supported by Asian Development Bank through its technical assistance program.

Working group DREM's main task is on how to enhance alternative dispute resolution (ADR) mechanisms to make it easier and more cost-effective for retail investors to seek remedies against intermediaries regarding cross-border products. The issue for nonretail investor dispute resolution is not a major concern of this working group, because nonretail investors are deemed to possess sufficient resource and capacity needed to take legal action for their rights. In the initial phase, working group D focuses on cross-border dispute between retail investors and market intermediaries. A consultant has been assigned to detail the different ADR mechanisms in each country and provide a recommendation regarding the most appropriate cross-border dispute resolution model. The consultant has come up with three alternatives: fully centralized system (through an ASEAN Dispute Resolution Center ADRC), outsourcing (given to each country's dispute resolution mechanism), and the hybrid combination of centralized and outsourcing system (dispute resolution is done under the centralized system, while the enforcement is given to each jurisdiction). Most ASEAN members preferred the hybrid system to the other systems. The consultant is currently working on developing detailed rules and regulations for dispute resolution mechanisms.

WORKING GROUP D

Working group D focuses on strategic components 2 and 3: establishment of ASEAN exchange alliance and governance framework and promotion of new products and building ASEAN as an asset class. Two important products of working group D are the expedited review framework for secondary listing and ASEAN corporate governance standard. The main objectives of the expedited review framework are cost reduction and efficiency. In 2011, Malaysia, Singapore, and Thailand, the three countries promoting regional market integration, signed the expedited review framework. Indonesia did not sign the framework because it is not yet a signatory of International Organization of Securities Commissions (IOSCO) Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU). After the establishment of the

Indonesian Financial Services Authority (Otoritas Jasa Keuangan [OJK]), however, the information sharing issue has been addressed in a clause of the OJK Act. As a consequence, after IOSCO recognizes this information sharing clause, Indonesia is expected to be eligible to sign the IOSCO MMoU.

The second product, ASEAN corporate governance scorecard, is to help determine the ASEAN star companies (further details are explained below under working group E). Experts from each ASEAN country were involved in drawing up the scorecard, which stems from the OECD standards for corporate governance. The ASEAN corporate governance scorecard has been piloted in the 50 largest public companies (by market capitalization) of each ASEAN country—350 companies in total. The results of the pilot project show that few Indonesian companies meet the criteria. Accordingly, Bapepam & LK has launched efforts to enhance corporate governance practices by Indonesia-listed companies, including encouraging public companies to improve information disclosed on their websites. Several listed companies have websites only in Bahasa Indonesia, which makes evaluating the companies difficult for foreign parties.

WORKING GROUP E

Working group E focuses on the establishment of exchange and linkage among seven ASEAN capital markets: Bursa Efek Indonesia, Bursa Malaysia, Singapore Exchange, Stock Exchange of Thailand, Philippines Stock Exchange, Ho Chi Minh Stock Exchange, and Hanoi Stock Exchange. The members of working group E are ASEAN countries' market operators and participants. This working group is divided into four sub-working groups: business, regulation, market operation, and technology.

The business sub-working group's main responsibility is to develop a business plan for marketing the ASEAN exchange. The marketing initiatives are divided into at least two phases. Communication and marketing plan phase 1, from October 2010 to June 2011, focused on the development of an ASEAN brand identity, ASEAN story, and the ASEAN exchange's website. Communication and marketing plan phase 2, from July 2011 to June 2012, facilitated broker networking to encourage brokerage companies to join the ASEAN exchange.

The regulation sub-working group focuses on ensuring the ASEAN exchange has a legal framework in accordance with international law. Bursa Efek Indonesia, as the capital market operator, has signed several memorandums on the development of electronic linkage through the ASEAN common exchange gateway, advertising, and the media agency. Several issues are still pending: registration of securities and markets, distribution of research materials, enforcement, and dispute resolution. In addition, the sub-working group has been discussing the ASEAN exchanges and ASEAN index company development plans. The use of ASEAN exchanges for marketing initiatives faces an obstacle because ASEAN should not be used for commercial purposes.

The other issue discussed in this subgroup is the plan to incorporate the ASEAN exchange proposed by Bursa Malaysia, Singapore Stock Exchange, and Stock Exchange of Thailand. This proposal has several pros and cons. The proponents of this plan argue that the incorporation of ASEAN exchanges will provide benefits such as legal entity and a centralized and standardized decision-making process. Opponents are concerned about the costs and tax implications of incorporation. The last initiative under discussion by the

regulation sub-working group is the establishment of an ASEAN benchmark index consisting of 210 stocks from seven ASEAN exchanges—30 stocks from each exchange (known as ASEAN stars)—but the question of who will hold the intellectual property rights of the listed stocks has not been resolved.

The market operation sub-working group addresses trading, depository and corporate actions, clearing, and settlement to support the development of the most suitable trading model for ASEAN exchange trading. So this sub-working group's main task is to develop the operational definition, user business requirements, and operational procedures. The working group has thus far come up with two trading models, a traditional inter-broker model and the ASEAN link.

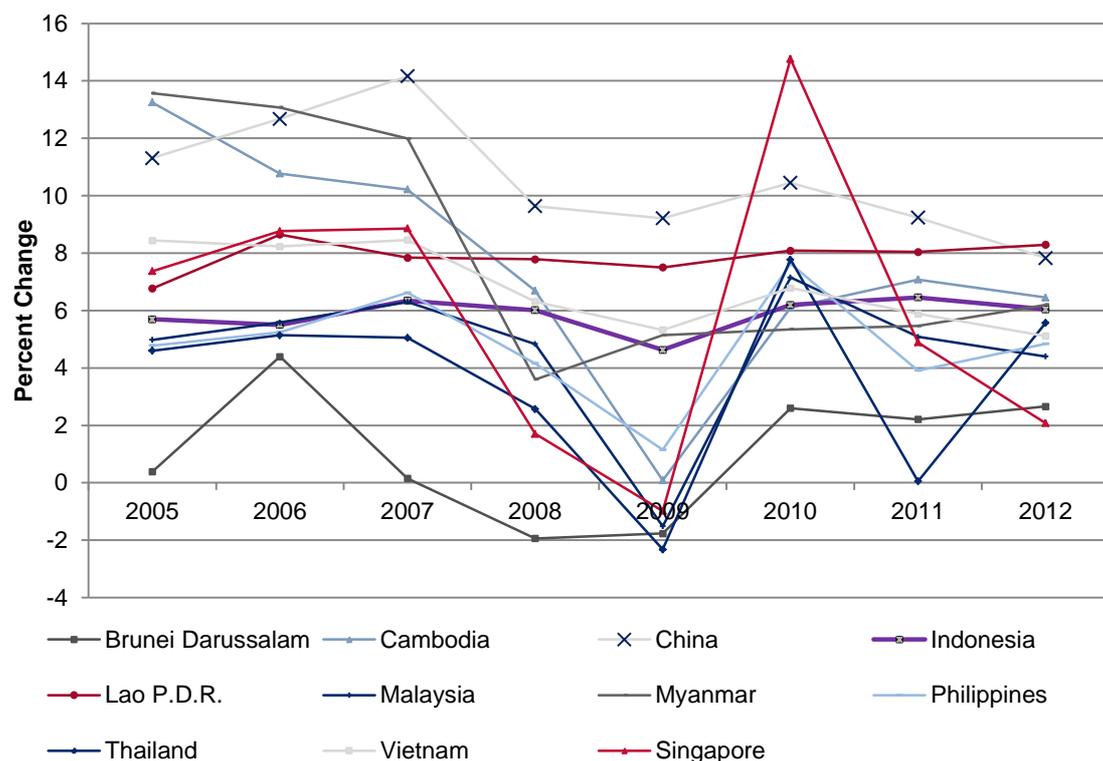
The technology sub-working group is responsible for preparing infrastructure for the trading connection, such as developing an ASEAN trading link, vendor selection, and risk management.

3. Macroeconomic Indicators of ASEAN Countries

GENERAL MACROECONOMIC INDICATORS

The first macroeconomic indicator in ASEAN countries that we examine is gross domestic product (GDP). Figure 3-1 shows annual growth in GDP of ASEAN countries and, for regional comparison, China, for 2005–2012.

Figure 3-1
Annual GDP Growth, ASEAN Countries and China, 2005–2012



Source: WEO (2012)

This graph shows Indonesia's GDP annual growth increased by 6.04 percent in 2012, which is a deceleration compared to the rate in 2011, which was 6.45 percent. The 2011 growth rate was the highest during the period studied, while the lowest, 4.6 percent, was posted in 2009. The European sovereign-debt crisis in 2009 seems to have had an impact on the GDP growth rate of ASEAN countries. China's GDP growth rate is higher than that of all ASEAN countries most of the time. We also compare ASEAN growth to other regions in Table 3-1.

Table 3-1
GDP Growth in Asia (%)

	2009	2010	2011	ADB Forecast	
				2012	2013
Developing Asia	6	9.1	7.2	6.6	7.1
Central Asia	3.2	6.6	6.2	5.8	6.2
East Asia	6.8	9.8	8	7.1	7.5
PRC	9.2	10.4	9.2	8.2	8.5
South Asia	7.5	7.7	6.2	6.2	6.9
India	8.4	8.4	6.5	6.5	7.3
Southeast Asia	1.4	7.9	4.6	5.2	5.6
The Pacific	4.3	5.5	7	6	4.2
MAJOR INDUSTRIALIZED ECONOMIES					
United States	-3.5	3	1.7	1.9	2.2
Eurozone	-4.4	2	1.5	-0.7	0.8
Japan	-5.5	4.4	-0.7	2.2	1.5

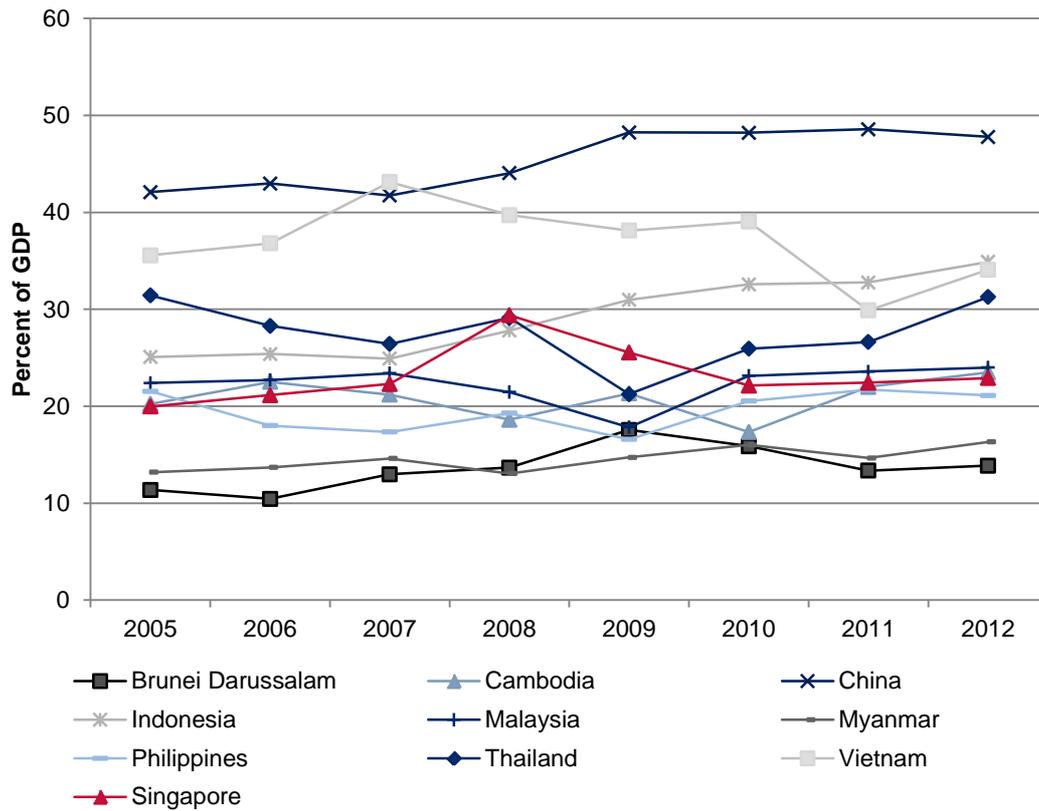
Source: Asian Development Bank (2012)

According to Table 3-1, Asia, especially Southeast Asia-5, have luxurious economic growth compared to major industrialized economies (United States and Euro zones). East Asian and Southeast Asian countries have become the drivers of world economic growth since the global crisis. According to ADB (2012), in Southeast Asia, strong domestic demand should keep GDP growth robust despite the weak external environment. Private consumption remains strong, creating a sustainably robust growth outlook for the region.

The dynamics of “double-track” growth – emerging economies expanding faster than advanced countries – in Asian countries are complex and will continue to define the global economy for some time to come. One reason Asia continues to forge ahead is increasing economic integration.

One important component of GDP is investment. Investment refers to the goods purchased by individuals and firms to add to their stock of capital. Figure 3-2 shows the ratio of investment to GDP for ASEAN countries (plus China) for the period of 2005 to 2012.

Figure 3-2
Ratio of Investment to GDP of ASEAN Countries and China, 2005–2012

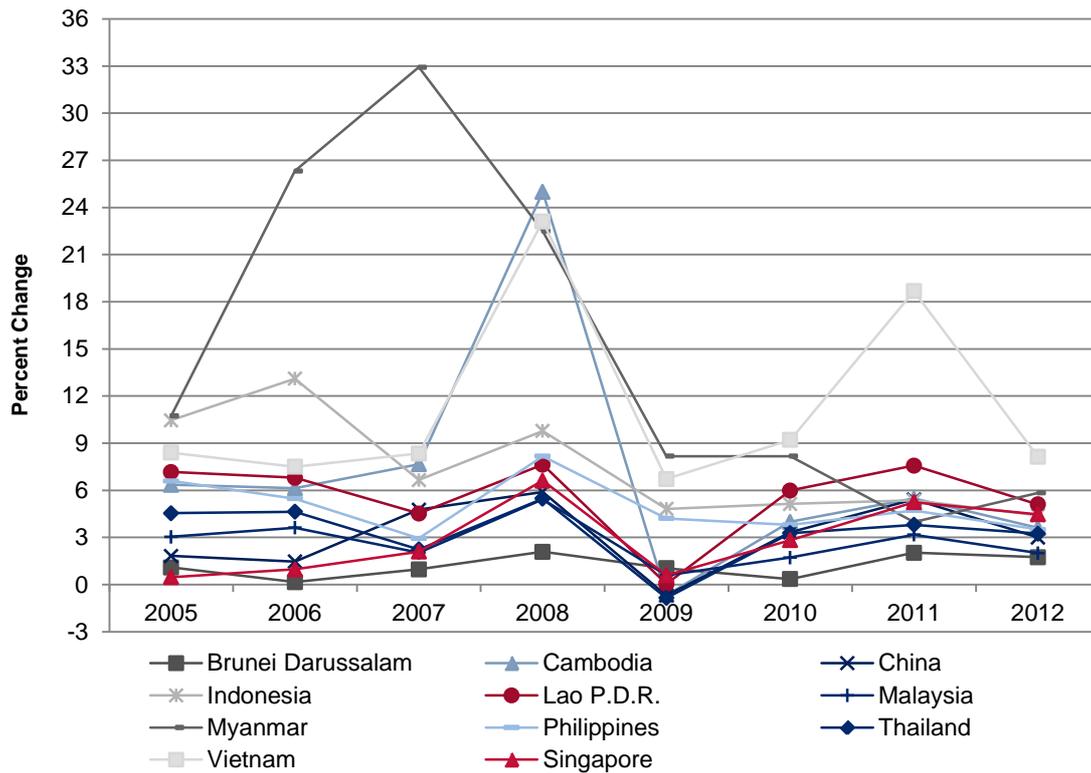


Source: WEO (2012)

The investment-to-GDP ratio in Indonesia increased to 34.89 percent in 2012, the highest recorded during the period; the lowest, 24.92 percent, was posted in 2007. The investment-to-GDP ratio was lower in Indonesia than in China or Vietnam for all years but 2011 and 2012. For the whole 2005–2012 period, Indonesia’s investment-to-GDP ratio trended upward. The Chinese investment-to-GDP ratio is higher than those of all ASEAN countries for all years except for 2007. The variation in the ratio appears minimal, especially in the last four years of the eight-year period.

The next macroeconomic variable is inflation. Figure 3-3 shows inflation in ASEAN countries and China for the 2005–2012 periods. Inflation is important because it describes asset-valuation risks that investors take when deciding to invest in capital markets.

Figure 3-3
Inflation Rate of ASEAN Countries and China, 2005–2012 (%)

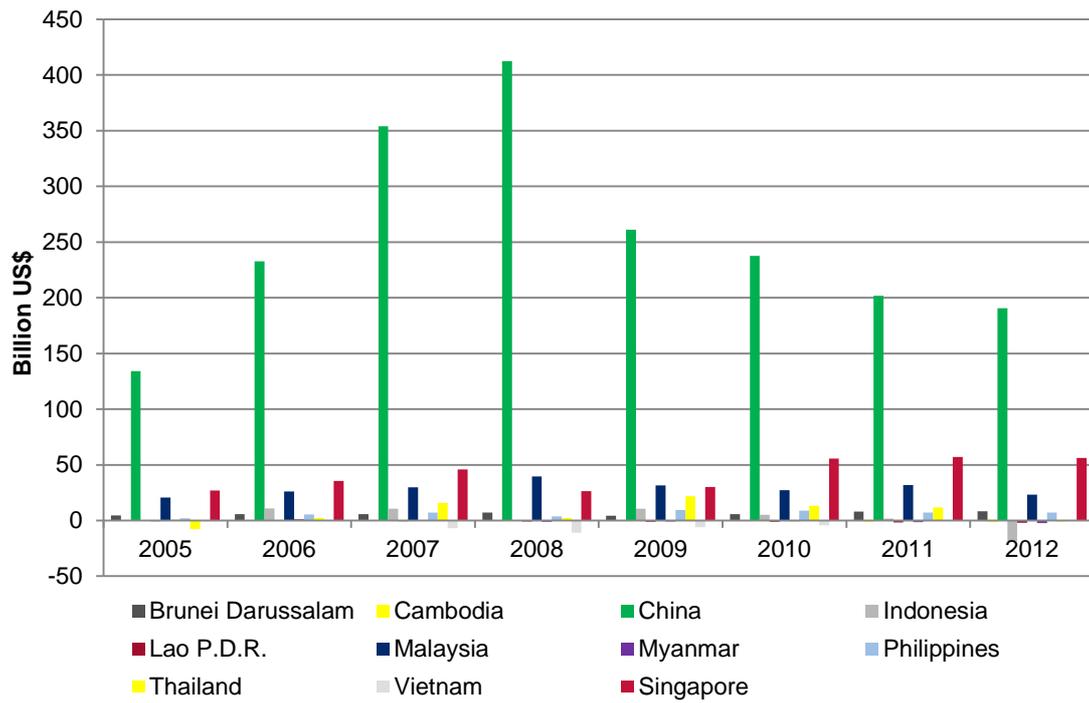


Source: WEO (2012)

Inflation is calculated using the price increase of a defined product basket, which contains the products and services that the average consumer buys throughout the year. The products and services include groceries, clothes, rent, power, telecommunications, recreational activities, and raw materials (such as gas and oil), as well as federal fees and taxes. In 2012, inflation in Indonesia was at its lowest, at an average 4.4 percent per year; the highest inflation rate for the period was recorded in 2006, at 13.10 percent. Among the inflation rates of ASEAN member states, Myanmar's rate is remarkable for its volatility during the period examined. Myanmar's average inflation rate was highest in 2007 at 32.92 percent and lowest in 2011 at 3.97 percent.

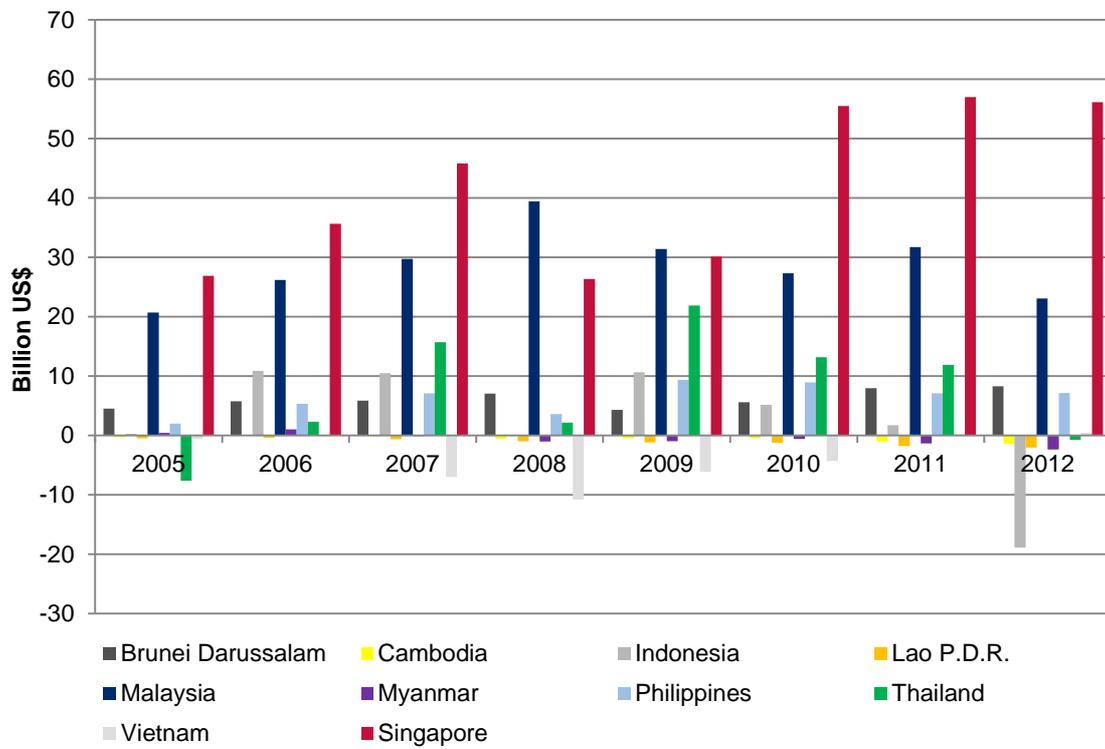
The next macroeconomic variable described is the current account balance. Figure 3-4 shows the current account balance for ASEAN countries and China and Figure 3-5 shows only ASEAN countries.

Figure 3-4
 Current Account Balance of ASEAN Countries and China, 2005–2012



Source: WEO (2012)

Figure 3-5
 Current Account Balance of ASEAN Countries, 2005–2012



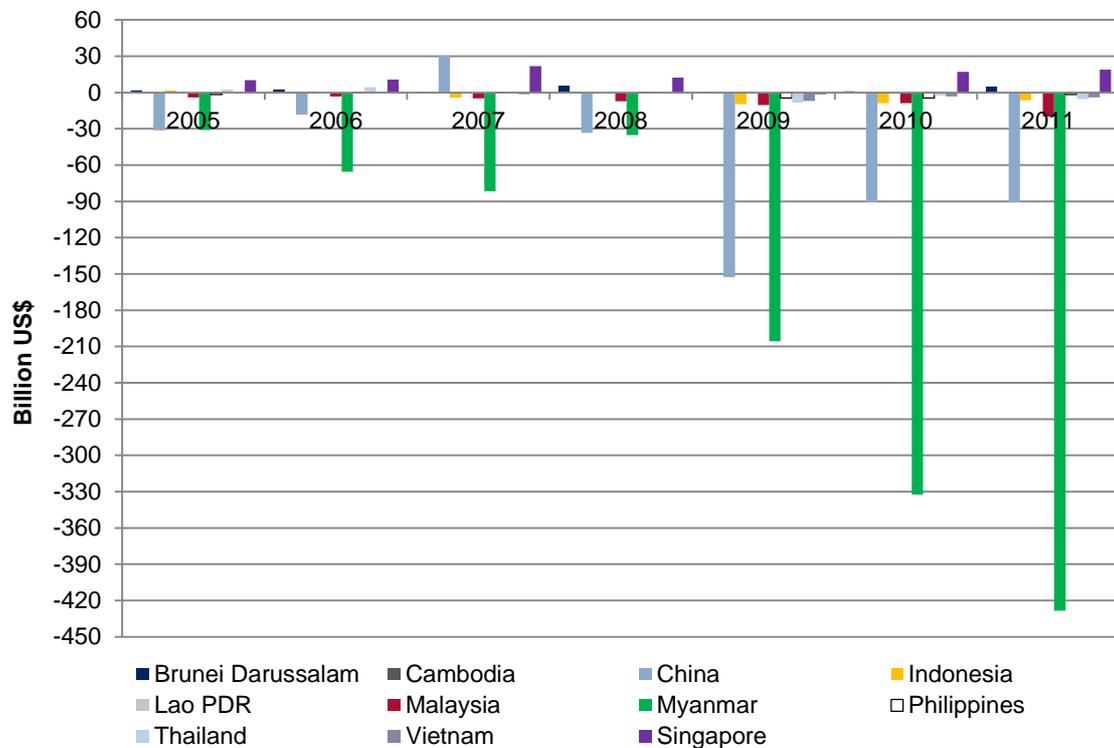
Source: WEO (2012)

Indonesia had a US\$10.62 billion current account surplus in 2011 but a US\$21.5 billion current account deficit in 2012, reflecting slowing export growth and growing imports. China maintains a high current account surplus, with its highest level in 2008 at US\$412.37 billion. In ASEAN countries, Singapore's current account surplus is higher than other ASEAN countries' current account surplus except in 2008 and reached its highest point in 2011 at US\$56.98 billion.

The next variable influencing investors' investment decision and sovereign ratings is the government budget deficit. A government budget surplus or deficit is the difference between government revenue and government expenditure—surplus when revenue is higher than expenditure, and deficit when revenue is lower than expenditure. Figure 3-6 shows the government budget deficit (or surplus) in ASEAN countries and China for the 2005–2011 period.

Figure 3-6

Government Budget Surplus or Deficit for ASEAN Countries and China, 2005–2011

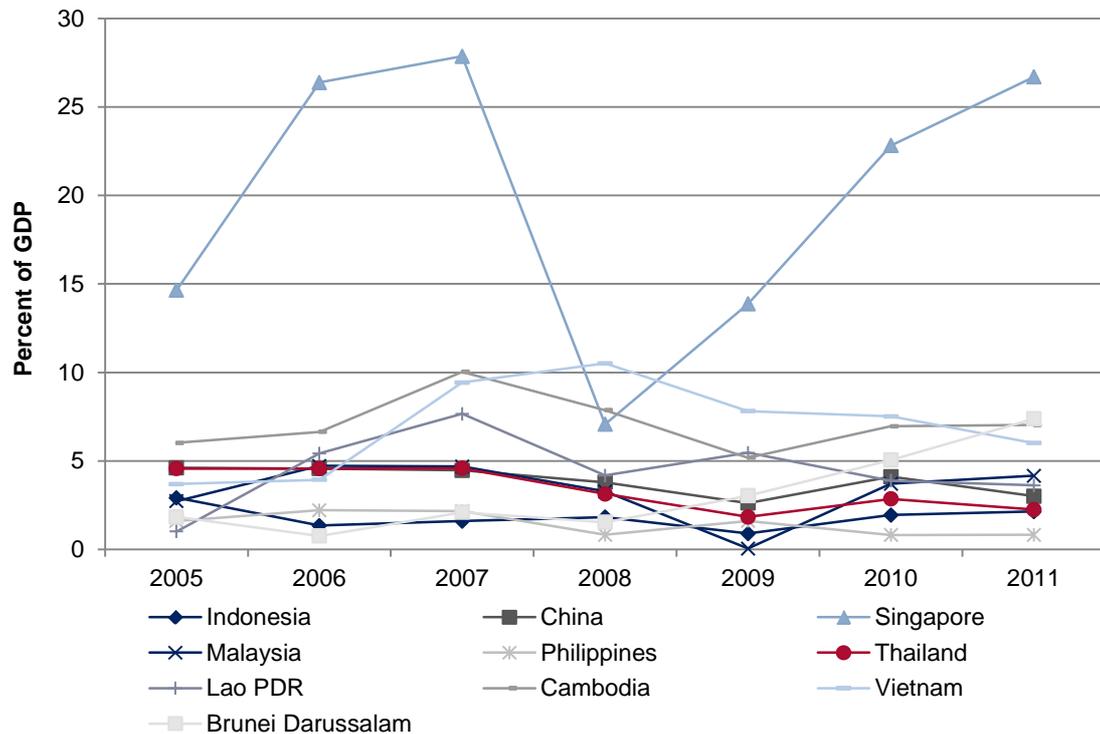


Source: WEO (2012)

Indonesia experienced a government budget deficit in every year of the period studied except in 2005 and 2006, when it had a surplus of US\$0.82 billion. The highest budget deficit was US\$9.49 billion in 2009 and the lowest was US\$0.01 billion in 2008. Central government applied deficit fiscal policy to maintain price level and to increase economic growth with the coordination between central bank – monetary policy and central government – fiscal policy. Myanmar's government runs the highest budget deficit among the other ASEAN countries and China—US\$428.53 billion at its highest, in 2011, and US\$30.90 billion in 2008 at its lowest. Bad fiscal policy and monetary policy management are the main contributors to macro-economic instability – for example, budget deficit shock on government spending.

The next macroeconomic variable is foreign direct investment. Foreign direct investment is the net inflow of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Foreign direct investment as a share of GDP for ASEAN Countries and China for the period 2005–2011 is presented in Figure 3-7.

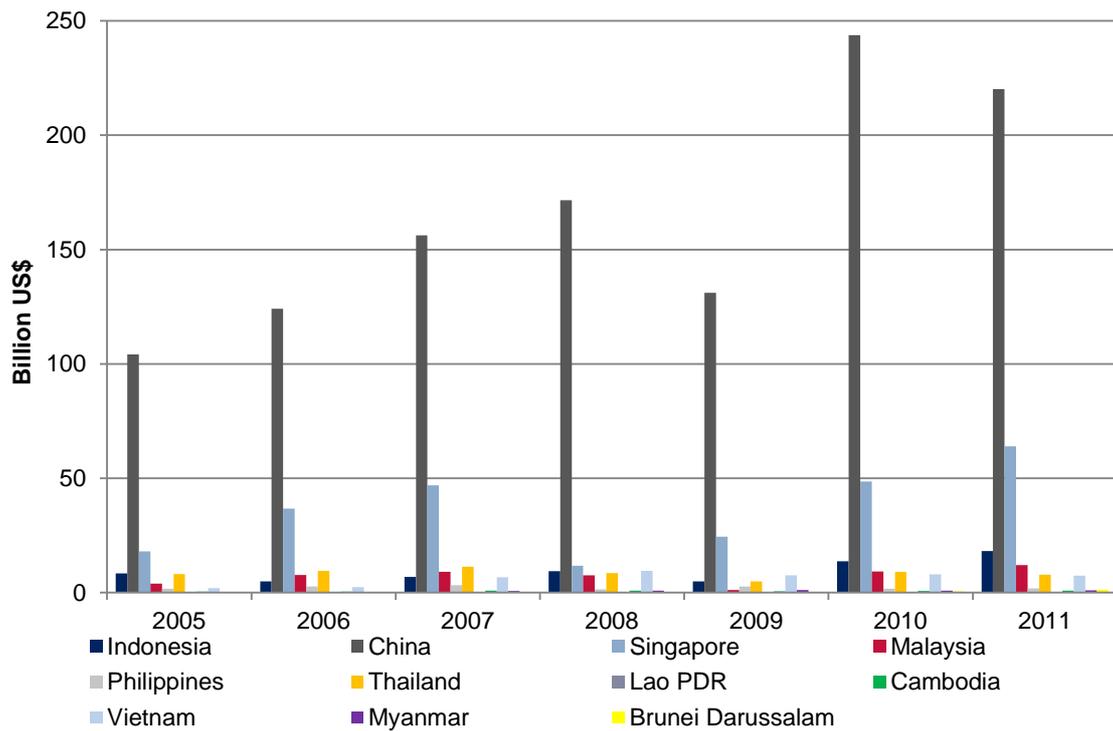
Figure 3-7
Net Inflows of Foreign Direct Investment for ASEAN Countries and China, 2005–2011 (% of GDP)



Source: World Bank (2012)

This series shows net inflows (new investment inflow less disinvestment) in the reporting economy from foreign investors divided by GDP. In 2011, Indonesia’s net foreign direct investment inflow (as a percent of GDP) was 2.14 percent. Its highest value in the past seven years was 2.91 percent in 2005, and its lowest value was 0.90 percent in 2009. Singapore’s net foreign direct investment inflow is higher than net FDI inflows in ASEAN countries most of the time, except for 2008. Singapore’s net FDI inflow was the highest in 2007 at 27.86 percent of GDP and the lowest in 2008 at 7.07 percent of GDP. In 2008, Vietnam’s foreign direct investment was higher than Singapore’s. Figure 3-8 shows net inflows of FDI for ASEAN countries and China for the period 2005–2011 below.

Figure 3-8
Net Inflows of FDI for ASEAN Countries and China, 2005–2011

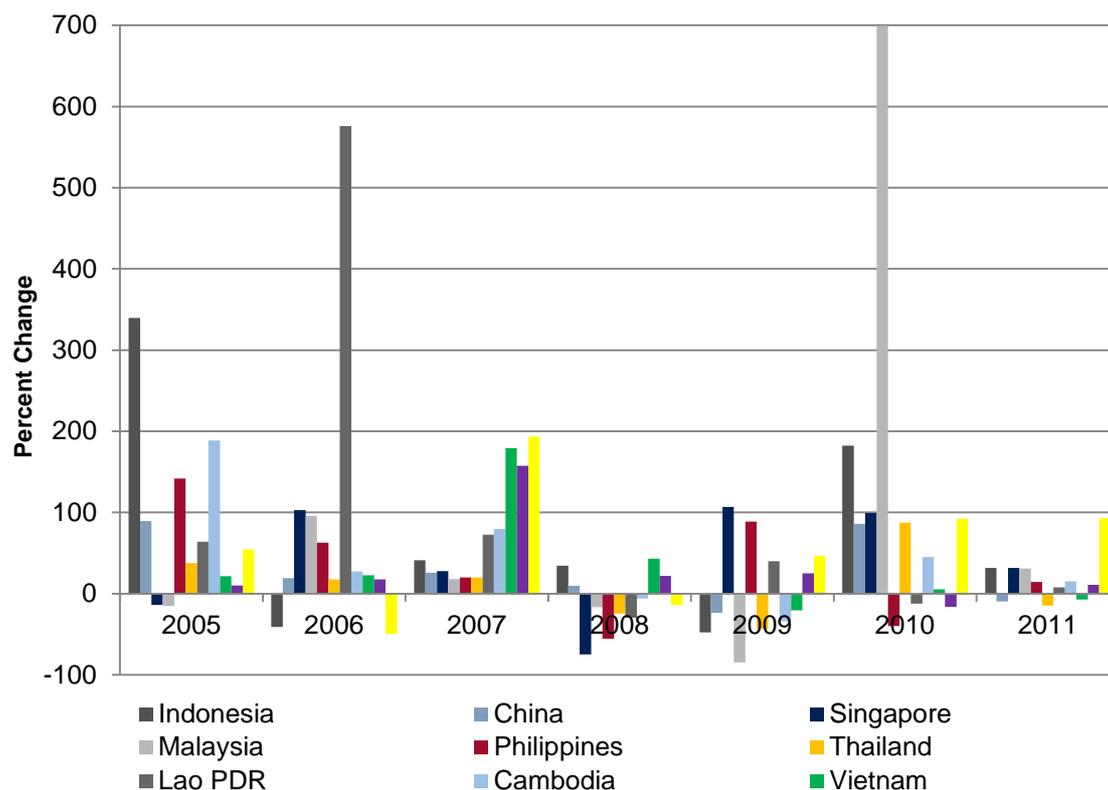


Source: World Bank (2012)

This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors. Data are in current U.S. dollars, Indonesia's net FDI inflow was highest in 2011 at US\$18.15 billion and lowest in 2009 at US\$4.88 billion. China's net foreign direct investment inflow is higher than ASEAN countries' net FDI inflow. China's net FDI inflow was the highest in 2010 at US\$243.7 billion and the lowest in 2005 at US\$104.5 billion. Singapore's net FDI inflow is highest among ASEAN countries' FDI inflows. It reached its highest point in 2011 at US\$64 billion and its lowest point in 2008 at US\$11.79 billion.

Figure 3-9

Growth of Net FDI Inflows in ASEAN Countries and China, 2005–2011



Source: World Bank (2012)

In 2011, Indonesia's net growth in FDI inflow was 31.87 percent. Its highest value over the past seven years was in 2005 at 339.65 percent, while its lowest value was -47.65 percent in 2009. Malaysia's net FDI inflow growth was the highest in 2010 at 699.48 percent, which was the highest net FDI inflow growth in ASEAN countries and China for the past 7 years.

Figure 3-10

Regional Comparison of Ease of Doing Business Index, 2011-2012

Country Name	2011	2012
Indonesia	130	128
Singapore	1	1
Malaysia	14	12
Thailand	17	18
Philippines	136	138
Lao PDR	166	163
Vietnam	99	99
Myanmar	NA	NA
Cambodia	141	133
Brunei Darussalam	83	79
China	91	91

Note: NA means Not Available

Source: World Bank (2012)

FDI has a close relationship with ease of doing business. Figure 3-10 shows a comparison of ASEAN countries' and China's rankings on the World Bank Ease of Doing Business index for 2011–2012. The index ranks economies from 1 to 185, and a good ranking means that the regulatory environment is conducive to business operation.

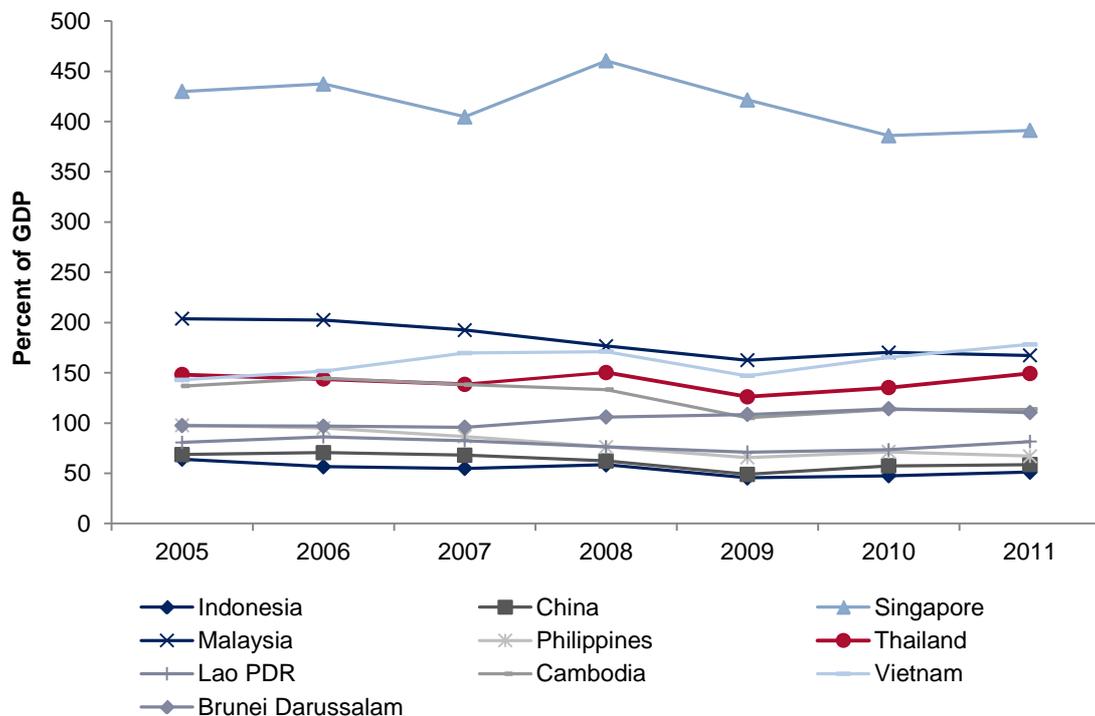
Indonesia ranked 130th on the Ease of Doing Business index in 2011 and improved its ranking to 128 in 2012 (World Bank 2012). Singapore ranked number 1 in 2011 and 2012 on the Ease of Doing Business index.

Trade is the sum of exports and imports of goods and services measured as a share of GDP. International trade in goods and services is a principal channel of economic integration. A convenient way to measure the importance of international trade is to calculate the share of trade in a country's GDP. Differences in trade-to-GDP ratios across countries might be caused by factors such as history, culture, trade policy, and the structure of the economy. Figure 3-11 shows trade for ASEAN countries and China from 2005 to 2011.

The Indonesian trade-to-GDP ratio was 63.98 percent in 2005—its highest during the time period analyzed—and 51.24 percent in 2011—a decline of 12.74 percentage points, although the ratio was at its lowest, 45.51 percent, in 2009. Singapore's trade-to-GDP ratio is higher than those of other ASEAN countries. It was highest in 2008 at 460.47 percent and lowest in 2011 at 385.91 percent. In Singapore international trade has an important role.

Figure 3-11

Regional Comparisons of Trade as a Fraction of GDP, 2005–2011



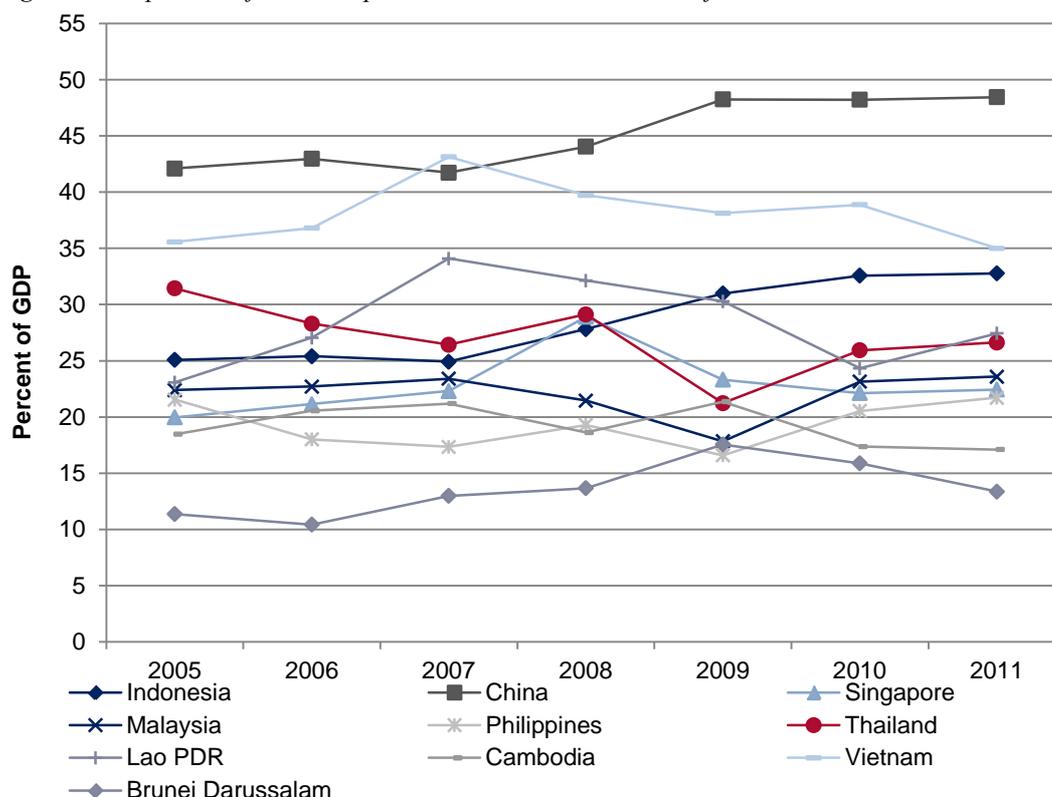
Source: World Bank (2012)

Gross capital formation (formerly called gross domestic investment) consists of outlays in addition to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and

equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.

Figure 3-12 shows annual gross capital formation as a fraction of GDP of ASEAN countries and China from 2005 to 2011. Indonesia’s gross capital formation as a fraction of GDP increased from 25.08 percent in 2005 to 32.77 percent in 2011. From figure 3-12, China’s annual gross capital formation as a fraction of GDP was higher than ASEAN countries’ gross capital formation except in 2007, when Vietnam’s gross capital formation as a fraction of GDP was higher at 43.13 percent. China’s gross capital formation as a fraction of GDP was highest in 2011, at 48.44 percent, and lowest in 2007 at 41.73 percent.

Figure 3-12
Regional Comparison of Gross Capital Formation as a Fraction of GDP, 2005–2011

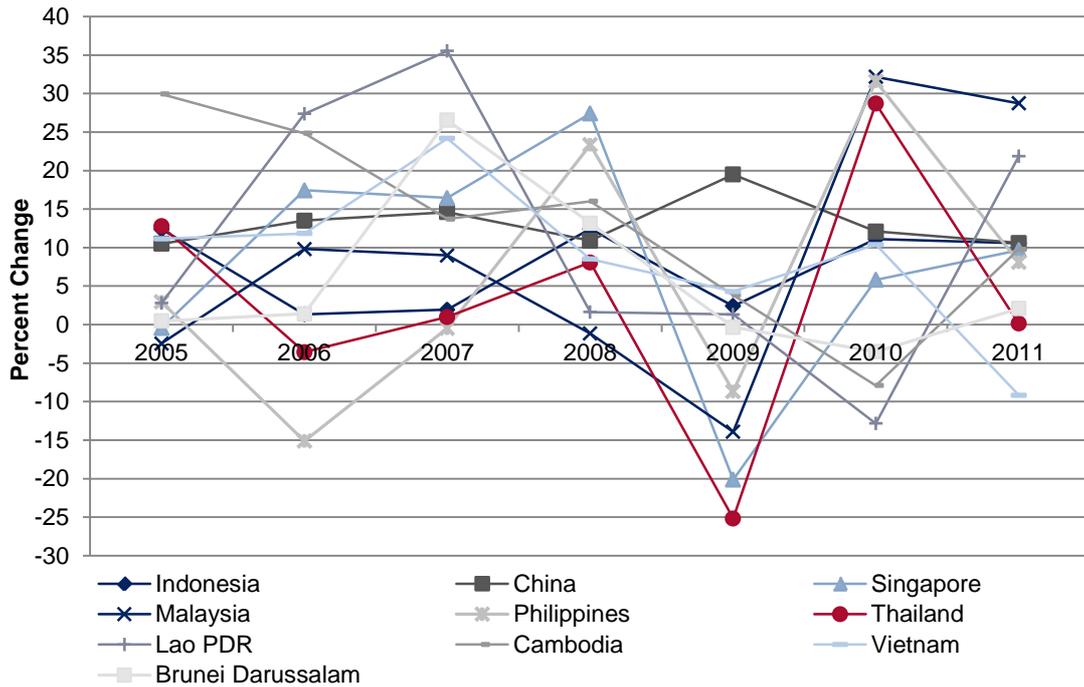


Source: World Bank (2012)

The next analysis of gross capital formation for ASEAN countries and China is the annual percent of change for this indicator. Figure 3-13 shows the annual percent of change in gross capital formation for ASEAN countries and China from 2005 to 2011. The latest value for growth of gross capital formation in Indonesia was 10.56 percent as of 2011. Over the past seven years (2005-2011), the value for this indicator has fluctuated between 12.38 percent in 2005 and 1.34 percent in 2006. China’s growth of gross capital formation is relatively stable; it was at its highest in 2009 at 19.5 percent and lowest in 2005 at 10.5 percent.

Figure 3-13

Change in Gross Capital Formation in ASEAN Countries and China, 2005–2011



Source: World Bank (2012)

The next factor of capital market integration that we consider is the monetary framework, which consists of a country's exchange rate arrangement and its inflation framework. The regression result should be noted with the differences in exchange rate arrangement and monetary policy framework. The ASEAN+3 economies – ASEAN member countries, China, Japan, and South Korea – implement a variety of exchange rate management systems; the differences among them must be taken into consideration in attempts to integrate ASEAN capital markets. Indonesia, Malaysia, and Thailand have independent floating. Malaysia, Vietnam, and Myanmar have a pegged system. Singapore, Cambodia, and Lao PDR have managed floating systems.

Table 3-2

Exchange Rate Arrangement and Year of ITF Adoption

Country	Exchange Rate Arrangement	Year
Indonesia	Independent floating	January 2005
Malaysia	Pegged	-
Philippines	Independent floating	December 1998
Singapore	Managed floating	-
Thailand	Independent floating	May 2000
Brunei	Currency board arrangement	-
Cambodia	Managed floating	-
Lao PDR	Managed floating	-
Vietnam	Pegged	-
Myanmar	Pegged	-

Source: Nasution (2010).

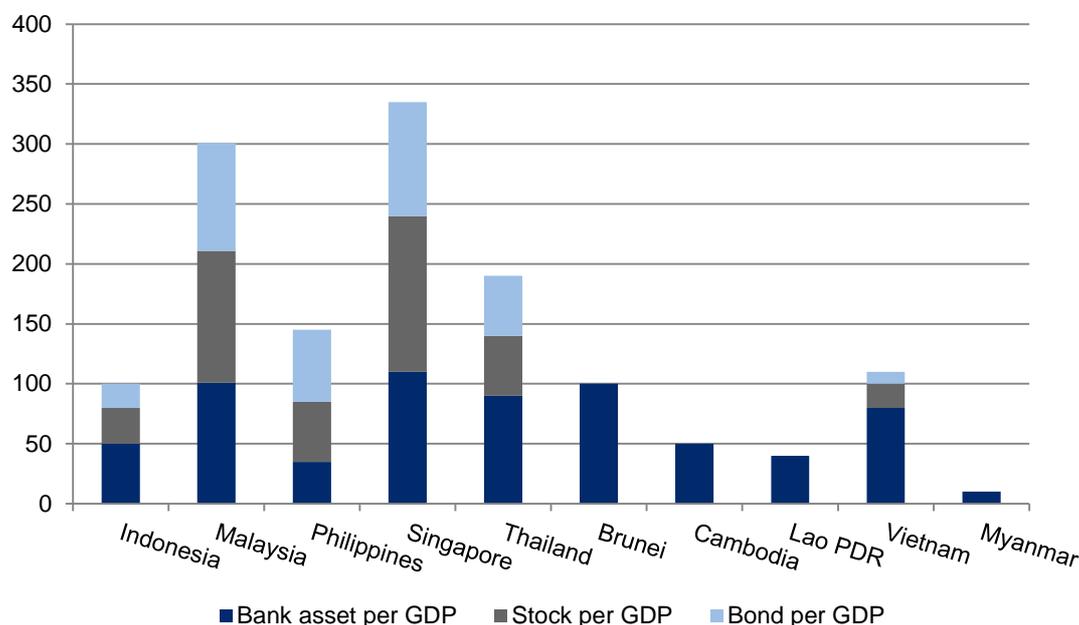
STRUCTURE OF FINANCIAL SYSTEM IN ASEAN COUNTRIES

According to D. Rillo (2012), there is a wide variety of financial systems in ASEAN countries. We divide the 10 ASEAN countries into three clusters: (1) Singapore, Malaysia, and Thailand, with advanced financial structures according to data on bond per GDP, stock per GDP, and bank assets per GDP; (2) Philippines, Indonesia, and Vietnam with medium development of the financial system, which means they have a complete financial structure—banks and stock and bond markets—but at a low level and characterized by bank dominance; and (3) Brunei Darussalam, Lao PDR, Myanmar, and Cambodia with low development of the financial system.

Figure 3.14 shows ASEAN financial markets with the total assets composition in 2009, according to data on bond per GDP, stock market capitalization per GDP, and bank assets per GDP. Singapore has the highest percentage of financial structures as the fraction of GDP, according to data on bond per GDP, stock per GDP, and bank assets per GDP compare to the other ASEAN member states

The similarity in the structure of the financial system in all ASEAN countries except Singapore is that the banking industry is the core of the system. Because of cheap and low-risk loans from the public sector bank under the long period of financial repression in the past, economic agents had no incentive to raise funds from a stock and bond market (Nasution, 2010).

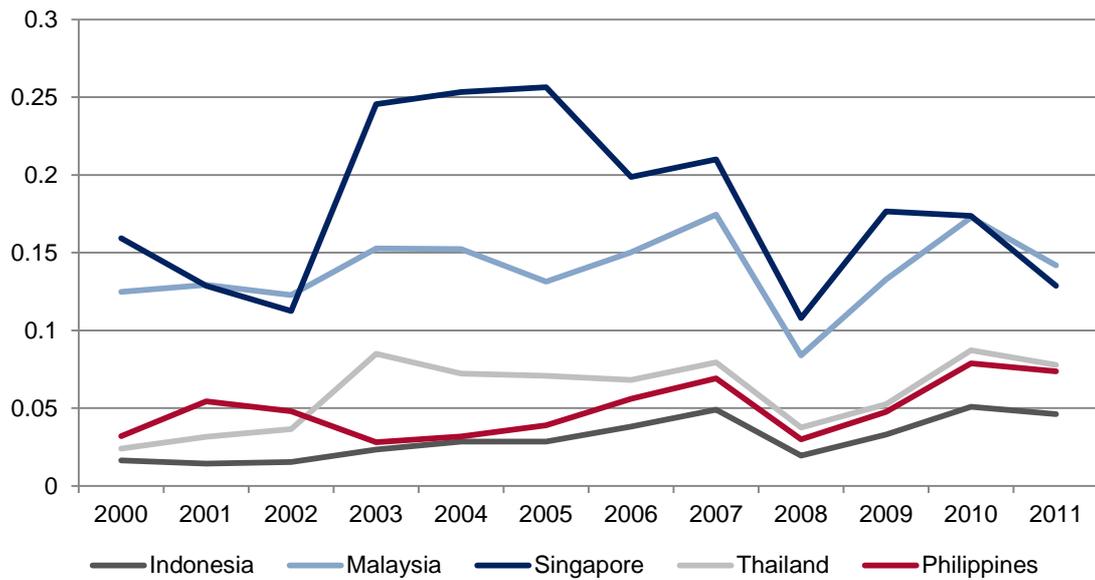
Figure 3-12
 ASEAN Countries' Financial Structures (Percent of GDP), 2009



Source: D. Rillo, Aladdin (2012). "Road to Financial Integration in ASEAN".

Figure 3-15 shows ratio of market capitalization to GDP in ASEAN-5 – Indonesia, Malaysia, Singapore, Thailand, and the Philippines – for the period 2000 to 2011.

Figure 3-13
Ratio of Market Capitalization to GDP of ASEAN-5 Countries, 2000–2011



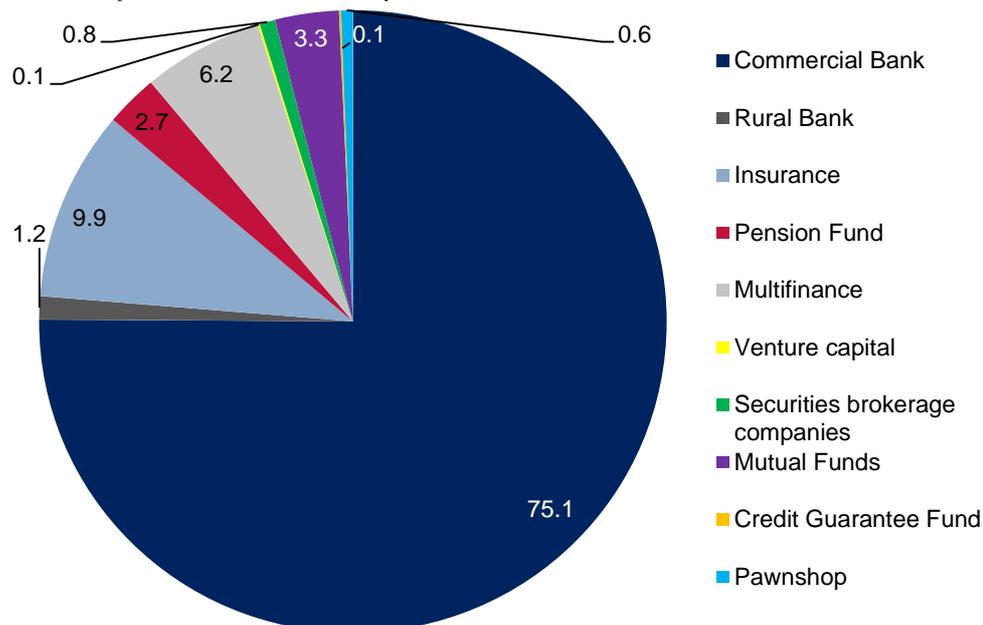
Source: World Development Indicator, World Bank

Indonesia has the lowest market capitalization per GDP of the ASEAN-5 countries – Indonesia, Singapore, Malaysia, Thailand, Philippines – but the figure shows that the trend over time is that market capitalization in Indonesia is growing trend, where in Malaysia and Singapore it has been decreasing, especially since 2009. The pattern shows that Indonesia has the potential to develop its capital market.

According to Nasution (2010), ASEAN countries need to strengthen regional cooperation to build up their financial systems and contribute to Basel III negotiations. The first area of cooperation would be to continue regional programs to develop the bond and capital markets. The existence of more mature national and regional bond markets allows ASEAN+3 in having good financial resources in their regional neighbors. The second area would be to reorganize and enlarge the SEANZA forum by establishing a college of regional bank supervisors to discuss common interest. The third area of cooperation would be to discuss and adopt a common stance on the harmonization of capital and supervisory practices in the region, and to anticipate the implications of discussion in international forums such as the BIS and G-20 on the expansion of regulatory and supervisory parameters to nonbank affiliates.

For Indonesia, Figure 3-16 shows that commercial banks have the dominant share in the financial system (75.1 percent in 2012).

Figure 3-14
Structure of Indonesian Financial System, 2012



Sources: Bank Indonesia and Bapepam LK (2012)

MACROECONOMIC INDICATORS RELATED TO POTENTIAL INVESTORS

In ASEAN capital market integration policymakers should also take into account the level of income of the population. According to Drysdale (2011), according to conservative growth forecasts, Asia will add 2.5 billion people to the world's middle classes in the next 20 years. The middle class in both China and India is growing at an extraordinary rate. As Kharas points out

If China is successful in its policy ambition to foster wage growth at least as fast as GDP growth, and if it continues to grow at its potential, its middle class could swell to 50 percent of its population in just 12 years. India's middle class could rise even more rapidly because Indian households benefit more from Indian growth than do Chinese households, given the prevailing distribution of income.²

Although the two Asian giants are the most important drivers of growth in the Asian middle class, many large Southeast Asia countries—Indonesia, Malaysia, Thailand, Cambodia, and Vietnam—could enjoy the same kind of prosperity and are poised to become predominantly middle-class countries within a decade to 15 years.

² East Asia Forum (<http://www.eastasiaforum.org/2011/06/13/asias-middle-class-on-the-rise/>). Accessed December 2012

Table 3-3
Demographic Comparison of ASEAN Countries in 2009

Countries	Total Population (Thousand)	Urban Population (%)	Population by Age			Adult Literacy Rate (%)	Labor Force Participation Rate (%)
			0-19 (Thousand)	20-64 (Thousand)	>65 (Thousand)		
Indonesia	214,214	50.0	83,427	130,776	11,439	93.85	66.60
Malaysia	27,245	66.0	11,348	14,704	1,193	98.45	62.80
Singapore	4,589	100.0	1,198	2,999	392	96.00	65.60
Thailand	66,041	30.0	19,778	41,428	4,835	94.25	71.70
Philippines	88,575	63.0	39,187	45,638	3,750	93.40	63.70
Brunei	390	78.0	138.6	238.9	12.5	93.65	67.80
Cambodia	14,364	20.0	6,994	6,836	534	76.75	NA
Laos	5,608	22.0	2,836	2,558	214	73.30	NA
Vietnam	86,610	27.4	30,843	48,199	6,113	NA	51.9
Myanmar	58,510	31.0	23,816	28,627	5,061	NA	62.6

Note: NA means Not Available

Source: ASEAN Statistical Yearbook

To determine potential investors in the ASEAN capital market we also look at ASEAN gross national savings (GNS) (Table 3-4) and GDP per capita (Tables 3-5 and 3-6). ASEAN countries have relatively high GNS. Only Cambodia has a GNS below 20 percent. Brunei has the highest rate at 51.8 percent and Singapore the second-highest at 46 percent. Indonesia has GNS rate of 33.4 percent. Vietnam as a new emerging market in ASEAN has a higher rate than Indonesia.

Table 3-4
Gross National Savings in ASEAN Countries, 2010

Country	% of GDP
Indonesia	33.4
Malaysia	33.1
Singapore	46.0
Thailand	30.7
Philippines	20.1
Brunei	51.8
Cambodia	14.1
Laos	NA
Vietnam	34.3
Myanmar	NA

Note: NA means Not Available

Source: Global Competitiveness Index 2011–2012

Using GNS rate as a proxy to estimate potential investors, ASEAN countries have high to moderate potential to increase capital accumulation in ASEAN capital markets, because high

savings will lead to higher capital accumulation. Even so, the GNS rate is macroeconomic data that should be confirmed using more specific data at the microeconomic or firm level.

Table 3-5
GDP per Capita ASEAN-6 (USD)

Year	Brunei	Indonesia	Malaysia	Philippines	Singapore	Thailand
2000	18,350.13	773.31	4,005.56	1,048.07	23,413.84	1,943.24
2001	18,441.35	791.08	3,933.94	1,055.81	22,512.83	1,962.24
2002	18,749.58	816.02	4,052.88	1,071.69	23,253.64	2,042.80
2003	18,896.53	844.18	4,194.26	1,102.22	24,684.76	2,164.30
2004	18,609.15	875.73	4,385.97	1,153.02	26,628.85	2,277.56
2005	18,311.88	914.60	4,529.60	1,185.38	27,930.51	2,359.64
2006	18,745.80	953.94	4,706.88	1,225.05	29,425.98	2,458.52
2007	18,416.75	1,003.37	4,925.77	1,283.47	30,702.19	2,562.72
2008	17,722.66	1,052.43	5,073.13	1,314.23	29,543.94	2,608.25
2009	17,092.46	1,089.17	4,906.38	1,307.14	28,445.34	2,531.23
2010	NA	1,143.83	5,173.86	1,383.40	31,990.26	2,712.33

Note: NA means Not Available

Source: World Bank

Table 3-6
GDP per Capita ASEAN-3 (Cambodia, Laos, Vietnam) (USD)

Year	Cambodia	Lao PDR	Vietnam
2000	293.57	326.34	401.55
2001	311.99	339.30	423.83
2002	327.89	353.62	448.60
2003	350.89	369.51	475.97
2004	382.19	387.26	506.94
2005	427.53	408.53	543.36
2006	468.03	436.55	581.58
2007	510.02	461.59	623.96
2008	538.13	489.12	656.31
2009	522.18	517.65	684.00
2010	550.85	553.18	722.74

Source: World Bank

ASEAN countries rank in the following order according to per capita GDP (using 2010 data):

1. Singapore
2. Brunei
3. Malaysia
4. Thailand
5. Philippines
6. Indonesia

7. Vietnam
8. Lao
9. Cambodia

Note: ASEAN countries rank according to GDP per capita are based on the availability of the data.

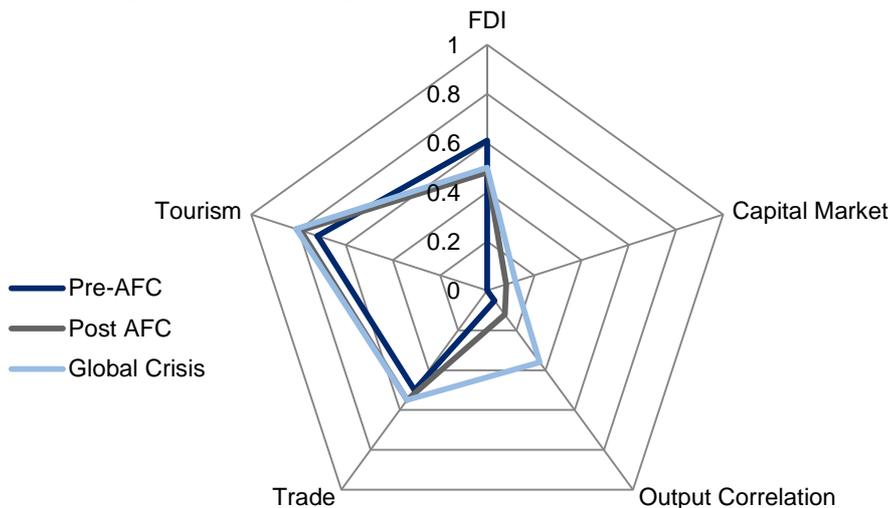
Notes : Myanmar GDP Per Capita is not available in World Bank Data

There are wide gaps in GDP per capita among ASEAN countries. And GDP per capita has a high correlation with the development of the capital market in all but Brunei. Singapore, which has the highest GDP per capita in ASEAN, is a financial center and has the best capital market. Indonesia is in middle to low position compared to other ASEAN members. Because Indonesia has a relatively moderate to low level of GDP per capita, the development of the capital market is also still relatively moderate to low, consistent with bank dominance in Indonesia's financial system.

Figure 3-17 shows the economic integration score among Asian countries – consists of Central Asia, East Asia, South Asia, Southeast Asia, the Pacific, and Oceania– form ADB assessment in 2012.

Figure 3-15

Economic Integration Score among Asian Countries in 2012 (Pre-AFC, post-AFC, and global crisis)



AFC = 1997/98 Asian Financial Crisis, global crisis = 2008 to present.

Source: Asian Economic Integration Monitor, ADB (2012)

The figure shows that economic integration in Asia occurs in trade, tourism, and capital markets. Capital markets are measured by total debt and equity security holding which is not have a pre-1997 benchmark as data unavailable. The only exception of economic integration in Asia is FDI inflows, which remain below pre-1997 levels. Overall Asian economic integration remains uneven across sub regions and sectors (Asian Development Bank 2012). East Asia appears to be the most integrated sub region, with all indicators improving except intraregional trade. Southeast Asia is the next-most integrated region, recording improvement in all indicators except FDI and portfolio holding. For that reason, it is important to analyze and review capital market integration especially in Southeast Asia – ASEAN countries – to build a good regional economic integration and cooperation among Asian countries.

4. ASEAN Stock Exchanges

This section provides an overview of the market microstructure of the ASEAN stock markets and compare those markets to the stock markets in ASEAN's ASEAN+3 partners (Hong Kong standing in for China, South Korea, and Japan) Tables 4-1 through 4-3 show significant differences in market design among ASEAN+ 3 stock markets including trading mechanisms, pre-trade transparency, order types-continuous auction, order types-call auction, and call auction design.

Table 4-1 indicates the market type, the trading mechanisms used, when these mechanisms are used, and market segmentation details.

Table 4-1
Trading Mechanisms of ASEAN+3 Stock Markets.

Exchange	Market Type	Market Segmentation	Intraday Trading Mechanism	Call auction	
				At Market Opening?	At Market Closing?
IDX	Order driven	Yes ³	Continuous auction	Yes	Yes
SET	Order driven	Yes ⁴	Continuous auction	Yes	Yes
SGX	Order driven	Yes ⁵	Continuous auction	Yes	Yes
TSE	Order driven	Yes ⁶	Continuous auction ⁷	Yes	Yes
HKEx	Order driven	Yes ¹	Continuous auction	Yes	No ²
KRX	Order driven	No	Continuous auction	Yes	Yes

¹ HKEx operates the main market and the Growth Enterprise Market (GEM).

² HKEx does not use a call auction to close the market. A special closing procedure is used.

³ The JSX is segmented into trading boards. The regular board and the negotiated boards.

⁴ The SET is segmented into trading boards. These include the main board which trades most common stocks, the foreign board, the big lot board and the odd lot board.

⁵ SGX operates the main board and SGX SESDAQ.

⁶ The TSE market is divided into four market segments. The first segment trades liquid blue chip stocks, the second trades less liquid stocks, the third is called Mothers and trades small emerging growth stocks and the fourth segment trades foreign stocks.

⁷ The continuous auction (zaraba) is suspended if a "special quote" is entered. A call auction (itayose) is used to restart the continuous auction.

The level of pre-trade transparency is presented in Table 4-2. Details are presented separately for continuous auction and call auction. Information on the dissemination of indicative auction prices (IAP), indicative equilibrium volumes (IEV), disclosure of broker identification, and use of hidden orders is also presented.

Table 4-2
Pre-trade Transparency

Exchange	Continuous Auction		Call Auction			Continuous and Call Auction	
	Trader/Broker	Investor	Trader/Broker	IAP	IEV	Broker ID Display	Hidden Orders
IDX	Full order book	Full order book	Closed	x	x	x	x
SET	3 best prices	3 best prices	3 best prices	✓	x	x	✓
SGX	Full order book	Full order book for a fee	Full order book ¹	x	x	x	✓
TSE	5 best prices ²	5 best prices	4 best prices	✓ ³	✓	x	x
HKEx	5 best prices	5 best prices	5 best prices		✓	✓	x
KRX	10 best prices	10 best prices	best prices	✓	✓	✓ ⁴	x

Note: IAP is also known as indicative equilibrium price or indicative opening price.

¹SGX displays the top 50 levels of the order book, but only on subscription. The best bid and ask is available at no cost.

²If a special quote is displayed, the price and cumulative volume at that price are displayed and the next bid and ask prices and volumes.

³The TSE displays an IAP before the call auction at the open of the morning and afternoon sessions.

Order types allowed in the continuous auction are presented in Table 4-3. Descriptions of these order types are provided. The maximum order validity period is also presented.

Table 4-3
Order Types—Continuous Auction

Exchange	IDX	SET	SGX	TSE	HKEx	KRX
Market order	X	✓	✓	✓	x	✓
Limit order	✓	✓	✓	✓	✓	✓
Stop market order	X	X	x	x	x	x
Stop limit order	X	X	x	x	x	x
Fill or kill order	X	✓	✓	x	✓	✓
IOC order	X	✓	x	✓	x	✓
Incomplete order	X	X	x	✓	x	✓
Market-on-open	-	-	-	-	-	-
Market-on-close	-	-	-	-	-	-
Maximum order validity (days)	1	1	1	1	1	1

Exhibit 4-1
Description of Order Types

<ul style="list-style-type: none"> • Market order—specifies the stock and volume but not transaction price • Limit order—specifies stock, volume and maximum or minimum transaction price • Stop market order—activates and becomes a market order when a specified price level (the stop price) is reached • Stop limit order—becomes a limit order when a specified price level (the stop price) is reached • Fill or kill order—must be executed in full or the entire order is rejected. Immediacy of execution may or may not be necessary. • Immediate and cancel order (IOC)—must execute immediately but not necessarily entirely. Any unfilled portion is cancelled. 	<ul style="list-style-type: none"> • Incomplete (market) order—sometimes known as an at-market order or market-to-limit order—the unfilled portion of the market order is converted into a limit order at the price of the executed portion. • Market-on-open order—trades at the opening price for that trading day. If the order is not executed in the call auction it may be cancelled or continue for possible execution in the continuous trading session. • Market-on-close order—trades at the closing price for that trading day; This includes limit orders that if not executed by the close of continuous trading convert to market-on-close orders and are executed at the closing price or are executed in the closing call auction if a closing call auction is used.
---	---

Figure 4-1 shows the movement of ASEAN countries’ return from 2010 to 2012 by quarter. On average, the return for each selected ASEAN country demonstrates a similar pattern, except for Vietnam and the Philippines. In some periods, when stock returns in Indonesia, Malaysia, Singapore, and Thailand decrease, stock returns in Vietnam and the Philippines tend to increase.

Figure 4-1
Quarterly ASEAN Stock Returns 2010–2012

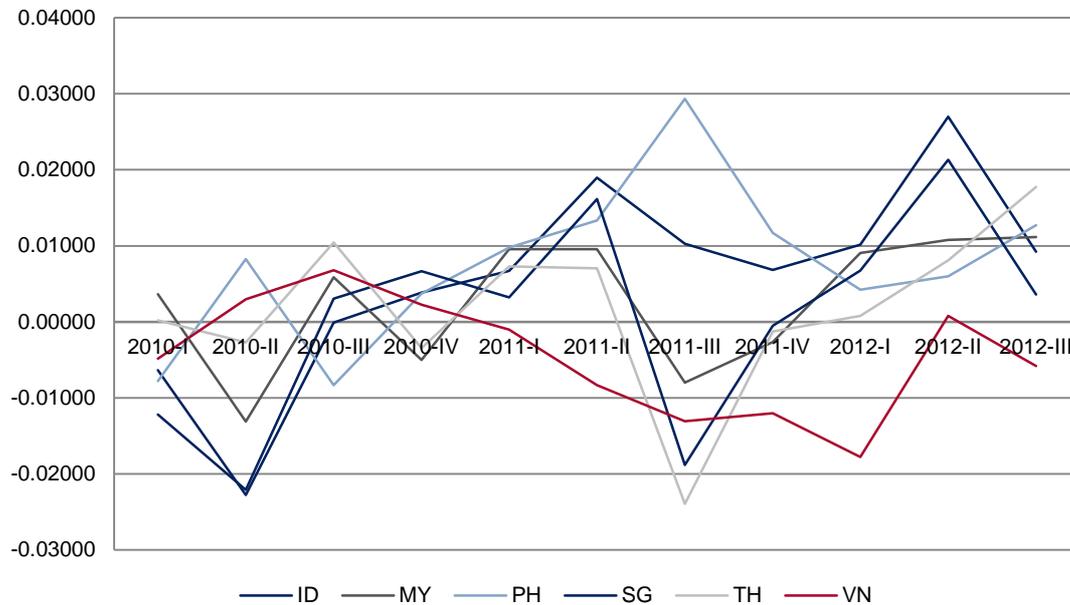
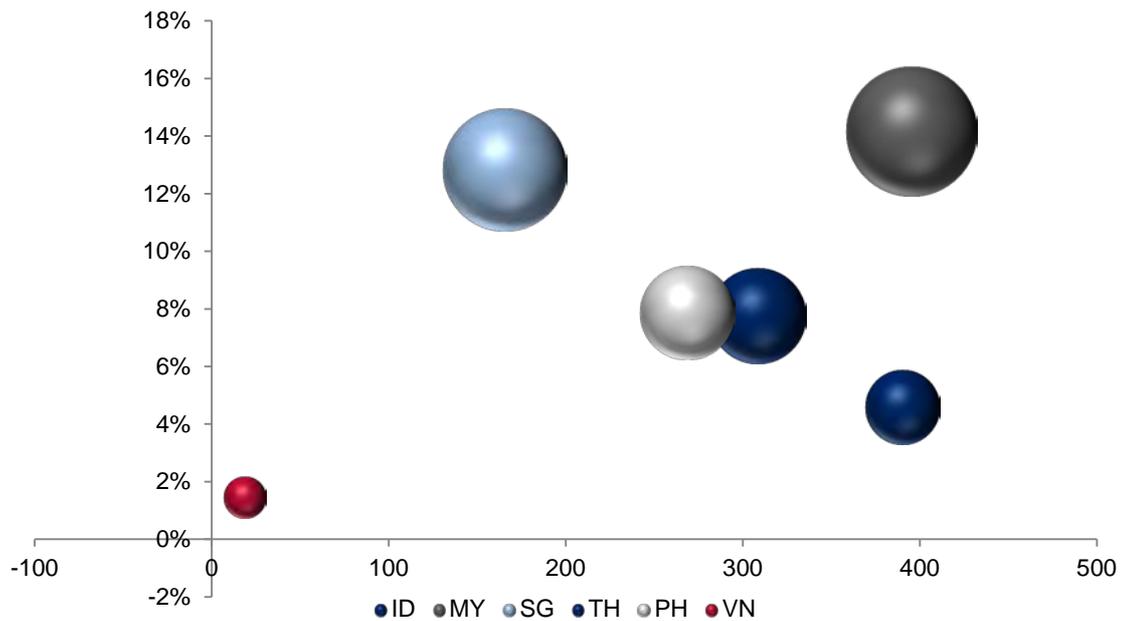


Figure 4-2 shows market capitalization as a percentage of GDP in ASEAN-6 in 2011. The horizontal axis is market capitalization in billion U.S. dollars, and the vertical axis is market capitalization as percentage of GDP.

Figure 4-2
Market Capitalization as Percentage of GDP of ASEAN in 2011



Malaysia has the greatest rate of market capitalization and Singapore is second. Market capitalization is used to determine whether a market is undervalued or overvalued. The ratio can be used to focus on specific markets or it can be applied to the world market, depending on which values are used in the calculation. The result of this calculation is the percentage of GDP that represents stock market value. Typically, a result of greater than 100 percent shows that the market is overvalued, while a value of 50 percent or less shows undervaluation. In recent years, however, determining what percentage level is accurate in showing undervaluation and overvaluation has been hotly debated. In 2011, according to World Bank statistics, the market capitalization-to-GDP ratio for ASEAN countries was below 100 percent, a sign of an undervalued market.

Table 4-4 shows summary statistics by country from 2000 to 2011. It displays the total number of listed companies and market capitalization used in regressions. Market capitalization is nominated in billion U.S. dollars.

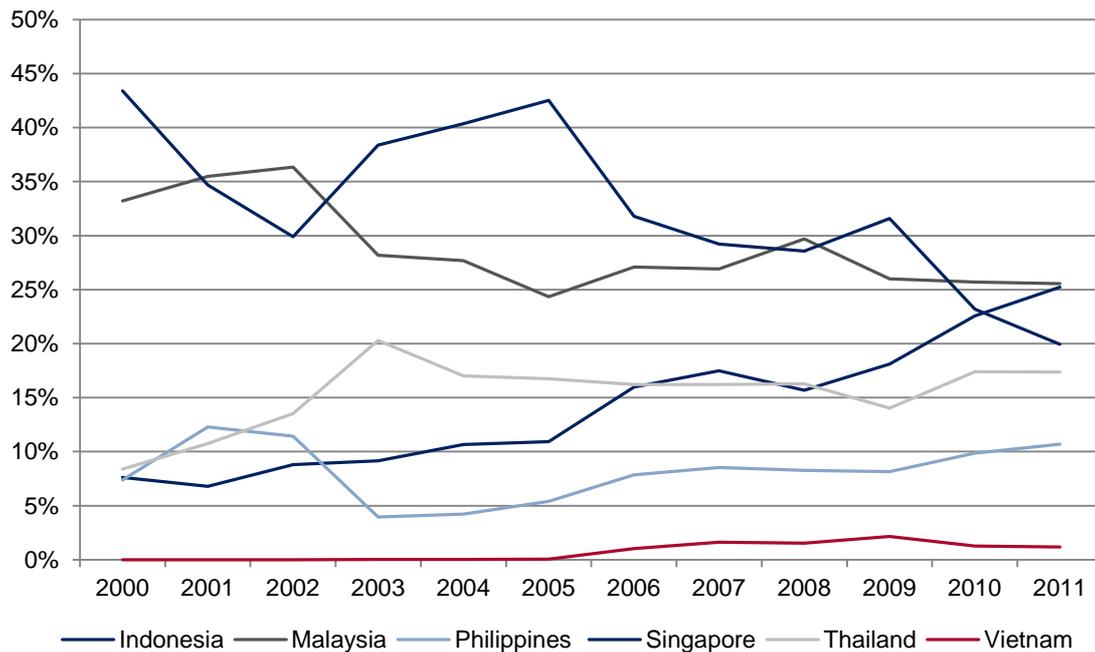
Table 4-4
Number of Listed Companies and Market Capitalization

Sample Period	Indonesia (IDN)			Malaysia (MY)			Philippines (PH)			Singapore (SG)			Thailand (TH)			Vietnam (VN)			Hong Kong (HKG)		Japan (JPN)		South Korea (KOR)	
	Listed Companies	Mar. Cap (US\$ Bio)	% of Mar.Cap	Listed Companies	Mar. Cap (US\$ Bio)	% of Mar.Cap	Listed Companies	Mar. Cap (US\$ Bio)	% of Mar.Cap	Listed Companies	Mar. Cap (US\$ Bio)	% of Mar.Cap	Listed Companies	Mar. Cap (US\$ Bio)	% of Mar.Cap	Listed Companies	Mar. Cap (US\$ Bio)	% of Mar.Cap	Listed Companies	Mar. Cap (US\$ Bio)	Listed Companies	Mar. Cap (US\$ Bio)	Listed Companies	Mar. Cap (US\$ Bio)
2000	290	26.8	7.6%	795	116.9	33.2%	228	26.0	7.4%	418	152.8	43.4%	381	29.5	8.4%	-	-	0.0%	779	623.4	2561	3,157.2	1308	171.6
2001	316	23.0	6.8%	809	120.0	35.5%	232	41.5	12.3%	386	117.3	34.7%	385	36.4	10.7%	-	-	0.0%	857	506.1	2471	2,251.8	1409	220.1
2002	331	30.0	8.8%	865	123.9	36.3%	235	39.0	11.4%	434	101.9	29.9%	398	46.2	13.5%	-	-	0.0%	968	463.1	3058	2,126.1	1518	249.6
2003	333	54.7	9.2%	897	168.4	28.2%	234	23.6	3.9%	551	229.3	38.4%	421	121.2	20.3%	22	0.2	0.0%	972	551.2	3116	3,040.7	1563	329.6
2004	331	73.3	10.7%	962	190.0	27.7%	233	29.0	4.2%	625	277.0	40.4%	464	116.7	17.0%	26	0.3	0.0%	1014	665.3	3220	3,678.3	1573	428.7
2005	335	81.4	10.9%	1020	181.2	24.3%	235	40.2	5.4%	685	316.7	42.5%	504	124.9	16.8%	33	0.5	0.1%	1020	693.5	3279	4,736.5	1620	718.2
2006	344	138.9	16.0%	1027	235.4	27.1%	238	68.4	7.9%	461	276.3	31.8%	518	141.1	16.2%	102	9.1	1.0%	1021	895.3	3362	4,726.3	1694	835.2
2007	383	211.7	17.5%	1036	325.7	26.9%	242	103.2	8.5%	472	353.5	29.2%	475	196.1	16.2%	121	19.5	1.6%	1029	1,162.6	3844	4,453.5	1767	1,123.6
2008	396	98.8	15.7%	977	187.1	29.7%	244	52.1	8.3%	455	180.0	28.6%	525	102.6	16.3%	171	9.6	1.5%	1251	1,328.8	3299	3,220.5	1789	494.6
2009	398	178.2	18.1%	960	256.0	26.0%	246	80.1	8.1%	459	310.8	31.6%	535	138.2	14.0%	196	21.2	2.2%	1308	915.8	3208	3,377.9	1778	836.5
2010	420	360.4	22.6%	957	410.5	25.7%	251	157.3	9.9%	461	370.1	23.2%	541	277.7	17.4%	275	20.4	1.3%	1396	1,079.6	3553	4,099.6	1781	1,089.2
2011	440	390.1	25.2%	941	395.1	25.6%	251	165.4	10.7%	462	308.3	19.9%	545	268.5	17.4%	301	18.3	1.2%	1472	889.6	3961	3,540.7	1792	994.3
Mean		138.9			225.8			68.8			249.5			133.2			8.2			814.5		3,534.1		624.3
Median		90.1			188.5			46.8			276.7			123.0			4.8			791.5		3,459.3		606.4
SD		125.5			102.4			49.2			91.6			81.1			9.2			276.3		862.8		350.5
Min.		23.0			116.9			23.6			101.9			29.5			-			463.1		2,126.1		171.6
Max.		390.1			410.5			165.4			370.1			277.7			21.2			1,328.8		4,736.5		1,123.6

Figure 4-4 shows that market capitalization in Indonesia, Thailand, Philippines, and Vietnam increased compared to total market capitalization of ASEAN countries, but market capitalization of Singapore and Malaysia decreased compared to total market capitalization of ASEAN countries. Market capitalization in Indonesia increased significantly from 2009 to 2011 while market capitalization in Singapore decreased significantly. This indicates that the decrease in market capitalization in Singapore may be due to Singaporean investors moving their money to Indonesia. Thus, without formal integration, capital markets in ASEAN already integrate themselves.

Figure 4-3

Market Capitalization as Percentage Among ASEAN Countries



5. Integration of ASEAN Capital Markets

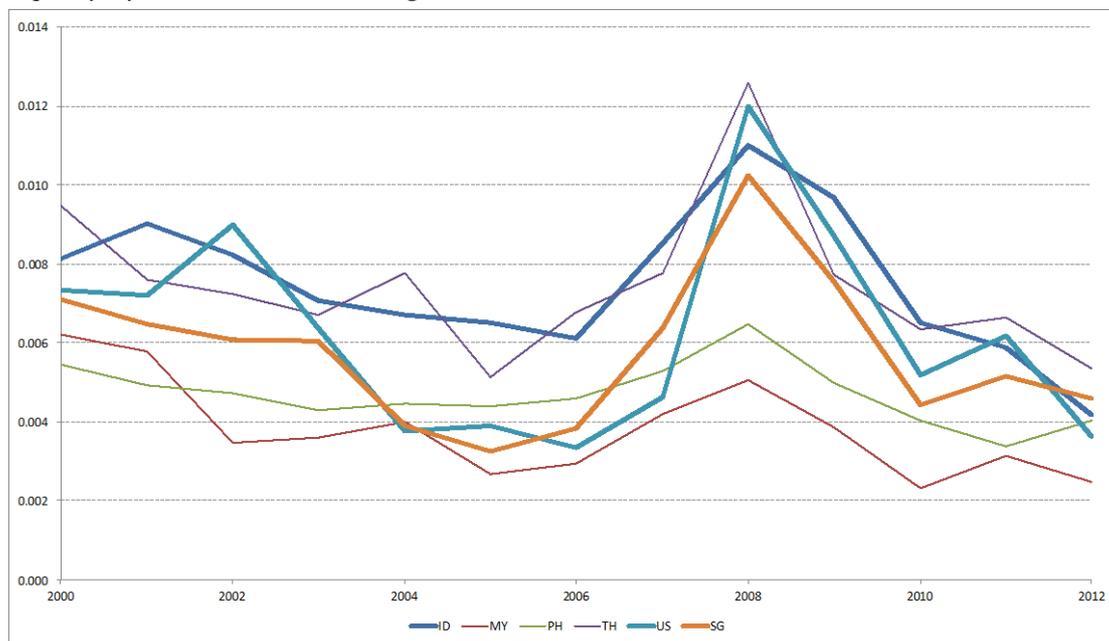
In this section we study prevailing ASEAN capital markets integration, which is supposedly driven by the market and economic participants, not by governments. The empirical results presented are based on a market microstructure approach, and the complete discussion of the methodology is provided in the appendix.

LIQUIDITY PROFILE

At the first stage of our study, we describe the microstructure profile reflected in the liquidity level of each ASEAN member. The measure of liquidity follows the high and low method for low-frequency data as proposed in Corwin and Schultz (2012). Our result shows that the liquidity level is dynamic (see Figure 5-1). Indonesia, Thailand, and the United States have a similar illiquidity pattern, which rise sharply in 2008, while for Malaysia and the Philippines the pattern is a very slight rise from the previous illiquidity level.

The pattern shows that during the 2008 crisis, Indonesia and Thailand were highly sensitive to the international economy, as they were becoming more illiquid than Malaysia and the Philippines. This indicates that the equity market in Indonesia and Thailand are closely related to that in the United States.

Figure 5-1
Liquidity Dynamics in the ASEAN Region and United States.



The estimation of illiquidity level follows closely the Corwin and Schultz (2012) method to infer the bid-ask spread from the ratio of high and low stock prices in two days. Daily data consist of open, high, low, and close-of-market indices of the stock market from each ASEAN country. Data are provided from Datastream.

The dynamics of the illiquidity profile from 2000 to 2012 in Figure 5-1 suggest that there are two groups of economies in the four ASEAN member countries analyzed. The first group is Indonesia and Thailand, which are highly sensitive to international economic conditions, and the other is Malaysia and the Philippines, which are less sensitive than the first.

Table 5-1

Firm-level, Zero-return Incidence in ASEAN Equity Market from 2000-2012.

Date	ID	MY	PH	TH	VN	SG
Jan-10	0.472	0.133	0.133	0.431	0.575	0.099
Feb-10	0.532	0.298	0.088	0.478	0.632	0.124
Mar-10	0.508	0.141	0.148	0.382	0.564	0.110
Apr-10	0.519	0.133	0.205	0.452	0.563	0.133
May-10	0.398	0.160	0.159	0.460	0.462	0.064
Jun-10	0.456	0.130	0.180	0.399	0.506	0.081
Jul-10	0.513	0.154	0.118	0.417	0.489	0.095
Aug-10	0.506	0.172	0.107	0.356	0.403	0.117
Sep-10	0.523	0.211	0.092	0.303	0.489	0.088
Oct-10	0.424	0.134	0.135	0.307	0.450	0.057
Nov-10	0.389	0.164	0.180	0.283	0.445	0.075
Dec-10	0.421	0.152	0.187	0.326	0.398	0.052
Jan-11	0.280	0.109	0.056	0.304	0.521	0.063
Feb-11	0.429	0.232	0.093	0.311	0.559	0.095
Mar-11	0.365	0.067	0.091	0.285	0.486	0.068
Apr-11	0.465	0.090	0.166	0.378	0.485	0.095
May-11	0.427	0.140	0.100	0.376	0.459	0.096
Jun-11	0.444	0.073	0.129	0.268	0.420	0.038
Jul-11	0.359	0.032	0.100	0.296	0.470	0.062
Aug-11	0.396	0.101	0.139	0.208	0.404	0.041
Sep-11	0.315	0.101	0.092	0.212	0.393	0.036
Oct-11	0.283	0.048	0.100	0.243	0.408	0.021
Nov-11	0.361	0.102	0.201	0.237	0.394	0.044
Dec-11	0.446	0.070	0.105	0.346	0.369	0.091
Jan-12	0.421	0.143	0.149	0.341	0.569	0.095
Feb-12	0.341	0.151	0.071	0.222	0.350	0.033
Mar-12	0.435	0.024	0.077	0.263	0.311	0.038
Apr-12	0.444	0.102	0.220	0.376	0.371	0.081
May-12	0.436	0.064	0.106	0.263	0.236	0.051
Jun-12	0.363	0.019	0.105	0.294	0.324	0.028
Jul-12	0.443	0.023	0.063	0.225	0.387	0.034
Aug-12	0.519	0.140	0.223	0.297	0.400	0.083
Sep-12	0.437	0.071	0.086	0.208	0.443	0.050
Mean	0.426	0.118	0.127	0.320	0.447	0.071
Median	0.435	0.130	0.107	0.304	0.445	0.068
SD	0.068	0.062	0.047	0.077	0.087	0.030
Min.	0.280	0.019	0.056	0.208	0.236	0.021
Max.	0.532	0.298	0.223	0.478	0.632	0.133

Zero return incidences are estimated following the Lesmond et al. (1999) methodology using firm-level data. The measure reflects the percentage of zero return in a particular period. The higher zero-return incidences indicate higher illiquidity. The daily stock prices at the firm-level data were extracted from the Datastream for the period of 2000–2012.

Figure 5-1 might also indicate a higher percentage of foreign investors in Indonesia and Thailand than in Malaysia and Philippines, as the latter shows a somewhat steady level of illiquidity during the 2008 global crisis. Another possible explanation is differences in equity market regulation of foreign investor entrance and activity.

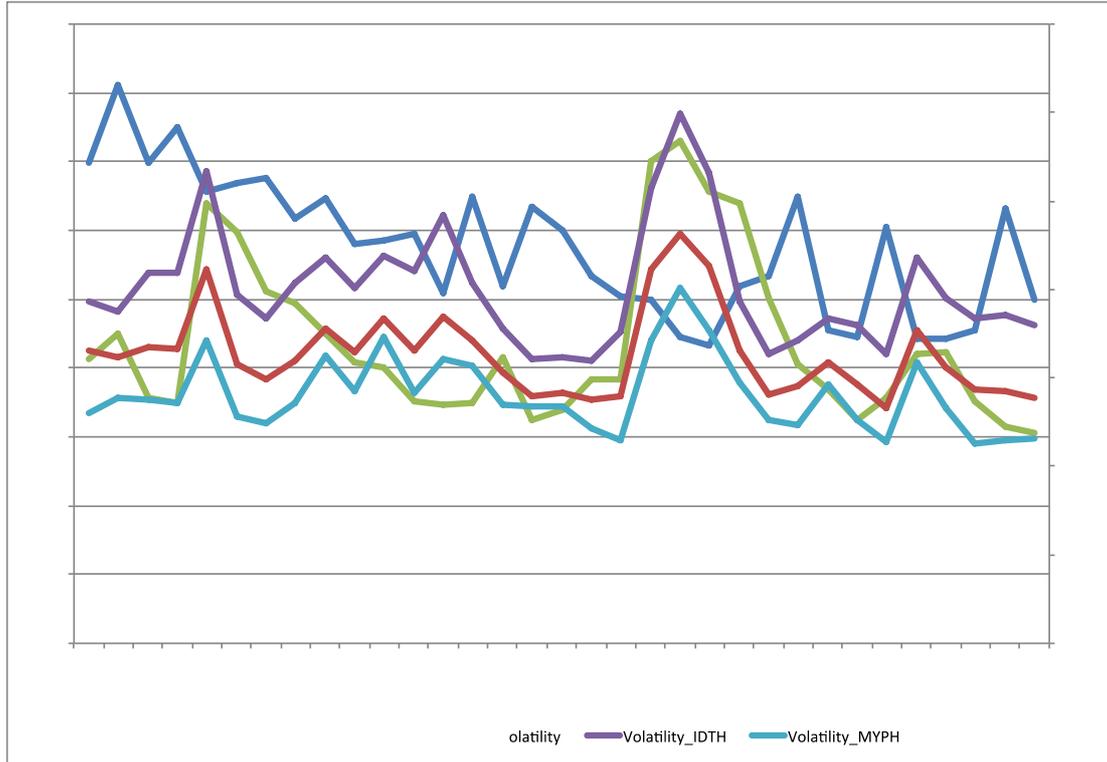
We also estimate the zero-return incidences (Lesmond et al., 1999) at the firm level to reveal the liquidity dynamics presented in Table 5-1. The range of liquidity in the equity markets in the ASEAN region goes descending, in order, from Malaysia to the Philippines, Thailand, Indonesia, and Vietnam. Again, the figure shows two groups with similar illiquidity profiles: Indonesia and Thailand in the first and Malaysia and the Philippines in the second.

The illiquidity level in the Indonesia stock market at 43 percent per annum is the highest among the ASEAN equity markets, except that of Vietnam. Assuming 250 business days in a year, a stock trade takes place roughly only once every two days. In contrast, the Singapore Stock Exchange, as the benchmark, shows only 7 percent zero-return incidences per annum. Meanwhile, the Malaysia Stock Exchange exhibits 12 percent per annum, and the Philippines and Thailand are at 13 percent and 32 percent, respectively.

VOLATILITY PROFILE

We analyze the characteristics of illiquidity and volatility in the ASEAN equity market along with the Index of International Volatility (VIX) as our proxy for international investors' risk level as conveyed by global financial information. Figure 5-2 shows a negative relation between zero-return incidences and volatility. Furthermore, we investigate the possibility of significant correlation between volatility and global variables to infer the information content in ASEAN equity market volatility. The pattern of average volatility confirms greater sensitivity to the VIX for Indonesia and Thailand than for Malaysia and the Philippines. The persistence of the volatility pattern indicates that volatility in ASEAN, particularly Indonesia and Thailand, is much more sensitive to global information than the rest of the equity markets in the region.

Figure 5-2
Firm Level Liquidity and Volatility of ASEAN Stock Market



Range-based volatility is the average daily standard deviation aggregated in a month. Parkinson (1980) high-low method is used to estimate firm-level volatility. Daily stock prices at the firm level were provided by Datastream for the period of 2010–2012.

For the Indonesia stock market, the annual standard deviation of stock return at the firm level is 34 percent. Again, the illiquidity profile in Table 5-2 shows the volatility in Indonesia is the highest in the ASEAN market. In fact, the volatility in Indonesia is comparable to that of the Vietnam stock market. Combining this finding with our previous result, Indonesia has high illiquidity and high volatility in the stock market indicating thin market characteristics. The risk of stock transactions is high, as reflected in the high annual standard deviation in the Indonesia Stock Exchange, which is translated into a wide bid-ask spread, causing high illiquidity.

The liquidity and volatility measures are estimated from firm-level data from ASEAN stock markets. Liquidity measure is zero return incidences as found in Lesmond et al. (1999), and volatility measure follows Parkinson (1980) high-low method. Volatility IDTH and MYPH are volatility for Indonesia and Thailand, Malaysia and Philippines, respectively.

Table 5-2
Firm Level Annual Range-based Volatility

Date	ID	MY	PH	TH	VN	SG	Average
Jan-10	0.346	0.145	0.266	0.265	0.420	0.286	0.288
Feb-10	0.365	0.140	0.299	0.227	0.326	0.250	0.268
Mar-10	0.369	0.150	0.285	0.292	0.333	0.225	0.276
Apr-10	0.335	0.135	0.295	0.328	0.315	0.223	0.272
May-10	0.515	0.183	0.357	0.329	0.407	0.283	0.346
Jun-10	0.360	0.138	0.269	0.261	0.327	0.221	0.263
Jul-10	0.307	0.142	0.252	0.274	0.336	0.201	0.252
Aug-10	0.361	0.186	0.243	0.284	0.378	0.191	0.274
Sep-10	0.371	0.194	0.320	0.317	0.343	0.206	0.292
Oct-10	0.335	0.200	0.250	0.300	0.315	0.219	0.270
Nov-10	0.366	0.201	0.345	0.326	0.352	0.217	0.301
Dec-10	0.365	0.172	0.275	0.301	0.394	0.194	0.283
Jan-11	0.438	0.188	0.321	0.328	0.306	0.186	0.294
Feb-11	0.339	0.207	0.290	0.306	0.314	0.214	0.278
Mar-11	0.314	0.161	0.266	0.248	0.335	0.219	0.257
Apr-11	0.256	0.160	0.262	0.252	0.312	0.171	0.236
May-11	0.239	0.182	0.240	0.272	0.349	0.186	0.245
Jun-11	0.264	0.148	0.237	0.241	0.353	0.196	0.240
Jul-11	0.271	0.160	0.202	0.286	0.331	0.183	0.239
Aug-11	0.463	0.271	0.269	0.352	0.327	0.314	0.332
Sep-11	0.552	0.297	0.337	0.394	0.330	0.250	0.360
Oct-11	0.424	0.288	0.271	0.417	0.294	0.286	0.330
Nov-11	0.316	0.219	0.247	0.294	0.355	0.229	0.277
Dec-11	0.247	0.187	0.212	0.271	0.349	0.195	0.244
Jan-12	0.299	0.156	0.236	0.242	0.318	0.218	0.245
Feb-12	0.304	0.186	0.276	0.276	0.331	0.214	0.264
Mar-12	0.271	0.150	0.250	0.296	0.354	0.189	0.252
Apr-12	0.262	0.135	0.225	0.257	0.336	0.172	0.231
May-12	0.340	0.196	0.305	0.348	0.384	0.207	0.297
Jun-12	0.366	0.165	0.255	0.249	0.336	0.200	0.262
Jul-12	0.295	0.147	0.208	0.287	0.334	0.198	0.245
Aug-12	0.334	0.151	0.211	0.253	0.323	0.174	0.241
Sep-12	0.306	0.186	0.180	0.263	0.305	0.162	0.234
Mean	0.342	0.180	0.265	0.292	0.340	0.215	0.272
Median	0.335	0.172	0.266	0.286	0.334	0.207	0.268
SD	0.073	0.041	0.042	0.043	0.029	0.036	0.033
Min.	0.239	0.135	0.180	0.227	0.294	0.162	0.231
Max.	0.552	0.297	0.357	0.417	0.420	0.314	0.360

The plot in Figure 5-2 shows similarities of characteristics among Indonesia, Thailand and the VIX indicating high sensitivity of the Indonesia and Thailand stock markets to the expected short-term volatility of the international market. It is vital to find that at both the market and firm levels, high-risk and high-illiquidity level is found reflecting high transaction risk in the Indonesian stock market.

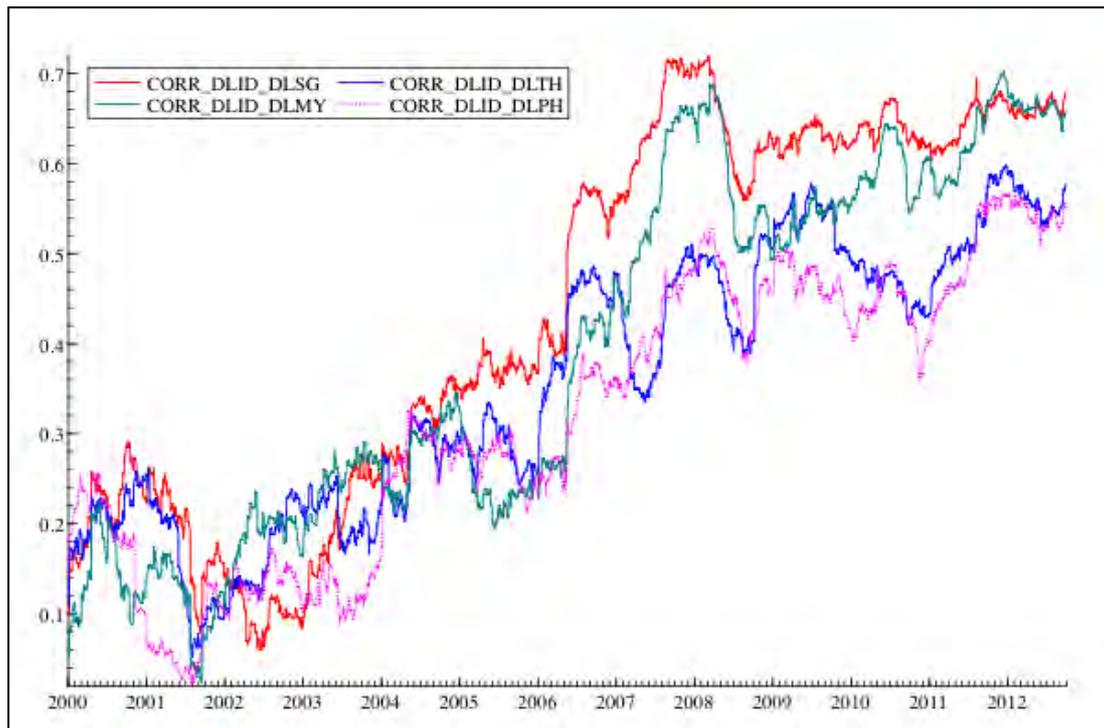
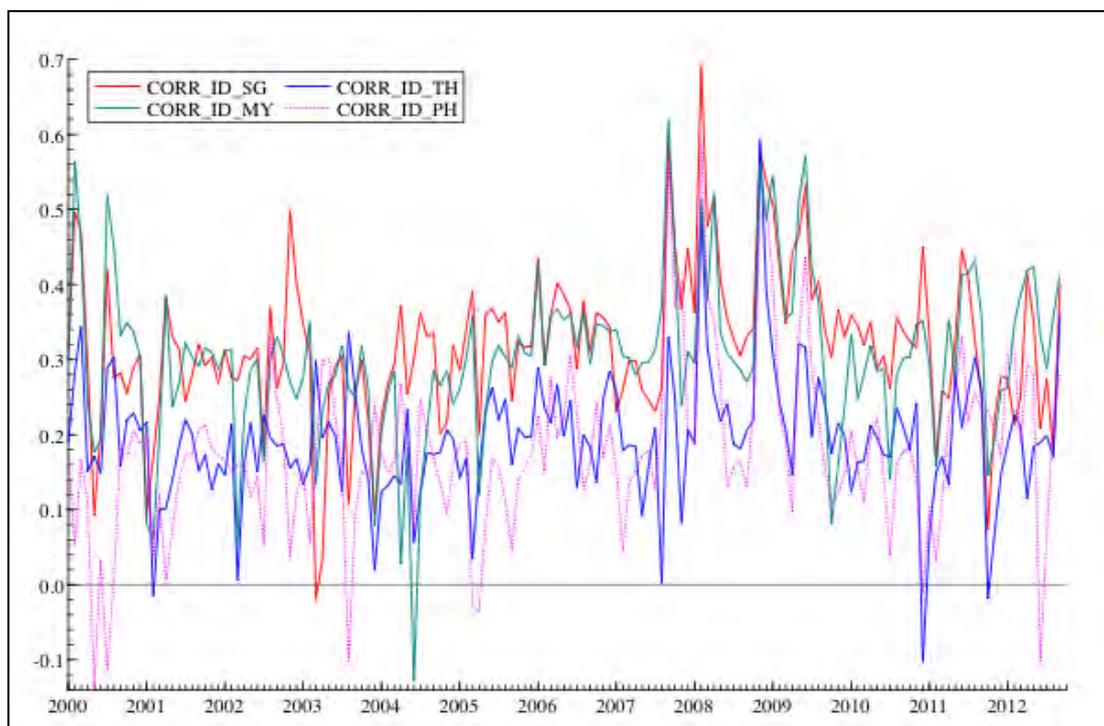
DYNAMIC CORRELATION

We estimate the dynamic correlation between stock market returns and illiquidity level in ASEAN stock markets to reveal the time-varying correlation among them. The dynamic correlation analysis is a proxy for estimating existing dynamic integration among stock markets in ASEAN. Higher dynamic correlation indicates higher integration among markets.

In Figure 5-3, Panel A shows the correlation among stock market returns and Panel B presents the correlation of illiquidity among stock markets.

Figure 5-3

Dynamic Conditional Correlation of the Indonesia Stock Market with other Stock Markets in the ASEAN Region.

Panel A**Panel B**

SG, ID, MY, TH and PH are Singapore, Indonesia, Malaysia, Thailand and Philippines respectively

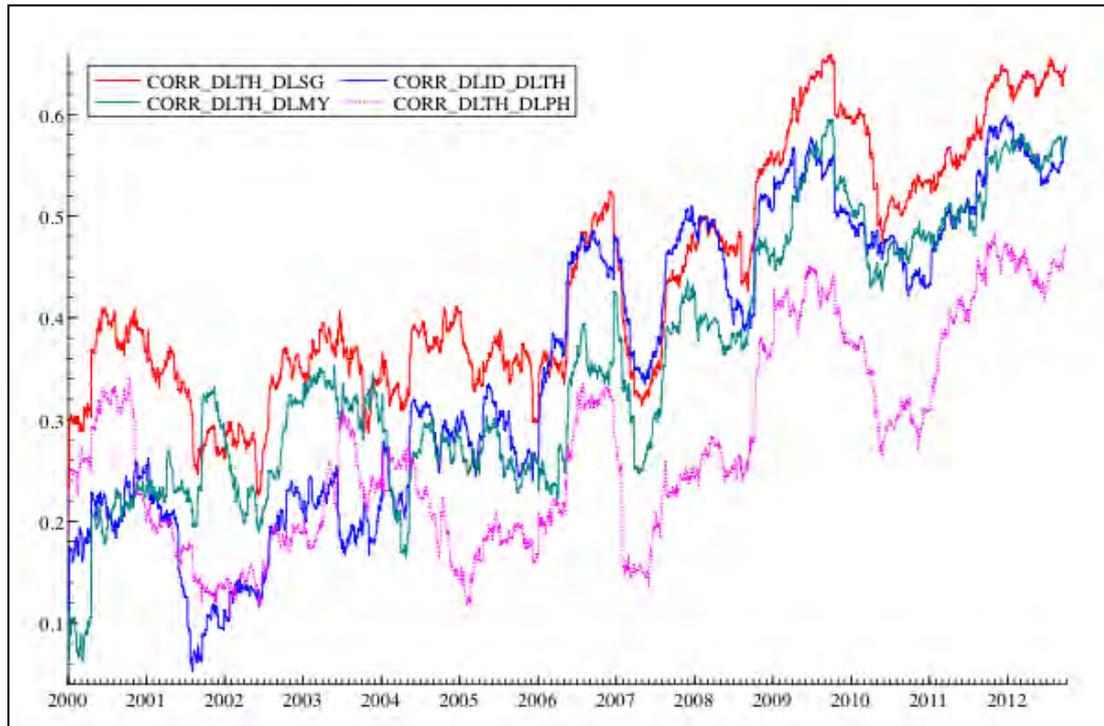
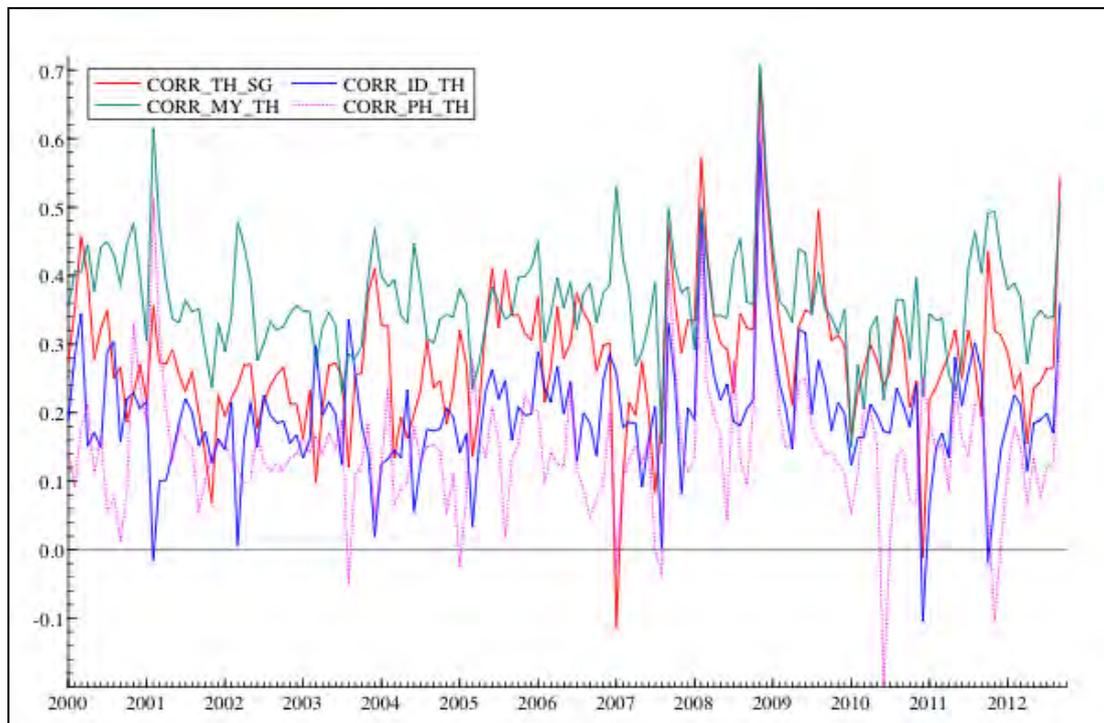
As Figure 5-3 Panel A shows, market index return correlation shows a time-varying nature of the integration level among ASEAN stock markets. Overall, integration of ASEAN stock markets, as indicated from the time-varying correlation, shows a positive trend, implying higher stock market integration in the region. The figure shows that the stock market integration between Indonesia and Singapore shifts to the highest among the rest of the equity market starting from 2005 to early 2012. After that, the correlation between Indonesia and Malaysia shifts at par to the correlation between Indonesia and Singapore. It is clear that the integration of the Indonesian stock market with the other stock markets in the ASEAN region is dynamic in nature.

Further analysis of the correlation of illiquidity of the Indonesia stock market with ASEAN member equity markets is presented in Figure 5-3 Panel B. On average, the illiquidity correlation among ASEAN stock markets is positive, suggesting similar liquidity risks. Again, for Indonesia, the illiquidity correlation between Indonesia and Singapore is the highest, implying that not only is the market index return highly correlated, but the liquidity risk is also closely related. In conjunction with systematic liquidity risk in the integrated market, the high liquidity risk in one market in the ASEAN region would be transmitted to other markets. Because the illiquidity correlation between Indonesia and Singapore after 2005 is the highest compared to correlation with other markets, the higher liquidity risk in Singapore is most likely transmitted to Indonesia and vice versa.

Figure 5-4 shows that the dynamic correlation between the Thai stock market return and Singapore is the highest among the ASEAN stock markets. The illiquidity correlation reveals, however, that the relation between Thailand and Malaysia is the highest. It implies that although the return correlation is the highest between Thailand and Singapore, the liquidity risk, as shown in Figure 5-4, Panel B, between Thailand and Malaysia shares a similar profile.

Figure 5-4

Dynamic Conditional Correlation of the Thailand Stock Market with other Stock Markets in the ASEAN Region

Panel A**Panel B**

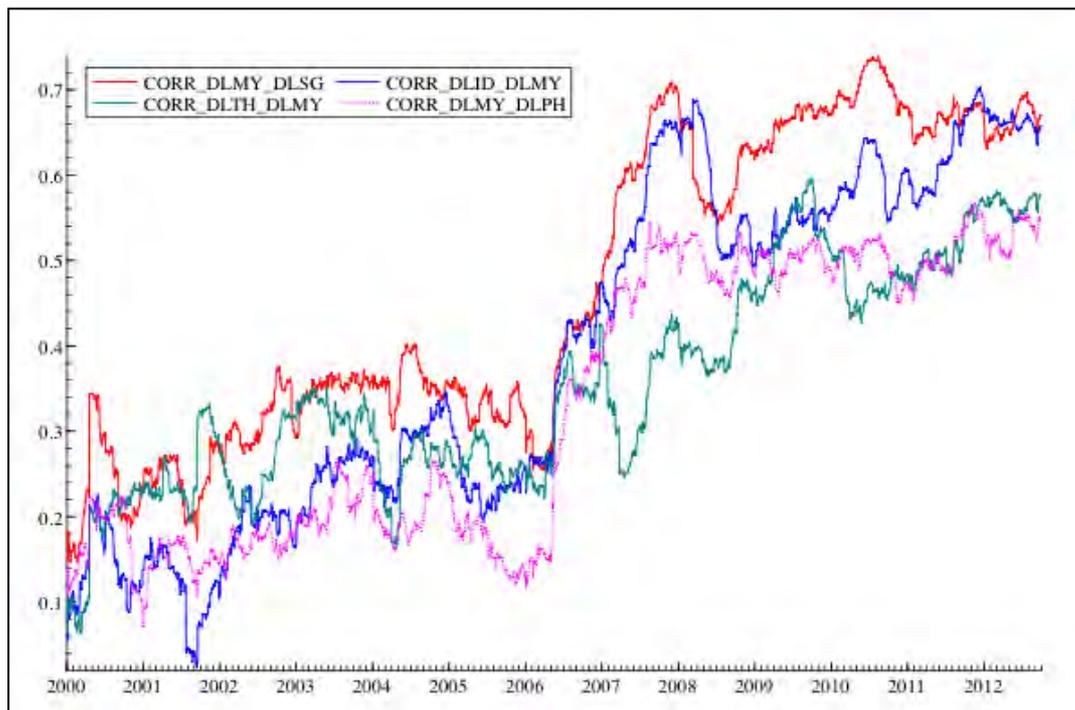
SG, ID, MY, TH and PH are Singapore, Indonesia, Malaysia, Thailand and Philippines respectively.

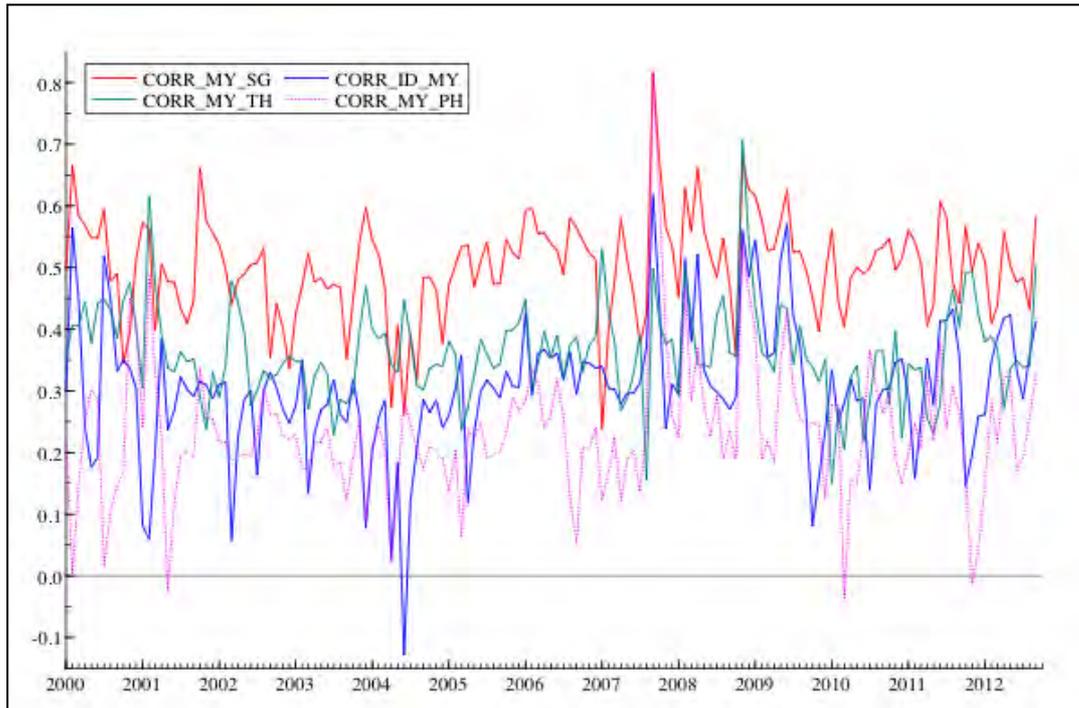
The correlation dynamics of stock return in Malaysia is presented in Figure 5-5 Panel A, where the correlation of the Malaysia stock return with the rest of the stock markets in the ASEAN region has a positive trend, suggesting greater integration among them. As for the liquidity risk correlation shown in Figure 5-5 Panel B, Malaysia and Singapore have the highest level of correlation, implying a similar liquidity risk for the countries. The liquidity risk correlation patterns of Malaysia and Indonesia with Singapore are analogous.

Figure 5-5

Dynamic Conditional Correlation of the Malaysian Stock Market with other Stock Markets in the ASEAN Region

Panel A



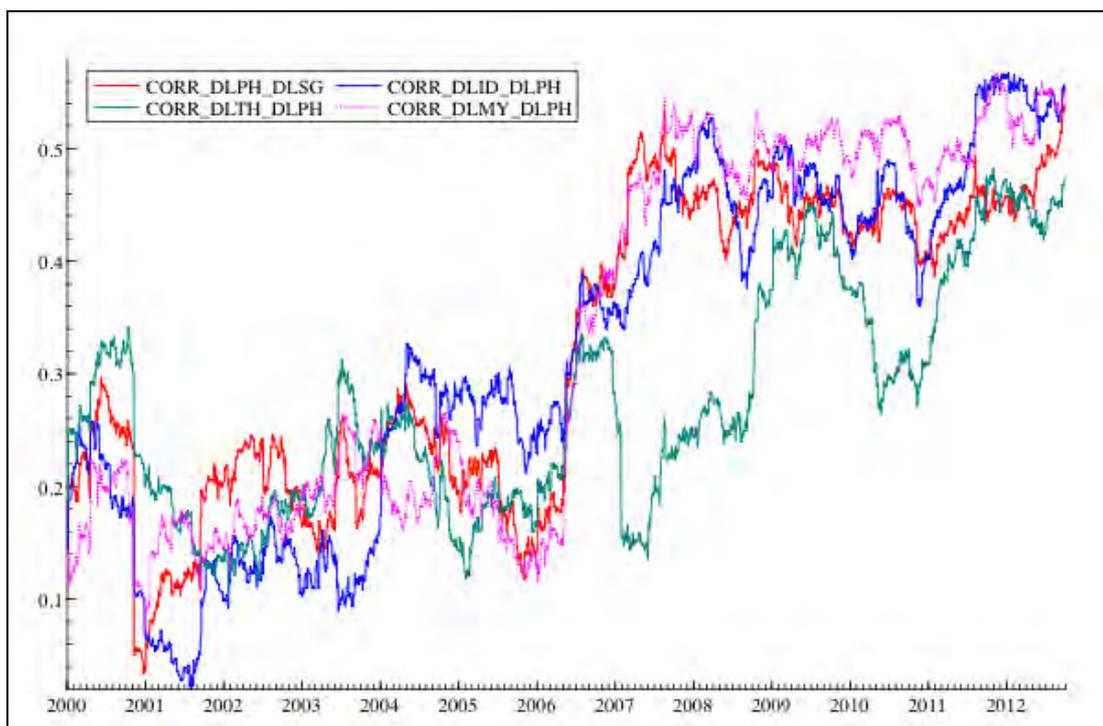
Panel B

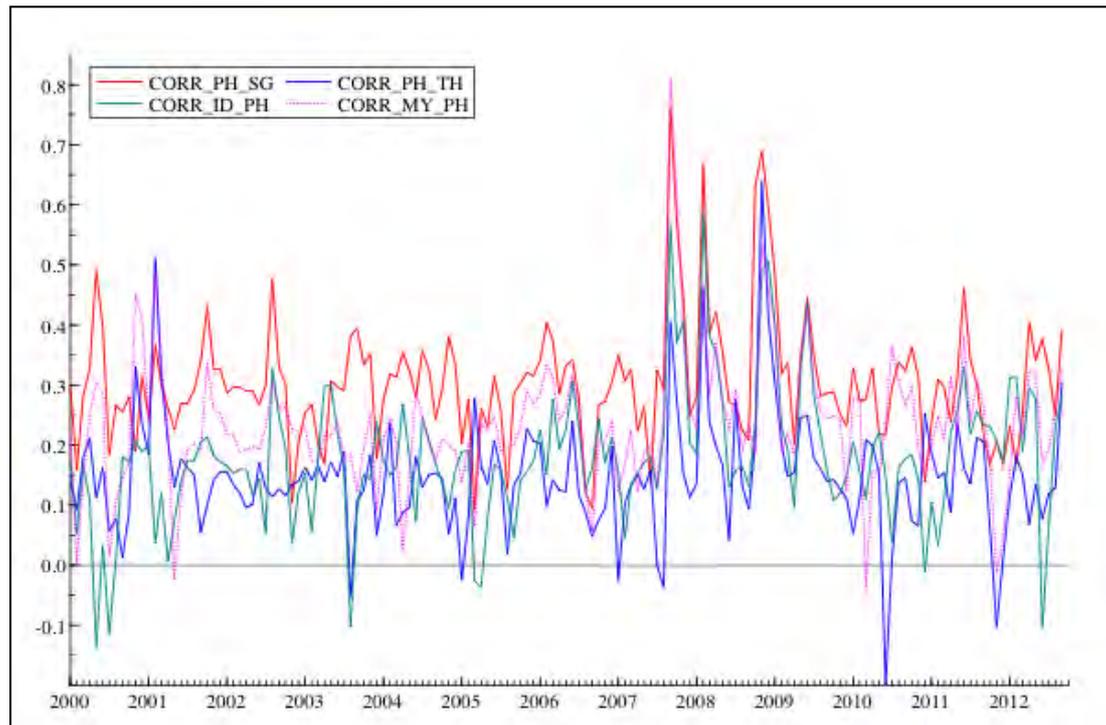
SG, ID, MY, TH and PH are Singapore, Indonesia, Malaysia, Thailand and Philippines respectively.

In Figure 5-6 Panel A, the dynamic correlation of the Philippines with other stock markets in the ASEAN region is different from the previous pattern. Starting from 2007, the Philippines stock market becomes more correlated to those of Indonesia, Malaysia, and Singapore. Furthermore, from 2007 the correlation between the Philippines and Malaysia is the highest.

Figure 5-6

Dynamic Conditional Correlation of the Philippines Stock Market with other Stock Markets in the ASEAN Region

Panel A

Panel B

SG, ID, MY, TH and PH are Singapore, Indonesia, Malaysia, Thailand and Philippines respectively.

These graphs show that from 2000 to 2012 stock return correlations in ASEAN stock markets display a positive trend, suggesting higher integration in the region. Moreover, the higher integration among stock markets is achieved without any integration scheme from governments toward the ASEAN Economic Community. It is important that higher integration over time reflects market-driven integration instead of regulation-driven. From the liquidity risk perspective, as estimated from the dynamic correlation of low frequency bid-ask spread in ASEAN stock market indices, in general, the liquidity risk correlation of the stock markets is positive and each has a high correlation with the Singapore market.

To complete the graphical analysis, a time-series regression is estimated to gain more information on the structure of interdependency among stock markets. The result reported in Table 5-3 shows that Singapore has a significant, positive liquidity risk relationship with each stock market in ASEAN, suggesting the important contribution of the Singapore stock market to the level of liquidity risk in the each stock market in the region. The coefficient of Singapore's liquidity risk is the highest in the Indonesia stock market, denoting a positive, significant liquidity risk transmission from Singapore to Indonesia. In fact, from the regression coefficients presented in column ID, the level of liquidity risk in the Indonesia stock market is driven primarily by Singapore's liquidity risk as it has the largest magnitude (0.42) compared to other stock markets' coefficients. In sum, the Indonesia stock market is highly sensitive to the level of liquidity risk in Singapore.

Table 5-3
Illiquidity Regression Analysis

	ID	TH	MY	PH	SG
Constant	0.0035 **	0.0011	-0.0001	0.0026 ***	-0.001 **
AR(1)	0.0137	0.1431	0.4890 ***	-0.1242	0.483 ***
SG	0.4178 ***	0.2828 **	0.1165 **	0.2413 ***	
ID		0.0564	0.0270	0.0207	0.129 ***
TH	0.0715		0.0928 ***	0.0851	0.087
MY	0.1606	0.4778 ***		0.1442	0.230 **
PH	0.0813	0.2952	0.1026		0.341 ***
Adj-R ²	0.204	0.343	0.406	0.210	0.598

Thailand (column TH) assumes the greatest impact of liquidity risk from the Malaysia stock market, as it has the highest coefficient (0.48). Furthermore, the impact of Singapore-to-Thailand liquidity risk is smaller than that of Singapore-to-Indonesia liquidity risk. In Malaysia (column MY), the domestic market makes the largest contribution to the liquidity risk because the autoregressive coefficient is the largest in the equation. More important, the Malaysia stock market is relatively independent because although Singapore and Thailand have a statistically significant impact; the magnitude is not as high as the lag of domestic market represented by AR(1) coefficient. For the Philippines (column PH), the market is comparable to the Indonesian market since both markets exhibit positively significant constant and statistically positively significant coefficient of estimation from Singapore: 0.42 for Indonesia and 0.24 for Philippines. The difference is clear, however, that the impact of Singapore on the liquidity risk in the Philippines is nearly half the impact of Singapore on the liquidity risk in Indonesia. Finally, from the regression estimates for Singapore stock market reveal interdependency among markets in attaining level of liquidity risk because the stock markets, excluding Thailand, obtain positively significant impact on Singapore's level of liquidity risk. The findings suggest that the integration of stock markets in ASEAN would improve the liquidity level among them with Singapore as the originator of improvement.

VOLATILITY SPILLOVER

As has been discussed in the previous analysis, the degree of integration estimated from the dynamic correlation among ASEAN stock markets had a positive trend from 2000 to 2012. The finding implies not only greater integration but also greater potential of volatility spillover among stock markets in the region. Ideally, volatility spillover is estimated in a multivariate setting. In this study, however, a univariate GARCH-in-mean framework is used for its simplicity. Nevertheless, the GARCH-in mean has similar characteristics to the multivariate setting.

The GARCH-in-mean estimation results presented in Volatility spillover is estimated using GARCH-in-mean framework. We use residual series from Singapore after controlling for the U.S. stock market return.

Table 5-4 reveals substantial potential volatility spillover to other ASEAN stock markets originating in Singapore. From the variance equation, the coefficients of time-varying volatility from Singapore significantly increase the volatility of each domestic stock market. The result shows that Indonesia, with the coefficient of 0.83, is the most sensitive to the

uncertainty level in Singapore followed by Thailand (0.33), the Philippines (0.28), and Malaysia (0.27). Further, the volatility feedback has also been studied to infer the destabilizing impact of a higher uncertainty level from Singapore to the stock market return on the rest of ASEAN equity markets. Volatility from Singapore significantly affected the level of volatility in each of the stock markets in the ASEAN region, engendering lower expected rate of return in domestic stock markets.

Volatility spillover is estimated using GARCH-in-mean framework. We use residual series from Singapore after controlling for the U.S. stock market return.

Table 5-4
Volatility Spillover Estimation

	ID		TH		MY		PH	
	I	II	I	II	I	II	I	II
Mean								
c	0.0015	0.0032 ***	0.0023 *	0.0032 ***	0.0002	0.0015 ***	-0.0005	0.0029
$\delta_{MA(1)}$	0.0217	0.0101	0.0299 *	0.0240	0.1115 ***	0.1008 ***	0.1373 ***	0.1259
$\lambda_{GARCH-in-mean}$	-0.0311	-0.1364 **	-0.1057	-0.1733 **	0.0259	-0.1249 *	0.0597	-0.1928 *
Variance								
$\omega \times 10^4$	0.2237 ***	0.6680	0.1470 ***	0.4497 **	0.0186 **	0.1889 ***	0.1801 ***	0.3864 ***
ν_{SG}		0.8348 ***		0.3298 ***		0.2711 ***		0.2769 ***
α	0.0513 ***	0.0258	0.0663 ***	0.0673 ***	0.0678 ***	0.0782 ***	0.0834 ***	0.0972 ***
β	0.8126 ***	0.2648 ***	0.8329 ***	0.4844 ***	0.8828 ***	0.2183 ***	0.7699 ***	0.4297 ***
ν_{GR}	0.1715 ***	0.2717 ***	0.1023 ***	0.1742 ***	0.0737 ***	0.0964 *	0.1285 ***	0.0892 *
$\alpha + \beta$	0.8639	0.2907	0.8992	0.5517	0.9506	0.2964	0.8533	0.5269

The Philippines suffers the greatest negative impact to its expected stock market return resulting from higher volatility generated by greater uncertainty in Singapore. Alternatively, the negative risk-return relationship as shown in Table 5-4 row λ , may be explained as lower market risk premium in the Indonesia, Thailand, Malaysia and Philippine stock markets as a result of higher risk premium demanded due to higher volatility in the Singapore market. In this case, the ASEAN stock markets serve as a place for fund outflow from Singapore due to higher risk. As the data is at daily level, the stock market investment outflow from Singapore to other stock markets and vice versa occurred at daily intervals. Therefore, the ASEAN stock markets, excluding Singapore, face greater liquidity risk due to the short-term reversals of fund flow when the investment risk in Singapore is increasing.

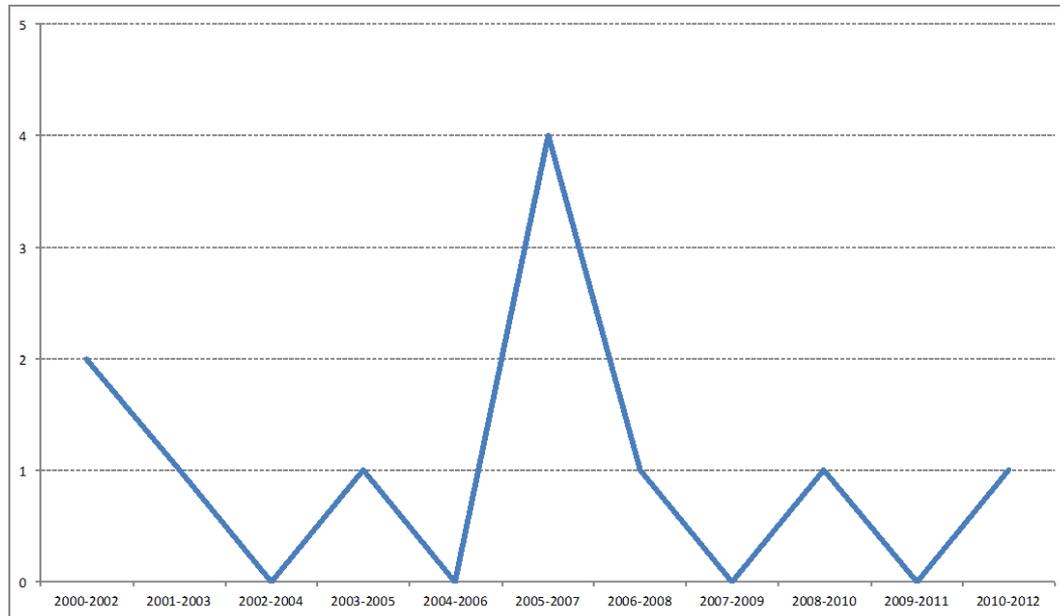
DYNAMIC COINTEGRATION

The cointegration analysis infers the efforts among ASEAN stock markets to achieve long-term equilibrium in the region that is highly likely attained from policy coordination among equity markets in ASEAN. To assess the persistence of cointegration, a dynamic approach is used—a rolling 3-year Johansen test procedure as in Pascual (2003). This tests to find the existence of cointegration and the numbers of cointegrating rank. Kasa (1992) shows that in the cointegration system with n stock market, a condition for complete cointegration is that there be $n-1$ cointegrating vectors. Following Kasa, numbers of cointegrating rank is plotted against 3-year rolling period.

The Johansen cointegration test is employed to indicate the existence of long-term equilibrium in the ASEAN region. Rolling three-year estimation is used to reveal the dynamic cointegration.

The cointegration dynamic is presented in Figure 5-7. The most stable cointegration exists in 2005 to 2007 with four cointegrating rank. Other periods—2003–2005, 2008–2010, 2010–2012—show weak cointegration in ASEAN stock markets. As a result, cointegration among ASEAN stock markets exists, although mostly through only one channel, which implies unstable integration.

Figure 5-7
Dynamic Cointegration Analysis



6. Impact of Integration on Macroeconomic Variables

In this section we examine the impact of capital market integration on the economy from a macroeconomic perspective. The core approach is to explore the impact of various measures of integration on key macro variables.

Our first regression examines the impact on market capitalization of various measures of integration and country fixed effects. From the regression below, we conclude that in ASEAN-4 countries, capital market integration measured by the decrease in spread and money market rate differential will increase market capitalization significantly. We use two approaches here to proxy capital market integration. The first proxy is bid-ask spread that has been calculated in the previous section, while the second proxy is money market differential. In terms of magnitude, the spread has a greater effect on market capitalization. It is clear that the bid-ask spread is a more direct proxy for capital market transaction cost. Therefore, it has a greater impact on market capitalization. We use ASEAN-4 data because of availability. Singapore is excluded because we use Singapore as the benchmark in the money market rate differential.

Table 6-1

Impact of Capital Market Integration on Market Capitalization in ASEAN-4 (Dependent Variable: Market Capitalization)

Variable	(1)	(2)
Intercept	0.107444*** (8.41)	0.078928*** (11.79)
Spread	-6.378079** (-3.14)	
Money market rate differential		-0.002992 (-1.78)*
FIXED EFFECT (CROSS)		
Indonesia	-0.027922	-0.029097
Malaysia	0.056989	0.063448
Philippines	-0.029540	-0.015851
Thailand	0.000473	-0.018500
R-squared	0.862055	0.840146

Note: The dependent variable is market capitalization. T-stats are listed below the coefficient. Coefficients were estimated using fixed-effect panel regression.

**—statistical significance at 10 percent*

***—statistical significance at 5 percent*

****— statistical significance at 1 percent*

Data are annual data from 2000 to 2010, with 44 observations.

Table 6-2 shows that capital market integration measured by the decrease in money market rate differentials will increase total investment significantly in ASEAN countries. Spread, however, is not significantly influencing total investment. Total investment used in this term is a macroeconomic variable as a component of GDP, which is defined as the purchase of physical capital (such as equipment, buildings, and machinery) to increase economic capacity.

Table 6-2

Impact of Capital Market Integration on Investment (Dependent Variable: Log of Total Investment)

Variable	(1)	(2)
Intercept	191.1354*** (8.41)	427.1557*** (11.79)
Spread	-0.0099 (-0.05)	
Money market rate differential		-0.03677** (-2.57)
FIXED EFFECT (CROSS)		
Indonesia	0.3922	0.5179
Malaysia	-0.1437	-0.2293
Philippines	-0.4100	-0.3398
Thailand	0.1616	0.0513
R-squared	0.7346	0.7731

Note: The dependent variable is log of total investment. T-stats are listed below the coefficient. Coefficients were estimated using fixed effect panel regression.

**—statistical significance at 10 percent*

***—statistical significance at 5 percent*

****—statistical significance at 1 percent*

Data are annual data from 2000 to 2010, with 44 observations.

In terms of individual intercepts, Indonesia has the highest coefficient. This shows that the level of total investment in Indonesia is the highest among ASEAN-4 (Malaysia, Thailand, and Philippines).

The next regression conducted is measuring the impact of ASEAN capital market integration to GDP growth in ASEAN. From Table 6-3, we see that both market capitalization and total investment have positive and significant effects on growth of GDP. We run this regression using ASEAN-5 countries. For dummy intercept, Indonesia ranks second after the Philippines.

The positive impact shows that ASEAN capital market integration could have a positive effect on ASEAN member countries **on average**, but we must investigate further whether this is true for Indonesia.

We use time series econometric analysis to measure the impact of ASEAN capital market integration on Indonesia. Because of limited observations in yearly data (only 11 observations in 2000–2010), we use quarterly data time series regressions. As usual, the first step in time series analysis is to check the stationarity of the data. From the ADF (Augmented Dickey Fuller) stationarity test, we find that market capitalization, spread, and money market rate differential are stationary. GDP, labor ratio, and investment, however, are nonstationary. We run five OLS regressions using data from 2000Q1 to 2010Q4, which are summarized in Table 6-4 to 6-6.

Table 6-3
Impact of Capital Market Integration on GDP (Dependent Variable: Log GDP)

Variable	
Intercept	5.9588*** (4.049)
Market Capitalization	0.7862** (2.466)
Log Total Investment	0.7755*** (8.576)
Labor Ratio	1.8111 (0.75603)
FIXED EFFECT (CROSS)	
Indonesia	0.1833
Malaysia	0.0277
Singapore	-0.2713
Philippines	0.1938
Thailand	-0.1334
R-squared (weighted)	0.9543

Note: The dependent variable is GDP (in Log). t-stats are listed below the coefficient. Coefficients were estimated using fixed effect panel regression.

*—statistical significance at 10 percent

**—statistical significance at 5 percent

***—statistical significance at 1 percent

Data are annual data from 2000 to 2009, with 40 observations.

The first and the second regressions in Table 6-4 employ first difference of log total investment in Indonesia as dependent variable. We use the first difference model because of the non-stationarity of total investment in level data. The regression shows that changes in money market rate differential and bid-ask spread do not have significant effect on a change in log of total investment.

Table 6-4
Impact of Capital Market Integration on Total Investment [Dependent Variable: d (Log Total Investment in Indonesia)]

Variable	(1)	(2)
Intercept	0.006734*** (2.8752)	0.006726*** (2.8757)
d(Money Market Rate Differential Indonesia)	0.000232 (0.021168)	
d(Spread Indonesia)		0.251702 (0.3092)
Dummy Crisis	0.01317*** (3.2088)	0.01327*** (3.2333)
R-squared	0.167	0.168

Note: The dependent variable is total investment in Indonesia (in Log). t-stats are listed below the coefficient. Coefficients were estimated using ordinary least square (OLS). The symbols *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

The third and fourth regressions, set out in Table 6-5, use the level of market capitalization because market capitalization, spread, and money market rate differential are stationary. The results show that money market rate differential negatively affects market capitalization, while spread does not seem to affect market capitalization.

Table 6-5

Impact of Capital Market Integration on Market Capitalization (Dependent Variable: Market Capitalization Indonesia)

Variable	(1)	(2)
Intercept	0.049515*** (6.905)	0.053791** (2.559)
Money market rate differential Indonesia	-0.002947** (-3.147)	
Spread Indonesia		-0.031437 (-1.210)
Dummy crisis	0.007948*** (3.2059)	0.01567*** (4.667)
R-squared	0.592	0.348

*Note: The dependent variable is Market Capitalization in Indonesia. t-stats are listed below the coefficient. Coefficients were estimated using ordinary least square (OLS). The symbols *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.*

We also regress the first difference of Log GDP on the first difference of log total investment, first difference of labor ratio, and first difference of market capitalization. The regression result (Table 6-6) shows that a change in market capitalization significantly affects the change in Indonesian GDP growth. The change in market capitalization moderately affects the change in GDP growth (significant at 10 percent level).

Table 6-6

Impact of Investment, Employment, and Market Capitalization on GDP in Indonesia [Dependent Variable: d(Log GDP Indonesia)]

Variable	
Intercept	0.01138*** (4.444)
d(Log Total Investment in Indonesia)	0.1327 (1.5489)
d(Labor Ratio in Indonesia)	-3.222 (-1.0513)
d(Market Capitalization Indonesia)	0.844* (1.833)
Dummy	0.00447 (1.3801)
R-squared	0.130
Durbin-Watson stat	2.09

Note: The dependent variable is GDP in Indonesia (in Log). t-stats are listed below the coefficient. Coefficients were estimated using ordinary least square (OLS).

*—statistical significance at 10 percent

**—statistical significance at 5 percent

***— statistical significance at 1 percent

From the results we conclude that for Indonesia, capital market integration measured by money market rate differential significantly affects market capitalization. Furthermore, the change in market capitalization also significantly affects the change in GDP. Nevertheless, we must be cautious on the relatively low R square and the use of first difference to overcome the problem of non-stationarity in several variables of time series data.

7. Stakeholders Perceptions of ACMI Plan

We conducted two focus group discussions to complement our quantitative studies and get input from Indonesian capital market stakeholders on issues relevant to ASEAN Capital Market Integration (ACMI). The first focus group discussion involved self-regulated organizations (SROs): Indonesia Stock Exchange (IDX), Indonesia Central Securities Depository (KSEI), Kliring Penjaminan Efek Indonesia (KPEI); and regulators: PPAJP, Ministry of Finance, Fiscal Policy Office, Ministry of Finance, Debt Management Office, Ministry of Finance, and Bank Indonesia. The first focus group discussion was conducted December 12, 2012, at Bapepam & LK. The second focus group discussion involved market participants: Asosiasi Pengelola Reksadana Indonesia (APRDI), Asosiasi Emiten Indonesia (AEI), Asosiasi Perusahaan Efek Indonesia (APEI), Asosiasi Bank Kustodian Indonesia (ABKI), and Asosiasi Wali Amanat. The second focus group discussion was conducted December 14, 2012, at Bapepam & LK.

This section reports the major findings of the focus group discussions. Discussion of strengths, weaknesses, opportunities, and threats is in the next section.

STAKEHOLDERS' AWARENESS OF ACMI PLAN

Capital market stakeholders have heard about the ACMI plan but are not clear about its direction. The best-informed institution is the Indonesian stock exchange, because it is involved in the ASEAN Exchange Linkage (AEL) or Working Group E. From attending Indonesian stock exchange presentations, some brokerage companies and investment banks are partially aware of the ACMI plan but do not seem to realize that ACMI is more than AEL. Other institutions such as custodians, clearinghouses, and trustees have also heard about the ACMI plan from other forums such as ASEAN+3 Bond Market Forum. Indonesian capital market stakeholders have heard about ACMI but do not know the full scope of the integration plan, and are concerned about the impact of ACMI.

Market participants expect the regulator to enlighten and guide them and they want to know the details of the plan so that they can prepare themselves. Hence, it is advisable for the capital market regulator to meet and discuss with market participants on a regular basis. At the same time, the regulator can receive input from stakeholders on how to face the plan and to create united responses towards the plan.

PREPARATION (OF POLICIES, LEGAL FRAMEWORK, HARDWARE, SOFTWARE) FOR ACMI

Capital market regulators, especially those involved in working group meetings, need clearer directives from the top. The teams in the working groups representing Indonesian interests

must be well informed on the extent of Indonesia's readiness for and involvement in the ACMI plan. Simultaneously, regulators also need to coordinate and communicate with market participants on a regular basis.

From the policy side, the capital market regulator, Ministry of Finance, and Central Bank must coordinate and communicate to align their policies. For example, the Central Bank issues a policy prohibiting foreign investors to sell currency forward contract maturing in less than seven days. Although this policy may curb exchange rate volatility, it may also deter foreign investors from investing in the Indonesian capital market.

In terms of human capital, market participants feel that the capacity and capability of local finance companies must be improved on par with their regional counterparts. Only then will Indonesia benefit from the ACMI plan.

EXIT POLICY

Learning from the Eurozone experience, it might be a good idea to establish an exit policy for any ASEAN member perceiving that ASEAN capital market integration is not beneficial for its country. Stakeholders think that although having an option to exit the capital market integration may be attractive, the sunk costs will be high for all ASEAN member countries and implementing exit policies will be almost impossible because the "ASEAN way" does not recognize backtracking.

Although backtracking is not recognized, the "ASEAN way" is not to impose any sanction if a member country is not ready to implement any new measure. Other member countries will wait until a country is ready, or implements ASEAN minus X (X country is not participating) policies with the approval of all member countries.

DISTRIBUTION OF BENEFITS OF CAPITAL MARKET INTEGRATION

Almost all market participants agree that the benefits of ASEAN capital market integration will not be enjoyed equally among ASEAN members and that Singapore will probably benefit the most. It has the most advanced financial industry.

Some participants believe that Indonesia should take the opportunity to internationalize Indonesian companies through cross-listings in other ASEAN capital markets. Imposing home-country principal requirements—that is, requiring that the issuing firm be listed in its home-country stock market before it can be listed in another country's stock market—would give the home-country capital market regulator the access to information needed to regulate the firm.

ACTIVITIES AND PROFESSIONS AFFECTED NEGATIVELY BY ACMI

Almost all stakeholders agree that all professions in the Indonesian financial industry will be impacted if Indonesia implements full capital market integration. Full means professionals need to be recognized only by the host-country regulator to be permitted to work freely in other ASEAN countries. Full integration is still not possible because of the many differences in ASEAN capital market regulations. Full capital market integration may also induce price

wars, which may hurt local financial companies and professionals. Even with current domestic competition, financial services fees are already at an unhealthy level.

MECHANISM FOR RISK SHARING AND RISK MITIGATION IN ACMI

The ASEAN Capital Market Forum has formulated a dispute resolution and enforcement mechanism (DREM) for member countries. Although more details are needed, this mechanism has been established to help retail investors mitigate the credit and operational risks of their counterparts not delivering on their promises. Indonesia may also need to learn from other ASEAN capital markets about using insurance companies to mitigate credit risk. Such insurance, however, is not yet available in Indonesia. It might be worthwhile for Indonesian insurance companies to look into the possibility of covering investors' credit risk. To deal with market risk on the macro level, ASEAN has established its own regional policy coordination and crisis management protocol.

8. SWOT Analysis

STRENGTHS

Macroeconomic stability is important for companies and investors from other countries. The World Economic Forum (Schwab 2012) applies several criteria to determine a country's competitiveness in terms of its macroeconomic environment: government spending balance, national debt, inflation, national savings, interest rate spread, and credit rating. Using these indicators, Indonesia outperforms India, Russia, Brazil, Malaysia, Thailand, and the Philippines in terms of macroeconomic condition. This is due to the steady improvement in the Indonesian economy. Since the financial crisis at the end of the 1990s, it has had consistent growth. Between 2004 and 2008, it grew 5–6 percent annually, although it experienced a contraction in growth in 2009 due to the global financial crisis. From the perspective of fiscal management, the ratio of debt to GDP has been lowered from 83 percent in 2001 to 29 percent in 2009, one of the lowest among its ASEAN peers. Fitch and Moody's, two international credit rating references, upgraded Indonesia's rating to investment grade at the end of 2011 and beginning of 2012. The democratic government also plays a role in supporting the market-based economy. A Relatively good monetary policy framework reflected in its floating exchange rate system and inflation-targeting framework adoption also help Indonesia grow its financial market. In addition, according to the IMF (2012), Indonesia has a higher policy space in terms of fiscal, monetary, and structural policies.

Focus group discussions and in-depth-interviews identified the other main strengths of Indonesia, which are based on the fact that it has untapped market: many potential investors and companies to be listed in the capital market. Despite having the largest population among ASEAN countries, Indonesia has few investors in the capital market in comparison to its ASEAN peers—only about 200,000 investors. But with sustained economic growth, the size of the middle class is expected to grow, and growth in the Indonesian middle class will eventually increase the number of investors.

Despite the large number of eligible companies, only 440 firms had gone public in Indonesia by 2011. When we compare this number with the number of listed companies in Singapore and Malaysia, we can infer that the number of companies that can go public is significantly higher. This provides a huge market for the capital market industry, not only those who provide services as underwriters, but also public accountants, lawyers, tax consultants, and other capital market-related firms.

Indonesia's percentage of market capitalization to total ASEAN market capitalization is increasing. Market capitalization in Indonesia increased significantly in the past three years (2009–2011), while market capitalization in Singapore decreased significantly. It may indicate that decreasing market capitalization in Singapore may be due to Singapore investors

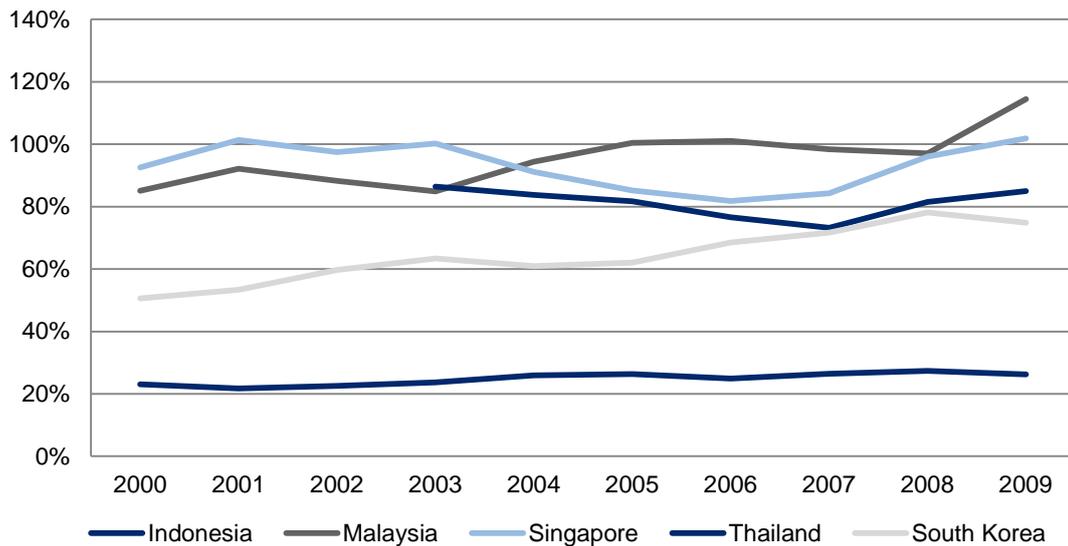
moving their money to Indonesia. Thus, without formal integration, capital markets in ASEAN already integrate themselves

WEAKNESSES

The main weakness of Indonesia comes from the financial development and regulatory environment. Indonesian investors in general have poor financial literacy. The use of financial services is not optimized, as can be seen from several indicators: Indonesia has a low credit-to-GDP ratio and a low deposit-to-GDP ratio compared to other ASEAN nations.

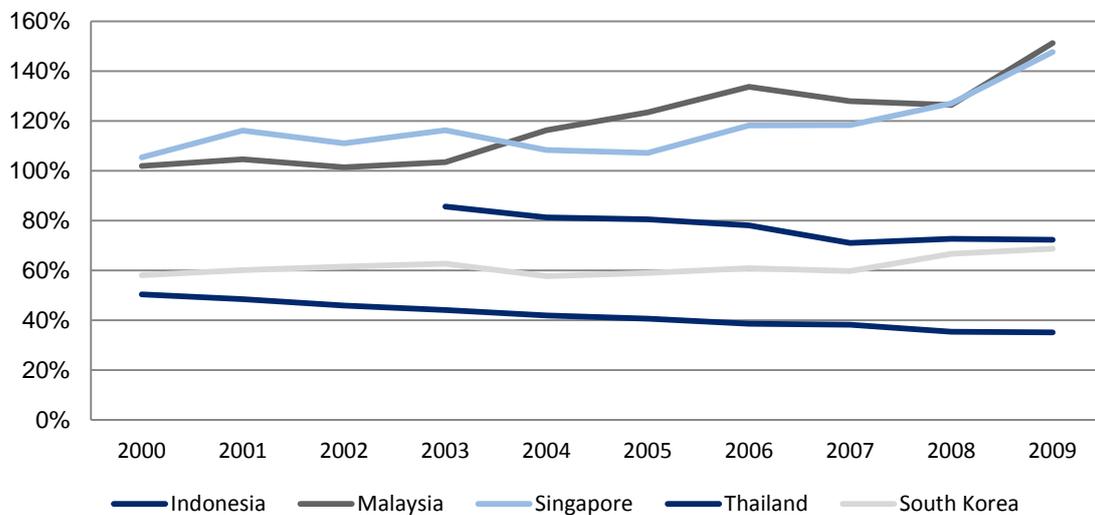
Figure 8-1
Credit and Deposit to GDP Ratio

Panel A. Credit-to-GDP Ratio



Source: Bisnis Indonesia Intelligence Unit (2010)

Panel B. Deposits-to-GDP Ratio



Source: Bisnis Indonesia Intelligence Unit (2010)

Compared to Malaysia, Singapore, Thailand, and South Korea, in the past decade, Indonesia has a low and stagnant credit-to-GDP ratio. Compared to Malaysia, Singapore, Thailand, and South Korea, in the past decade, Indonesia has a low and declining deposits-to-GDP ratio.

The number of people who have access to financial services is also considered low. World Bank (2010) data show that the share of the population that has formal financial access in Indonesia is considerably lower than in Singapore, Malaysia, and Thailand. Similar data also show that only 68 percent of Indonesians have savings, while only 60 percent of Indonesians have access to borrowing.

Low financial literacy is even more severe when it comes to understanding capital market products. A previous research by SEADI (SEADI RFP No.003) based on ABC 1 demographic group in Jakarta and Surabaya study found that over 80 percent of respondents have a very negative view of the capital market. To alleviate this weakness, a national blueprint for improving financial literacy will be released in June or July 2013.

Other indicators are the low number of mutual fund owner and capital market investors compared to the total population, and a vast majority of investors do not understand sophisticated financial products such as derivatives. Although there are needs for derivative products to hedge Indonesian companies' risk exposure, financial product availability remains limited. For example, an interest rate swap product is still under development.

Based on the previous discussion, opening the Indonesian consumer market to foreign firms will likely follow the path of the unit linked insurance products. Consumers will be sold products by trained marketers and will have little understanding of the product risks.

One aim of capital market integration is to allow financial intermediaries from one ASEAN country to operate in other ASEAN countries without facing significant barriers and difficulties in aspects such as licensing. The focus group discussion showed that Indonesian financial intermediaries are less competitive than financial intermediaries of other ASEAN members such as Singapore, Malaysia, and Thailand. Therefore, Indonesian capital market-related companies do not have the capabilities to face international competition.

Regulatory environment is often regarded as an important consideration for companies in choosing where to operate, including in deciding where to go public. For example, tax regulations can have a significant impact on companies' profits. Hence, if other factors are assumed equal, companies tend to choose countries with the most efficient tax regime. According to the focus group discussion with market participants, several foreign companies complain about the practice of tax refunds in Indonesia. Although regulations on tax refund exist, the implementation process is complicated—sometimes impossible. Companies compare the process of obtaining tax refunds in Indonesia with the process in Singapore, which is deemed efficient in terms of time and cost. Moreover, regulations from BI, BAPEPAM & LK, and Directorate General of Tax sometimes conflict. For example, the development of Real Estate Investment Trusts (REITs) in Indonesia is hindered by the unfavorable tax codes for such collective investment scheme. So far in Indonesia there is only one REIT (DIRE in Bahasa Indonesia) available. Indonesia also has a weak position in property rights protection, while according to Bae et al. (2004), guaranteed property rights is a crucial consideration for foreign investors in determining where to invest their money.

Companies also consider the ease of doing business in the country where they will operate. Low scores on the Ease of Doing Business index reflect many obstacles in the investment climate. Doing Business (World Bank 2012) survey results show that even though the time needed to set up a business in Indonesia improved from 2006 to 2012 (from 151 days to 45 days), it is still significantly longer than in several other ASEAN countries. On average, setting up a business in Indonesia takes one month longer than in Malaysia and four times longer than in Thailand.

Most Indonesian market players feel they are not ready to face ACMI. Their un-readiness is due to many reasons such as limited capital and know-how. They also admit that Indonesian investments banks and brokerage companies are not as strong as Malaysian and Singaporean counterparts.

Our analysis of the condition of Indonesian capital market reveals a pattern of thin trading with high investments risk. The Indonesian stock market shows high illiquidity and high volatility. In fact, the volatility of Indonesia's stock market is the highest in ASEAN. This is reflected in the high annual standard deviation, which is then translated into wide bid-ask spread or high illiquidity.

Moreover, the Indonesian market tends to show great sensitivity to international financial information, leading to market fragility. The pattern of average volatility in Indonesia and Thailand confirms higher sensitivity to international information, which is measured with the implied volatility index (VIX). The persistence indicates that Indonesia and Thailand are more sensitive to global information than the rest other regional markets.

OPPORTUNITIES

If ASEAN capital market integration is formalized, Indonesian companies will benefit from the possibilities of listing shares and issuing bonds in regional capital markets. Companies will have the opportunity to tap larger and more liquid pools of funds. The more integrated market may also reduce barriers for financial intermediaries across the region to operate in different ASEAN countries, including in Indonesia. Despite Indonesian financial intermediaries' reputation for lacking competitiveness, a foreign presence is expected to increase the professionalism of local financial market participants. In addition, local intermediaries will be pressured to operate more efficiently, which in the end will benefit investors.

Foreign capital inflow to Indonesian capital market is also expected to increase, which in turn is expected to increase market liquidity. Stulz (1999) argues that participation from large international financial institutions is important for a country's bond market because it will increase market liquidity through better information disclosure and more active trading.

The integration of the ASEAN stock market, as indicated from the time-varying correlation, shows positive trend implying higher short-term stock market integration in the region. It is found that the stock market integration between Indonesia and Singapore shifts to the highest among the rest of the equity market starting from 2005 to early 2012. After that, the correlation between Indonesia and Malaysia shift at par to the correlation between Indonesia and Singapore. It is clear that the short-term integration of the Indonesia stock market with the other stock markets in the ASEAN region is high but dynamic in nature.

THREATS

The threat of a more integrated capital market in a formal way is faced by market participants, including securities companies, investment managers, banks, and other financial service providers. Undoubtedly these companies will face more direct and open competition with foreign financial service providers. From the demand side, because Indonesia has the largest potential market in the region, both in terms of companies and investors, foreign financial intermediaries, with their more advanced operations and financial products, will dominate the Indonesian market. The focus group we convened expects Singapore, the regional financial hub, to benefit most from ASEAN capital market integration. In recent years, Singapore has strengthened its position as the financial center in the Asia Pacific region—several financial activities have moved from Hong Kong to Singapore, and even large non-Asian financial companies locate their headquarters in Singapore.

In addition to its positive impact on market depth and liquidity, higher foreign capital flow also posits threats to the financial stability of Indonesia. We found a high risk of liquidity spillover and substantial volatility spillover from Singapore to other ASEAN stock markets. From the variance equation, the coefficients of time-varying volatility from Singapore increase the volatility of other ASEAN stock markets significantly. Indonesia, with a coefficient of 0.83, is the most sensitive to uncertainty in Singapore (followed by Thailand (0.33), the Philippines (0.28), and Malaysia (0.27)).

Furthermore, feedback on volatility indicates the destabilizing impact of uncertainty in Singapore on the other ASEAN stock markets. The cointegration dynamic estimation results show that the most stable cointegration existed in 2005 to 2007. Other periods—2003–2005, 2008–2010, and 2010–2012—show weak cointegration in ASEAN stock markets. Overall, the natural long-term integration among ASEAN stock markets shows a lack of stability, which is different from its short-term integration counterpart. Despite short-term integration trends, over the long term, ASEAN stock market integration shows instability.

Greater capital market integration also increases volatility in foreign capital inflow and the possibility of foreign capital flight from Indonesia. This highlights the need for closer coordination between fiscal and monetary authorities, because according to previous studies, a sudden reversal is closely linked to current account reversal (Guidotti et al. 2004; Hutchison and Noy 2006), and also exchange market pressure (Girton and Roper 1977). Hence, sudden reversal might lead to a significant reduction in GDP (Calvo et al. 2006; Hutchison and Noy 2006) and even recession (Calvo 1998). To reduce the lag time of policy response, regulators need to receive information in a timelier manner, as addressed in Glick and Rose (1999). Policy coordination is also important to maintain the attractiveness of the Indonesian capital market (Bae et al. 2004).

If Indonesia agrees to full capital market integration, financial market professionals across ASEAN countries will compete directly but Indonesian professionals feel they are not ready to compete with professionals from more developed ASEAN countries. Furthermore, they feel that international competition will provoke price wars at an unprecedented level. Even without ACMI the current price war is already very severe.

9. Concluding Remarks

Following approval of ASEAN capital market integration plan by ASEAN leaders, there is a need for further study on the impact of this integration plan on the Indonesian economy. This study examined the profile and level of integration among six ASEAN countries' stock markets, as well as the impact of financial integration on the Indonesian stock market and economy. The profile and condition of capital markets are crucial because they are important for predicting whether integration will bring benefits to the constituents of ASEAN.

Macroeconomic indicators show that ASEAN is a major contributor to the world's economic growth. ASEAN countries in 2012 still enjoyed significant economic growth, of 4–6 percent. With increasing productivity of their labor forces, an emerging middle class, and a commodity boom, ASEAN countries still have considerable room to increase the number of stock market investors, improve stock market performance, contribute to economic growth, and eventually improve society's welfare.

For Indonesia, stock market integration, measured as money market rate differential, significantly affects market capitalization and has a positive effect on domestic stock market growth. Furthermore, the change in market capitalization significantly affects the change of GDP, indicating integration would increase stock market size and would contribute to GDP.

The market microstructure analysis of liquidity and volatility in ASEAN stock markets found two distinct groups with similar illiquidity profiles: Indonesia and Thailand, and Malaysia and Philippines. Indonesia and Thailand have similar patterns as the developed markets of Singapore and the United States, suggesting that Indonesian and Thai stock markets have greater exposure to international financial information than Malaysia and Philippines.

The correlation of stock market index return between Indonesia and Singapore shows a positive trend from 2000 to 2012, suggesting greater integration in the period. Consequently, integration is trailed by the imminent volatility spillover from the Singapore stock market to the to Indonesia stock market because the impact of uncertainty in Singapore is positively significant. The volatility spillover from Singapore is translated into a wider bid-ask spread, generating higher liquidity risk in the Indonesian stock market.

Overall, from micro- and macroeconomic studies conducted, Indonesia has great potential to be a well-developed financial market in ASEAN because Indonesia has the greatest number of potential investors and high yet stable economic growth. The analysis on the microstructure of stock markets shows that without government-driven integration policy, from 2000 to 2012, the stock market in ASEAN found its way to integration. It is clear that regional markets govern themselves toward greater stock market integration. However, the nature of the integration is short-term as it is found that the co-integration, as a measure of potential policy-based integration, shows rather instable integration in a long term.

Following the evidences of similarities in the market microstructure characteristics, we suggest partial stock market integration between Indonesia and Thailand, and between Malaysia and Philippines. Other possible partial integration based on the similarity in the international information content in the stock market is among Singapore, Indonesia and Thailand.

From the potential spillover effect analysis, Singapore clearly has an important position in the equity market as it positively contributes significantly to the level of risk in the most of the ASEAN stock exchanges. It is found that when there is a negative shock in Singapore, the rest ASEAN stock exchanges provides additional market capacity to absorb the risk emanating from Singapore. It infers that Singapore get the greatest benefit of stock market integration in ASEAN.

The result of our study suggests that stock markets liberalization in the ASEAN region must be conducted with cautions. Although the result indicates that Indonesia is an important country for the regional integration, due to its high potential market and current market condition, the benefit of this integration for Indonesia is quite limited, especially in the formation of integrated ASEAN exchange. Based on the discussion with market participants, the integration will be mostly beneficial for companies issuing stocks, because they would have the opportunity to tap larger pool of funds as provided by the integration. Many studies argue that liberalized market will bring higher liquidity for a capital market. Our finding asserts that financial integration is highly likely to drive more international information inflows to Indonesia driving higher investment potentials. Unfortunately, due to low financial literacy, Indonesian investors will perceive the information as private information inflows increasing the risk of stock transaction hence, the increasing illiquidity. On the other hand, there is a high potential of higher presence of foreign financial intermediaries with Singapore as the main beneficiary, because it has the most developed market in the region as well as various types of financial products.

To get the benefit of ASEAN capital market integration, we view that Indonesia must deal with several prominent issues. Some of the issues are as follows. First, most capital market stakeholders are not yet fully aware of the ASEAN capital market integration plan. Some market participants have heard partially about the plan from the IDX as the Indonesian representative in the ASEAN Exchange Linkage (Working Group E). They express concerns of not knowing what to prepare for ACMI plan because they not know the direction and the extent of the plan.

Second, they admit that they are not ready to face the fully integrated ASEAN capital market, due to their limited capacity in monetary capital, human capital, know how, system, and experience. They need to prepare themselves to compete head on with other financial companies from more advanced ASEAN countries such as Singapore and Malaysia.

Third, some market participants indicate that capital market regulators, central bank, and the MOF should coordinate better, especially before they issue a new policy that may impact the capital market. For example, when the central bank prohibits foreign companies to engage in currency forward contract maturing in less than one week, they view it as a deterrent for foreign investors to invest in Indonesian capital market.

Fourth, the number of Indonesian capital market investors is still very small. Indonesian financial system is still bank-dominated, where most Indonesians still invest their money in

the banking system. We construe that this is partly affected by the low level of financial literacy of Indonesians compared to its ASEAN peers. Furthermore, a previous study by SEADI indicates that more than 80 percent of Indonesia's upper-middle socio-economic classes still show very negative assessments towards the capital market.

Fifth, allowing international financial institutions from more advanced countries to offer financial products to Indonesian investors directly may posit problems for Indonesian investors. This is related to the previous issue of limited financial literacy. If Indonesian investors are faced with savvy international marketers, they may end up investing in financial products that are not suitable for their investment goals and risk profile.

Bibliography

- Akram, Q.F., Rime, D., Sarno, L., 2009. *Does the law of one price hold in international financial markets? Evidence from tick data*. *Journal of Banking and Finance* 33 (10), 1741–1754.
- Ang, A., Bekaert, G. 2002. *International asset allocation with regime shifts*. *Review of Financial Studies*, 15(4), 1137-1187.
- Artis, M.J., Hoffmann, M. 2008. *Financial globalization, international business cycles and consumption risk sharing*. *The Scandinavian Journal of Economics*, 110(3), 447-471.
- Asian Development Bank, 2012. *Asian Economic Integration Monitor*.
- Babestskii, I., Boone, L., Maurel, M., 2004. *Exchange rate regimes and shocks asymmetry: The case of the accession countries*. *Journal of Comparative Economics* 32, 212–229.
- Backus, D. K., P. J. Kehoe, F.E. Kydland (1992). *International Real Business Cycles*. *Journal of Political Economy*, 100, 745–775.
- Bae, K.H., Yun, Y.S., Bailey, W. 2004. *Determinants of Bond Holding by Investors*. Mimeo
- Baele, L., Ferrando, A., Hordahl, P., Krylova, E., Monnet, C., 2004. *Measuring financial integration in the Euro Area*. Occasional paper 14, European Central Bank.
- Beine, M., Cosma, A., Vermeulen, R., 2010. *The dark side of global integration: Increasing tail dependence*. *Journal of Banking and Finance* 34 (1), 184–192.
- Bekaert, G., Hodrick, R.H., 1992. *Characterising predictable components in excess returns on equity and foreign exchange markets*. *Journal of Finance* 47 (2), 467–509.
- Bekaert, G., Harvey, C.R. 2002. *Foreign speculators and emerging equity markets*. *The Journal of Finance*, 55(2), 565-613.
- Boyle, G. 2009. *Capital market integration: A review of the issues and an assessment of New Zealand's position*. A report prepared for the Ministry of Economic Development and the Capital Market Development Taskforce, University of Canterbury, P1-34, available online at: <http://www.iscr.org.nz/f522>, 15213.
- Calvo, G.A., 1998. *Capital market contagion and recession: An explanation of the Russian virus*.
- Campbell, J.Y., Hamao, Y., 1992. *Predictable stock returns in the United States and Japan: A study of long term capital market integration*. *Journal of Finance* 47 (1), 43–69.

- Cavoli, T., Rajan, R.S., Siregar, R., 2004. *A survey of financial integration in East Asia: How far? How much further to go*. Discussion paper 0401, University of Adelaide.
- Cheung, Yin-Wong, Chinn, M.D., Fujii, Eiji, 2006. *The Chinese economies in global context: The integration process and its determinants*. *Journal of the Japanese and International Economies* 20, 128–153.
- Chi, J., Li, K., Young, M.R., 2006. *Financial integration in East Asian equity markets*. *Pacific Economic Review* 11 (4), 513–526.
- Ching, S.T.F., Devereux, M. 2000. *Risk sharing and the theory of optimal currency areas: A re-examination of Mundell 1973*.
- Chinn, M., Frankel, J., 1992. Financial links around the Pacific Rim: 1982–1992. In: Glick, R. (Ed.), *Exchange Rate Policies in Pacific Basin Countries*. Cambridge University Press, Cambridge.
- Click, R.W., Plummer, M.G., 2005. *Stock market integration in ASEAN after the Asian financial crisis*. *Journal of Asian Economics* 16, 5–28.
- Corsetti, G. 1998. *Interpreting the Asian financial crisis: open issues in theory and policy*. *Asian Development Review*, 16(2), 18-63.
- Costello, D., Gray, S., McCrystal, A. (2008). *The diversification benefits of Australian equities to international investors*. *Finsia Journal of Applied Finance*, 4, 31-35.
- Danareksa Research Institute, 2004. *Toward a regional financial architecture for East Asia*. Report commissioned by ASEAN Secretariat.
- De Brouwer, G., 1999. *Financial Integration in East Asia*. Cambridge University Press, Cambridge.
- De Joong, F. and de Roon, F.A., 2005. *Time-varying market integration and returns in the emerging markets*, *Journal of Financial Economics*, 78, 583-613.
- De Santis, G., Gerard, B., Hillion, P. 1997. *The single European currency and world equity markets*. INSEAD.
- Dimson, E., Marsh, P., Staunton, M. 2002. *Triumph of the Optimists*. Princeton, NJ: Princeton University Press.
- Drysdale, P. 2011. *A new look at Chinese FDI in Australia*. *China & World Economy*, 19(4), 54-73.
- Edwards, S. 2001. *Capital mobility and economic performance: Are emerging economies different?* w8076 National Bureau of Economic Research.
- Edwards, S., Biscarri, J.G., de Gracia, F.P., 2003. *Stock market cycles, financial liberalization and volatility*. *Journal of International Money and Finance* 22, 925–955.
- Eichengreen, B., 2006. *The development of Asian bond markets*. BIS paper 30, Bank for International Settlements.

- Emiris, M., 2002. *Measuring capital market integration*. BIS paper 12, Bank for International Settlements.
- Engle, R.F., 2002. *Dynamic conditional correlation: A simple class of multivariate generalised autoregressive conditional heteroskedasticity models*. *Journal of Business and Economic Statistics* 20(3), 339–350.
- Engle, R.F., Sheppard, K., 2001. *Theoretical and empirical properties of dynamic conditional correlation multivariate GARCH*. Working paper 8554, NBER.
- Errunza, V. R., & Miller, D. P. (2000). *Market segmentation and the cost of the capital in international equity markets*. *Journal of Financial and Quantitative analysis*, 35(04), 577-600.
- Feldstein, M., Horioka, C., 1980. *Domestic savings and international capital flow*. *The Economic Journal* 90 (358), 314–329.
- Flood, R., Rose, A., 2002. *Uncovered interest parity in crisis*. IMF Staff Papers 49, 252–265.
- Fung, L., Tam, C.S., and Yu, I.W., -----. *Assessing financial market integration in Asia: equity and bond markets*, Hong Kong Monetary Authority.
- Ghosh, S.R., 2006. *East Asian Finance: The Road to Robust Markets*. Washington DC: The International Bank for Reconstruction and Development/The World Bank, 1-217.
- Girton, L., Roper, D. 1977. *A monetary model of exchange market pressure. Applied to the postwar Canadian experience*. *American Economic Review*, 67, 537-548.
- Glick, R., Rose, A., 1999. *Contagion and trade: Why are the currency crisis regional*. *Journal of International Money and Finance*, 5(18), 603-617.
- Goetzmann, W., Li, L., and Rouwenhorst, K. 2005. *Long-Term global market correlations*. *Journal of Business* 78, 1-38.
- Graham, M., Kiviahho, J., and Nikkinen, J., 2012. *Integration of 22 emerging stock markets: A three dimensional analysis*, *Global Finance Journal*, 23, 34-47.
- Grubel, H.G. 1968. *Internationally diversified portfolios: welfare gains and capital flows*. *The American Economic Review*, 58(5), 1299-1314
- Guesmi, K. and Nguyen, D.K., 2011. *How strong is the global integration of emerging market regions? An empirical assessment*, *Economic Modelling*, 28, 2517-2527.
- Guidotti, P.E., Sturzenegger, F., Villar, A. 2004. *On the consequences of sudden stops*, *Journal of LACEA Economia*.
- Guillaumin, C., 2009. *Financial integration in East Asia: Evidence from panel unit root and panel cointegration tests*. *Journal of Asian Economics* 20 (3), 314–326.
- Harding, D., Pagan, A.R., 2002. *Dissecting the cycle: A methodological investigation*. *Journal of Monetary Economics* 49 (2), 365–381.

- Henry, P.B. 2000. *Do stock market liberalizations cause investment booms?* Journal of Financial Economics, 58(1), 301-334.
- Hunter, D., Simon, D. 2004. *Benefits of international bond diversification.* Journal of Fixed Income, 13, 57-72.
- Hutchison, M.M., Noy, I. 2006. *Sudden stops and the Mexican wave: Currency crises, capital flow reversal, and output loss in emerging markets.* Journal of Development Economics, 79(1), 225-248.
- Institute for International Monetary Affairs, 2006. *Intra-regional exchange rate stability and prevention of financial crisis in East Asia.* Working Group report of the Network of East Asian Think-tanks (NEAT).
- Isaksson, A., 2001. *Financial liberalization, foreign aid, and capital mobility: Evidence from 90 developing countries.* Journal of International Financial Markets, Institutions and Money 11, 309–338.
- International Monetary Fund. 2012. *World Economic Outlook.*
- Jeon, J., Oh, Y., Yang, D.Y., 2006. *Financial market integration in East Asia: Regional or global.* Asian Economic Papers 5 (1), 73–89.
- Johansen, S., 1988. *Statistical analysis of cointegration vectors.* Journal of Economic Dynamics and Control 12, 251–254.
- Kasa, K., 1992. *Common stochastic trends in international stock markets.* Journal of Monetary Economics 29, 206–217.
- Kawai, M., 2005. *East Asian economic regionalism: Progress and challenges.* Journal of Asian Economics 16, 29–55.
- Kim, D., Sheen, J. 2007. *Consumption Risk-Sharing within Australia and with New Zealand**. Economic Record, 83(260), 46-59.
- Kim, S., Kim, S.H., Wang, Y. 2004. *Regional Versus Global Risk Sharing in East Asia**. Asian Economic Papers, 3(3), 182-201.
- Kim, S., Kim, S.H., Wang, Y., 2006. *Financial integration and consumption risk sharing in East Asia.* Japan and the World Economy 18, 143–157.
- Kim, S., Kim, S.H., Wang, Y., 2007. *Saving, investment and international capital mobility in East Asia.* Japan and the World Economy 19 (2), 279–291.
- Kose, M.A., Prasad, E.S., Terrones, M.E. 2003. *Volatility and comovement in a globalized world economy: an empirical exploration* (Vol. 3). International Monetary Fund.
- Kose, M.A., Prasad, E.S., Terrones, M.E. 2007. *How does financial globalization affect risk sharing? Patterns and channels.*

- Kose, M.A., Prasad, E.S., Terrones, M.E. 2009. *Does openness to international financial flows raise productivity growth?* Journal of International Money and Finance, 28(4), 554-580.
- Kuper, G.H., Lestano, 2007. *Dynamic conditional correlation analysis of financial market interdependence: An application to Thailand and Indonesia.* Journal of Asian Economics 18, 670-684.
- Kyle, A.S. 1985. *Continuous auctions and insider trading.* Econometrica, 53, 1315-1335.
- Le, H.G., 2000. *Financial openness and financial integration.* Working paper 00-4, Asia Pacific School of Economics and Management, Australia National University.
- Lee, J.W., 2008. *Patterns and determinants for cross-border financial asset holdings in East Asia.* Working paper series on regional economic integration 13, Asian Development Bank.
- Lesmond, D., Ogden, J., Trzcinka, C., 1999. *A new estimate of transaction cost.* Review of Financial Studies, 12, 1113-1141.
- Levine, R., Renelt, D. 1992. *A Sensitivity Analysis of Cross-Country Growth Regressions.* The American Economic Review, 82(4), 942-863.
- Levy, H., Sarnat, M. (1970). *International diversification of investment portfolios.* The American Economic Review, 668-675.
- Lewis, K.K. (2006). *Is the international diversification potential diminishing? Foreign equity inside and outside the US,* w12697, National Bureau of Economic Research.
- Lins, K. V., Strickland, D., & Zenner, M. (2005). *Do non-US firms issue equity on US stock exchanges to relax capital constraints?* Journal of financial and quantitative analysis, 40(01), 109-133.
- London Economics in Association with PricewaterhouseCoopers and Oxford Economic Forecasting. 2002. *Quantification of the Macro-Economic Impact of Integration of EU Financial Markets.* Final Report to The European Commission-Directorate-General for the Internal Market.
- Manning, N., 2002. *Common trends and convergence? South East Asian equity markets, 1988-1999.* Journal of International Money and Finance 21, 183-202.
- Masson, P.R. (1998). *Contagion-monsoonal effects, spillovers, and jumps between multiple equilibria.* 98. International Monetary Fund.
- McCauley, R., Fung, S.S., Gadanecz, B., 2002. *Integrating the finances of East Asia.* Bank for International Settlements Quarterly Review (December), 11-12.
- McKinnon, R. 2001. *After the crisis, the East Asian Dollar standard resurrected: An interpretation of high frequency exchange rate pegging.*

- Méltitz, J., Zumer, F. 1999. *Interregional and international risk-sharing and lessons for EMU*. In Carnegie-Rochester Conference Series on Public Policy, 51, pp. 149-188). North-Holland.
- Merton, R.C. 1987. *A Simple Model of Capital Market Equilibrium with Incomplete Information*. The Journal of Finance, 42(3), Papers and Proceedings of the Forty-Fifth Annual Meeting of the American Finance Association, New Orleans, Louisiana, December 28-30, 1986 (Jul., 1987), 483-510.
- Meyer, T.O., Rose, L. C. 2003. *The persistence of international diversification benefits before and during the Asian crisis*. Global Finance Journal, 14(2), 217-242.
- Miller, D. P. (1999). *The market reaction to international cross-listings: evidence from Depository Receipt*. Journal of Financial Economics, 51(1), 103-123.
- Nasution, A. 2010. Building strong banks and bond markets in the ASEAN+3.
- Pagan, A.R., Sossounov, K.A., 2003. *A simple framework for analysing bull and bear markets*. Journal of Applied Econometrics 18 (1), 23–46.
- Panchenko, V., Wu, E., 2009. *Time-varying market integration and stock and bond return concordance in emerging markets*. Journal of Banking and Finance 33 (6), 1014–1021.
- Park, Y.C., 2004. *Regional financial integration in East Asia: Challenges and prospects*. In: Paper prepared for presentation at the United Nations Conference on Regional Financial Arrangements.
- Pascual, A.G., 2003. *Assessing European stock markets (co)integration*. Economics Letters 78, 197–203.
- Prasad, E.S., Rajan, R.G., Subramanian, A. 2007. *Foreign capital and economic growth*. Working Paper 13619, National Bureau of Economic Research.
- Prasad, E., Rogoff, K., Wei, S.J., Kose, M.A. (2003). *Effects of financial globalisation on developing countries: Some empirical evidence*. Economic and Political Weekly, 4319-4330.
- Perron, P., 1989. *The great crash, the oil price shock, and the unit root hypothesis*. Econometrica 57 (6), 1361–1401.
- Phuan, S.W., Lim, K.P., Ooi, A.Y. 2009. Financial liberalization and stock market integration for Asean-5 countries. International Business Research, 2,1.
- Phuvanatanarubala, T. 2009. Implementation plan for ASEAN capital markets integration, The 2nd OECD South East Asia Regional Forum.
- Poonpatpibul, C., Tanboon, S., Leelapornchai, P., 2006. *The Role of Financial Integration in East Asia in Promoting Regional Growth and Stability*. Mimeo, Bank of Thailand.
- Quinn, D. 1997. *The correlates of change in international financial regulation*. American Political Science Review, 531-551.

- Radelet, S., Sachs, J.D. 1998. *The onset of the East Asian financial crisis*. In *Currency crises* (pp. 105-162). University of Chicago Press.
- Rillo, A.D. 2012. *Road to Financial Integration in ASEAN*. OECD-ADBI 12th Roundtable on Capital Market Reforms in Asia.
- Rodrik, D. (1998). *Who needs capital-account convertibility?* Essays in international finance, 55-65.
- SEADI (2012). *Investing in the Future: Support to Bapepam-LK on its Socialization Program*. Workshop & Executive Presentation June 2012. RFP No .003.
- Schmukler, S.L. 2004. Financial globalization: Gain and pain for developing countries. *Federal Reserve Bank of Atlanta Economic Review*, 39-66.
- Schwab, K. 2012. *The global competitiveness report*. World Economic Forum.
- Serletis, A., King, M., 1997. *Common stochastic trends and convergence of European Union stock markets*. *The Manchester School* 65 (1), 44–57.
- Singh, Datuk Ranjit Ajit. *ASEAN Capital Market Integration Issues and Challenges*.
- Smith, K., Sofianos, G. 1997. *The impact of an NYSE listing on the global trading of non-US stocks*. New York Stock Exchange.
- Sohn, Injoo, 2007. *East Asia's counterweight strategy: Asian financial cooperation and evolving international monetary order*. G-24 discussion paper series 44, United Nations.
- Solnik, B.H. 1974. *Why not diversify internationally rather than domestically?* *Financial Analysts Journal*, 48-54.
- Solnik, B., Roulet, J., 2000. *Dispersion as cross-sectional correlation*. *Financial Analysts Journal* 56 (1), 54–61.
- Sørensen, B.E., Yosha, O. 1998. *International risk sharing and European monetary unification*. *Journal of International Economics*, 45(2), 211-238.
- Stulz, R.M. 1999. *International portfolio flows and security market*. Mimeo.
- Takeuchi, A., 2006. *Identifying impediments to cross-border bond investment and issuance in Asian countries*. BIS paper 30, Bank for International Settlements.
- Tandon, K. 1998. External financing in emerging markets: an analysis of market responses. *Emerging Market Capital Flows*, 2, 259.
- Thavaramara, Tipsuda, 2010. *Progress and Issues in Capital Markets Integration: ASEAN Experience*. OECD-ADBI 11th Roundtable on Capital Market Reform in Asia.
- Umutlu, M., Akdeniz, L., Altag-Salih, A., 2010. *The degree of financial liberalization and aggregated stock-return volatility in emerging markets*. *Journal of Banking and Finance* 34 (3), 485–696.

- World Bank. 2010. *Improving access to financial services in Indonesia*.
- World Bank, International Finance Corporation. 2012. *Doing business in Indonesia*.
- Working Group on Dispute Resolution and Enforcement Mechanism, March 7th 2012, 16th ACMF Meeting,
- Working Group on Dispute Resolution and Enforcement Mechanism (WG-DREM), 26 September 2012, 17th ASEAN Capital Markets Forum Meeting, MAS, Singapore.
- Yang, S.Y., 2005. *A DCC analysis of international stock market correlation: The role of Japan on the Asian four tigers*. Applied Financial Economics Letters 1 (2), 89–93.
- Yu, Ip-Wing, Kang-Por Fung and Chi-Sang Tam, 2010. *Assessing Financial market Integration in Asia Equity markets*, Journal of Banking & Finance 34 (2010), 2874–288

Appendix A. Literature Review

DEFINITION OF CAPITAL MARKET INTEGRATION

According to Emiris (2002), if markets are completely integrated, asset possessing the same risk characteristics will have same prices even if they are traded on different markets. In a completely integrated capital market, investors face common and country specific or idiosyncratic risk, but price only common risk factors, because country specific risk is fully diversifiable. When markets are partially integrated, investors face both common and idiosyncratic risks and price the both. If markets are completely segmented, investors face and price only country specific risk source of risks. In this case, the same projects in two countries can have different expected return, since the source of risk and their price may differ across markets.

Integration allows firms to access saving from other countries. It allows investors in one country are able to purchase capital market securities in another country. Firms in one country are also able to raise capital by selling new securities in another country and able to list their securities (new or existing) in the capital market of another country

CAPITAL MARKET INTEGRATION

Contagion and Spillover

Corsetti (1998), Radelet and Sachs (1998), find the herd behavior and contagion during Asian crisis 1997/1998. Masson (1998) argues there are three main channels that financial turbulence can spread from one country to another country: monsoonal effect, spillover, and pure contagion. Spillover effect may be due to trade linkages or financial linkages (macroeconomic fundamentals). Pure contagion happens when crisis in one country trigger crisis elsewhere for the reason unexplained by macroeconomic fundamentals.

Evidence on Capital Market Integration

Plummer and Click (2005) consider the degree to which the five stock markets in the original Association of Southeast Asian Nations countries (ASEAN-5) are correlated as a way to assess the feasibility of policy initiatives to enhance ASEAN stock market integration and the implications for portfolio investors. In particular, this paper considers whether the ASEAN-5 markets are integrated or segmented using the time series technique of cointegration to extract long-run relations. The empirical results suggest that the ASEAN-5 stock markets are co-integrated and are thus not completely segmented by national borders. However, there is only one cointegrating vector, leaving four common trends among the five variables. Therefore, ASEAN-5 stock markets are integrated in the economic sense, but that integration is far from complete. On a policy level, initiatives to further integrate the stock markets are feasible, and

in fact desirable. From the perspective of the international portfolio investors, benefits of international portfolio diversification across the five markets are reduced but not eliminated.

A study by Phuan, Lim, and Ooi (2009) examines the ASEAN stock market integration. In the first period, the causal relationships are running from Thailand to Indonesia, Singapore to Malaysia, and Thailand to the Philippines. Thailand seems as a leader since it affects two countries: Indonesia and Philippines. No feedback is found among ASEAN-5. The result offers some evidence that the earliest country liberalizing their stock markets (Singapore and Thailand) tend to lead the market that are not yet liberalized.

During the second period, there is a two-way causal relationship found between Singapore and Malaysia. The Philippines is leading the Singapore and Malaysia, while Thailand does not cause any other countries and is affected only by Singapore. Surprisingly, other markets do not affect Indonesia and the Philippines market in this period.

In the third period there were some changes to the causality relationship. The Philippines no longer affects Singapore and Malaysia, and in fact it does not affect any other markets. Indonesia is affected by Malaysia and Thailand, and there are two-way causal relationships between Indonesia and Thailand. Meanwhile, Singapore is not causally affected by other markets, and it leads Malaysia, Thailand, and Philippines.

For all three periods of the financial liberalization progress, it can be observed that the linkages have increased after all ASEAN-5 countries liberalized their stock markets. It is also found that Singapore has an increased influence on other stock markets i.e. Malaysia, Thailand, and the Philippines. The increase in integration among ASEAN-5 stock markets implies the limited benefits of portfolio diversification for investors in this region.

Risk Sharing

Asian Development Bank (2012) concludes that while the level of Asia's financial integration may have increased, its benefits in terms of consumption and investment risk sharing have been limited. Risk sharing is another possible benefit of integration; unfortunately, there is little empirical evidence supporting it. Backus, Kehoe and Kydland (1992) found that perfect risk sharing does not happen in Asia. Given an idiosyncratic shock, risk sharing in Asia was not strong, nor did it improve. The reasons come from several factors, ranging from using domestic equity market as a major source of finance, time horizon and measurement errors, consumption endowment uncertainty, to the limited size of capital flows and higher sovereign default.

Estimation results from Kim, Kim, and Wang (2004) that the degree of risk sharing among the East Asian countries is far from complete and quite low; only about 20 percent of cross-sectional GDP variance is smoothed. Regional capital markets play a minimal role while regional credit markets play some positive role, but limited. Such a level of consumption risk sharing achieved within the East Asian countries is far lower than that achieved within a successful monetary union like US states. It is also lower than that achieved within industrial countries such as OECD and EU countries.

According to Kim, Kim, and Wang (2004), there can be many reasons why the degree of risk sharing among the East Asian countries, especially among relatively poor countries, is very low and why regional financial markets have not provided much consumption

insurance/smoothing in this region. First, most emerging East Asian economies face with more severe financial market constraints, as shown in the fact that generally these economies find it impossible to issue debt denominated in national currencies. Under multiple currencies in the region, there is a risk with nominal bond trade that one country might resort to surprise inflation to reduce the real value of outstanding asset claims (Ching and Devereux, 2000; McKinnon, 2001). Thus, international risk sharing through regional financial markets could be severely discouraged unless the exchange rate risks are sufficiently hedged.

Second, there are too much uninsurable country-specific risks such as shocks in the non-traded sector, wage and labor markets. These risks cannot be easily diversified across countries. The levels of trade integration and labor mobility in East Asian countries are far smaller than those in European Union, which may result in larger uninsurable idiosyncratic shocks. This might explain a lower degree of consumption risk sharing achieved in East Asia.

Third, most East Asian countries have less developed financial markets with high transaction costs and information asymmetry. Lack of financial securities that can be traded for diversifying country-specific risks prevents countries from engaging in risk sharing activities. Furthermore, many emerging East Asian countries have still maintained restrictions on capital flows. Thus, less financial integration combined with less financial development in East Asia would result in less international risk sharing within East Asia through financial market channels.

Table A-1
Risk Sharing Gain by Country

Country	With all East Asia	With ASEAN	With NEA	With Developed	With Greater China
CHN	1.53	1.46	1.53	1.55	1.74
HKG	1.08	1.22	1.19	0.72	1.78
IDN	4.49	3.83	4.5	4.72	3.99
JPN	0.51	0.5	0.52	0.41	0.5
KOR	0.93	0.59	1.14	1.08	1.05
MYS	3.48	3.06	3.97	2.76	5.22
PHL	0.65	0.61	0.66	0.55	0.74
SGP	0.94	1.06	0.87	0.78	0.87
THA	1.03	1.7	1.13	1.15	1.38
TWN	0.42	0.45	0.41	0.31	0.47

Source: Kim and Wang (2004)

The effect of financial integration on economic growth has been well documented more so than the effect of integration on international risk sharing. Examining the impact of financial integration on macroeconomic volatility (one indicator of risk sharing), Prasad, Rogoff, Wei (2003) argued that for more financially integrated developing countries, the consumption volatility relative to the volatility of gross domestic product (GDP) increases. A more comprehensive explanation on the impact of financial integration will be provided in the following part.

IMPACT OF INTEGRATION ON MACROECONOMY

A number of studies have assessed the impact of capital market integration on the economy. For example, Asian Development Bank (2012) assessed how financial integration affect the co-movement of output of ASEAN countries, and concludes that the region's output correlation rose sharply during the 2008/2009 global financial crisis, largely reflecting the impact of global shock.

This section presents several important conclusion findings from previous studies on financial integration, as well as the summary of other studies examining similar issue.

Boyle (2009)

This study concludes that greater integration of capital market offers several advantages and disadvantages. The advantages are listed below:

1. **Better allocation of capital**—Countries in which there is a shortage of investment capital offering a high rate of return can access surplus capital from countries where investment returns are low. As a result, capital is allocated to more productive uses, overall investment rises, and economic growth is enhanced.
2. **More efficient risk sharing**—Access to foreign capital markets allows countries to delink consumption from output, thus enabling inter-temporal smoothing of consumption and hence an improvement in national welfare. For example, the effects of temporary recession can be softened by borrowing from abroad in order to sustain aggregate consumption.
3. **Enhanced portfolio diversification**—One of the most enduring principles in finance is diversification; adding more imperfectly correlated securities to a portfolio allows investors to reduce portfolio risk without any sacrifice of expected return. Accessing foreign capital markets not only results in a wider range of securities with which to implement this strategy, but also, at least potentially, offers securities whose returns are only weakly correlated with those available in the domestic market—thereby maximizing possible diversification benefits. Moreover, portfolio diversification effects will have a significant impact on the cost of capital.
4. **Lower of cost of capital**—Capital market integration can lead to lower cost of capital via two channels. First, the cost of equity capital is proportional to domestic market volatility in a segmented market but depends only on the covariance with world returns in an integrated market. Given that such covariances are typically much lower than local variances this directly lowers securities' expected returns and hence the cost of capital. Second, firms can broaden their shareholder base and enhance liquidity—both of which lower required return and the cost of capital (Merton 1987) by listing on foreign exchange. A lower cost of capital should stimulate investment and enhance economic growth.
5. Exposes financial intermediaries to foreign competition
6. Sharpens the disciplines imposed on policymakers
7. Encourage development of capital markets

Greater capital market also carries risks, as follows:

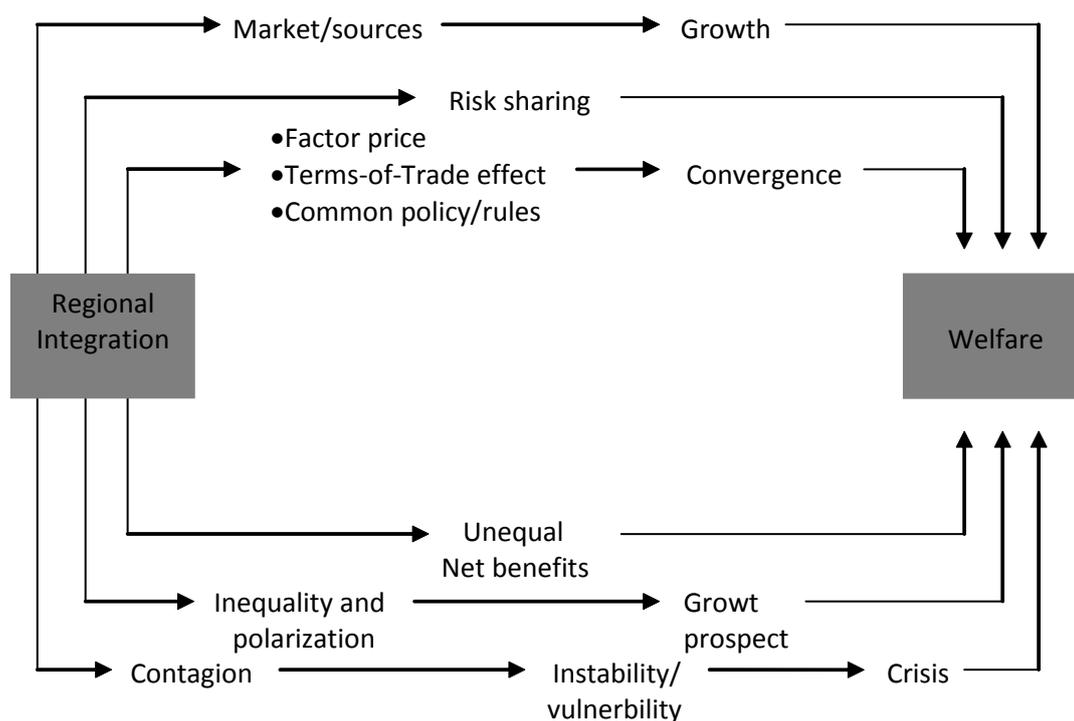
1. **Capital flight**—While greater integration allows, and encourages, more foreign capital to flow into domestic capital market, it also allows higher outflow probability,

which potentially results in adverse consequences for the domestic economy. For example, wholesale withdrawal of foreign capital in response to a domestic shock that is perhaps only temporary, reduces the country's attractiveness as an investment destination and puts significant pressure on its currency and interest rates, then exacerbating the effects of the shocks.

2. **Credit crunch**—In a similar vein, domestic firms that rely on rolling over financing from foreign lenders may encounter difficulties when international credit conditions tighten. Any inability to renew financing or to do so at reasonable cost has obviously adverse consequences for aggregate domestic consumption.
3. **Systemic information problems**—The usual information problems associated with financial markets are inevitably greater for cross country transactions, so as predicted by the theory of second best-capital may inadvertently flow into areas where the expected rerun fails to cover its opportunity cost.
4. **Corruption**—Greater integration may paradoxically facilitate increased corruption activity. One reason is that improved detection methods and legal systems have made it more difficult for corrupt official to conceal the proceeds of their graft domestically. Smuggling abroad has become a more necessary process that is assisted by integration. Indeed, corruption and per capita GNP appear to be negatively correlated in countries with more integrated capital markets, but not in segmented countries.
5. **Collapsing correlations**—The observed tendency of asset correlations to all head towards 1.0 in the presence of a crisis suggest that the benefits of international diversification may disappear exactly when they are most needed.
6. **Crisis Spillover**—Financial globalization also can cause crisis in emerging markets even those countries have healthy economic fundamental. This effect is supported by Schmukler (2004), which states that financial globalization cannot be reserved. This means higher risk of spillover probability. Financial globalization also reduces the availability of policy instruments in national level. As an emerging market become more integrated in trade and financial, the national authority becomes harder to monitor and manage cross border transaction.

Crisis spillover through financial channel becomes increasing as shown by the latest global crisis (IMF, 2009). Crisis could spread out by common creditor/common investor. Common creditors/investors tend to decrease their portfolio in emerging market as a precautionary motive if one of emerging market has the probability of crisis.

Figure A-1
Impact of Integration



Source: Asian Development Bank (2012)

London Economics (2002)

London Economics (2002) predicts that a more open and effective European financial market will bring a number of benefits both for investors and the corporate sectors. Investors will benefit from higher risk adjusted returns on savings, through enhanced opportunities for portfolio diversification and more liquid and competitive markets. The corporate sector will benefit from generally easier access to financing capital. Competition in the financial intermediation sector will offer corporations a wider range of financial products at attractive price. The economy wide improved allocation of financial resources to investment projects should impact positively on the equilibrium level of GDP and potentially also on GDP growth. London Economics in collaboration with PWC has developed simulations of the macroeconomic impact of integration of European financial market using multi-country macroeconomic model. As a result of combined reduction in the cost of equity, bond, and bank finance together with the increase in the share of bond finance in total debt finance. The details of the impact are as follows:

1. The level of EU-wide real GDDP is raised by 1.1% or EUR 130 billion in 2002 prices;
2. Total business investment is almost 6% higher and private consumption is up by 0.8%;
3. Total employment is 0.5% higher;
4. The reduction in the cost of equity finance is the most important impact accounting for 0.5 pp of the 1.1 percentage point increase in the EU wide level of GDP in constant prices.

The combined impact of the four changes in the user cost of capital (i.e. the reduction in the cost of equity, bond and bank finance, and increase in the share of bond finance in total debt

finance) varies somewhat across countries. Across EU, the estimated increase in the level of real GDP stemming from integration of financial markets ranges from 0.3 to 2.0%. While the impact of the reductions in user cost of capital varies somewhat across countries, it is economically significant in all.

Researchers have used many methods to estimate the impact of greater market integration on the cost of capital. Henry (2000) examines the local stock market response to the relaxation of control on foreign participation in 12 countries and finds a strong upward revaluation- implying a fall in the cost of capital. In a similar analysis of 20 emerging countries, Bekaert and Harvey (2000) use an explicit proxy for the cost of capital and estimate that this falls by between 5 and 75 basis points following stock market liberalization.

Quinn (1997)

Quinn (1997) investigates the financial liberalization in association with economic growth, income distribution, corporate taxation, and government expenditure. This investigation can be made because Quinn (1997) made measurement of the regulation of international financial transactions called Openness. Openness is based upon a coding of the domestic and international laws of 64 nations, most of whose legislation is available from 1950 to 1994. The laws were reviewed from Annual Report on Exchange Restriction published yearly by the International Monetary Fund (IMF).

This coding process resulted in several variables, namely Capital, Current, and international legal agreement (Agree). Inward and outward capital account transactions are measured by Capital, which is scored on a 0-4 scale. Inward and outward current account transactions are coded Current, which is scored on a 0-8 scale. (The latter scale is larger because goods and services are each scored on a 0-4 scale, and both are included by the IMF as current account transactions.) International legal agreements (Agree) that constrain a nation's ability to restrict exchange and capital flows; its scoring was 0, 0.5, 1, 1.5, or 2, ranging from not at all to very constrained.

The resulting 0-14 measure of financial openness is called Openness. The change in international financial regulation can be obtained by taking the first difference of Openness. A measure of capital account liberalization is generated by taking the first difference of Capital. These change measures of international financial regulation are the independent variables measuring financial liberalization.

The method used in by Quinn (1997) is a cross sectional regression model, used by Levine and Renelt (1992) with the addition of measuring change in international financial regulation. This method then followed by Leamer's extreme bound analysis (EBA) for assessing the robustness of relationship. This method uses 4 different models, which the dependent variable is the average growth rate of real per capita GDP and the independent variables for each model can be seen in Table 1. The results suggest that capital account deregulation may contribute to economic growth.

Kose et al. (2008)

The objective of Kose et al. (2009) study is to explore the relationship between financial openness and TFP growth. Financial openness can be distinguished between de jure capital account openness (the absence of restrictions on capital account transactions) and de facto

financial integration, which is measured by stocks of foreign assets and liabilities relative to GDP.

This paper use cross-section regression to characterize more formally the correlation between financial openness and TFP growth and panel regression to exploit the time series variation in the data. The cross-section regression model consists of eight different equations, where the dependent variable is TFP growth. In panel regression, TFP growth (ten-years panel) used as a dependent variable and analyzed using fixed effects and system GMM, which both have four different equations that depend on the independent variables.

The results show that financial openness, as measured by de jure capital account openness, is associated with higher medium-term TFP growth. These results are robust with potential problems of endogeneity and reverse causality, leading us to the view that this may in fact be a causal relationship. But it is a subtle one. The level of de facto financial integration, as measured by the stock of external liabilities to GDP, is not correlated with TFP growth. But splitting up the stock of external liabilities reveals a novel and interesting result. FDI and equity inflows (cumulated over decade-long periods) contribute to TFP growth while debt inflows have the opposite effect. The negative effect of stocks of external debt liabilities on TFP is partially attenuated in economies with better-developed financial markets and better institutional quality.

Rodrik (1998)

In this study, Rodrik (1998) wants to investigate the relationship between capital account liberalization with three indicators of economic performance: per-capita GDP growth, investment (as a share of GDP), and inflation. Rodrik (1998) uses the data from 23 countries with the period between 1973 and 1996.

The method used in this paper is partial scatter plots which relating capital account liberalization to three indicators of economic performance: per-capita GDP growth, investment (as a share of GDP), and inflation. Each of these indicators is measured as an average over the 1975-89 periods. The indicator of capital account liberalization is the proportion of years during 1975-89 for which the capital account was free of restrictions. The sample covers almost 100 countries, developing as well as developed. The following controls are used in each scatter plot: initial per-capita GDP, initial secondary enrollment rate, an index of the quality of governmental institutions, and regional dummies for East Asia, Latin America, and sub-Saharan Africa. Hence, the scatter plots display the relationship between the capital-account regime and economic performance controlling for these other variables.

The result is that there is no evidence in the data that countries without capital controls have grown faster, invested more, or experienced lower inflation. Capital controls are essentially uncorrelated with long-term economic performance once other determinants are controlled for.

Prasad et al. (2007)

The objective of this paper is to investigate the recent phenomenon of "uphill" flows of capital from nonindustrial to industrial countries and analyze whether this pattern of capital flows has hurt growth in nonindustrial economies that export capital. The method used in this paper is cross sectional and panel GMM regression, with data used from 103 countries where the period used is from the year 1970-2004. In cross-section regression used five different

models, where the dependent variable is the average annual rate of growth of GDP per capita and the independent variables for each model can be seen in Table 5. In model 2, the current account are replaced with net foreign asset, and in model 3, the current account is split into gross assets and gross liabilities. For panel GMM regression, the average annual rate of growth of GDP per capita are used as dependent variable, and for the independent variable use current account balance GDP ratio, GDP per capita, life expectancy, trade policy, fiscal balance GDP ratio, institutional quality, net foreign assets GDP ratio, gross asset GDP ratio, gross liabilities GDP ratio, investment GDP ratio, domestic savings GDP ratio, working age share of total population, and industrial country dummy.

The result shows that non-industrial countries that have relied more on foreign finance have not grown faster in the long run. By contrast, growth and the extent of foreign financing are positively correlated in industrial countries. This difference may lie in the limited ability of non-industrial countries to absorb foreign capital – especially because of the difficulty their financial systems have to allocate it to productive uses, and because of the proneness of these countries to exchange rate appreciation (and, often, overvaluation) when faced with such inflows. This paper suggests that the current anomaly of poor countries financing rich countries may not really hurt the former's growth, at least conditional on their existing institutional and financial structures. The results does not imply that there is no role for foreign finance in the process of economic development or that it is natural for all types of capital to flow “uphill”. Indeed, the patterns of foreign direct investment flows have generally been more in line with the predictions of theory. However, there is no evidence that providing additional financing in excess of domestic savings is the channel through which financial integration delivers its benefits.

Edwards (2001)

The purpose of this study is to analyze empirically the relationship between economic performance and capital mobility in the world economy. This paper focuses on two related issues: First, is there any evidence, at the cross country level, that higher capital mobility is associated (after controlling for other factors) with higher growth? And, second, is the relationship between capital mobility and growth different for emerging and advanced countries?

The first question about the relationship between capital account restrictions and economic performance will be answered by using the following two equations:

$$(1) \quad g_j = \alpha_0 + \alpha_1 \kappa_j + \sum \alpha_2 X_j + \varepsilon_j$$

$$(2) \quad \tau_j = \beta_0 + \beta_1 \kappa_j + \sum \beta_2 X_j + \mu_j$$

where g_j is average real GDP growth in country j during the 1980s; τ_j is the average rate of TFP growth during the 1980s; κ_j is a measure of capital account openness in country j , using Quinn's indicator (CAPOP); the X_j are other variables that affect economic performance; ε_j and μ_j are heteroskedastic errors with zero mean. The α s and β s are parameters to be estimated.

Following the recent literature on growth and cross-country economic performance in the estimation of equation (2) the following X_j were included: (a) The investment ratio during the 1980s (INV80). Its coefficient is expected to be positive. (b) A measure of human capital, taken to be the number of years of schooling completed by 1965 (Human65). Its coefficient is

expected to be positive. And (c) the log of real GDP per capita in 1965, which is take to be a measure of initial economic activity. To the extent that countries real income tends to converge, the coefficient of this variable (GDP65) is expected to be negative.

Equations (1) and (2) were estimated using a number of procedures, including weighted least squares, weighted two stages least squares, SURE, and weighted three stage least squares. In all regressions GDP per capita in 1985 was used as a weight.

The second question about the effect of capital restrictions on growth depends on the country's level of development will be answered by adding the interactive independent variable ($\log GDPC * CAPOP$) in the estimation of equations (1) and (2). GDPC is GDP per capita in 1980. In this case, equation (2) becomes:

$$(2) g_j = \alpha_0 + \alpha_1 CAPOP_j + \alpha_2 (CAPOP_j \log GDPC_j) + \alpha_3 Human65_j + \alpha_4 \log GDPC65_j \varepsilon_j$$

If coefficient α_2 is significant, the total effect of capital openness on growth becomes country-specific, and will be given by:

$$(3) E_j = \alpha_1 + \alpha_2 \log GDPC_j$$

If α_2 is positive (negative), the effect of capital account openness on growth increases (declines) with the level of development.

The results reported in this study suggests, quite strongly, that the positive relationship between capital account openness and productivity performance only manifests itself after the country in question has reached a certain degree of development. A plausible interpretation is that countries can only take advantage, in the net, of a greater mobility of capital once they have developed a somewhat advanced domestic financial market. Edward explored this interpretation by a term that interacted the CAPOP index with standard measures of domestic financial development, including the ratio of liquid liabilities in the banking sector to GDP and the exchange rate black market premium.

SUMMARY OF OTHER PREVIOUS STUDIES ON IMPACT OF CAPITAL MARKET INTEGRATION

Table A.2 provides the summary of findings on the impact of capital market integration. As can be seen, there are diverging results on whether capital market integration brings positive or negative impact on the economy.

Table A-1
Summary of Studies Examining the Impact of Capital Market Integration

No	Type of Study	Positive Impact	Neutral or Insignificant Impact	Uncertain or Conditional
1.	Study Examining the Benefits of International Diversifications	Grubel (1968)	Costello, et. al. (2008)	Goetzmann et al. (2005)
		Levy and Sarnat (1970)		Dimson et al. (2002)
		Solnik (1974)		Lewis (2006)
		Hunter and Simon (2004)		
		Meyer and Rose (2003)		
		Ang and Bekaert (2002)		
		de Santis and Gerard (1997)		
2.	Study Examining the Cost of Capital Response to Increased Market Integration	Henry (2000)	NA	Bekaert and Harvey (2000)
		Miller (1999)		Lins et al (2005)
		Errunza and Miller (2000)		Lewis (2006)
		Smith and Sofianos (1997)		
		Tandon (1997)		
3.	Recent Studies Examining the Effect of Capital Market Liberalisation on Economic Growth	Quinn (1997)	Rodrik (1998)	Edwards (2001)
		Kose, et. al. (2008)	Prasad et. al.	
4.	Study Examining the Effect of Capital Market Liberalisation on Country Risk Sharing	Artis and Hoffman (2008)	Kose, et al. (2007)	Kose, et al (2003)
		Kim and Sheen (2007)	Sorensen and Yosha (1998)	
			Mélitz and Zumer (1999)	

Source: Glenn (2009)

Appendix B. Data and Research Methodology

DATA

Micro- and macroeconomic related data are employed in this study. Data from stock exchanges in ASEAN is the micro economic data while aggregate economy data is the macro economy one. We compile the following market indices from six ASEAN stock exchanges from January 1st 2010 to December 31st 2012 at daily interval: JKSE from Indonesia Stock Exchange (IDX), KLSE from Malaysia Stock Exchange (KLSE), PSI from the Philippines Stock Exchange (PSE), FTSTI from Singapore Stock Exchange (SGX), SETI from Thailand Stock Exchange (SET), Vietnam Stock Exchange (HOSE and HNX). Further, three non-ASEAN stock exchanges' market indices are also compiled; HIS from Hong Kong Stock Exchange (HKSE), Nikkei 225 from Japan Stock Exchange (TSE) and KS11 from South Korea Stock Exchange (KRX). Finally, S&P500 market index represents US stock market. All data are in US Dollar term provided from Datastream where available. Otherwise, we refer to Yahoo Finance and convert the domestic market index to US Dollar based on OANDA exchange rates.

Then, macro economy related data; market capitalization, interest rate, number of listed companies, and GDP are compiled from World Bank website. The sample period covers from January 1st 2010 to December 31st 2012. The study on the impact of capital market integration from macroeconomic perspective consists of two parts. The first discusses the effect of ASEAN capital market integration on market capitalization, total investment growth, and GDP growth of ASEAN countries. The analysis uses annual data from four ASEAN member countries (Indonesia, Malaysia, the Philippines, and Thailand) from 2000 to 2010, where the variables used in this section are market capitalization (*MARKETCAP*), bid ask spread (*SPREAD*), the differences in short term money market rate between each of the four ASEAN countries with Singapore's rate (*MMRATEDIF*), the logarithm of the total investment (*LTOTINV*), the logarithm of real GDP (*LGDP*), and the ratio of labor force to total population (*LABORRATIO*). The listed variables are obtained from various databases, IMF and World Bank.

Next, the second section of macroeconomic analysis discusses the effect of ASEAN capital market integration to market capitalization, investment growth, and GDP growth in Indonesia. In this part of analysis, we use both annual and quarterly data from Indonesia. The annual data spans from the period of 2000 to 2010, and the quarterly data covers the period of 2000Q1 to 2010Q4. The variables used in this section are the same as the variables in the first section: *SPREAD*, *MARKETCAP*, *MMRATEDIF*, *LGDP*, *LTOTINV*, and *LABORRATIO*. The quarterly *LABORRATIO* data is derived using cubic-spline

interpolation from the annual data. Quarterly *LGDP* and *LTOTINV* are sourced from the OECD. The data will be analyzed using fixed effect panel regression or OLS regression.

RESEARCH METHODOLOGY

In this study, we combine qualitative and quantitative methods. Qualitative approaches that are used in this research comprised of focused group discussions (FGD) and in depth interviews with stakeholders to gather the idea regarding the characteristics of Indonesian capital market and current development in the integrated capital market initiative. The views from the participants, combined with desk study, will then be analyzed to determine strengths, weaknesses, opportunities, and threats of Indonesian capital market in comparison to those of other ASEAN countries' capital market, with specific focus on Singapore, Malaysia, and Thailand. Quantitative models are used in determining the development of ASEAN capital market integration.

We propose a market microstructure approach to study the integration of equity market in ASEAN countries. Specifically, we analyze the liquidity and volatility at daily level to shed more lights on the market characteristics in the region. We argue that the integration in the equity market would be highly benefited from similar characteristics of market microstructure reflected in the liquidity and volatility level of each equity market in the ASEAN countries. The challenge to study the market microstructure characteristics in the emerging market is the availability of quality high frequency data. Fortunately, Lesmond et al. (1999) developed a measure to estimate the liquidity in emerging markets that rely on the incidence of observed zero daily returns in these markets. They argue that if the value of an information signal is insufficient to outweigh the costs associated with transacting, then market participants will elect not to trade, resulting in an observed zero return. The advantage of this measure is that it requires only a time series of daily equity returns. Given the paucity of time-series data on preferred measures such as bid-ask spreads or bona-fide order flow [following Kyle (1985)], this measure is an attractive empirical alternative.

Corwin and Schultz (2012) Range-Based Daily Spread

We follow the daily spread inferred from the ratio of the high-to-low price in a single two-day period and the high-to-low volatility for two consecutive single days. Monthly high-low spreads are estimated either by taking an average of daily high-low spread estimates within the month, or by using the average β and γ parameters within the month. We assume that the daily high price is a buyer-initiated trade and is discounted by half of the spread.

The closed form equation is in the following:

$$(1) \quad \beta = E \left\{ \sum_{j=0}^1 \left[\ln \left(\frac{H_{t+j}^0}{L_{t+j}^0} \right) \right]^2 \right\}$$

Where H_{t+j}^0 (L_{t+j}^0) is observed high (low) stock

$$(2) \quad \gamma = \left[\ln \left(\frac{H_{t,t+1}^0}{L_{t,t+1}^0} \right) \right]^2$$

Where $H_{t,t+1}$ is the high price over the two day and $L_{t,t+1}$ is the low price over days t and t+1.

$$(3) \quad S = \frac{2(e^\alpha - 1)}{1 + e^\alpha} \quad (4) \quad \frac{-\sqrt{\beta}}{2\sqrt{2}} - \sqrt{\frac{\gamma}{3 - 2\sqrt{2}}}$$

The spread estimator given in formula (4) is easy to compute and does not require us to iterate through successive estimates of the spread to get the correct value. To get spreads for longer periods like a month, we average the spread estimates from all overlapping two-day periods within the month. In estimating spreads and variances, we use the observed ratio of high to low prices, while the estimator is derived using the expected ratio. Because the variance and the spread are nonlinear functions of the high-low price ratio, an average of spread estimates is not an unbiased estimate of the spread. However, our simulation results and empirical analysis both suggest that this is not a problem in practice.³

The following implicit assumptions underlie the high-low spread estimator:

- The stock trades continuously while the market is open
- The stock values do not change while the market is closed.

To correct for overnight returns, we determine whether the close on day t is outside the range of prices for day $t+1$ for every pair of consecutive trading days. If the day $t+1$ low is above the day t close, we assume that the price rose overnight from the close to the day $t+1$ low and decrease both the high and low for day $t+1$ by the amount of the overnight change when calculating spreads. Similarly, if the day $t+1$ high is below the day t close, we assume the price fell overnight from the close to the day $t+1$ high and increase the day $t+1$ high and low prices by the amount of this overnight decrease.

Even if the expectation is true, the observed two-day variance may be more than twice as large as the single-day variance during volatile periods, in cases with a large overnight price change, or when the total return over the two-day period is large relative to the intraday volatility. For most of the analysis to follow, we set all negative two-day spreads to zero before calculating monthly averages.

Parkinson (1980) Range-Based Volatility

The Parkinson (1980) estimator efficiency intuitively comes from the fact that the price range of intraday gives more information regarding the future volatility than two arbitrary points in this series (the closing prices). Assuming that the asset price follows a simple diffusion model without a drift term, his estimator $\hat{\sigma}_P^2$ can be written:

$$(5) \quad \hat{\sigma}_P^2 = \frac{1}{4 \ln 2} (\ln H_t - \ln L_t)^2$$

Dynamic Conditional Correlation⁴

As the previous studies, this paper is also use DCC-GARCH as a model to the correlation structure. DCC estimator is as the following:

$$H_t = D_t R_t D_t$$

³ To address the importance of this problem, we re-estimate monthly spreads using an average of the high-low ratio parameters rather than an average of daily spread estimates over the month. We find in both our simulations and empirical tests that this method does not produce more accurate monthly spread estimates. We are grateful to an anonymous referee for this suggestion

⁴ Engle, Robert. 2002. *Dynamic Conditional Correlation: A Simple Class of Multivariate Generalized Autoregressive Conditional Heteroskedasticity Models*. Journal of Business & Economic Statistics. July 2002, Vol. 20, No. 3. DOI 10.1198/073500102288618487.

DCC model can be formulated as the following statistical specification:

$$r_t | \mathfrak{I}_{t-1} \sim N(0, D_t R_t D_t)$$

$$D_t^2 = \text{diag}\{\omega_i\} + \text{diag}\{K_i\} \circ r_{t-1} r'_{t-1} + \text{diag}\{\lambda_i\} \circ D_{t-1}^2$$

$$\varepsilon_t = D_t^{-1} r_t$$

$$Q_t = S \circ (u' - A - B) + A \circ \varepsilon_t \varepsilon'_{t-1} + B \circ Q_{t-1}$$

$$R_t = \text{diag}\{Q_t\}^{-1} Q_t \text{diag}\{Q_t\}^{-1}$$

The assumption of normality in the first equation gives rise to a likelihood function. Without this assumption, the estimator will still have the Quasi-Maximum Likelihood (QML) interpretation. The second equation simply expresses the assumption that each asset follows a univariate GARCH process. Nothing would change if these were generalized.

The log likelihood for this estimator can be expressed as

$$r_t | \mathfrak{I}_{t-1} \sim N(0, H_t)$$

$$\begin{aligned} L &= -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + \log|H_t| + r'_t H_t^{-1} r_t) \\ &= -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + \log|D_t R_t D_t| + r'_t D_t^{-1} R_t^{-1} D_t^{-1} r_t) \\ &= -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + 2 \log|D_t| + \log|R_t| + \varepsilon'_t R_t^{-1} \varepsilon_t) \\ &= -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + 2 \log|D_t| + \log|R_t| + r'_t D_t^{-1} D_t^{-1} r_t - \varepsilon'_t \varepsilon_t + \log|R_t| + \varepsilon'_t R_t^{-1} \varepsilon_t) \end{aligned}$$

which can simply be maximized over the parameters of the model. However, one of the objectives of this formulation is to allow the model to be estimated more easily even when the covariance matrix is very large. In the several estimation methods below are presented, giving simple consistent but inefficient estimates of the parameters of the model. Sufficient conditions are given for the consistency and asymptotic normality of these estimators following Newey and McFadden (1994). Let the parameters in D be denoted θ and the additional parameters in R be denoted ϕ . The log-likelihood can be written as the sum of a volatility part and a correlation part:

$$L(\theta, \phi) = L_V(\theta) + L_C(\theta, \phi)$$

The volatility term is:

$$L_V(\theta) = -\frac{1}{2} \sum_{t=1}^T (n \log(2\pi) + \log|D_t|^2 + r'_t D_t^{-2} r_t)$$

and the correlation component is:

$$L_C(\theta, \Phi) = -\frac{1}{2} \sum_{t=1}^T (\log|R_t| + \varepsilon_t' R_t^{-1} \varepsilon_t - \varepsilon_t' \varepsilon_t)$$

DCC modelling has the advantage of separating the estimation of the volatility of each time series (with great flexibility, using single univariate models) and the correlation part (with the strong constraint imposing the same dynamics to all the correlations).

The volatility part of the likelihood is apparently the sum of individual GARCH likelihoods:

$$L_V(\theta) = -\frac{1}{2} \sum_t \sum_{i=1}^n (\log(2\pi) + \log(h_{i,t}) + \frac{r_{i,t}^2}{h_{i,t}})$$

which is jointly maximized by separately maximizing each term.

The second part of the likelihood is used to estimate the correlation parameters. Because the squared residuals are not dependent on these parameters, they do not enter the first-order conditions and can be ignored. The resulting estimator is called DCC log likelihood mean reverting if the mean reverting formula $q_{i,j,t} = \bar{\rho}_{i,j} + \alpha(\varepsilon_{i,t-1}\varepsilon_{j,t-1} - \bar{\rho}_{i,j} + \beta(q_{i,j,t-1} - \bar{\rho}_{i,j}))$ is used and DCC log likelihood integrated model with the integrated model in $q_{i,j,t} = (1 - \lambda)(\varepsilon_{i,t-1}\varepsilon_{j,t-1}) + \lambda(q_{i,j,t-1})$, $\rho_{i,j,t} = \frac{q_{i,j,t}}{\sqrt{q_{ii,t}q_{jj,t}}}$

Cointegration

Cointegration is an analytic technique for testing for common trends in multivariate time series and modelling long-run and short-run dynamics. Two or more predictive variables in a time-series model are co-integrated when they share a common stochastic drift. Variables are considered co-integrated if a linear combination of them produces a stationary time series.⁵

An n -dimensional time series y_t is co-integrated if some linear combination $\beta_1 y_{1t} + \dots + \beta_n y_{nt}$ of the component variables is stationary. The combination is called a co-integrating relation, and the coefficients $\beta = (\beta_1, \dots, \beta_n)$ form a co-integrating vector. Co-integration is usually associated with systems of $I(1)$ variables, since any $I(0)$ variables are trivially co-integrated with other variables using a vector with coefficient 1 on the $I(0)$ component and coefficient 0 on the other components. The idea of co-integration can be generalized to systems of higher-order variables if a linear combination reduces their common order of integration.

Co-integration is distinguished from traditional economic equilibrium, in which a balance of forces produces stable long-term levels in the variables. Co-integrated variables are generally unstable in their levels, but exhibit mean-reverting "spreads" (generalized by the co-integrating relation) that force the variables to move around common stochastic trends. Co-integration is also distinguished from the short-term synchronies of positive covariance, which only measures the tendency to move together at each time step. Modification of the

⁵ www.mathworks.com

VAR model to include co-integrated variables balances the short-term dynamics of the system with long-term tendencies.

Co-integrated variables, identified by cointegration tests, can be combined to form new, stationary variables. In practice, it must be determined if such transformations lead to more reliable models, with variables that retain an economic interpretation.

In the presence of cointegration, simple differencing is a model misspecification, since long-term information appears in the levels. Fortunately, the co-integrated VAR model provides intermediate options, between differences and levels, by mixing them together with the cointegrating relations. Since all terms of the co-integrated VAR model are stationary, problems with unit roots are eliminated.

GARCH-in-Mean⁶

GARCH-in-mean is a model to evaluate the time-varying risk-return relationship. This model allows the introduction of conditional variance. The return of a security may depend on its volatility and to model that phenomenon, the GARCH-in-mean (GARCH-M) model adds a heteroskedasticity term into the mean equation. It has the specification:

$$r_{i,t} = c + \varepsilon_t + \rho\varepsilon_{t-1} + \lambda_{\sigma SG}$$

$$\varepsilon_t \sim W.N.(0, h_t)$$

$$h_t = \omega + \nu\varepsilon_{t-1,SG}^2 + \alpha\varepsilon_{t-1}^2 + \beta h_{t-1} + \gamma I_{t-1}\varepsilon_{t-1}^2$$

With,

$$\varepsilon_{t,SG}^2 = (r_{SG,t} - c + \delta r_{US,t})^2$$

And

$$h_{t,SG} = \omega_{SG} + \alpha_{SG}\varepsilon_{t-1,SG}^2 + \beta_{SG}h_{t-1,SG} + \gamma_{SG}I_{t-1,SG}\varepsilon_{t-1,SG}^2$$

is the time series value at time is the mean of GARCH model is the volatility coefficient (risk premium) for the mean. is the conditional standard deviation (i.e volatility) at time is the order of the ARCH component model are parameters of the GARCH component model are the standardized residuals: is the probability distribution function for , currently, the following distributions are supported:

Panel Data Regression

Panel data regression analysis is used for analyzing the impact of capital market integration to the macroeconomic variables. The general model used in this regression analysis is:

⁶ Engle, R.F., Lilien, D.M., & Robins, R.P. (1987). *Estimating time varying risk premia in the term structure: the ARCH-M model*. *Econometrica*, 55, 391–407.

Macroeconomic variable = f(capital market integration, control variable)

Panel data is obtained by observing the individuals at several points in time. Basically there are two basic models that can be used in analyzing panel data: fixed effect and random effect model. Panel data may offer a solution to the problem of bias caused by unobserved heterogeneity, as is commonly encountered in cross section data.

Suppose a regression model of the observed individual $i = 1, 2, \dots, N$, at time $t = 1, 2, \dots, T$, are as follows:

$$y_{it} = \alpha + x'_{it}\beta + c_i + u_{it} \quad (1)$$

where:

Y_{it} : dependent variable,

X'_{it} : row vector of explanatory variable,

α : intercept,

β : vector of parameter,

c_i : individual-specific effect,

u_{it} : idiosyncratic error term.

In random effect model, c_i are assumed as a random variable that is uncorrelated with the explanatory variables, while in fixed effect model, c_i are allowed to be correlated with the explanatory variable.

Estimation using fixed effect is done by taking a time average of the variables x and y from model (1) to obtain:

$$\bar{y}_i = \alpha + \bar{x}'_i\beta + c_i + \bar{u}_i \quad (2)$$

Where the above equation is a cross section regression of the average value of each variable with respect to time. Furthermore, by subtracting equation (1) and (2), we will get:

$$(y_{it} - \bar{y}_i) = \beta(x'_{it} - \bar{x}'_i) + (u_{it} - \bar{u}_i) \quad (3)$$

Or, in simplified form:

$$\dot{y}_i = \dot{x}'_i\beta + \dot{u}_i \quad (4)$$

It appears that individual-specific effect (c_i) and intercept (α) are removed from the equation. This equation can then be estimated using pooled OLS.

The empirical models employed in this study for analyzing the impact of capital market integration are:

1. Market Capitalization as Dependent Variables. The effect of capital market integration on the market capitalization can be viewed by using the following two models:

$$(1) \text{marketcap}_{it} = c + a_i + \beta_1 \text{spread}_{it} + u_{it}$$

$$(2) \text{marketcap}_{it} = c + a_i + \beta_1 \text{mmratedif}_{it} + u_{it}$$

2. Total Investment as Dependent Variable. The effect of capital market integration on the growth of total investment can be viewed by using the following two models:

$$(1) \text{ltotinv}_{it} = c + a_i + \beta_1 \text{mmratedif}_{it} + u_{it}$$

$$(2) \text{ltotinv}_{it} = c + a_i + \beta_1 \text{spread}_{it} + u_{it}$$

3. GDP as Dependent Variable. The effect of capital market integration to the GDP growth can be viewed by using the following model:

$$\text{lgdp}_{it} = c + a_i + \beta_1 \text{laborratio}_{it} + \beta_2 \text{marketcap}_{it} + \beta_3 \text{ltotinv}_{it} + u_{it}$$

FOCUS GROUP DISCUSSIONS AND IN-DEPTH-INTERVIEWS

The qualitative approach involved in this study mainly consists of focus group discussions (FGD) and in-depth interview (IDI). We held two FGDs which brought together small group of participants to discuss the current condition and the future of Indonesian capital market under different scenarios. In general the issues discussed in both FGDs are similar, but there are specific points that are addressed in each FGD. For example, in the FGD with market participants, we ask to what extent they are aware on the integration plan. In the FGD with regulators and SROs, we ask whether they have tried to assess the impact of ASEAN capital market integration on Indonesian capital markets. Specifically, issues that were discussed comprised of:

- Current condition of Indonesia capital market, its strengths and weaknesses in comparison to other ASEAN countries' capital market, especially Singapore, Thailand, and Malaysia, who are very active among its ASEAN peers to promote the capital market integration plan
- Opportunities and threats faced by Indonesia capital market
- Level of participants' awareness on capital market integration's plan
- Impact of capital market integration on Indonesian capital market, both positive and negative impacts, with regards to liquidity, companies' market access, capital market products distribution, foreign capital flow, interest rate differential between ASEAN countries, and Gross Domestic Product (GDP) growth
- Government and private sectors preparation in facing the regional integrated market
- Factors that should be improved in Indonesia capital market to support and take the most benefit of the integration plan.

In order to get multiple angle point of views, we invite stakeholders of Indonesian capital market in two FGD sessions. In the first session, we invite regulators and self-regulated authorities (SROs). In addition to participants from Bapepam LK, participants from other directorate general of Indonesian finance ministry (i.e. fiscal policy office and debt management office) and the central bank of Indonesia were also invited to share their views and opinions on the impact of regional capital market integration, since previous studies

suggest that monetary and fiscal policy implementation will be affected by integration. SROs that participated in the FGD were Indonesia Central Securities Depository (Kustodian Sentral Efek Indonesia/KSEI), Indonesia Securities Clearing and Guarantee Institution (Kliring Penjaminan Efek Indonesia/KPEI), and Indonesia Stock Exchange (Bursa Efek Indonesia/BEI). Participants in the second FGD come from various associations of capital market participants that will directly and indirectly affected if the integration plan is implemented, which are Indonesia Securities Companies Association (Asosiasi Perusahaan Efek Indonesia/APEI), Indonesia Custodian Bank Association (Asosiasi Bank Kustodian Indonesia/ABKI), and Indonesia Trustee Association (Asosiasi Wali Amanat Indonesia/AWMI).

We have conducted IDI with the heads of five ACMF working groups under Bapepam LK. Throughout these IDIs, we gather mainly information on recent key development and achievement in each working group and Indonesia's position and progress in the capital market integration plan related to different working group issue. To get as many insights as possible, we used guided open ended questions.

Appendix C. E-Views Output

1. Market Capitalization as Dependent Variables

Dependent Variable: MARKETCAP?

Method: Pooled Least Squares

Sample: 2000 2010

Included observations: 11

Cross-sections included: 4

Total pool (balanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.107444	0.012780	8.407466	0.0000
SPREADY?	-0.063781	0.020310	-3.140341	0.0032
Fixed Effects (Cross)				
_IND—C	-0.027922			
_MAL—C	0.056989			
_PHI--C	-0.029540			
_THAI--C	0.000473			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.862055	Mean dependent var	0.068255
Adjusted R-squared	0.847907	S.D. dependent var	0.046843
S.E. of regression	0.018268	Akaike info criterion	-5.060662
Sum squared resid	0.013015	Schwarz criterion	-4.857914
Log likelihood	116.3346	Hannan-Quinn criter.	-4.985473
F-statistic	60.93054	Durbin-Watson stat	1.795191
Prob(F-statistic)	0.000000		

Dependent Variable: MARKETCAP?
 Method: Pooled Least Squares
 Date: 01/11/13 Time: 08:55
 Sample: 2000 2010
 Included observations: 11
 Cross-sections included: 4
 Total pool (balanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.078928	0.006692	11.79402	0.0000
MMRATEDIF?	-0.002992	0.001682	-1.778987	0.0830
Fixed Effects (Cross)				
_IND--C	-0.029097			
_MAL--C	0.063448			
_PHI--C	-0.015851			
_THAI--C	-0.018500			
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.840146	Mean dependent var		0.068255
Adjusted R-squared	0.823751	S.D. dependent var		0.046843
S.E. of regression	0.019666	Akaike info criterion		-4.913253
Sum squared resid	0.015083	Schwarz criterion		-4.710504
Log likelihood	113.0916	Hannan-Quinn criter.		-4.838064
F-statistic	51.24313	Durbin-Watson stat		1.767212
Prob(F-statistic)	0.000000			

2. Total investment as Dependent Variable

Method: Pooled Least Squares
 Sample: 2000 2010
 Included observations: 11
 Cross-sections included: 4
 Total pool (balanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.28361	0.056850	427.1557	0.0000
MMRATEDIF?	-0.036770	0.014288	-2.573484	0.0140
Fixed Effects (Cross)				
_IND--C	0.517856			
_MAL--C	-0.229321			
_PHI--C	-0.339823			
_THAI--C	0.051289			
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.794234	Mean dependent var		24.15245
Adjusted R-squared	0.773130	S.D. dependent var		0.350732
S.E. of regression	0.167057	Akaike info criterion		-0.634320
Sum squared resid	1.088413	Schwarz criterion		-0.431571
Log likelihood	18.95503	Hannan-Quinn criter.		-0.559130
F-statistic	37.63391	Durbin-Watson stat		0.355598
Prob(F-statistic)	0.000000			

Dependent Variable: LTOTINV?
 Method: Pooled Least Squares
 Sample: 2000 2010
 Included observations: 11
 Cross-sections included: 4
 Total pool (balanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.15853	0.126395	191.1354	0.0000
SPREADY?	-0.009892	0.200875	-0.049244	0.9610
Fixed Effects (Cross)				
_IND--C	0.392146			
_MAL--C	-0.143658			
_PHI--C	-0.410046			
_THAI--C	0.161558			
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.759307	Mean dependent var		24.15245
Adjusted R-squared	0.734620	S.D. dependent var		0.350732
S.E. of regression	0.180680	Akaike info criterion		-0.477535
Sum squared resid	1.273163	Schwarz criterion		-0.274786
Log likelihood	15.50578	Hannan-Quinn criter.		-0.402346
F-statistic	30.75796	Durbin-Watson stat		0.169467
Prob(F-statistic)	0.000000			

3. GDP as Dependent Variable

Dependent Variable: LGDP?
 Method: Pooled Least Squares
 Sample (adjusted): 2000 2009
 Included observations: 10 after adjustments
 Cross-sections included: 5
 Total pool (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.958829	1.471356	4.049890	0.0002
LABORRATIO?	1.811083	2.395571	0.756013	0.4539
MARKETCAP?	0.786215	0.318800	2.466170	0.0178
LTOTINV?	0.775498	0.090430	8.575624	0.0000
Fixed Effects (Cross)				
_IND--C	0.183281			
_MAL--C	0.027682			
_PHI--C	0.193826			
_SING--C	-0.271366			
_THAI--C	-0.133423			
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.960832	Mean dependent var		25.61085
Adjusted R-squared	0.954304	S.D. dependent var		0.296981
S.E. of regression	0.063484	Akaike info criterion		-2.530408
Sum squared resid	0.169270	Schwarz criterion		-2.224484
Log likelihood	71.26019	Hannan-Quinn criter.		-2.413910
F-statistic	147.1877	Durbin-Watson stat		0.466479
Prob(F-statistic)	0.000000			

4. Regression for Indonesia

a. Yearly Data

Dependent Variable: MARKETCAP_IND
 Method: Least Squares
 Sample: 2000 2010
 Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.053791	0.021016	2.559487	0.0307
SPREADY_IND	-0.031437	0.025981	-1.210011	0.2571
R-squared	0.139919	Mean dependent var		0.028782
Adjusted R-squared	0.044354	S.D. dependent var		0.012916
S.E. of regression	0.012626	Akaike info criterion		-5.743170
Sum squared resid	0.001435	Schwarz criterion		-5.670826
Log likelihood	33.58744	Hannan-Quinn criter.		-5.788774
F-statistic	1.464127	Durbin-Watson stat		0.752432
Prob(F-statistic)	0.257095			

Dependent Variable: MARKETCAP_IND
 Method: Least Squares
 Sample: 2000 2010
 Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.049515	0.007171	6.905133	0.0001
MMRATEDIF_IND	-0.002947	0.000936	-3.147220	0.0118
R-squared	0.523935	Mean dependent var		0.028782
Adjusted R-squared	0.471039	S.D. dependent var		0.012916
S.E. of regression	0.009393	Akaike info criterion		-6.334643
Sum squared resid	0.000794	Schwarz criterion		-6.262299
Log likelihood	36.84054	Hannan-Quinn criter.		-6.380247
F-statistic	9.904992	Durbin-Watson stat		1.441141
Prob(F-statistic)	0.011790			

Dependent Variable: LGDP_IND
 Method: Least Squares
 Sample (adjusted): 2000 2009
 Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.34140	2.009306	6.639803	0.0006
LABORRATIO_IND	6.163677	2.901565	2.124260	0.0778
MARKETCAP_IND	0.603269	0.592124	1.018822	0.3476
LOG(TOTINV_IND)	0.396101	0.136926	2.892801	0.0276
R-squared	0.993314	Mean dependent var		26.04266
Adjusted R-squared	0.989971	S.D. dependent var		0.156052
S.E. of regression	0.015628	Akaike info criterion		-5.190340
Sum squared resid	0.001465	Schwarz criterion		-5.069306
Log likelihood	29.95170	Hannan-Quinn criter.		-5.323114
F-statistic	297.1271	Durbin-Watson stat		2.280759
Prob(F-statistic)	0.000001			

b. Quarterly Data

Dependent Variable: Market Capitalization

Dependent Variable: MARKETCAP_IND

Method: Least Squares

Sample (adjusted): 2000Q4 2010Q4

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.040106	0.005464	7.340593	0.0000
SPREAD	-2.164406	0.711514	-3.041974	0.0042
DUMMY	0.015663	0.003356	4.666901	0.0000
R-squared	0.380852	Mean dependent var		0.028346
Adjusted R-squared	0.348265	S.D. dependent var		0.011545
S.E. of regression	0.009321	Akaike info criterion		-6.442839
Sum squared resid	0.003301	Schwarz criterion		-6.317456
Log likelihood	135.0782	Hannan-Quinn criter.		-6.397181
F-statistic	11.68732	Durbin-Watson stat		0.491429
Prob(F-statistic)	0.000111			

Dependent Variable: MARKETCAP_IND

Method: Least Squares

Date: 01/14/13 Time: 12:24

Sample (adjusted): 2000Q4 2010Q4

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.040309	0.002957	13.63005	0.0000
MMRATEDIF	-0.002100	0.000343	-6.128072	0.0000
DUMMY	0.007998	0.002495	3.205089	0.0027
R-squared	0.612763	Mean dependent var		0.028346
Adjusted R-squared	0.592383	S.D. dependent var		0.011545
S.E. of regression	0.007371	Akaike info criterion		-6.912148
Sum squared resid	0.002065	Schwarz criterion		-6.786765
Log likelihood	144.6990	Hannan-Quinn criter.		-6.866491
F-statistic	30.06562	Durbin-Watson stat		0.375289
Prob(F-statistic)	0.000000			

Dependent Variable: Investment

Dependent Variable: D(LOG(INV_IND))

Method: Least Squares

Sample (adjusted): 2000Q2 2010Q4

Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006734	0.002342	2.875175	0.0064
D(MMRATEDIF)	0.000232	0.001141	0.203367	0.8399
DUMMY	0.013170	0.004104	3.208807	0.0026
R-squared	0.206403	Mean dependent var		0.011013
Adjusted R-squared	0.166723	S.D. dependent var		0.013806
S.E. of regression	0.012602	Akaike info criterion		-5.842674
Sum squared resid	0.006353	Schwarz criterion		-5.719800
Log likelihood	128.6175	Hannan-Quinn criter.		-5.797362
F-statistic	5.201715	Durbin-Watson stat		0.175273
Prob(F-statistic)	0.009817			

Dependent Variable: D(LOG(INV_IND))

Method: Least Squares

Sample (adjusted): 2000Q2 2010Q4

Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006726	0.002339	2.875732	0.0064
D(SPREAD)	0.251702	0.814037	0.309203	0.7588
DUMMY	0.013270	0.004104	3.233176	0.0025
R-squared	0.207477	Mean dependent var		0.011013
Adjusted R-squared	0.167851	S.D. dependent var		0.013806
S.E. of regression	0.012594	Akaike info criterion		-5.844028
Sum squared resid	0.006344	Schwarz criterion		-5.721154
Log likelihood	128.6466	Hannan-Quinn criter.		-5.798716
F-statistic	5.235859	Durbin-Watson stat		0.185042
Prob(F-statistic)	0.009555			

Dependent Variable: GDP
 Dependent Variable: D(LOG(GDP_IND))
 Method: Least Squares
 Sample (adjusted): 2001Q1 2009Q4
 Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.011382	0.002561	4.443564	0.0001
D(LOG(TOTINV_IND))	0.132763	0.085711	1.548971	0.1315
D(MARKETCAP_IND)	0.844245	0.460577	1.833017	0.0764
D(LABORRATIO_IND)	-3.222104	3.064710	-1.051357	0.3012
DUMMY	0.004474	0.003242	1.380057	0.1774
R-squared	0.130434	Mean dependent var		0.012360
Adjusted R-squared	0.018232	S.D. dependent var		0.005315
S.E. of regression	0.005266	Akaike info criterion		-7.526845
Sum squared resid	0.000860	Schwarz criterion		-7.306912
Log likelihood	140.4832	Hannan-Quinn criter.		-7.450082
F-statistic	1.162492	Durbin-Watson stat		2.093273
Prob(F-statistic)	0.346294			

Dependent Variable: D(LOG(GDP_IND))
 Method: Least Squares
 Sample (adjusted): 2001Q1 2009Q4
 Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.023865	0.009904	2.409717	0.0221
D(LOG(TOTINV_IND))	0.083382	0.087919	0.948395	0.3503
D(MARKETCAP_IND)	0.769796	0.358949	2.144582	0.0399
D(LOG(LABORFORCE_IND))	-2.985816	2.026860	-1.473124	0.1508
DUMMY	0.004117	0.002561	1.607366	0.1181
R-squared	0.158347	Mean dependent var		0.012360
Adjusted R-squared	0.049746	S.D. dependent var		0.005315
S.E. of regression	0.005181	Akaike info criterion		-7.559471
Sum squared resid	0.000832	Schwarz criterion		-7.339538
Log likelihood	141.0705	Hannan-Quinn criter.		-7.482708
F-statistic	1.458067	Durbin-Watson stat		2.188941
Prob(F-statistic)	0.238745			

Appendix D. Microstructures of ASEAN Stock Exchanges

Table D-1

Asia-Pacific Exchange Opening Hours and After-hours Trading Rules

Exchange	Trading Hours	After Hours	Description
IDX	Preopening session: 08.45–08.55 Session 1: Monday–Thursday 09.00–12.00 Friday: 09.00–11.30 Session 2: <i>Regular:</i> Monday–Thursday: 13.30–15.49.59 Friday: 14.00–15.49.59 <i>Negotiation:</i> Monday–Thursday: 13.30–16.15 Friday: 13.30–16.15 <i>Preclosing session:</i> 15.50–16.00 Post-trading session: 16.05–16.15	X	
SET	10:00–12:30 and 14:30–16:30	✓	In the off-hour trading session, held from the closing call auction to 17:00, off-market orders may be executed and recorded in the trading system. Only Main Board, Big Board and Foreign Board trading is permitted. Main Board trades, less than 1 million shares and less than 3 million baht are traded at the closing price of the trading day. Transactions of greater than 1 million shares and 3 million baht trade on the Big-Lot Board without price restrictions. Foreign Board trades have no size, value or price restrictions
SGX	09:00–12:00 and 14:00–17:00	✓	Orders may be submitted from 20:30 until 20:59. From 20:59 pm to 21:00 no entry, amendment or cancellation of orders is possible. Orders are matched at 21:00 using the single price call auction
TSE	09:00–11:00 and 12:30–15:00		The TSE Trading Network System (ToSTNeT-1) executes block and basket orders by anonymous negotiation through the trading platform. This is not an off-market transaction. ToSTNet-2 matches investor's orders of any size at the closing price of the stock.
HKEx	10:00–12:30 and 14:30–16:00	X	
KRX	09:00–15:00 and 13:30–16:00	✓	Orders are entered from 15:10–15:30 and are matched in time priority at the closing price from the main trading session. After-hours single price trading operates from 15:30–18:00. Orders are matched every 30 min during this period at no more than F5% from the closing price. The KRX allows block

Exchange	Trading Hours	After Hours	Description
			transactions to be traded in the after-hours session from 15:10–18:00. Block orders are transactions of at least 500 shares or greater than 100 million Won. Before a block trade is executed, a broker firm must submit a block transaction application to the exchange containing the counterpart brokers' name. Basket trades are also allowed in the after-hours session on the KRX. A basket trade comprises at least 5 stocks with a total amount of at least 1 billion won. However, the traded prices for both block and basket orders must not be more than $\pm 5\%$ from the closing price and within the highest and lowest prices of the day.

¹All Asia-Pacific exchanges are open Monday to Friday only. HKEx, SGX, SET, and TSE split the trading day into a morning and afternoon session. HKEx and SGX do not use a special mechanism to close the morning session or open the afternoon session. On the SET, no special mechanism is used to close the morning session. However, the afternoon session is opened with a call auction. On TSE the morning session is closed with a call auction and the afternoon session is opened with a call auction.

²On Friday the IDX operating hours are 9:00 to 11:30 and 14:00 to 15:49:59.

Table D-2 presents details on order priority rules in the continuous auction and call auction.

Table D-2
Order Priority Rules

Exchange	Continuous Trading	Call auction Trading
IDX	Price/Time	Price/Time
SET	Price/Time	Price/Time
SGX	Price/Time	Price/Time
TSE	Price/Time	Price/No Time Priority ⁴
HKEx	Price/Time ¹	Order Type/Price/Time ²
KRX	Price/Time	Price/Time ³

¹Odd lot orders are not automatically matched in price/time priority in AMS/3. They are executed manually at the conclusion of the trading session. (Both semi-automatching and manual conclusions are available for odd lot orders).

²At-auction orders (market-on-open) have a higher priority than at-auction limit orders.

³There is one exception to time priority in call auction trading. ⁴Orders at the same price are deemed to reach the order book simultaneously.

Table D-3 presents details on market fragmentation. The availability of block trade facilities is indicated. Details on off-market trading are also presented. These include the use of price links to the order book and delayed reporting.

Table D-3
Tick Size

Stock Price	Minimum Tick Size
SGX (SGD)	
1 or less	0.5
> 1 to 3	1
> 3 to 5	2
> 5 to 10	5
> 10	10
SET (BAHT)	
Less than 2	0.01
> 2 to 5	0.02

Stock Price	Minimum Tick Size
> 5 to 10	0.05
> 10 to 25	0.1
> 25 to 50	0.25
> 50 to 100	0.5
> 100 to 200	1
> 200 to 400	2
> 400 to 800	4
> 800	6
TSE (YEN)	
2,000 or less	1
> 2,000 to 3,000	5
> 3,000 to 30,000	10
> 30,000 to 50,000	50
> 50,000 to 100,000	100
> 100,000 to 1 million	1,000
> 1 million to 20 million	10,000
> 20 million to 30 million	50,000
> 30 million	100,000
KRX (WON)	
< 5,000	5
> 5,000 to 10,000	10
> 10,000 to 50,000	50
> 50,000 to 100,000	100
> 100,000 to 500,000	500
HKEX (HKD)	
0.25 or less	0.001
> 0.25 to 0.5	0.005
> 0.5 to 2	0.01
> 2 to 5	0.025
> 5 to 100	0.05
> 100 to 200	0.1
> 200 to 500	0.2
> 500 to 1,000	0.5
> 1,000 to 2,000	1
> 2,000 to 5,000	2
> 5,000 to 9995	5
IDX (RP)	
Less than 500	5
> 500 to 2,000	10
> 2,000 to 5,000	25
> 5,000	50

Table D-4
Fragmentation of Order Flow and Delayed Reporting

Exchange	Block Trade Facility or Mechanism?	Off-Market Trading		
		Off-Market Trading?	Price Links to Order Books	Delayed Reporting Allowed?
IDX	✓	✓	X	✓
SET	✓	✓ ¹	✓ ²	X ³
SGX	X	✓	X	✓
TSE	X	✓	✓	X
HKEx	X	✓	✓	✓
KRX	✓		✓	X

¹Put Through (PT) trading is a form of off-market trading where brokers advertise their positions and trade between themselves. PT trading is the only trading mechanism used on the big lot board. Trading may be conducted by automatic matching or PT trading on the foreign board.

²Off-hours trading on the Main Board is permitted by PT trading and trades are executed at the closing price of that trading day.

³Big lot board traders must input details of the trade into the trading system within 15 min of the trade and within trading hours.

Table D-5
Price Variation Control

Exchange	Price Controls	Description of Price Controls													
		Equity Market	Equity-based Derivatives Contracts												
IDX	✓	<p>An auto rejection system is in place on the IDX. The price limit is set as a percentage of the previous trade price. For example, for a stock that last traded on the previous day at Rp. 3000, the price limit is set at F25% (that is, the stock may trade between Rp. 2250 and Rp. 3750).</p> <table border="1"> <thead> <tr> <th>Previous trade price (Rp.)</th> <th>Price Limit</th> </tr> </thead> <tbody> <tr> <td>5–100</td> <td>50%</td> </tr> <tr> <td>greater than 100 to 500</td> <td>35%</td> </tr> <tr> <td>greater than 500 to 2500</td> <td>30%</td> </tr> <tr> <td>greater than 2500 to 5000</td> <td>25%</td> </tr> <tr> <td>greater than 5000</td> <td>20%</td> </tr> </tbody> </table>	Previous trade price (Rp.)	Price Limit	5–100	50%	greater than 100 to 500	35%	greater than 500 to 2500	30%	greater than 2500 to 5000	25%	greater than 5000	20%	No Price Controls
Previous trade price (Rp.)	Price Limit														
5–100	50%														
greater than 100 to 500	35%														
greater than 500 to 2500	30%														
greater than 2500 to 5000	25%														
greater than 5000	20%														
SET	✓	<p>Stock prices may fluctuate within a range of $\pm 30\%$ of the previous closing price. If the stock price is less than 1 baht, the stock price may fluctuate within a range of $\pm 100\%$ of the previous closing price. Price controls do not apply on the foreign board or big lot board.</p>	Not Available												
SGX	✓	<p>An order greater than 6 minimum ticks from the market or an order that overlaps the best price on the other side of the market generates a warning signal. This warning signal is to alert brokers to possible errors in order entry.</p> <p>The order may proceed if a \$0.20 fee is paid to the exchange.</p>	<p>A price limit of F15% from the previous day's settlement price applies for equity based index futures such as the Straits Times Index (STI) Futures. If this limit is exceeded, a cooling off period of 10 min applies where trading is not permitted outside the F15% price limit. Price limits are then lifted for the remainder of the day. There are no price limits on the expiry date. There are no price limits on single stock futures.</p>												
TSE	✓	<p>Every stock has a daily price variation limit set at around F10–20% of the previous day's closing price. Orders submitted outside this price range are rejected.¹ Orders submitted inside this daily price variation range are also subject to price controls that restrict excessive price deviations</p>	<p>Equity based index contracts, for example the Tokyo Stock Price Index (TOPIX), attract the following price limits.</p> <table border="1"> <thead> <tr> <th>Previous day's Closing price</th> <th>Price Limits</th> </tr> </thead> <tbody> <tr> <td>Less than 2000</td> <td>± 100 points</td> </tr> </tbody> </table>	Previous day's Closing price	Price Limits	Less than 2000	± 100 points								
Previous day's Closing price	Price Limits														
Less than 2000	± 100 points														

Exchange	Price Controls	Description of Price Controls	
		Equity Market	Equity-based Derivatives Contracts
		from the last traded price of the stock.	2000 to less than 3000 ±150 points 3000 to less than 4000 ±200 points 4000 or more ±250 points Price limits on equity options are identical to the price limits applicable to the underlying stock on the same day.
HKEx	✓	Price variation limits are set so that no bid order shall be entered into the system that is more than 8 minimum ticks below the best bid and no sell order shall be entered into the system that is more than 8 minimum ticks above the best ask price in the limit order book.	No Price Controls
KRX	✓	Every stock has a daily price variation limit set at ±15% of the previous days closing price. Orders outside this limit are rejected. If the price limit is reached trading is not officially halted however will only continue when/if the price moves back to within this ±15% daily price variation range.	For the majority of share price index contracts, when the lead month contract is ±5% from the previous closing price for one minute, and the difference between the current price and the theoretical price is greater than or equal to ±3%, trading of all contracts is halted for 5 min. Following the 5-min cooling off period, orders are batched for a 10 min period and executed at a single price. A daily price limit of 10% of the previous closing price also applies to certain contracts.

Table D-6
Order Types—Call Auction

Exchange	IDX	SET	SGX	TSE	HKEx	KRX
Market Order	x	✓	✓	√✓	x	✓
Limit Order	✓	✓	✓	✓	✓	✓
Market-on-open	x	✓	x	✓	✓	x
Market-on-close	x	✓	x	✓	x	✓

Details on call auction design are presented in Table D-7. The length of the pre-open period prior to the call auction is presented for both the opening and closing call auctions. The use of order noncancellation periods and volatility extensions are also presented. N/A indicates that the design feature is not applicable to the market.

Table D-7. Call Auction Design

Exchange	Length of Pre-open before Call Auction		Order Noncancellation Period?	Volatility and/or Imbalance Extension?
	Opening Call Auction	Closing Call Auction		
IDX	15 min	N/A	x	x
SET	30 min ¹	10 min ²	x	x
SGX	30 min	6 min	✓	x
TSE	60 min ³	0 min ⁴	x	✓
HKEx	30 min	N/A	✓	x
KRX	60 min	10 min	x	✓

¹The market in each stock opens randomly between 9:55 and 10:00. The pre-open prior to the afternoon session is 30 min with a random call auction opening between 14:25 and 14:30.

²The closing call auction occurs randomly between 16:35 and 16:40.

³The pre-open period prior to the call auction at the start of the afternoon session is 25 min.

⁴There is no set pre-open period before the closing call auction held at the end each trading session.