

**CAN MARKET INTEGRATION EXPLAIN
INFORMATIONAL EFFICIENCY OF MALAYSIAN
LISTED FIRMS?**

TAI KUI GUAN

UNIVERSITI SAINS MALAYSIA

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**CAN MARKET INTEGRATION EXPLAIN INFORMATIONAL
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by

TAI KUI GUAN

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LIST OF ABBREVIATIONS

ARCH	Autoregressive conditional heteroscedasticity
ARDL	Autoregressive distributed lag
ASEAN	Association of Southeast Asian Nations
BLUE	Best linear unbiased estimators
CAPM	Capital asset pricing model
CLRM	Classical linear regression model
CRSP	Center for Research in Security Prices
DELAY	Price delay measure of Hou and Moskowitz (2005)
EMDB	Emerging Markets Database
EMH	Efficient market hypothesis
EMS	European Monetary System
FDI	Foreign direct investment
GARCH	Generalized autoregressive conditional heteroskedasticity
HKSE	Hong Kong Stock Exchange
IAPM	International Asset Pricing Models
ICAPM	International capital asset pricing model
IFC	International Finance Corporation
INTEGRATEM	Integration with Bursa Malaysia
INTEGRATEW	Integration with world stock market
INVESTIBILITY	Proportion of foreign investors ownership
KLCI	Kuala Lumpur Composite Index
KLSE	Kuala Lumpur Stock Exchange
KLSEB	Kuala Lumpur Stock Exchange Berhad

LDELAY	Logistic transformation of original price delay measure
LM	Lagrange multiplier
LOP	Law of one price
MENA	Middle East and North African
MSCI	Morgan Stanley Capital International
OLS	Ordinary least squares
PCSE	Panel corrected standard error
RM	Ringgit Malaysia
SIC	Schwarz Info Criterion
SUR	Seemingly unrelated regression
TSE	Tokyo Stock Exchange
VAR	Vector autoregression model

BOLEHKAH INTEGRASI PASARAN MENERANGKAN KECEKAPAN INFORMASI BAGI FIRMA-FIRMA YANG DISENARAIKAN DI BURSA MALAYSIA?

ABSTRAK

Integrasi pasaran dan kecekapan pasaran saham merupakan dua konsep yang penting dalam bidang kewangan. Walaupun perbahasan mengenai konsep-konsep ini masih berterusan di kalangan pengamal dan ahli akademik, namun ia masih sangat kurang kajian empirikal untuk meneroka kesan integrasi pasaran terhadap kecekapan pasaran. Objektif tesis ini adalah untuk mengkaji sama ada penyebaran maklumat global adalah pantas ke atas harga saham jika sesebuah firma adalah sangat bersepadu dengan pasaran saham dunia. Sebaliknya, satu firma segmentasi yang mempunyai darjah integrasi yang lebih tinggi dengan pasaran tempatan dijangka mempunyai tindak balas yang lambat terhadap maklumat global. Tesis ini adalah untuk menyiasat sama ada hipotesis-hipotesis di atas adalah sah bagi firma-firma yang disenaraikan di Bursa Malaysia, satu pasaran membangun yang terdiri daripada firma-firma bersepadu dan bersegmen dengan pasaran saham dunia. Sampel data kajian ini merangkumi 265 saham yang disenaraikan di Pasaran Utama - Bursa Malaysia dan bermula dari Januari 1995 hingga Disember 2010. Darjah integrasi pasaran diukur oleh pendekatan nisbah varian yang dicadangkan oleh Akdogan (1997) manakala kecekapan informasi diukur oleh langkah kelewatan harga dari Hou dan Moskowitz (2005). Ukuran harga kelewatan direka untuk mengukur kelajuan pelarasan harga saham terhadap maklumat baru di seluruh pasaran, memandangkan bahawa pasaran yang cekap dengan maklumat yang lengkap dan pelabur yang rasional, harga saham akan dengan segera menyelaraskan kepada ketibaan maklumat baru. Tambahan pula, penentu-penentu ukuran kelewatan harga telah mendapat

sokongan empirikal yang kukuh dan juga berasaskan dari teori. Dengan itu, tesis ini juga mengawal kesan-kesan penentu ukuran kelewatan harga seperti pelaburan asing, saiz firma, pusing ganti aset dan volatiliti dalam regresi panel. Keputusan utama tesis ini menunjukkan bahawa firma yang mempunyai integrasi yang lebih tinggi dengan pasaran dunia mempunyai kecekapan maklumat global yang lebih baik atau kelewatan harga yang lebih rendah. Ini menunjukkan bahawa integrasi dengan pasaran saham dunia telah meningkatkan kualiti serta kelajuan maklumat dalam mencapai pasaran Malaysia. Sebaliknya, ia adalah sangat ketara dimana firma-firma yang bersegi dengan pasaran saham dunia adalah perlahan dalam bertindak balas dengan berita global, ini menunjukkan bahawa geseran pasaran seperti sekatan ke atas pemilikan ekuiti asing dalam ekonomi-ekonomi baru membangun mungkin menghalang pemprosesan pantas maklumat pasaran global. Oleh itu, penyingkiran sekatan pemilikan boleh meningkatkan tahap kecekapan maklumat bagi pasaran saham negara-negara baru membangun.

CAN MARKET INTEGRATION EXPLAIN INFORMATIONAL EFFICIENCY OF MALAYSIAN LISTED FIRMS?

ABSTRACT

Market integration and market efficiency are two important concepts in finance. Although debates on these concepts are still ongoing among practitioners and academicians, but it is still very few of empirical studies to explore the effect of market integration on market efficiency. The objective of this thesis is to examine whether global information transmits fast into share price if a company is highly integrated with the world stock market. On the contrary, a segmented firm that has higher integration with local stock market is expected to have slow response to global news. This thesis is to investigate whether the above hypotheses are valid for listed firms in Malaysia, a fast emerging market that consist of a large pool of both integrated and segmented firms. The sample study consists of 265 stocks listed on the Main Market of Bursa Malaysia and the data are from January 1995 to December 2010. The degree of market integration is measured by the variance ratio approach proposed by Akdogan (1997) while the informational efficiency is captured by the price delay measure of Hou and Moskowitz (2005). The price delay measure is designed to gauge the speed of stock prices adjust to new market-wide information, given that in an efficient market with complete information and rational investors, stock prices should adjust immediately to the arrival of new information. Besides, the determinants of price delay measure have received strong empirical support and well grounded theoretically. Therefore, this thesis also controls for the effects of investibility, firm size, turnover and volatility in the panel regression. The results show that firm that has higher integration with the world market has better global

information efficiency or lower price delay measure. This suggests that integration with world stock market has improved the quality as well as the speed of information in reaching to Malaysian stock market. On the other hand, a segmented firm was significantly slow to impound global news, suggesting that market frictions including restriction on foreign equity ownership in emerging economies are likely to impede the swift processing of global market information. Thus, concludes that removal of ownership restrictions could improve the degree of informational efficiency of emerging stock markets.

CHAPTER 1

INTRODUCTION

This chapter begins with the motivation of the study and describes the background of Malaysian stock market. The capital control implemented in Malaysia over the periods of 1995 – 2010 will be delivered accordingly. The problem statement which is the essence of this study discusses the expected impact of market integration on market efficiency. The next section provides the research questions as well as the research objectives. The scope of the study is presented in the section after that. Then, the theoretical and practical contributions of the study are summarized. Finally, this chapter ended with a brief on the organization of the whole study.

1.1 Motivation of the Study

The increasing trend in globalization of national economy, the wave of financial market liberalization and deregulation in many of the emerging countries which started in 1980s had affected the structure of international financial markets. Owing to these processes, the degree of segmentation between local stock market and world stock market has decreased significantly and it is aligned with the tremendous increases in institutional investment across borders, the advocate of free market capitalism and the associated reductions in national barriers to trade and capital (Farrar, 1999). This can be seen where the degree of international portfolio investments by global investors has been steadily increasing. Global investors are now allocating a substantially higher proportion of financial wealth in international assets than few decades ago.

The extensive literature on the topic of international equity market integration shows that domestic markets are increasingly integrated in a global scale. For instance, Jong and Roon (2005) found that the annual decreased in the segmentation index in emerging markets were around 0.055, on a scale of 0 to 1. Academicians have long studied its potential effects on both developed and emerging economies. On the one hand, the benefits derived from the more globally integrated stock market should be able to lower the cost of capital, increase the real investment opportunities, enhance the national productivity and spur the country's economic growth (Bekaert and Harvey, 2000; Chari and Henry, 2008; Bekaert *et al.* 2009). On the other hand, integration with the world stock market may have some drawbacks as well. For instance, it may be diminished the benefit derived from international portfolio diversification. The reason is that equity risk premiums have been equalized across markets due to the highly integrated market. Besides, the highly integrated stock market may also facilitate the contagion effect and spread the negative news from one country to another. Despite these effects, this study proposes another benefit of stock market integration, improves the informational efficiency of the local stock market.

Moreover, the fast pace of financial market deregulation, liberalization and globalization, together with advances in information technology that begun in the second part of the 1990s are expected to drive for emerging market development and leading to a higher degree of market efficiency. In finance literature, it is very common where market efficiency also called informational efficiency of financial markets (The terms "market efficiency" and "informational efficiency" are used interchangeably throughout the study). This is true because investors' decisions to

trade are relying on the availability of market-wide information. Thus, the proper compute on the degree of informational efficiency of an economy is vital to investors because this will serve as an important policy guidance and the choices of various trading strategies in order to exploit the abnormal returns.

Many empirical studies have proved that local stock markets are increasingly integrated with the world stock market, but the extant literature has yet to investigate whether integration with world stock market will lead to a more efficient stock market. In other words, the net effect of market integration on informational efficiency remains ambiguous. Thereby, the novelty of this study is to propose an establishment of a link between market integration and informational efficiency at firm-level data. In particular, this study aims to investigate the proportion of stock returns explained by the combination of local and global risk factors on the speed of stock price adjustment to new global market information. In this setting, there are two different scenarios that have been arisen. Firstly, when a firm is perfectly integrated with Bursa Malaysia (or segmented from Bursa Malaysia), one might expect that the firm to be sluggish in response to new global information or there is a delay in the transmission of global market information into local stock prices. Secondly, if the firm is highly integrated with the world market (or segmented from the local market), the stock price of this firm is expected to be very sensitive to any changes in the global market news.

In light of the above discussion, this study is inspired by the recent studies like Bae *et al.* (2012) and Hooy and Lim (2013). This study will provide additional insights into the novel issue of the effect of market integration on stock market

efficiency and aims to fill up the void in the literature. Bae *et al.* (2012) investigate the effect of financial market liberalization on informational efficiency across emerging economies. They found that liberalization process (liberalization is proxy by degree of investibility) aids to improve the overall informational efficiency of these markets and there was a significant decreased in the price delay measure with respect to new global market information.

Generally speaking, financial market liberalization often refers to *de jure* market openness where foreign investors can trade local equity without any restrictions. Foreign investors are defined as those residing or not residing in Malaysia and that engage transactions in the local equity market. Foreign investors consists of those individuals, institutions, nominees, blockholders, government investors and the like. In recent literature, there are some arguments or debates regarding the concepts of market integration and financial liberalization. For instance, Bekaert and Harvey (1995) and Carrieri *et al.* (2010) argued that liberalization captures only part of the capital control which is the direct barriers in the local markets. However, liberalization process does not account for those indirect barriers like investor's protection, country risk, accounting standards and the availability of information that can affect the foreign investors' decision to trade. This is consistent with Jong and Roon (2005) and Bae *et al.* (2004) studies where they had concluded that investibility failed to capture market integration because the presence of indirect barriers in some emerging markets.

Unlike liberalization, market integration provides a broader and comprehensive definition to capture both the direct and indirect barriers in the

formulation. Hooy and Lim (2013), for example, show that both market integration and liberalization have an independent effect on the stock price adjustment process. Their study provides the first direct evidence that reduction of implicit barriers tend to improve the speed of stock price adjustment to new market-wide information. In line with Hooy and Lim (2013) research, this study aims to explore the effect of market integration on informational efficiency instead of financial liberalization process.

Besides Bae *et al.* (2012) study, the motivation of this study also comes from Hooy and Lim (2013) research. Hooy and Lim (2013) explore the effect of market integration on market efficiency across both developed and emerging economies. Based on the aggregate country-level data analysis, they documented a positive relationship between market integration and informational efficiency. Price delay measure is a proxy for informational efficiency where it aims to capture the speed of stock price adjustment to new market information. The higher the degree of price delay indices implies the more inefficient the market is. The negative relationship between integration and price delay measure suggests that stock prices should adjust instantaneously to any new global information when local markets are integrated with world stock market. Hooy and Lim (2013) posit that when local markets are integrated with the world market, there will be a higher compliance with international norms in terms of corporate governance, leading to more liberalized in the equity market, more competitive pricing and stringent disclosure rules in these markets. So, an integrated world stock market will improve the quality as well as the speed of information in reaching to these markets.

Although this study is not the first attempt to investigate the effect of market integration on informational efficiency and from my understanding however, it is thus far the first study to explore the aforementioned issues based on firm-level analysis. Moreover, the idea of this study has never been suggested in any established theoretical model. With the absence of theoretical model in guiding and explaining the relationship between these two concepts, the common belief of financial economists has suggested that informational efficiency is positively associated with market stabilization and a more liberalized in the capital market. In addition, Bae *et al.* (2004) asserted that investibility (proxy for the liberalization process) is a good measure of integration process with the world market. Hence, this serves as a supplement justification to strengthen the setting of this study where the more liberalized market led to more integrated markets and finally, both are contributing to the more efficient stock market. Therefore, the theme and design of this study is restricted to identify the association or determinants of market efficiency instead of exploring the causal effect between these two variables.

Overall, this study needs to ascertain whether the speeds of information dissemination in Malaysian stock market will improve through a more globally integrated stock market. Besides, this study also seeks to understand in depth the other determinants that impede the price discovery process in Bursa Malaysia. As a result, this study has bridged up the gap and analyze the effect of market integration on information efficiency hypothesis in the context of Malaysian firms with its consequences towards the decision making framework of policy makers and investors.

1.2 Background of Bursa Malaysia

In a small and open economy like Malaysia, stock market is pivotal to the signal of health and accumulators of wealth of a country. Stock market plays a vital role and as a channel for resource reallocation in the economy. For example, by mobilizing the excess funds from surplus to deficit units, stock market aids to stimulate the development, growth and sustainability of local economy. Given the importance of the modern stock market and its role, so, it is worth to highlighting the development of Malaysian stock market over the last 50 years.

Malaysian stock market is primarily composed by small and medium cap companies and a number of large companies that engaged in multinational business. These companies are listed in Bursa Malaysia, formerly known as Kuala Lumpur Stock Exchange (KLSE). KLSE is one of the largest stock exchanges in Southeast Asia with a history stretched to more than 5 decades. In 1930, the first security organization in Malaysia was officially established and it is known as Singapore Stockbrokers' Association. It was restructured and renamed to Malayan Stockbrokers' Association 7 years later. In 1960, it was replaced by Malayan Stock Exchange. Again, Malayan Stock Exchange was renamed to Stock Exchange of Malaysia 4 years later. In the following year, the Stock Exchange of Malaysia and Singapore was established in conjunction with the announcement of Singapore officially split from Malaysia. Next, the separation of currencies between Ringgit Malaysia (RM) and Singapore Dollar (SD) in 1973 once again changed the Stock Exchange of Malaysia and Singapore to Kuala Lumpur Stock Exchange Berhad (KLSEB) and the Stock Exchange of Singapore. Three years later, Kuala Lumpur Stock Exchange (KLSE) has established and took over all the operations of its predecessor, KLSEB.

To increase the global competitiveness and transform its operations into a more customer-driven and market-oriented organization, KLSE was transformed from a non-profit organization to an entity limited by its shares in 2004 and renamed to Bursa Malaysia Berhad. In 2005, Bursa Malaysia was listed on the Malaysian stock exchange.

Table 1.1 shows the market size of selected stock exchanges (ASEAN-5+3) in the Asia Pacific region from 1995 to 2010. Market size is measured by the aggregate market capitalization (in billions of US dollars) of 8 selected stock exchanges, namely Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and Tokyo stock exchange, respectively.

Table 1.1: The Market Size of ASEAN-5 + 3

Market Capitalization (in USD billion)								
Year	Hong Kong	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand	Tokyo
1995	303.71	66.45	181.95	213.76	58.78	150.96	135.77	3,545.31
1996	449.22	90.86	139.12	306.16	80.46	153.11	95.90	3,011.16
1997	413.32	29.05	41.88	93.17	31.21	106.32	22.79	2,160.58
1998	343.57	22.08	114.59	95.56	34.91	96.47	34.12	2,439.55
1999	609.09	64.04	306.13	139.91	41.54	198.04	57.18	4,463.30
2000	623.40	26.81	148.36	113.16	25.26	155.13	29.22	3,157.22
2001	506.07	23.00	194.47	118.98	20.61	117.34	35.95	2,264.53
2002	463.05	30.07	216.12	122.89	18.20	101.55	45.41	2,069.30
2003	714.60	54.66	298.25	160.97	23.19	148.50	119.02	2,953.10
2004	861.46	73.25	389.47	181.62	28.60	217.62	115.39	3,557.67
2005	1,055.00	81.43	718.01	180.52	39.82	257.34	123.88	4,572.90
2006	1,714.95	138.89	834.40	235.58	68.27	384.29	140.16	4,614.07
2007	2,654.42	211.69	1,122.61	325.29	102.85	539.18	197.13	4,330.92
2008	1,328.77	98.76	470.80	189.24	52.03	264.97	103.13	3,115.80
2009	2,305.14	214.94	834.60	289.22	86.35	481.25	176.96	3,306.08
2010	2,711.32	360.39	1,091.91	408.69	157.32	647.23	277.73	3,827.77
	1,066.07	99.15	443.92	198.42	54.34	251.21	106.86	3,336.83

Source: World Federation of Exchanges, WFE (2011).

Tokyo Stock Exchange (TSE) is the largest and it is apparently the largest stock exchange in the Asia Pacific region, with the average market size value of USD

3,337 billion. Next, it is followed by Hong Kong Stock Exchange (HKSE). At the end of fiscal year 2010, the average market size of HKSE is up to USD 1,066 billion and it is still smaller than TSE by USD 2,271 billion. When narrow down to ASEAN-5 markets, Bursa Malaysia is the second largest stock exchange in ASEAN-5 markets after Singapore Stock Exchange. Moreover, Bursa Malaysia is also the leading market among ASEAN-5 countries since Singapore is classified as a developed country. As shown in Table 1.1, the size of Bursa Malaysia has grown steadily in the last 3 years of observations and remains its competitiveness in Asia Pacific due to the economic and political stability in Malaysia. Finally, Philippines Stock Exchange (PSE) is the smallest stock exchange within Asia Pacific where the average value of PSE is only about USD 55 billion.

Table 1.2 presents the total numbers of stocks listed on Bursa Malaysia from 1995 to 2011. Based on this table, the total numbers of stocks listed on Bursa Malaysia were 954, as of March, 2011. These including 840 stocks are listed on the Main Market and the remaining 114 stocks are listed on ACE market. Compared to 529 stocks listed in Bursa Malaysia in 1995, there are approximately 80% increased in the total number of stocks listed on Bursa Malaysia in the last 17 years.

In August 2009, Bursa Malaysia has restructured its existing operation where they merged Bursa Malaysia Main Board and Second Board into one single market, called - Bursa Malaysia Main Market. Besides, the ACE market also consists of the revamp of MESDAQ market. The objective of this restructures aimed to enhance the mobility of capital and investments into Malaysian stock market and also to attract the potential foreign direct investment (FDI) to Malaysia.

Table 1.2: Total Number of Companies Listed in Bursa Malaysia

Total Number of Listed Securities				
Year	Main Board	Second Board	MESDAQ	Total
1995	369	160	0	529
1996	413	208	0	621
1997	444	264	0	708
1998	454	282	0	736
1999	474	283	0	757
2000	498	297	0	795
2001	520	292	0	812
2002	562	294	12	868
2003	598	276	32	906
2004	622	278	63	963
2005	646	268	107	1021
2006	649	250	128	1027
2007	636	227	124	987
2008	634	221	122	977
	Main Market		ACE Market	Total
2009	844		116	960
2010	844		113	957
2011	840		114	954

Source: Bursa Malaysia (March, 2011)

1.3 A Brief on the Capital Control in Malaysia

Capital controls imposed by local authorities are very common in emerging countries. These controls or barriers to trade are vital especially to local entrepreneurs and businesses because it is sometimes “intended” to protect the national sovereignty and domestic business entities from being controlled by foreign entities (Bae, 1995). The common types of capital controls including the exchange controls which prevent or limit the buying and selling of a national currency at the foreign exchange market, caps on the allowed volume of the international purchase or sale of various financial assets, transaction taxes and restrictions on the amount of money a citizen or nonresident is allowed to take away from that country.

During the Asian Financial Crisis, Malaysian government had imposed and maintained a fairly stringent capital control policies on her finance sector which encompasses the following areas such as foreign equity ownership, money markets and foreign exchanges. Table 1.3 presents a range of policies or events on capital control imposed by Malaysia's government from 1995 to 2004. For instance, Malaysian had re-imposed the capital control during the mild of 1990s to early 2000s, particularly during the period of Asian Financial Crisis (1997-1999) such as effective from September 1, 1998, a limit of a maximum amount of RM1, 000 for exports and imports of Ringgit Malaysia (RM) by residents and non resident traveler in order to stabilize and maintain (outflow of RM) the value of RM from continuous depreciated. However, there are major changes in capital control policies in the late 1990s where we witnessed a series of the liberalization plan undertaken. For instance, the ceiling on the import and export of RM for border trade has been raised, foreign equity holding in manufacturing projects was allowed up to 100% for all types of investment, the loans for non residents have been raised from RM200, 000 to RM10, 000,000 and so on.

Malaysia is a small and open economy that based heavily on external trade climate, the Malaysian public listed firms hence are highly exposed to global information. With the eruption of the 1997 Asian financial crisis and the implementation of the capital control and fixed exchange rate policy in 1998, the Malaysian equity market has had a dynamic integration with the world market over the one and a half decade. Since 2000s, Malaysian stock market has become more accessible and visible to global investors after waves of liberalization plans that have been undertaken by the central government. The pegging exchange rate system was

lifted in July 2005, but then there is a outbreak of the US subprime crisis and European sovereign debt crisis in the late 2000s. Hence, Malaysia firms can serve as a good platform to examine how global information was impounded at the firm level given the variation in market integration.

Table 1.3: Selected Capital Control Imposed by Malaysian's Government, Starting from 1995 to 2004

Date	Events	Category
June 1995	Corporate residents with a domestic credit facility were allowed to remit funds up to the equivalent of RM 10 million for overseas investment purposes each calendar year.	Outflows of portfolio and other capital
Feb 1996	The threshold for the completion of the statistical forms for each remittance to or receipt of funds from, nonresidents was raised from amounts exceeding RM 50,000 to RM 100,000 or its equivalent in foreign currency.	Payments for invisible Transactions
Aug 1998	A ban on short-selling of the listed securities on KLSE was introduced to limit speculative pressures on stock prices and exchange rates.	Stock market transactions
Sept 1998	-A limit was introduced on exports and imports of ringgit by residents and nonresident travellers, effective September 1, 1998 (no limits existed previously). -All imports and exports were required to be settled in foreign currency.	International transactions in ringgit
Sept 1998	A 12-month waiting period for nonresidents to convert RM proceeds from the sale of Malaysian securities held in external accounts (excluding FDI, repatriation of interest, dividends, fees, commissions and rental income from portfolio investment). No such restrictions previously.	Outflows of portfolio and other capital
Feb 2001	The exit levies on profits repatriated after one year from the month the profits are realized was abolished. Portfolio profits repatriated within one year remained subject to the 10 percent levy.	Outflows of portfolio and other capital
June 2001	All controls on the trading of futures and options by nonresidents on the MDEX were eliminated. The Commodity and Monetary Exchange of Malaysia and the KLSE were merged to form the MDEX.	Derivatives
Dec 2002	Payments between residents and nonresidents as well as between nonresidents for RM assets are liberalized to allow payments to be made either in RM or foreign currency (previously, only in RM)	Settlement
June 2003	Foreign equity holding in manufacturing projects was allowed up to 100% for all types of investment.	Foreign direct investment

Table 1.3: Continued

Date	Events	Category
Apr 2004	The limit for banking institutions on loans to nonresidents (excluding stock broking companies, custodian banks and correspondent banks) was raised from RM 200,000 to RM 10,000,000.	International transactions in ringgit
Apr 2004	Resident individuals who have foreign currency funds were allowed to invest freely in any foreign currency products offered by onshore licensed banks.	Bank and foreign exchange transactions

Source: Adopted and modified from IMF working paper no. WP/06/51.

1.4 Problem Statement

Stock market efficiency and market integration are among the two hotly debated topics in the international finance literature and both topics are facing the ongoing rigorous empirical testing. The conventional asset pricing theory assumed that equity markets are frictionless, complete information and all investors are well diversified. In this circumstance, stock prices should adjust instantaneously to the arrival of new information and this is central to the efficient market hypothesis, EMH (Fama, 1970). However, these assumptions were, in fact, not met in practice and it is too “ideal” to be applicable in the real world especially in emerging stock markets. The reason is most of the emerging countries are not fully integrated with the world stock market. Indeed, there were wide array of capital controls and investment restrictions that had hinder and hamper the free flows of capital and information across the countries (Bekaert and Harvey, 1995; Korajczyk, 1996).

The underlying assumptions of EMH failed to reflect the real behaviour of stock prices. The existence of sizeable market frictions like bid-ask spreads, transaction cost, liquidity and so on which have constrained the immediate impounding of new information into individual stock returns. Obviously, the

imperfections in capital markets have significantly impeded the dissemination of global market information into local stock prices in a timely manner. As a result, markets are inefficient and stock prices failed to reflect its fundamental value and hence, the investors, arbitrageurs as well as market speculators may profit from this delayed adjustment processes and price differential. Cohen *et al.* (1980) asserted that the effect of market friction has to be accounted in order to grasp a better understanding of the market behaviour.

Since capital markets are imperfect and consists of a wide variety of capital controls, it seems logical that the attribute of market integration might shed some light on the stock price adjustment processes. The integrated market hypothesis indicated that in the absence of capital controls, financial assets with identical risk characteristics should have the same expected returns across markets if there are perfectly integrated and *vice versa* when markets are fully segmented from the world. Empirically and theoretically, tons of research had focused on either market efficiency or market integration alone. However, there is less effort to link the concept of market integration to informational efficiency. So, it is interesting to know that whether an improve in informational efficiency is due to the increasing trend in market integration.

The issue mentioned above is important since it is related to the pricing of firm values and various investment strategies. When a firm is segmented from the world stock market, the delayed of stock price adjustment to new global market information is potentially risky to investors. Callen *et al.* (2010) argued that investors may encounter additional risks because there may be unfavourable global

information that has yet to be fully incorporated into stock prices. To compensate for adverse selection strategy, investors may demand an additional risk premium. This shows that investors habitually depend on their existing available information set to predict and forecast the future returns or stock prices. The uncertainty in stock prices occurred because the new information is not always arrived in a timely manner (delayed) due to the segmentation in capital markets where the direct and indirect barriers had obstructed the movements of information.

As an emerging market, Malaysia has become more and more integrated with the world market over the past years (Bekaert and Harvey, 1995). However, the integration process is also very dynamic. The issue becomes more complicated especially during financial crises and it is well demonstrated in the prevailing market scenarios. The Asian Financial Crisis and US Subprime Crisis are among the best examples. When the economic or financial crises happened in another part of the world, the unfavourable or negative information spread instantaneously to Bursa Malaysia. As results, the Kuala Lumpur Composite Index (KLCI) has slumped into its lowest ever historical level, 262 points during the peak of the Asian Financial Crisis. Likewise, the KLCI has dropped to 900 points from its peak, 1450 points in the recent subprime crisis. The aforementioned issues show that how Malaysia is integrated with the world market might play an integral role in determining the level of informational efficiency, especially during financial crisis. Hence, a proper investigation of the determinants of informational efficiency yields important insights because this will affect the state of health of an economics, investment strategies and the wealth of investors.

1.5 Research Questions

Based on the problem statement discussed in the previous section, the main research question of this study is:

1. Does market integration explain informational efficiency of Malaysian stock market?

More specifically, the main research question above can be divided into two specific questions as:

1. Does integration with world stock market enhance the degree of informational efficiency of Malaysian stock market?
2. Does integration with Bursa Malaysia enhance the degree of informational efficiency of Malaysian stock market?

1.6 Objectives of the Study

The main objective of this study is to examine the association between market integration and informational efficiency at Bursa Malaysia. Moreover, by controlling for the other possible causes and factors that influencing the degree of informational efficiency, this study aims to:

1. Investigate the role of integration with world stock market on the speed of stock price adjustment to new global market information.
2. Investigate the role of integration with Bursa Malaysia on the speed of stock price adjustment to new global market information.

1.7 Scope of the Study

This study covers three major aspects of finance including stock market integration, stock market efficiency and firm-level analysis. First, this study examines the historical price data. Therefore, the findings of the study are restricted to the weak-form market efficiency only. The other forms of market efficiency like semistrong-form efficiency and strong-form efficiency are not delivered in this study. The weak-form EMH is tested by using the price delay measure of Hou and Moskowitz (2005).

In the extant integration literature, there are various approaches to gauge the degree of time-varying market integration. In this study, the degree of market integration is measured by the two-factor asset pricing model, specifically, the two-factor international capital asset pricing model (ICAPM) proposed by Akdogan (1997).

The third scope of this study is focused on the firm-level, the sample study is Malaysian stock market. The sample size encompasses the 265 firms listed in Bursa Malaysia- Main Market. The sample period for this study covered 16 years in total, starting from January 1995 to December 2010. Malaysian stock market is the focus of this study since Malaysia is characterized as one of the leading markets in emerging countries and Bursa Malaysia is also getting integrated with the world stock market (see Bekaert and Harvey, 1995). Thus, this provides a natural setting to explore the effect of market integration on informational efficiency. Next, the sample period was set from 1995 to 2010 because these periods contain several distinct scenarios of economic circumstances, which reflected the completed set of business cycle. For instance, Malaysia's economy was in the boom period during the 1995 to

early 1997. However, Malaysia faced the severe recession in 1997-1998 (Asian Financial Crisis) and the economic recovery period or the post crisis period from 1999 to 2002. Once again, the same business cycle happened ten years later when come to the US Subprime Crisis in 2008. Altogether, the sample periods in this study are suitable to investigate how robust the relationship between market integration and informational efficiency during the periods of financial turbulences.

1.8 Significance of the Study

This section presents the significance of the study. First, this study attempts to investigate the factors that affect informational efficiency of Malaysian stock market, specifically the degree of integration with Bursa Malaysias and world stock market. Different from Hooy and Lim (2013) study who focus on the aggregate country-level analysis, this study is focused solely on one small and open emerging country, Malaysia. So, the behavior of Malaysian firms toward a more integrated and efficient market environment can be well addressed. From Table 1.3, it is pretty clear that Malaysia has put substantial effort to liberalize her stock market in the last two decades. The elimination of barriers in the financial market or in other words, the greater degree of integration with world market should allow the firms to seek for the most efficient resources and capital allocation. Besides, investors are also exposed to the most productive investment opportunities and reallocation of funds. As a result, the integration process will increase the competition and also improve the efficiency of the local financial market system. Thereby, this has laid down a foundation to investigate the effect of integration on informational efficiency in Malaysian stock market.

Second, in addition to narrow down the sample study to the firm-level data, this study also employs two-factor ICAPM instead of single factor model (price error measure) to address the issue of time-varying market integration process. The literature on market integration had documented that stock markets are mildly integrated instead of perfectly integrated or fully segmented from a benchmark market portfolio. Carrieri *et al.* (2010) stated that stock returns are determined by both global and local risk factors and there are strong evidences show that the conditional market risk remains relevant in pricing of stock returns. By using the variance ratio model to gauge the time-varying market integration process, a firm is assumed to have both the local and global systematic risk exposures (Akdogan, 1997). So, this study aims to address the issues on the risk reduction and improvement in informational efficiency when market moves from segmentation toward integration in terms of greater access and relatively free of capital control.

Third, the empirical studies on the determinant of price delay measure that focus on emerging markets are relatively sparse where most of the studies were focused on developed economies or US stock market. So, this study works towards filling up the void in price delay literature by focusing on the Malaysian stock market and also the firm-level analysis. As a result, this study provides the first evidence of the benefit of market integration in improving the degree of informational efficiency of Malaysia firms.

1.9 Contribution of the Study

Research on the effect of market integration on informational efficiency has gained attention in recent literature. However, the empirical study of this field is still

considered to be very young and very much lacking even in both the developed and emerging markets. So, the findings of this study not only contribute to the existing body of knowledge but also empirical significance.

First, this study sheds light on the role of global private information on emerging stock markets. Global private information refers to the information possessed by global investors that is valuable for trading in multiple countries at the same time (Albuquerque *et al.*, 2009). To avoid ambiguity, it is prudent to distinguish global private information from the insider information or private information that is leaked before public announcements. Albuquerque *et al.* (2009) make a key assumption of their model where stock returns are driven by both global and local factors. When local markets are increasingly integrated with world market, the information asymmetry between local and global investors in acquiring global information leads local investors to underreact to movement in global factors. Stocks that are not accessible to global investors are not likely to incorporate global information into their prices in a timely way. This implies that the participation of global investors in local market has facilitated the diffusion of global information into local stock prices. In other words, increases the speed of stock price adjustment to the new global information.

Second, the study also contributes to the literature against the theoretical model of EMH. EMH stated that markets are efficient when stock price fully reflect to all information. However, the existence of various market frictions like incomplete market, illiquidity of an asset, limited market participation and so on in emerging market has deteriorated the immediate adjustment of stock price to new information.

This indicates that there is a delay between the arrival of new information and stock price adjustment process. Since stock prices are not instantaneously response to new information, investors may profit from trading strategy based on past public available information. Overall, the findings from this study highlighted whether EMH is still applicable in the complex business environment and real world phenomena.

Third, the findings of this study also intriguing due to the practical implications and its consequences towards the market practitioners like fund managers, investors and speculators. Since Malaysian's firms are mildly integrated with world stock market and it is not fully efficient, this has a great implication in both investments and corporate finance. For international portfolio investors, Malaysia is a favourable destination to diversify their investments because international portfolio diversification opportunities to be exploited are greater under this circumstance. Next, this study also important for corporate managers. For corporations, when Bursa Malaysia becomes integrated with global markets, local firms are more efficient in adopting the global new information as well as the opportunities to obtain the lowest cost of capital. So, the corporate managers may now consider the policies like merger and acquisition with foreign business entities, direct foreign investment or undertaking the high risk and high expected return projects because they are able to diversify part of their total risk in this circumstance.

Fourth, apart from the practical implications, this study also contributes to the following policy consideration. Since market integration and informational efficiency are positively correlated, hence, those strategies intend to promote for greater

financial market integration are complement to the policy efforts aim to enhance the informational efficiency.

1.10 Organization of the Study

The thesis is organized into five chapters. Chapter 1 is the introduction of the study and contains all the essence of this study like motivation, problem statement, research questions, research objectives, scope of the study, the significance of the study and contribution of the study. Chapter 2 addresses the literature review. Chapter 3 discusses the methodology used to achieve the objectives of this study. Chapter 4 reports and discusses the core findings and results of the study. Finally, Chapter 5 summarizes the core findings of the study, implications and recommendations for future studies.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the previous studies on stock market efficiency and market integration (both independently and collectively). Since there are voluminous of empirical studies on both topics, hence, the discussion of this chapter is limited to the main ideas and findings only since it is impossible to review and provide full details for all studies.

This chapter is organized into four sections. The first section reviews the literature on stock market efficiency. Next, it is followed by the literature on stock market integration. The literatures that link market integration to market efficiency are reviewed then. The last section will be the concluding remarks for this chapter.

2.1 Market Efficiency

2.1.1 Efficient Market Hypothesis (EMH)

Over the last 40 years, efficient market hypothesis (EMH henceforth) proposed by Professor Eugene Fama from University of Chicago, in his hallmark paper- Fama (1970) has successfully emerged as the world leading and the most established theory in finance literature.¹ EMH postulates that information play a significant role in determines the stock prices and stock prices should fully reflected all available market information when EMH holds. Fama (1970) also categorized and distinguished three types of market efficiency and it is depicted in Figure 2.1. The three classes of information subsets include the weak-form EMH, semistrong-form

¹ Fama (1970) stated that with a few exceptions, the efficient markets model stands up well.

EMH and strong-form EMH. Based on Figure 2.1, the weak-form EMH is subsets of semistrong-form EMH while both the weak-form and semistrong-form EMH are a subset of strong form EMH.

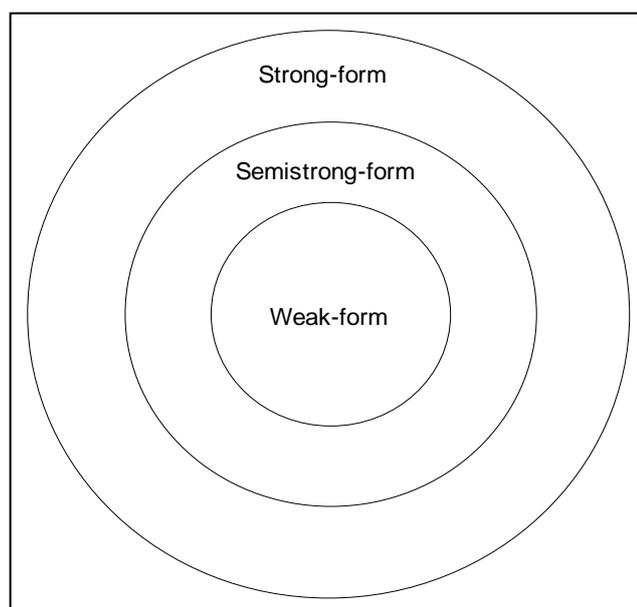


Figure 2.1: The Subset of EMH.

First, stock market is said to be in weak-form efficient when the current stock prices already reflect all available information that can be derived by examining the historical data like past prices. If the market is in weak-form efficient, then the historical market data are unable to make any precise prediction of the movements of future stock prices because the random walk movements in stock prices. So, the weak-form EMH implies that investment strategy based on technical analysis will not be able to make any abnormal returns.²

² Technical analysis refers to the investment strategy where an analysts predicting the future stock prices by detecting and interpreting patterns in historical information like stock price and trading volume.