THE DYNAMICS OF MARKET INTEGRATION LEVEL AND ITS DETERMINANTS FOR ASEAN-5

by

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DINAMIK TAHAP INTEGRASI PASARAN SAHAM DAN PENENTU-PENENTUNYA UNTUK ASEAN-5

ABSTRAK

Walaupun debat tentang integrasi pasaran saham telah muncul dari ahli akademi dan para pengamal, tiada kesimpulan yang kukuh telah dihasilkan terhadap sifat dan perilaku hal ini. Walaupun integrasi pasaran saham memberi beberapa faedah penting seperti menggalakkan perkembangan pasaran kewangan dan mengurangkan kos perantaraan kewangan, pasaran yang berintegrasi tinggi juga mungkin menghapuskan faedah pempelbagaian portfolio dan memudahkan kesan penularan. Tidak sama dengan kebanyakan kajian lepas yang mengandai tahap integrasi pasaran saham tidak berubah mengikut masa, tesis ini menggunakan teknik tapisan Kalman (*KF*) untuk menyiasat tahap integrasi pasaran saham berubah mengikut masa bagi pasaran saham ASEAN-5 dengan pasaran saham dunia. Tambahan pula, tesis ini juga menilai pengaruh berubah mengikut masa bagi penentu terpilih yang menyumbang kepada integrasi pasaran saham. Dalam kajian ini, sampel data merangkumi tempoh masa 23-tahun, dari Februari 1988 hingga Februari 2010.

Keputusan menunjukkan bahawa model *KF* adalah lebih baik daripada model regresi KKDT dari segi kebagusuaian dan ukuran ralat telahan. Walaupun ralat piawai berubah mengikut masa yang dianggar oleh model *KF* pada amnya adalah lebih besar berbanding nilai sepadan yang dianggar oleh model regresi KKDT, model *KF* menghasilkan nilai anggaran tahap integrasi pasaran yang lebih munasabah dari sudut kewangan. Walaupun anggaran KKDT mencadangkan pasaran saham ASEAN-5 adalah berintegrasi penuh dengan pasaran saham dunia bagi

sepanjang tempoh sampel, anggaran *KF* mencadangkan bahawa tahap integrasi pasaran saham adalah sebenarnya berubah mengikut masa dengan pasaran saham ASEAN-5 adalah terasing daripada pasaran saham dunia bagi tempoh masa krisis kewangan Asia 97/98. Kajian ini juga telah membentuk suatu pertalian antara tahap integrasi pasaran saham berubah mengikut masa daripada model *KF* dengan perubahan keadaan ekonomi di pasaran kewangan antarabangsa dan tempatan. Berkenaan dengan penentu terpilih, siasatan mendapati tahap pengaruh berubah dengan banyak dari masa ke masa, terutamanya hubungan yang kuat dengan pertukaran dalam kemeruapan pasaran. Implikasi utama daripada kajian ini adalah pelabur tidak akan sentiasa mendapat faedah daripada pempelbagaian portfolio serantau disebabkan tahap integrasi pasaran saham yang berubah mengikut masa di pasaran saham di negara ASEAN-5.

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ABSTRACT

Although debates on the stock market integration have emerged from academicians and practitioners, no firm conclusions about its nature and behavior have been fully drawn. While stock market integration gives a few important benefits such as fostering development of financial markets and reducing the cost of financial intermediation, highly integrated market may also eliminate the benefit of portfolio diversification and facilitates contagion effect. Unlike most previous studies that assumed constant level of stock market integration, this thesis employs Kalman filter (KF) technique to investigate the time-varying stock market integration level of ASEAN-5 stock markets with the world market. Furthermore, this thesis also assesses the time-varying influence of determinants that drive the stock market integration level. In this study, the sample covers a 23-year period, from February 1988 to February 2010.

The results show that the KF model is superior than the OLS regression model in terms of goodness-of-fit and measure of forecast error. Although the time-varying standard errors estimated by the KF model are generally larger than those of the OLS regression model, the KF model has produced more reasonable estimates for the level of market integration from financial point of view. While the OLS estimation suggests that the ASEAN-5 stock markets are fully integrated with the world market throughout the sample period, the KF estimation suggests that the stock market integration level is in fact vary over time with the ASEAN-5 stock markets

were segmented from the world market during the 97/98 Asian financial crisis period. This study has also established a link between the time-varying stock market integration level of the KF model and the changing economic conditions in the international and domestic financial markets. With regards to the determinants, investigation found the level of influence to vary considerably over time with a particular strong association with the changes in the time-varying market volatility. The main implication of this study is that investors will not consistently benefit from regional portfolio diversification due to time-varying market integration level of the stock market of in the ASEAN-5 countries.

CHAPTER 1

INTRODUCTION

1.1   The Importance of Stock Exchange in Modern Economics

The primary function of a stock market is to allow business to be publicly traded and raise capital to expand the business by selling shares of ownership of the company. Besides that, the stock market work as a common platform for the buyers and sellers to trade these listed stocks. Hence, in the modern economics, the stock market play a crucial role in the growth of the financial industry and the trade of a country that eventually affects the economy of the country to a great extent. Particularly, following the financial liberalization in many developed and emerging countries that lead to huge capital flows across borders, the stock exchange industry has grown tremendously over the past few decades.

Table 1.1 tabulates the ratio of national's market capitalization to the national gross domestic product (GDP) for selected developed countries (the United States, the United Kingdom and Japan) and five Southeast Asia countries (ASEAN-5 countries) that under investigate in this study; Malaysia, Thailand, Singapore, Indonesia and the Philippines. From Table 1.1, it can be seen that the contribution of stock exchange capital mobilization to the economic production has been high regardless of emerging or developed countries, implying the significant role of the stock exchange industry in the modern economics.

In general, for the ASEAN-5 countries, the relative size of stock market to GDP remains very significant over the past fifteen years, despite the 97/98 Asian financial crisis and the current global slump. For the case of Singapore and Malaysia, it can be seen that their market capitalization over GDP ratio are much higher than those of major developed countries prior the Asian financial crisis. Particularly, the stock market of Singapore is even more significant to the national economy after recovered from the Asian financial crisis, recording the ratio of 220.3% for 2005 and 334.3% for 2007, despite that the ratio has dropped to 145.6% in 2008 due to global slowdown. However, with the exception of Singapore, it can be seen that the significance of stock markets in ASEAN-5 economies has been dropped after the Asian financial crisis and not fully recovered from the crisis in the new millennium.

Table 1.1: Ratio of National's Market Capitalization to National GDP

Country	1995	1997	1998	2000	2005	2007	2008
US	95.5	132.7	148.6	152.7	109.2	113.3	63.8
UK	121.7	155.0	171.0	184.3	145.0	137.3	69.7
Japan	83.5	52.9	65.7	67.3	107.4	98.8	63.4
Malaysia	259.4	94.6	95.2	126.7	137.8	174.2	85.4
Thailand	95.1	19.2	29.0	23.9	71.6	80.3	37.7
Singapore	194.8	113.0	114.3	168.2	220.3	334.3	145.6
Indonesia	33.8	13.5	17.7	17.5	29.3	48.9	19.3
Philippines	81.0	37.5	53.6	33.8	39.0	71.4	31.2

Source: World Federation of Exchanges (2010)

1.2   Stock Market Integration

The growing awareness that different national stock markets display noticeable differences in performance at any point in time have led to increase in the interest of investors in international diversification of investment portfolios. The action of investors to diversify the portfolio across borders is just reflected the old saying "Do

not put all your eggs in one basket". That is, do not chance everything on a single venture but spread the risk. Of course, for investors who are only willing to invest domestically, the diversification benefits can also be obtained through investing in different industries or different asset classes.

Strictly speaking, financial market integration is defined as a situation where assets in different currencies or countries display the same risk-adjusted expected returns. Meanwhile, the risk-return relationship of similar assets in segmented markets is primarily determined by the domestic factors. In another way of saying, in a financially integrated world with free capital mobilization, the compensation that investors receive for bearing risk should be equal across countries. In financial term, the compensation is more commonly known as the price of risk. On the other hand, a financial market is segmented from the world when the flow of capital is restricted by capital controls that imposed by government or any other forces that prohibit investors to seek for the fair market price of risk.

Since the deregulation of many financial markets which started in the 1980s, the extent of international investments by investors worldwide has been steadily increasing. Investors, both institutional and individual, now allocate a substantially higher proportion of their financial wealth in international assets than three decades ago. As equity markets are becoming more open globally, understanding the extent of market integration and the implications are of great importance for policy makers and investors. In the practice of international investors, emerging markets are somewhat considered to be segmented from the international market, by including emerging countries assets in the investment opportunity set is believed to help to

improve the risk-adjusted performance of a portfolio due to the international diversification benefits. Harvey (1995) founds evidence to reject the hypothesis that emerging markets are priced if they were integrated to the world market. However, the conclusion from this study is likely to change as the emerging markets are increasingly liberalized and they are expected to be more integrated with the world market (World Bank, 1997).

It should be noted that if the emerging markets are overwhelmingly integrated with the world market, it indicates that the international investors could hardly obtain diversification benefits though investing in emerging countries. Since there is no firm conclusion on this issue, the debate on the integration level of emerging markets with the world is still ongoing and the exploration on the determinants that affect the integration level has raised the attentions of both researchers as well as practitioners.

From the definition of stock market integration above, it is worth to highlight that market integration is grounded on the law of one price and thus voluminous of empirical studies that test the correlations, lead-lag relationships of stock returns, common trend (cointegration) of stock prices are not sufficient to explain how integrated the markets are. In essence, a test of market integration should be built on an asset pricing model as the asset pricing model takes the price of risk of investors into account. The International Capital Asset Pricing Model (ICAPM) and Arbitrage Pricing Theory (APT) are the example of asset pricing models and further detail of ICAPM can be found in Section 1.4.

1.2.1   Reasons for Increasing Tendency of Stock Market Integration

Stock markets all over the world have witnessed the growing of integration across boundaries, spurred by the process of market liberalization and the efforts of central banks in various parts of the world to develop financial markets. As expected, financial markets tend to be better integrated in developed countries. However, over the past three decades, the financial liberalization that has taken place in many emerging market economies, for example the Southeast Asian and South America countries, has reduced or removed barriers for international investors by opened up their domestic markets and institutions to the free cross-border flow of capital and services, which is one of the pre-requisites for market integration.

A more fundamental explanation on higher stock market integration is the growth in international trade. Particularly, the trade relationship for almost all the developed and developing countries with the largest economy in the world, the US, is likely to promote world market integration. The US stock exchange industry has a dominant influence on the world market and is highly integrated with many of the stock exchanges around the world. In addition, emerging economies which relied mainly on the primary commodities and manufacturing trade have continued to increase their shares in global trade. The spreading out of the production process across countries, with companies increasingly finding it profitable to allocate different links of the value chain across a range of countries, has been accompanied by increased in financial market integration. The rapid growth in the real sector links the cash flows of the trading partners and makes their financial markets become more integrated.

In addition, the revolution of information technology has brought immense benefits in facilitating and improving the settlement process. For example, the deployment of communication satellites and telecommunication networks has linked the exchange industry around the world on real time. Computerized trading system, and increasing accessibility to computers and internet by brokers and investors have eased monitoring, transaction, and information updating, thereby aiding the cross border mobility of funds and eventually lead to a more integrated world stock market. Also, the advances in technology development have promoted widespread participation of the public in the national and international stock markets. It also leads to higher synchronization of investment behavior around the world.

Cross-country listing of corporate stocks is another channel of market integration. With the globalization trend in international business and the deregulation in many stock exchanges, it is not uncommon that multinational corporations are now dually listed their shares in home country and another host country. The cross-country listing enable a company to obtain a better pool of resources, lower their price of capital and for the purpose of gaining market accessibility. As a result, when there is a fundamental shock in the home country, the dual listed shares in the host country will also be affected and thus creating a channel of linkage between two markets (see Karolyi and Stulz, 1996).

Lastly, the emergence of global and regional financial centers offers a potential source for world stock market integration due to *monsoonal effect* (see Masson, 1998). Monsoonal effect means that even without close economic ties, a stock market can exhibit co-movement behavior with another stock market due to the

explosion of these two markets to the same source of dominant force, by and large through the global financial centers, such as the US, the UK and Japan. Besides these three world leading countries, the potential monsoonal channels in Asia would be Singapore and Hong Kong.

1.2.2   Pros and Cons of Market Integration

Integration of financial markets market brings about importance for several reasons. A very common benefit arise from international financial market integration is reducing the cost of financial intermediation. The growth in international financial markets is associated with the entry or creation of new intermediaries which lead to enhancing competition and efficiency of intermediaries in their operations and allocation of resources and thereby curtail monopoly rents. The more integrated financial markets will increase the capacity of the financial system to meet the differentiated and growing demands of investors. Also, integrated markets that lead to innovations and cost effective financial intermediation will improve the accessibility of public, institutions and companies alike to financial services (see Giannetti *et al.*, 2002).

Furthermore, financial integration would facilitate a more efficient transfer of surplus funds for investments in the world market, with lower intermediation costs and thus more optimal returns. Through the greater opportunity for risk-sharing and diversification across a wider geographical area, country-specific shocks and financial vulnerabilities would be reduced, thus contributing towards enhanced regional financial stability and foster development.

Despite these benefits, highly integrated market may eliminate the portfolio diversification benefit for international investors. Also, a high degree of integration alters investors' demand function for international assets that can subsequently leads to higher portfolio risk that discourages domestic savings. Although it is always deemed that financial integration promote financial stability, however, in the turmoil period, highly integrated market may facilitate the contagion effect and transmit the negative impacts of one country's economy to the others. In addition, tendency towards financial integration may diminish the ability of governments to achieve independent economic policies (Swanson, 1987).

In a recent speech by Lucas Papademos, the Vice President of the European Central Bank, he highlighted that the current global crisis may harm the financial stability in the highly integrated financial system in the euro-zone:

"..., the crisis demonstrated that a highly integrated and developed financial system does not always and necessarily strengthen financial stability. Under certain conditions, financial integration and certain forms of financial innovation can contribute to the build-up of vulnerabilities and the emergence of systematic risks. In the years preceding the crisis, as the global financial system evolved at a rapid pace, the proliferation of complex and opaque financial products, the development of innovative securitization techniques, ..., in an environment of enhance competitive pressures and excessive credit growth, encouraged risk-creation and risk-taking; and increased the scope for contagion across institutions, markets and borders."

(Source: European Central Bank, April 12, 2010)

From the discussion above, it can be said that financial integration does not bring definite benefit to the world financial system. Some studies like Prasad *et al*. (2003) and Anderson and Moreno (2005) also stated that it remains unclear whether financial integration enhance growth for emerging countries and stimulate the development of financial markets.

1.3   Background of ASEAN

The Association of Southeast Asian Nations (ASEAN) was formed on the 8th August 1967 with the signing of the ASEAN Declaration by the foreign affairs ministers of Indonesia, Malaysia, the Philippines, Singapore and Thailand. Since then, the membership has expanded to include Brunei, Vietnam, Laos, Myanmar and Cambodia for making up the ten member states of ASEAN today. The purpose of ASEAN is mainly to strengthen the economic and social stability of the region and to guarantee peaceful and progressive national development.

In order to achieve its inspiration, ASEAN has formulated various strategies which includes the ASEAN Vision 2020. One of the aims of the vision is to bond the ASEAN countries together in partnership in dynamic development and to bring the members together to forge closer economic integration within ASEAN. Among the measures include create a region with a free flow of capital, enforce equitable economic development and reduce poverty and socio-economic disparities. In addition, the ASEAN countries also aim to create a stable, prosperous and highly competitive region, functioning as a single market and production base by the year 2020. Besides focusing on the regional linkages, ASEAN also focus on the global integration and this is spelled through one of the vision identified in ASEAN Vision 2020, which is an outward-looking ASEAN.

The ASEAN countries are mainly committed to export-oriented economic growth strategies. Despite that in the late 1980s, with the exception of Singapore and Brunei, the economies of ASEAN countries were still largely depending on agricultural commodities such as rubber, palm oil and coffee for export, the manufacturing sectors in Malaysia, Thailand, Indonesia and the Philippines are increasing important in their economies. Additionally, Indonesia, Malaysia and Brunei are important energy exporters, producing most of the East Asia petroleum and natural gas. On the other hand, Singapore has a highly diversified commercial and industrial economy, with growing emphasis on the services and financial sectors.

Despite the intention of ASEAN members to establish ASEAN as a single market, the progress of financial development is noticeably different across the countries. Generally, the researches that related to the ASEAN stock markets will only focus on ASEAN-5 countries, namely, Malaysia, Thailand, Singapore, Indonesia and the Philippines as the financial markets of Brunei, Vietnam, Cambodia, Laos and Myanmar are either virtually immature or non-existent. Hence, the focal point of subsequent discussion on the economic situations and the development of stock markets will be based on ASEAN-5 countries.

1.3.1 Overview of ASEAN-5 Economic Situations

The ASEAN-5 countries are among the most attractive countries for global investors following the dramatic structural change and industrialization in these countries. From Figure 1.1, it can be seen that since 1980s, and especially in the early through to mid-1990s, Malaysia, Thailand, Singapore and Indonesia experienced rapid economic growth with GDP growing well above 7% per year. The economic

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development of the Philippines is a bit slow compared to the other ASEAN-5 countries, the Philippines only open up the economy in the early 1990s.
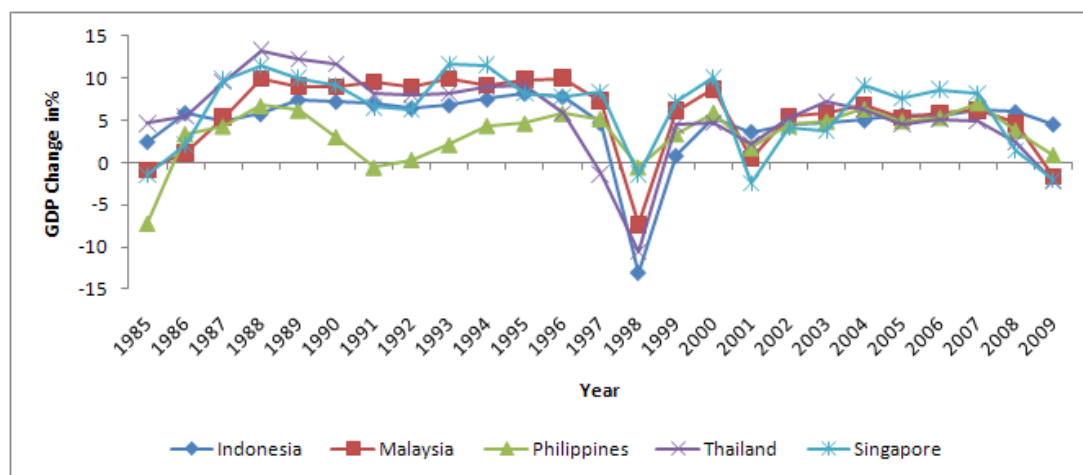
Figure 1.1: GDP Change in Percentage
(Source: IMF, World Economic Outlook Database 2010)

The impressive economic growth in the region has been largely fueled by foreign direct investment, especially after the Plaza Accord currency realignments on 1985. Japan and the Northeast Asian newly industrializing economies (NIEs) are the origin of most of these inflows. These countries were eager to relocate their labor-intensive industries to Southeast Asia countries with lower costs of land and cost of labor. The high-performing Asian economies for Japan, first generation NIEs (South Korea, Taiwan, Hong Kong and Singapore) and second generation Southeast Asian NIEs (Malaysia, Thailand and Indonesia) were termed as the "East Asian Miracle" by World Bank (1993).

Due to the booming international trade in Southeast Asian, it is very likely that the financial markets in the region have become more converged with the global financial market to facilitate the international trade. Furthermore, the deregulation of financial markets in South East Asian since the early 1990s is believed to increase

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the capital market integration of ASEAN-5 with the world market. However, the miracle of ASEAN-5 has turned into disaster when the currency crisis originated from Thailand on July 1997 spread quickly to the other countries in the region and leads to the collapse in the stock markets. In 1998, all the ASEAN-5 countries were in recession with specifically Thailand, Indonesia and Malaysia were the most hardest-hit economies. The crisis was short-lived and most of the economies had recovered from the second half of 1999. Despite of that, it can be seen from Figure 1.1 that the GDP change in percentage for ASEAN-5 countries in the new millennium is generally lower than that of prior 97/98 Asian financial crisis period.

1.3.2 Development of ASEAN-5 Stock Markets

In addition to the foreign direct investment that contributed to the remarkable growth rates of ASEAN-5 countries in the end of 1980s through to early of 1990s, the portfolio investment from developed countries has also played a significant role in the growth of these economies and stock markets. From Table 1.2 through to Table 1.4, it can be seen that the ASEAN-5 stock markets has an incredible increase in their size of market capitalization, trading value as well as the number of listed companies. In the short 10-year period from 1988 to 1998, the market capitalization of ASEAN-5 stock markets has growth tremendously; varies from 387.29% for Thailand to 8832.00% for Indonesia. In terms of trading value, the growth changes from 374.64% for Thailand to 266000% for Indonesia. For the number of listed companies of ASEAN-5 stock markets, although the information for year 1988 is not available, it can be seen from Table 1.4 that the percentage change in the number of listed companies is 145.1% for the Philippines and 269.74% for Malaysia. These growths are even more impressive when one considers that the ASEAN-5 stock

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markets experienced substantial decline in value in 1997 and 1998 following the Asian financial crisis.

Table 1.2: Market Capitalization (in USD Billion) of ASEAN-5 Stock Markets

Year / Country	Malaysia	Thailand	Singapore	Indonesia	Philippines
1988	23.30	8.81	24.00	0.25	4.28
1996	306.16	95.90	153.11	90.86	80.46
1998	95.56	34.12	96.47	22.08	34.91
2007	325.29	197.13	539.18	211.69	102.85
2009	286.16	176.96	481.25	214.94	86.35
% change (1988 & 1998)	410.13	387.29	401.96	8832.00	815.65
% change (1988 & 2009)	1228.14	2008.63	2005.21	84956.52	2017.52
% change (1998 & 2009)	299.45	518.64	498.86	973.46	247.35

Source: World Federation of Exchanges (2010); World Development Indicators of the World Bank (2010)

Table 1.3: Trading Value (in USD Billion) of ASEAN-5 Stock Markets

	Malaysia	Thailand	Singapore	Indonesia	Philippines
1988	2.62	5.60	4.47	0.004	0.88
1996	178.01	51.40	60.25	32.45	25.51
1998	26.84	20.98	58.51	10.64	10.15
2007	169.72	117.89	381.29	114.63	29.17
2009	86.03	126.10	245.42	94.35	20.80
% change (1988 & 1998)	1024.43	374.64	1308.95	266000	1153.41
% change (1988 & 2009)	3283.59	2251.79	5490.38	23587.50	2363.64
% change (1998 & 2009)	320.53	601.05	419.45	886.75	204.93

Source: World Federation of Exchanges (2010); World Development Indicators of the World Bank (2010)

Table 1.4: Number of Listed Companies of ASEAN-5 Stock Markets

	Malaysia	Thailand	Singapore	Indonesia	Philippines
1990	271	159	172	123	153
1996	618	454	296	252	216
1998	731	418	358	287	222
2007	986	523	762	383	244
2009	959	535	773	398	248
% change (1990 & 1998)	269.74	262.89	208.14	233.33	145.10
% change (1990 & 2009)	353.87	336.48	449.42	323.58	162.09
% change (1998 & 2009)	131.19	127.99	215.92	138.68	111.71

Source: World Federation of Exchanges (2010)

In comparing the data for the year 2009 and that for Asian crisis year of 1998, it can be seen that the ASEAN-5 stock markets have well recovered from the crisis. In addition, the number of listed companies in these countries also increased noticeably. Nonetheless, Table 1.2 and Table 1.3 show that, despite the Malaysia stock market has recovered from the Asian financial crisis, the market capitalization and trading value of this stock market in year 2009 do not surpassed than that of year 1996, prior the Asian financial crisis period. Same phenomenon happened on the trading value of the case of Philippines. Contrastingly, in spite of in year 2009 the world economy are not well recovered from the global crisis, the market capitalization and trading value of Thailand, Singapore and Indonesia are much higher than that of year 1996, especially for the case of Singapore. By comparing the ASEAN-5 stock markets of year 2007 and year 2009, it is no doubt that the economic slowdown of US economy that triggered global financial crisis in 2008 has an obvious negative impact on these stock markets. Anyway, the degree of destruction on the stock market is lesser than that of the Asian financial crisis.

1.3.3 Financial Liberalization in ASEAN-5 since Late 1980s

Until 1980s, extensive government intervention was the norm in the financial markets of developing countries. For examples, inflows of foreign capital were controlled strictly, ceilings were imposed on bank interest rates and credit was allocated by administrative decision rather than market driven. Nonetheless, a number of emerging countries, including the ASEAN-5 developing countries have started to liberalize their financial markets by reduce restrictions on capital account transactions and barriers to entry of foreign financial institutions into local markets and trade in financial services over the last twenty years.

For example, for the case of Thailand, the current and capital accounts of the country have been significantly liberalized with liberal treatment of foreign direct and portfolio investments since 1980s. Particularly, in the early of 1990s, a series of liberalizations made possible a considerable expansion in the scope of activities undertaken by the banks and financial institutions, especially as it related to foreign transactions. The intention of this liberalization was to in line with the globalization of the economic and financial systems and allows the free movements of international capital. Additionally, interest rate had been liberalized to enable the banking system to adjust it based on demand and supply. Moreover, the Bangkok International Banking Facility (BIBF) was established in 1993 with the aim to develop Bangkok as an international financial centre. The transactions though BIBF were granted tax concessions to enhance its competitiveness in relation to other such financial enterprises. Generally, the ASEAN-5 emerging countries have liberalized their current and capital accounts aggressively with various measures and policies, with the ultimate aim to boost the economies.

With regards to the official date of stock market liberalization of emerging countries, they are a few sources such as Kim and Singal (2000) and Bekaert *et al*. (2003) have tried to identify the date. Table 1.5 presents the official liberalization dates according to Bekaert *et al*. (2003) for ASEAN-5 emerging markets. Generally, these liberalization dates is defined based on the first time removal of foreign restrictions on domestic equity holdings. As can be seen from Table 1.5, the liberalization for Malaysia, Thailand and Indonesia were started in the late 1980s while the Philippines was started in the early of 1990s. Meanwhile, the more developed Singapore stock market has a much earlier liberalization date in 1978.

Further discussion on the liberalization process of ASEAN-5 will be provided in Section 5.2.1 as this section will relate the liberalization process with the corresponding integration level for all ASEAN-5 countries with the world market.

Table 1.5: Official Stock Market Liberalization Date of ASEAN-5

Country	Official Liberalization Date	Classification
Malaysia	December 1988[1]	Budget calls for liberalization of foreign ownership policies to attract more foreign investors.
Thailand	September 1987[1]	Inauguration of the Alien Board on Thailand's Stock Exchange. The Alien Board allows foreigners to trade stocks of those companies that have reached their foreign investment limits.
Singapore	June 1978[2]	Abolished foreign exchange controls and foreign ownership regulations
Indonesia	September 1989[1]	Minister of Finance allows foreigners to purchase up to 49% of all companies listing shares on the domestic exchange, excluding financial firms.
Philippines	June 1991[1]	Foreign Investment act signed into law. The Act removes, over a period of three years, all restrictions on foreign investments.

Source: [1] Bekaert *et al.* (2003) and [2] Phylaktis and Ravazzolo (2002)

1.3.4 ASEAN-5 during 97/98 Asian Financial Crisis

The Asian financial crisis has caused severe economic turbulence in the economies of Southeast Asia since the second quarter of 1997. The crisis that was initially a large-scale speculation has caused funds to drain out of the Thai currencies and stock markets. Eventually, the crisis has caused economic growth rates to collapse in most of the East Asian countries, in particular, the ASEAN-5 countries of Indonesia, Malaysia, Philippines, and Thailand and Korea were generally perceived to be the five countries that bore the full brunt of the crisis.

The crisis has abruptly halted the miracle transformation of East Asian countries, from a group of poor and stagnant developing countries into the dynamic component of the global economy. With the exception of the Philippines, in the pre-

crisis period, all the crisis countries had experienced sustained rapid growth that has elevated per capita incomes and has sharply reduced poverty. Korea was a first-wave newly industrialized economy (NIE) that has followed the path of Japan in successfully pursued export-oriented industrialization, whilst Indonesia, Malaysia, and Thailand make up the second-wave of NIEs. The chronology of Asian financial crisis which particularly focus on the ASEAN-5 countries is detailed in Table 1.6.

The explanation for the Asian financial crisis has been the subject of much attention. Some studies such as Furman and Stiglitz (1998), Bello (1999) and Zhuang and Dowling (2002) suggested that a number of 'structural' weaknesses in the ASEAN-5 emerging economies are the underlying causes of the crisis. Unsustainable current account deficit of Asian emerging countries is one of the main factors that contributed to the crisis. These deficits were financed by attracting inflows of capital from abroad.

In addition, the problem in the ASEAN-5 emerging countries was not merely allowing deleterious current account positions to build up, but of the form they took. Driving a large part of their capital inflows were lending boom, which led domestic banks to actively seek foreign fund from west to finance the lending. The same motives led blue chip companies to borrow excessively from overseas, rather than pay higher domestic interest rates. The circumstances worsened as the short-term borrowing abroad, primarily to finance long-term projects, leading to currency and maturity mismatches. As a result, a balance-sheet crisis occurred due to sudden capital outflows.

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Table 1.6: Chronology of Asian Financial Crisis in ASEAN-5 Countries

Date	Events
1997	
14-15 May	Speculator attacked the Thai baht. Thailand and Singapore jointly defended the currency
19 Jun	Dr. Amnuay Viravan resigned as Thai Finance Minister
27 Jun	Bank of Thailand suspended 16 finance companies
2 Jul	Thailand floated the baht and called on IMF for 'technical assistance'. Bangkok Sentral ng Pilipinas defended peso aggresively
8 Jul	Bank Negara defended the ringgit aggressively. Bank Indonesia widened its rupiah trading band
14 Jul	IMF offered an additional financial support to the Philippines. Bank Negara abandoned the defense of ringgit
17 Jul	Monetary Authority of Singapore allowed the Singaporean dollar to depreciate
24 Jul	Currencies of Indonesia, Thailand, Malaysia and the Philippines plunged
11Aug	The IMF announced Thailand's rescue package
14 Aug	Bank Indonesia floated the rupiah and the rupiah sank further
20 Aug	IMF approved a $3.9 billion standby credit for Thailand
16 Sept	Indonesia postponed projects to reduce budget deficits
20 Sept	Malaysia former prime minister, Dr. Mahathir said international currency should be regulated
8 Oct	Indonesia announced that it would turn to IMF for help
14 Oct	Thailand established the Financial Restructuring Agency and Asset Management Company
17 Oct	Malaysia announced belt-tightening budget
31 Oct	IMF unveiled Indonesia's $40 billion aid package
1 Nov	Singapore and Japan each pledged to extend a $5 billion loan to Indonesia. Indonesia closed 16 banks
31 Dec	Indonesia announced a reform package through merger of 7 existing banks into 3 entities by July 1998
1998	
5 Jan	Thailand announced decision to ask IMF to ease its bailout terms
6 Jan	Indonesia unveiled its 98/99 budget and the rupiah plunged further
12 Jan	Peregrine, one of Asian largest independent investment banks, collapsed
22 Jan	The rupiah collapsed. Intervention by Indonesia drove the currency back to close at 11800 to USD
10 Feb	Indonesia announced its plan of having a currency board

17 Feb	Indonesian Central Bank Governor Sudradjad Djiwandono was sacked
23 Mac	Indonesia nearly doubled interest rates to boost its currency and control inflation
13-15 May	Massive racial riots occurred in Jakarta and other major cities
21 May	Dr. B.J. Habibie succeeded Suharto as Indonesia's president
5 June	A deal was reached to reschedule the Indonesia's massive corporate debt
29 June	Singapore Former Minister of finance, Dr. Richard Hu delivered a statement on Singapore's off-budget measures
28 Aug	Malaysia Central Bank Governor Ahmad Mohamed Don and Deputy Fong Weng Pak resigned
1 Sept	Malaysia government imposed a wide range of currency and capital controls
2 Sept	Malaysia fixed the ringgit at RM 3.8 to US$1. Anwar Ibrahim was sacked as Malaysia's Deputy Prime Minister and Finance Minister
12 Nov	Singapore's National Wages Council recommended wage cuts
1999	
4 Feb	Malaysia replaced its restriction on funds repatriation with an exit tax
13 Mac	Indonesian government closed 38 insolvent banks
12 Jul	Kuala Lumpur Composite Index hit 22-month high
29 Jul	Malaysia unveiled plan to merge 58 financial institutions into 6 core groups
6 Aug	IMF suspended loans to Indonesia because of irregularities in loan recovery deal involving PT Bank Bali
1 Sept	Malaysia's one-year restriction on repatriation of foreign investor's money came to an end
2000	
15 Sept	IMF approved disbursement of USD 399 million to Indonesia for banking reforms, corporate restructuring and governance
20 Oct	68 banks in Indonesia have been closed since the onset of the crisis in 1997
2001	
May	10% capital gain tax imposed by Malaysia in September 1999 to control capital flows was removed
Oct	The Thai Asset Management Corporation was formed to manage the existing non-performing loans of the banking sector
2002	
Dec	IMF officially acknowledged the effectiveness of Malaysia's imposition of capital controls in stabilizing the economy

Source: Lim (2004)

A third contributory factor to the Asian Crisis has been the absence of an adequate regulatory framework for businesses, especially the banks, in ASEAN-5 emerging countries. This omission allowed unsound and possibly corrupt relationships to develop. Another weakness of the ASEAN-5 economies that made them vulnerable to a sharp downturn was the unrealistically high asset values in most of these countries. The cause was that the money supply was growing too quickly for the real economy to absorb. Excess credit was used to fuel speculative booms in real estate, factories and the stock markets.

Besides the factors outlined above have been recognized as contributing to the crisis, the crisis is believed causing by the ASEAN-5 governments that made basic errors of policy in running their economies, especially the policy of unofficially fixing their exchange rates to the USD. The appreciation of the USD that began in 1995 caused the ASEAN-5 currencies to also appreciate. This resulted in lost competitiveness in export markets and worsening current account deficit of ASEAN-5 countries and increasingly difficult to fund their current account deficits.

1.3.5   Financial Market of ASEAN-5 in the New Millennium

In the 2000-2002 period, after recovering from the Asian financial crisis, the capital flows into the ASEAN-5 countries are generally low, particularly for those severely affected countries. Studies such as Chinn and Ito (2005) and Park *et al.* (2009) pointed out that the low investment rate may due to the lingering effects from the 97/98 Asian financial crisis. For example, the extensive restructuring of nonfinancial firms in the wake of the crisis inevitably entailed a period of weaker investment. Furthermore, the efforts of banks to strengthen their balance sheets may have

reduced the flow of credit to firms and it may also due to the excess manufacturing capacity created by very high pre-crisis investment rates are blunting incentives for new investment. Since then, in a gradual manner, the capital flows started to move back to the ASEAN-5 crisis hit countries after a series of reforms in their respective financial sectors and restore the confidence of international investors. Additionally, the inflows to these countries also helped by favorable global financial conditions.

A slightly different phenomenon from other ASEAN-5 emerging countries, in the 2000-2006 period, the economy of Singapore not only had fully recovered but its financial sector had consistently grown faster than the neighboring countries. By 2004, Singapore was the world's fourth-largest derivatives trading centre. Singapore was also the second-largest FOREX centre outside Japan in Asia. The Singapore International Monetary Exchange is reported to be one of the world's best-run and most successful futures and options exchanges and the Singapore Stock Exchange has won similar accolades. The remarkable economy of Singapore has been reflected in the GDP of the country. As shown in Figure 1.2, in the new millennium, the GDP per capita for Singapore has surpassed all first generation NIEs since 2004 and getting closer to that of Japan.

In 2007, the US economy started to slow down due to the growing number of defaults in the subprime-mortgage market. However, the economies of ASEAN-5 are generally not much affected due to the small direct exposure to the subprime related markets. Despite that, global conditions deteriorated markedly and rapidly towards the end of 2008, with global growth prospects worsening beyond what was earlier anticipated, especially following the bankruptcy of Lehman Brother, one of the

largest investment banks in the US. The ASEAN-5 economies were negatively impacted by these adverse developments, as stated in the annual report of Bank Negara Malaysia:

> *"The weak global outlook is likely to have an adverse impact on the growth of the Asian economies, given the strong trade and investment linkages. Countries with high trade dependence will be more vulnerable, while foreign direct investment flows will be curtailed in view of increasing spare capacity and reduced trade financing. Several regional economies have already felt the impact, as evidenced from the sharp contraction in exports as well as large decline in industrial production and investment."*

<div align="right">(Source: Bank Negara Malaysia, April 12, 2008)</div>

In 2009, the ASEAN-5 economies are generally contracted despite that the severity is not as much as those of the advanced economies.
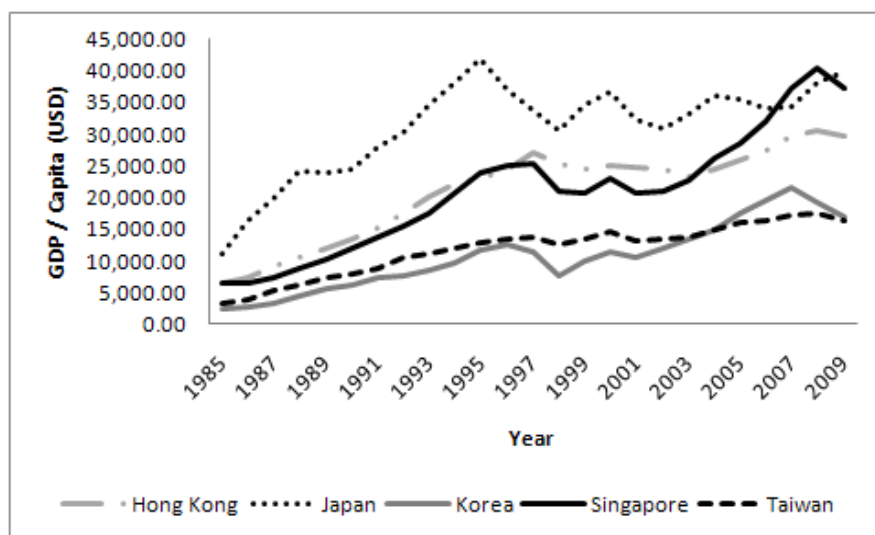

Figure 1.2: GDP per Capita in USD
Source: IMF, World Economic Outlook Database (2010)

1.4 Capital Asset Pricing Model (CAPM)

The CAPM due to Sharpe (1964) and Linter (1965) has dominated the finance and economic literature on asset pricing since the 1960s. CAPM provides the method and basis for estimating the risk-return relationship, or better known as risk-return equilibrium. The CAPM allows a linear relationship between the expected excess return and the non-diversifiable risk of holding a financial portfolio or asset. The CAPM can be expressed in mathematical form as in Equation (1.4.1) below:

$$R_{j,t} - R_{f,t} = \alpha_j + \beta_j (R_{m,t} - R_{f,t}) + \varepsilon_{j,t} \qquad (1.4.1)$$

for $t = 1, 2, \ldots, n$, where $R_{j,t}$ refers to the return on portfolio or asset j at time t, $R_{f,t}$ is the risk-free rate of interest such as the interest rate arising from government Treasury bill, $R_{m,t}$ is the return of the market and $\varepsilon_{j,t}$ is the error term. The sensitivity of the excess asset returns to the excess market returns are measured by β_j, better known in the literature as beta-risk. It can also be referred to as a measure of non-diversifiable or systematic risk that cannot be mitigated in a well-diversified portfolio. The intercept term, α_j is a measure of abnormal performance or the pricing error of the portfolio.

The domestic CAPM has been extended to an international setting to investigate the risk-return equilibrium of international markets, whereby the market portfolio is widened to encompass the world market. The international CAPM, ICAPM can be written as:

$$R_{i,t} - R_{F,t} = \alpha_i + \beta_i (R_{W,t} - R_{F,t}) + \varepsilon_{i,t} \qquad (1.4.2)$$

where $R_{i,t}$, $R_{F,t}$ and $R_{W,t}$ refer to the returns for the i market portfolio, international risk-free rate and returns for the world portfolio respectively. The ICAPM above

assumes that purchasing power parity holds, that is, investors bear no currency risk and the risk-return relationship is unaffected by the choice of the reference currency. In the literature, there exist other different specifications of ICAPM. In this study, the focus will be given on this simple yet widely accepted model. Previous studies that used this model among others have included Wells (1994) and Hooy (2008).

1.5   Literature Review

The early empirical studies on the relationship among stock markets across countries are motivated by the domestic portfolio theory that was developed by Markowitz (1952). Markowitz (1952) suggested a portfolio selection technique on the basis of its risk-return profile rather than merely compiling portfolios with individual assets that have attractive characteristics. Tobin (1958) took Markowitz's analysis one step further by showing how to identify which efficient portfolio should be held by an investor. Tobin (1958) considered how an investor should divide his or her funds between a risk-free asset such as cash or treasury bills and a risky asset such as equity. By combining the risk-free asset with the risky assets, investors are possible to construct portfolios whose risk-return profiles are optimum.

Grubel (1968) was the first to examine international version of domestic portfolio theory. Having data from 1959 to 1966, the study of Grubel (1968) found that US investors could obtain better risk and return opportunities by investing part of their portfolio in foreign equity markets. The intuition of international portfolio theory is that imperfect correlation among stock markets provides potential diversification benefits as compared to holding a portfolio with solely consisting of domestic assets. This idea lends itself quite naturally to the correlation analysis on