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Does Local Risk Still Matter in the Highly Liberalised Emerging Market of Malaysia?

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Abstract: Since 2009, both foreign and local investors in the Malaysian equity market have faced a single set of rules, enjoyed equal access to the same set of financial instruments, and benefited from international levels of minority investor protection, thus fulfilling the conditions for full integration with the world market. Malaysia can be identified as a highly liberalised Asian emerging equity market that aligns with the definition of an "integrated market" in existing empirical studies. Using a sample dataset from 2009 to 2016, we test whether Malaysia, as a highly liberalised emerging equity market, is still subject to local market risk pricing, along with six other Asian emerging markets, including China, India, Indonesia, the Philippines, South Korea and Thailand. The results from our study show that both world and local market risk are still priced in Malaysia and other Asian emerging markets, leading to the conclusion that none of them are fully integrated into the world market. This suggests that there may be other implicit barriers affecting equity market integration in emerging markets.

Keywords: Integration, Risk pricing, integration, liberalised, Asian emerging market
JEL classification: F30, G12, G14, G15, G18, G32

1. Introduction

The concept of market integration refers to the level of linkage between different markets, which can be measured by the level of price correlation, the speed of adjustment to new information, and the degree of cross-border investment. This is important because it affects the efficiency of capital allocation and the degree of risk-sharing across countries. When markets are integrated, investors can diversify their portfolios across a wider range of assets, reducing their exposure to idiosyncratic risk. Moreover, it enables countries to access external sources of finance and technology, which can contribute to their economic growth and development.

Market integration can be viewed from two perspectives: direct and indirect. Referring to the Kearney and Lucey (2004) survey paper, there are two primary approaches in defining the international financial (mainly equity market) markets integration. The first approach is the direct approach that invokes the definition of

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the law of one price, where the assets of identical risk command the same expected return, regardless of the trading location in an efficient market (Bekaert et al., 2003; Jorion & Schwartz, 1986; Kindleberger, 1973). The second approach is an indirect approach related to the international capital market completeness (Stockman, 1988). This approach suggests that the perfect financial integration exists with a complete set of international financial markets, which requires better efficient operation in the market. Under the second approach, Baele et al. (2004) further explained that in an integrated market, all market participants face a single set of rules for financial instruments; they have equal access to the same set of financial instruments, and they are treated equally regardless of their nationality. This finding is consistent with the results obtained by Carrieri et al. (2007) indicating that market integration is affected by the ability of the foreign investor to access the domestic markets and vice versa through direct investments. These two approaches have become the golden rules for scholars in explaining market integration in the subsequent asset pricing literature.

In the context of this paper, we focus on Malaysia's market integration and its distinction between de jure integration and de facto integration. We argue that Malaysia has fulfilled the rule-based definition of integration, but the empirical question remains whether local risk is still priced. This distinction between de jure and de facto integration is crucial in understanding the true level of market integration. De jure integration refers to the legal framework that allows for market integration, while de facto integration measures the actual level of integration that has been achieved. Through studying the differences between Malaysia and other Asian countries, particularly in terms of their stock market integration, we can better understand what sets Malaysia apart and how it can continue to improve its level of market integration. Therefore, we also include other Asian stock markets such as China, India, Indonesia, Korea, the Philippines, Thailand and Taiwan in our study. These markets were selected because they are the largest and most heavily traded markets in Asia and are also representative of different stages of market development at the time of study. Despite the fact that many Asian countries, including Malaysia, have experienced significant growth and development in their stock markets in recent years, the market integration level has been driven by various factors such as foreign investment. While some Asian countries are gradually promoting foreign direct investment (FDI), others have implemented significant FDI restrictions, particularly China, India, Indonesia, Korea, the Philippines, Thailand and Taiwan, which have implemented measures to protect national interests and limit foreign ownership in certain sectors.

For example, even though China has implemented its Foreign Investment Law to expand market access for foreign investors in various sectors, however many industries remain restricted or limited to foreign investment whereby China A-shares market is only available for purchase by mainland citizens due to China's restrictions on foreign investment. Due to the limited access of Chinese investors to B-shares, the stock of the same company often trades at much higher valuations on the A-shares market than on the B-shares market.[1,2] Meanwhile, India has established the Securities and Exchange

[1] https://www.china-briefing.com/news/chinas-stock-markets-an-introductory-guide-for-foreign-investors/

[2] https://www.china-briefing.com/news/chinas-upcoming-2016-foreign-investment-law-revisions-to-boost-service-sector/

Board of India (SEBI) as the regulator for securities markets, and has periodically revised its Foreign Direct Investment Policy to set out conditions and restrictions for foreign investment in different sectors.[3] Indonesia's Capital Market Law regulates the capital market and stipulates the sectors that are closed or restricted to foreign investment,[4,5] while foreign investment in South Korea is still at times hindered by insufficient regulatory transparency.[6,7] The Philippines,[8] Thailand[9] and Taiwan[10] have also established regulatory frameworks for securities markets and foreign investment. Nonetheless, they have also implemented restrictions on foreign investment in certain sectors, through the Foreign Investment Negative List and the foreign business act. These regulations aim to protect national interests and promote economic development, but they also limit the potential for market integration and hinder the inflow of FDI.

These FDI restrictions have had implications for market integration, both de jure and de facto. Despite their significant economic potential, these markets are not as highly integrated with the global market as they could be. In fact, their ranking on the World Bank's minority investor protection index in 2016 is lower than Malaysia, indicating weaker legal frameworks to protect minority investors. This raises the question of whether Malaysia stands out among Asian countries as the most highly integrated de jure and de facto among the emerging countries.

Although the correlation between emerging markets and developed markets has increased over the years, emerging markets are not fully integrated into the world market (Bekaert et al., 2023), Malaysia appears to be a unique case among the emerging markets. The reason is that Malaysia, being a small and open economy, has opened its financial sectors almost fully since 2009. From the theoretical perspective, we expect Malaysia to fulfil the golden rules of market integration. To deliberate our claim carefully, we consider from the golden rules mentioned above, in the context of the country's investment law to foreign direct investment (single set of rules), the attitude towards foreign direct investment (FDI) (equal treatment and equal accessibility for all investors) and the effort in promoting an international level of minority investors' protection (improve risk pricing and boost the confidence and accessibility of FDI).

First, to better fulfil the law of one price, the regulator needs to assess the merit of the investment policy in promoting market integration. Malaysia's investment entry and practice are ruled by the Companies Act of 1965 (CA) for all local and foreign investors. In other words, all foreign and domestic investors are governed by a single set of rules in Malaysia. An investor may trade a share on the same platform in Malaysia regardless of their nationality (USDOS, 2016). This situation is different from that of other emerging markets, where the FDI is treated differently from the domestic investor

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3 https://dpiit.gov.in/sites/default/files/FDI_Circular_2016.pdf
4 https://2009-2017.state.gov/documents/organization/241809.pdf
5 https://eoasis.rajahtann.com/eoasis/lu/pdf/2016-06-Indonesian_Negative_List.pdf
6 https://2009-2017.state.gov/e/eb/rls/othr/ics/2015/241618.htm
7 https://2009-2017.state.gov/e/eb/rls/othr/ics/2016/eap/254289.htm
8 https://2009-2017.state.gov/outofdate/bgn/philippines/47535.htm
9 https://2009-2017.state.gov/e/eb/rls/othr/ics/2013/204745.htm
10 https://2009-2017.state.gov/e/eb/rls/othr/ics/2016/eap/254317.htm

in the capital market under the FDI act. For example, the Philippines impose the FDI Negative List under Foreign Investment Act (FIA), Indonesia has its Law 25/2007 (the Investment Law) for FDI, and Thailand governs FDI using the Business Act (FBA) of 1999 (refer to Table 1 for details).

Second, as an effort in encouraging FDI, Malaysia had removed its former Foreign Investment Committee (FIC) investment guidelines in the year 2009. Removing the FIC enabled transactions for acquisitions of interests, mergers and takeovers of local companies by domestic or foreign parties to occur without prior approval. FIC now only reviews the purchase by foreigners of commercial properties valued at greater than RM20 million from Bumiputeras (U.S. Embassies and Diplomatic Missions Abroad, 2016). In addition, the Malaysian government has liberalised 27 service subsectors including tourism and computer-related businesses. The Malaysian government has added the 18th sub-sector, which covers quantity surveyor's services. This initiative allows 100% foreign equity participation in selected sub-sectors. The sub-sectors include private hospital services, accounting and taxation services, specialist medical clinics, department and specialty stores, incineration services, telecommunications Application Service Providers (ASP), courier services, private universities, vocational schools, specialist dental services, skills training centres, vocational schools and international schools for special needs (2014 Investment Climate Statement – Malaysia). To take the liberalisation process a step further, the Securities Commission Malaysia began on the first phase of a comprehensive regulatory review in 2014 to enhance efficiencies and promote greater competition in Malaysia`s capital market. This first phase includes the liberalisation of corporate bond and wholesale product approvals during the Securities Commission's upcoming Lodge and Launch framework, as well as revisions to the licensing regime, which allow for new classes of market participants. These initiatives had boosted the size of the capitalisation of Malaysia's capital market to RM2.76 trillion in year 2014 (Securities Commission Malaysia, 2015). Foreign issuers are freed from the 12.5% Bumiputera ownership requirements if most of the firm's operations are based overseas. Furthermore, the central bank (Bank Negara Malaysia) allows more than 70% FDI in an insurance company if the investment is determined to facilitate the consolidation of the industry (USDOS, 2016). Therefore, Malaysia generally offers equal treatment and equal accessibility to the same set of financial instruments irrespective of the trading place. Comparatively, many emerging markets still impose a "Negative Investment List" to restrict FDI in certain sectors (details in Table 1). Obviously, Malaysia has significantly opened its capital market to foreign investors since 2009.

Third, investor protection is highlighted simultaneously through regulatory amendments in such areas as disclosures and takeovers and mergers. Supervisory efforts by the Securities Commission now focus on the governance of market institutions and intermediary conduct (USDOS, 2016). The step taken strengthens minority investor protection to minimise the conflicts of interest among shareholders and enhance shareholders' rights in Malaysian firms. This step is a strong determinant of the Malaysian government in improving Malaysia's global pricing to boost the confidence of FDI. This effort also allowed Malaysia to stand fourth among 189 markets on the strength of the World Bank Minority Investor Protection Index 2006. It is worth noting that Malaysia's ranking is also ahead of many developed and major developing countries

Table 1. Regulation and limits on foreign direct investment and the minority investor protection index for Asian emerging markets (2016)

Country	Laws/Regulations on FDI	Limits on FDI
Malaysia	The Companies Act of 1965 (CA) for all local and foreign investors. The legal framework grants foreigners the right to establish businesses and hold equity stakes freely. Transactions, acquisitions, mergers, and takeovers of local firm by domestic or foreign investor can be done without approval. Listing requirements for foreign firm are same for the local firm.	All foreigners can register a company with 100% foreign equity in Malaysia. The only exceptions are FDI is restricted to 30% in Telekom Malaysia, 49% of equity stake in oil service and a limit up to 70% in insurance companies. However, Bank Negara Malaysia (BNM) may approve a greater FDI if it is meant to facilitate consolidation of the industry. Malaysia's stock market (Bursa Malaysia) is open to foreign investment and foreign corporation issuing shares. Foreign issuers are not subject to Bumiputera ownership requirements of 12.5%, if majority of their operations are not in Malaysia.
China	China uses a negative list to impose restriction on FDI. FDI is treated differently than domestic investment. Permission is needed to hold equity stakes. Broad sectors of the economy remain closed to foreign investors.	China "A" Share market comprises of mainland China-based firms that are closed to foreign investors except for certain selected foreign institutions could buy A-shares, while the B-share market is open only to foreigners. For some Chinese firms that list their share on both boards, their B-shares would trade at a large discount to their A-shares.
India	Permission is needed for FDI to hold equity stakes. Two channels for FDI in India are: The automatic route (not required to seek overall approval from the central government) or the government route (need multi-step processes for central and state government approval).	FDI is permitted to the 100% limit in some sectors. However, pensions, insurance, and defence are excluded from this permission. Furthermore, India has taken an anti-FDI attitude in the multi-brand retail sector. The rules regulating government approval for investments vary from industry to industry, and the approving government entity varies depending on the applicant and the product. When a foreign portfolio investor already holds 10% of equity shares in an Indian firm, no fresh purchases by such FPI shall be allowed in that firm until FPI holdings fall below 10%. [Ref. Regulation 21(7), SEBI, Regulations, 2014]
Indonesia	Indonesia imposes restrictions on FDI. FDI in Indonesia is regulated by Law 25/2007 (the Investment Law). The government has created a Negative Investment List that aims to restrict FDI in certain sectors.	FDI purchasing a controlling interest in publicly listed companies over the stock exchange are in the Negative List. The latest negative list was revised on May 2016. However, the list remains prohibited from FDI. Sectors — 2016 Revised Negative List Closed — Communication and Informatics

Table 1. Continued

Country	Laws/Regulations on FDI	Limits on FDI	
		≤ 80%	Finance, Insurance
		≤ 67%	Health/Hospital services, Transportation sector, Trade sector, Communication and Informatics sector
		For more details on 2014 and 2016 negative lists refer to Molina and Nugraha (June 2016) and U.S. Embassies and Diplomatic Missions Abroad (2016).	
Korea	The Foreign Investment Promotion Act (FIPA) is the law regulating FDI in South Korea. It labels business activities as open, partly restricted, or closed to FDI.	Restricted	Sectors
		Closed	Nuclear power generation, radio broadcasting, television broadcasting
		≤ 25%	News agency activities
		≤ 30%	Hydroelectric power generation, thermal power generation, other power generation, newspaper publishing.
		≤ 49%	Satellite and other broadcasting, program distribution, cable networks wired telephone and other telecommunications, satellite and mobile telephone, other telecommunications.
		≤ 50%	Transmission/distribution of electricity, wholesale of meat, coastal water passenger transport, coastal water freight transport, other support activities for air transportation, publishing of magazines and periodicals, international air transport, domestic air transport, small air transport, farming of beef cattle, inshore and coastal fishing.
Philippines	The Philippine Foreign Investment Act (FIA) impose Foreign Investment Negative List where part A of negative list details sectors in which FDI is restricted by the Philippine Constitution or laws, and part B of negative list lists the areas in which FDI is limited for reasons of national security, defence, public health, morals, the protection of small and medium enterprises.	Restricted	Sectors
		Closed	Mass media (except recording), small-scale mining, private security, marine resources, including the small-scale utilisation of natural resources in rivers, lakes, and lagoons and the manufacture of firecrackers and pyrotechnic devices, lending, financing, or investment companies.
		≤ 20%	private radio communications networks
		≤ 25%	private employee recruitment, construction and repair of locally funded public works.

Table 1. Continued

Country	Laws/Regulations on FDI	Limits on FDI
		≤ 30% advertising agencies ≤ 40% natural resource exploration, development and utilisation, educational institutions, operation and management of public utilities, operation of commercial deep-sea fishing vessels, Philippine government procurement contracts, operations of build-operate-transfer (BOT) projects in public utilities, manufacturing of explosives, firearms, military hardware, and massage clinics. ≤ 60% financing and securities underwriting
Thailand	The Foreign Business Act (FBA) of 1999 continues to govern most investment activity by non-Thai nationals. Certain types of business activities are reserved for Thai nationals only. Foreign investment in those businesses must comprise less than 50% of share capital, unless specially permitted or otherwise exempt.	List 1: prohibited sectors Newspaper or radio broadcasting stations, radio and television station, rice farming and growing plantations or crops, livestock farming, forestry and timber processing from a natural forest, fishery in Thai territorial waters and specific economic zones, extraction of Thai medicinal herbs, trading and auctioning of antique objects or objects of historical value from Thailand, making or casting of Buddha images, monk alms bowls, land trading. List 2: Thai nationals or legal persons hold ≥ 40% of the total shares and the number of Thai directors ≥ two-fifths of the total number of director's in sectors: related to national safety, security, affecting arts and culture, tradition, folk handicrafts, or natural resources and the environment such as: the production, sale and maintenance of firearms and armaments, domestic transportation by land, water and air, trading of Thai antiques or art objects, mining, including rock blasting and rock crushing, timber processing for production of furniture and utensils. List 3: Permission from the related department is required for sectors such as: The activities in which there is economic protection for Thai nationals: accounting, legal, architectural, or engineering services, retail and wholesale, advertising businesses, hotels, guided touring, selling of food or beverages.

Table 1. Continued

Country	Laws/Regulations on FDI	Limits on FDI	
Taiwan	Approval requirement for FDI investments below USD1 million threshold. Ex ante approval is required for FDI in restricted industries and those exceeding the threshold.	Restricted	Sectors
		≤ 20%	cable television broadcasting services
		≤ 49.99%	satellite television broadcasting services and piped distribution of natural gas
		≤ 49%	wireless and fixed line telecommunications firms, high-speed rail services
		< 50%	airport ground services firms, air-catering companies, aviation transportation businesses (airlines), and general aviation businesses (commercial helicopters and business jet planes), Taiwan-flagged merchant ships.
		≤ 55%	telecommunications

Table 2. World Bank minority investor protection index (2016)

Markets	Rank	Strength
Panel A: World Top-4 Market and United States		
Hong Kong	1	8.3
New Zealand	1	8.3
Singapore	1	8.3
Malaysia	4	7.8
United Kingdom	4	7.8
United States	35	6.5
Panel B: Other Asian Emerging Markets		
India	8	7.3
South Korea	8	7.3
Taiwan	25	6.7
Thailand	36	6.3
Indonesia	88	5.3
China	134	4.3
Philippines	155	3.8

Note: Data were retrieved from the World Bank report of November 1, 2015. The United States is included in the table for benchmarking. This index measures minority investors' protection from conflicts of interest over a set of indices and shareholders' rights. The Strength is rated from 0–10 (Best) scale, and it is ranked from 1 (Best)–190 among the 190 markets in the world.

such as the United States (35th rank), Japan (36th rank), Germany (49th rank) and Australia (66th rank). In contrast, other emerging markets have a relatively low ranking in the index (see Table 2).

The rest of this paper is structured as follows: the next section provides our hypothesis development, followed by the methodology and data in section 3. Section 4 discusses the empirical results, while section 5 concludes.

2. Hypothesis Development

Theoretically, since 2009 Malaysia has fulfilled the golden rule of the integrated equity market in the literature, where all the investors (foreign and local) are facing a single set of rules and have equal access to the same set of financial instruments as well as enjoy an international level of minority investor protection. With the minimum external barriers to FDI in Malaysia since year 2009, the asset pricing literature that accounts for the non-investible segment, for the pre-2009 data may not be relevant to Malaysia, for example Bekaert et al. (2023) and Carrieri et al. (2013). The International Asset Pricing Model (IAPM) assumes the fully segmented market prohibitive capital inflow should be priced only for local risk. However, for a highly liberalised market that is a nearly fully accessible economy such as Malaysia, it should be only globally priced. However, this study argues that it is not possible for Malaysia to be perfectly integrated into the world market due to the presence of market friction that interferes with the stock market trade and can lead to pricing error. Hence, it does not matter how the regulator accesses the merit of the deregulatory policy in achieving market integration, the market still may violate the law of one price in the first approach of market integration, and thus Malaysia may not be fully integrated into the world market. Consequently, the local market risk should remain significantly priced in Malaysia after 2009. Therefore, using a sample from 2009 to 2016, the hypothesis for our study is local market risk is still significantly priced in Malaysia.

3. Methodology and Data

3.1 International Asset Pricing Model

Our study applies the basic concept of the IAPM from Errunza and Losq (1989) in testing the pricing of risk in the market. This model is the extension of both the domestic and the international setting of the conditional Capital Asset Pricing Model to account for the mild segmentation between markets. This model assumes that the expected returns are a function of two risk factors: exposure to world market risk and exposure to non-diversifiable local market risk. If a market is fully integrated, only the world market`s systematic risk is priced, whereas under complete segmentation, only the local market risk is priced. The models are presented as follows:

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] \quad \forall_m \tag{1}$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \tag{2}$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] + \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \tag{3}$$

where R_{mt} and R_{wt} denote the return of local market and world market in excess of one-month Euro-dollar depository, respectively. We follow Errunza and Losq (1989) and Gérard et al. (2003) in calculating the value of the $Var(residual_{mt})$ to capture the local market non-diversifiable risk that is uncorrelated to global risk.

Equations (1), (2) and (3) consider investor's use of the latest information to make investment decisions that are useful for measuring market integration, where intuitively investors would use all the information at their disposal, including country specific and world information variables. Hence, the global information variables are used to condition the price of world market risk (δ_w), and local information variables are used to estimate the price of local market risk (δ_m). Merton (1980) and Adler and Dumas (1983) stated that the price of world market risk is equal to the world aggregate risk aversion coefficient. Since most investors are risk averse, the price of risk must be positive. Hence, aligned with Gérard et al. (2003), an exponential function is used in this study to model the dynamics. This function is presented as follows:

$$\delta_{w,t-1} = e^{(k_w^{`} Z_{w,t-1})} \tag{4}$$

$$\delta_{m,t-1} = e^{(k_w^{`} Z_{m,t-1})} \tag{5}$$

where $Z_{w,t-1}$ and $Z_{m,t-1}$ are the set of time-varying world and local market information variables, respectively and k is a set of weights that the investor uses to evaluate the conditionally expected returns. If the local risk is priced, the hypothesis that $k_m^{`}$ is jointly equal to zero would be rejected; $k_w^{`}$ is jointly equal to zero if the world market risk is priced. The variables used to condition the prices of domestic risks in the study are correlated with the degree of openness and development of the local stock markets.

Harvey (1991) and De Santis and Gerard (1997) showed that the prices and quantities of risk vary by times, hence we employed a time-varying asset pricing model in the study. As De Santis and Gerard (1997) found that world level shocks had an impact on conditional variances and the covariance of the other assets, we construct our integration index measure by taking into account the volatility spillover effect via the multivariate GARCH model of Bollerslev et al. (1988). The model assumes the variances only depend on past squared residuals and an autoregressive component, while the covariance depends on the past cross product of residuals and an autoregressive component. The multivariate GARCH in mean parameterization warrants the positive definiteness of the covariance matrix while reducing the number of parameters to be estimated. To avoid incorrect inference due to the misspecification of the conditional density of asset returns, it is estimated by the quasi-maximum likelihood (QML) of Bollerslev and Wooldridge (1992), and the estimation is performed using the Berndt-Hall-Hall-Hausman (BHHH) algorithm. Finally, the significance in the prices of the conditional local market risk is examined using the Wald test.

3.2 Instrumental Variables

The world and local market instrumental variables in this study follow Bekaert and Harvey (1995) and Ferson and Harvey (1993). Harvey (1991) concluded that US market variables are good predictors of global returns, so it is suitable for representing the world information. Hence, we use changes in the US default premium, US term

premium, the world dividend and the lagged world excess return to represent the time-varying world market instrument. For the local market instrumental variables, we use the change in bilateral exchange rates to reflect the changes in local inflation expectations, local dividend yield, month-to-month changes in the local risk-free short-term interest rate and the US vs. local market short term rate.

3.3 Data Sources and Sample Selection

We use the excess return with the sample period spanned from January 2009 to September 2016 for Morgan Stanley Capital International (MSCI) world, MSCI Malaysia and other MSCI Asia emerging economies (China, India, Indonesia, Philippines, Korea, Taiwan and Thailand). The time-varying excess return is calculated using monthly return in the excess of the one-month Eurodollar deposit rate. All the data, including the instrumental variables, are obtained from Thomson DataStream. However, there is a challenge in collecting those from Taiwan and Thailand, as some of their data are not available on DataStream. We obtained the Taiwan Treasury bill data from the Interbank Money Center, Taipei Exchange, Treasury Department of CBC. The market turnover rate of Taiwan is not available from any public source, it is hence omitted from the robustness test. On the other hand, we obtain Thailand treasury bill's rate from the Thailand BMA bank. All returns are calculated in percentages.

4. Empirical Results

4.1 Descriptive Statistics

Table 3 shows the list of variables in the mildly-segmentation IAPM. From Table 4, the outcome from the kurtosis shows that the unconditional distribution of excess returns has heavier tails than the normal distribution in the world market. The resulting non-normality condition is also found in the Philippines and Thailand's Jarque–Bera statistics, which uniformly are not significant at the 10% level. The mean of excess returns ranges from the lowest of 0.3% for Malaysia to the highest mean of 1.0% for Indonesia and the Philippines.

4.2 Baseline Results

Our main empirical results from Table 5 show that the time-varying world market risk is significant in the local market at the 1% statistically significant level. The time-varying local market risk is priced for all of the Asian emerging markets at the 1% significant level, except for Thailand. However, there is a need to exercise caution in interpreting the estimation integration measures for Thailand, as there is a negative adjusted R, which indicates weak evidence of correlation with local and world variables. The result for the joint hypothesis test of both world and local market risk in all the markets are similar, which is significant at the 1% level. The constant in all the models is not significant at the 1% level.

Table 3. List of variables in the Mild Segmentation IAPM

Notation	Determinants variable	Data description
m	Local market	Local market refers to Malaysia and other emerging markets in Asia, including China, India, Indonesia, Philippines, South Korea, Taiwan and Thailand.
w	World market	The MSCI World market that includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom and the United States.
$R_{m,t}$	Excess return	Time-varying return of local market in the excess of 1-month Eurodollar deposits rate. The 1-month Eurodollar deposits rate represent the risk free rate.
Independent variables		
$Cov[R_{m,t}, R_{w,t}]$	World market risk	Covariance of time-varying excess return between the local markets and the world market in excess of 1-month Eurodollar deposits rate.
$ar[residual_{m,t}]V$	Local market risk	The local market non-diversifiable risk that is uncorrelated to the world market risk.
World information variables ($Z_{w,t-1}$)		
UDP_{t-1}	U.S. default premium	The lagged yield difference between Moody's Baa-rated and Aaa-rated bonds.
UTP_{t-1}	Changes in the U.S. term premium	The lagged difference between U.S. 10-year Treasury bond and U.S. 3-month Treasury bill.
WDY_{t-1}	World dividend yield	The lagged MSCI World dividend yield in excess of 1-month Eurodollar deposits rate.
WER_{t-1}	Lagged world return	The lagged return of MSCI World in excess of 1-month Eurodollar deposits rate.
Local information variables ($Z_{m,t-1}$)		
$EXC_{m,t-1}$	Change in bilateral exchange rates	The lagged exchange rate for every local market to USD.
$LDY_{m,t-1}$	Local dividend yield	The lagged dividend yield for every local market in excess of 1-month Euro-dollar interest rate.
$LRF_{m,t-1}$	Local risk-free short-term interest rate	The lagged month-to-month changes in every local market's 3-month treasury bill discounted rate.
$ULSR_{m,t-1}$	U.S. vs local market short-term rate	The lagged difference between the US real short-term interest rate and local market real short-term interest rate
Robustness checks		
$TOV_{m,t-1}$	The local stock market turnover ratio	The lagged ratio of local market turnover rate to reflect the level of market`s activeness.

Table 4. Summary statistics for excess returns and instrumental variables

Market	Mean	Median	Max	Min	Std. Dev.	Skew	Kurtosis	Jarque–Bera	P-value
World									
R_{wt}	0.004	0.008	0.109	-0.160	0.045	-1.078	5.042	34.18***	0.000
UDP	0.011	0.010	0.031	0.006	0.005	2.416	9.557	257.081***	0.000
UTP	0.024	0.023	0.037	0.012	0.007	0.243	2.065	4.301	0.116
WDY	0.013	0.015	0.018	-0.007	0.005	-2.497	8.544	204.125***	0.000
WER	0.004	0.008	0.109	-0.160	0.045	-1.078	5.042	34.181***	0.000
Malaysia									
R_{mt}	0.003	0.005	0.111	-0.100	0.032	-0.057	4.234	5.96*	0.051
EXC	-0.002	0.001	0.047	-0.075	0.023	-0.382	3.513	3.277	0.194
LDY	0.033	0.030	0.065	0.013	0.015	0.541	1.980	8.560**	0.014
LRF	0.000	0.000	0.005	-0.006	0.001	-0.607	8.822	137.078***	0.000
ULSR	-0.006	-0.006	0.015	-0.043	0.012	-0.933	4.297	20.027***	0.000
TOV	0.293	0.284	0.435	0.265	0.026	2.282	12.436	384.511***	0.000
China									
R_{mt}	0.001	0.014	0.180	-0.166	0.066	-0.405	3.397	3.16	0.206
EXC	0.000	0.000	0.031	-0.011	0.005	2.754	15.304	704.145***	0.000
LDY	0.022	0.024	0.038	0.007	0.008	-0.187	2.151	3.337	0.189
LRF	0.000	0.000	0.028	-0.016	0.006	0.906	7.404	87.874***	0.000
ULSR	-0.013	-0.016	0.028	-0.049	0.018	0.427	2.613	3.406	0.182
TOV	2.329	1.992	4.803	1.360	1.045	1.793	4.713	55.263***	0.000
India									
R_{mt}	0.008	0.011	0.239	-0.150	0.059	0.625	5.305	26.64***	0.000
EXC	0.004	0.003	0.062	-0.042	0.020	0.417	3.497	3.654	0.161
LDY	0.004	0.003	0.013	-0.003	0.004	0.338	2.628	1.390	0.499
LRF	0.000	0.000	0.025	-0.017	0.005	1.277	12.484	373.831***	0.000
ULSR	-0.005	-0.008	0.034	-0.052	0.022	0.025	1.981	2.470	0.291
TOV	0.582	0.509	0.835	0.469	0.128	0.891	2.492	12.027**	0.002
Indonesia									
R_{mt}	0.010	0.011	0.191	-0.163	0.056	-0.146	4.123	5.22*	0.074
EXC	0.000	0.000	0.000	0.000	0.000	-0.045	4.261	6.197**	0.045
LDY	0.011	0.011	0.036	-0.004	0.008	1.027	4.805	23.983***	0.000
LRF	0.000	0.000	0.014	-0.009	0.003	0.978	6.300	57.010***	0.000
ULSR	-0.017	-0.017	0.029	-0.057	0.023	0.059	1.931	4.486	0.106
TOV	0.270	0.270	0.401	0.212	0.063	1.028	3.076	14.825***	0.001

Table 4. Continued

Market	Mean	Median	Max	Min	Std. Dev.	Skew	Kurtosis	Jarque–Bera	P-value
Korea									
R_{mt}	0.003	0.008	0.121	-0.239	0.054	-0.910	6.008	47.901***	0.000
EXC	-0.001	-0.003	0.112	-0.098	0.034	0.627	5.378	28.011***	0.000
LDY	0.002	0.003	0.004	-0.004	0.002	-1.974	7.349	133.668***	0.000
LRF	0.000	0.000	0.002	-0.003	0.001	-0.572	5.335	26.203***	0.000
ULSR	-0.005	-0.007	0.019	-0.018	0.009	0.613	2.561	6.567**	0.037
TOV	1.490	1.493	2.020	1.059	0.353	0.286	1.735	6.748**	0.034
Philippines									
R_{mt}	0.010	0.007	0.114	-0.149	0.046	-0.173	3.704	2.38	0.304
EXC	0.000	0.001	0.063	-0.030	0.015	0.722	4.966	23.055***	0.000
LDY	-0.003	-0.002	-0.002	-0.005	0.001	-1.049	2.875	11.964***	0.003
LRF	0.000	0.000	0.012	-0.021	0.004	-1.252	8.515	142.131***	0.000
ULSR	0.007	0.005	0.044	-0.037	0.017	-0.185	2.591	1.178	0.555
TOV	0.165	0.161	0.205	0.141	0.018	1.204	3.864	22.898***	0.000
Taiwan									
R_{mt}	0.004	0.009	0.137	-0.172	0.055	-0.288	3.598	2.68	0.263
EXC	0.000	0.000	0.044	-0.029	0.014	0.488	4.018	7.714**	0.021
LDY	0.028	0.024	0.177	-0.007	0.030	3.146	14.993	710.735***	0.000
LRF	0.000	0.000	0.002	-0.003	0.001	-0.517	24.390	1777.046***	0.000
ULSR	0.004	0.006	0.028	-0.024	0.011	-0.405	2.957	2.547	0.280
TOV	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thailand									
R_{mt}	0.008	0.011	0.195	-0.160	0.056	0.138	3.833	2.99	0.225
EXC	0.001	0.002	0.072	-0.073	0.015	-0.422	13.166	403.222***	0.000
LDY	0.021	0.022	0.022	0.015	0.002	-1.562	5.385	26.396***	0.000
LRF	0.000	0.000	0.020	-0.004	0.002	6.308	54.498	10893.630***	0.000
ULSR	-0.003	-0.003	0.030	-0.053	0.017	-0.449	3.254	3.378	0.185
TOV	0.774	0.778	0.987	0.613	0.107	0.620	3.091	5.418*	0.067

Table 5. Estimated price of risk

Equations:

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] \quad \forall_m \qquad (1)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (2)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] + \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (3)$$

$$\delta_{w,t-1} = e^{(k_w^{`} Z_{w,t-1})} \quad (4); \qquad \delta_{m,t-1} = e^{(k_w^{`} Z_{m,t-1})} \quad (5)$$

	(i) Price of world market risk ($H_0 : k_w^{`} = 0$)			(ii) Price of local market risk ($H_0 : k_m^{`} = 0$)			(iii) Price of world market risk and Price of local market risk ($H_0 : k_w^{`} = 0$ and $H_0 : k_m^{`} = 0$)		
	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2
Panel A: Highly Liberalised Emerging Market in Asia									
Malaysia	F:37.11984	0.000		F:9.900	0.000		F:14.568	0.000	
	χ^2:148.497	0.000	0.178	χ^2:39.601	0.000	0.286	χ^2:116.547	0.000	0.344
Panel B: Other Emerging Markets in Asia									
China	F:16.016	0.000		F:3.077	0.016		F:8.615	0.000	
	χ^2:64.065	0.000	0.104	χ^2:12.308	0.012	-0.010	χ^2:68.919	0.000	0.082
	F:31.8712	0.000		F:18.788	0.000		F:36.628	0.000	
	χ^2:127.485	0.000	0.178	χ^2:75.153	0.000	0.075	χ^2:293.026	0.000	0.332
India	F:35.864	0.000		F:9.590	0.000		F:14.914	0.000	
	χ^2:143.457	0.000	0.179	χ^2:47.948	0.000	0.303	χ^2:134.223	0.000	0.035
Indonesia	F:27.190	0.000		F:143.733	0.000		F:45.743	0.000	
	χ^2:108.759	0.000	0.107	χ^2:574.930	0.000	0.070	χ^2:365.940	0.000	0.134
Korea	F:32.279	0.000		F:47.369	0.000		F:21.32	0.000	
	χ^2:129.118	0.000	0.192	χ^2:189.477	0.000	0.115	χ^2:170.585	0.000	0.201

Table 5. Continued

Equations:

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] \quad \forall_m \qquad (1)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (2)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] + \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (3)$$

$$\delta_{w,t-1} = e^{(k_w^{`} z_{w,t-1})} \quad (4); \qquad \delta_{m,t-1} = e^{(k_w^{`} z_{m,t-1})} \quad (5)$$

	(i) Price of world market risk ($H_0 : k_w^{`} = 0$)			(ii) Price of local market risk ($H_0 : k_m^{`} = 0$)			(iii) Price of world market risk and Price of local market risk ($H_0 : k_w^{`} = 0$ and $H_0 : k_m^{`} = 0$)		
	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2
Philippines	F:23.167	0.000		F:28.849	0.000		F:11.687	0.000	
	χ^2:92.669	0.000	0.147	χ^2:115.400	0.000	0.127	χ^2:93.492	0.000	0.147
Thailand	F:33.170	0.000		F:1.532	0.214		F:14.193	0.000	
	χ^2:132.680	0.000	0.159	χ^2:6.126	0.190	-0.048	χ^2:113.541	0.000	0.114

Note: The table reports Wald statistics, P-values and adjusted R^2. Local market turnover rate is included in the model as an extra control variable. P-values are based on a χ^2 distribution with degrees of freedom (df) equal to the number of regressors. HAC standard errors and covariance that are robust to heteroscedasticity and serial correlation are used in all the estimations.

4.3 Robustness Tests

This study expands Equation (3) to include the turnover ratio in every local market as the first robustness checks. The value trade to GDP ratio is interrelated to the dimensions of the economy. The turnover ratio complements the ratio of value traded to GDP as it is linked to the size of the market (Rodriguez & Rodrik, 2000). Next, the local market turnover (TOV) variables are included in our robustness test to capture the liquidity of the equity market. The estimated result of this robustness test is presented in Table 6.

The price of local market risk is highly significant at the 1% statistical level in all of the samples. The turnover rate has a significant impact on Thailand's local risk pricing. The price of Thailand's local market risk has changed from being not significant to highly significant at the 1% level, as shown in Table 6. Furthermore, the Adj-R2 for Thailand has changed from a negative value to a positive value, suggesting that the model in the robustness check is a better model for explaining Thailand's local market risk pricing, while for the case of China, the price of local market risk declined significantly from the 5% level of the initial model to the 10% level in the robustness test. However, the conclusion of the pricing of local risk in China must be taken with caution due to the MSCI China index excluding the A-shares market. The MSCI index of China cannot fully represent the actual situation of local market risk pricing in China, as it only comprises the B-share market, which restricts FDI.

5. Conclusion

In the context of asset pricing, an integrated market is desirable. A fully integrated market has zero pricing of local market risk, and only world market risk pricing matters; a mildly segmented market has both world and local market risk pricing. We revisit the definition of "integrated market" and address inconsistencies found in previous literature. Past studies typically treated developed markets as integrated markets and all emerging markets as mildly segmented markets.

Based on monthly market indices from 2009 to 2016, we tested whether Malaysia, identified as a highly liberalised emerging equity market, is still subject to local market risk pricing. We also conducted similar tests on six other Asian emerging markets, including China, India, Indonesia, the Philippines, South Korea and Thailand. In summary, our results do not provide evidence that Malaysia is more integrated than other Asian emerging markets. We conclude that local market risk is still significantly priced in Malaysia. This result supports our argument that, even though Malaysia has fulfilled the golden rule of an integrated market since 2009, the presence of market frictions that interfere with stock market trade means that it does not matter how the regulator assesses the merit of deregulatory policy; the Malaysian stock market still violates the law of one price. Consequently, Malaysia has not yet fully integrated into the world market.

The results of this study provide further support for the claims made by Bekaert and Harvey (2023) and Carrieri et al. (2013), suggesting that all Asian emerging markets are not yet fully integrated into the world market. These findings also support the argument presented in this study that there exist implicit barriers affecting the level of integration in Malaysia.

Table 6. Robustness tests for estimated price of risk

Equations:

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1} Cov[R_{mt}, R_{wt}|\Omega_{t-1}] \quad \forall_m \qquad (1)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{m,t-1} Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (2)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1} Cov[R_{mt}, R_{wt}|\Omega_{t-1}] + \delta_{m,t-1} Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (3)$$

$$\delta_{w,t-1} = e^{(k_w' z_{w,t-1})} \quad (4); \qquad \delta_{m,t-1} = e^{(k_w' z_{m,t-1})} \quad (5)$$

	(i) Price of world market risk ($H_0 : k_w' = 0$)			(ii) Price of local market risk ($H_0 : k_m' = 0$)			(iii) Price of world market risk and Price of local market risk ($H_0 : k_w' = 0$ and $H_0 : k_m' = 0$)		
	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2
Panel A: Highly Liberalised Emerging Market in Asia									
Malaysia	F:37.11984	0.000		F:8.277	0.000		F:9.970	0.000	
	χ^2:148.497	0.000	0.178	χ^2:41.385	0.000	0.300	χ^2:89.734	0.000	0.397
Panel B: Other Emerging Markets in Asia									
China	F:16.016	0.000		F:2.197	0.094		F:6.906	0.000	
	χ^2:64.065	0.000	0.104	χ^2:10.980	0.084	-0.028	χ^2:62.156	0.000	0.062
India	31.8712	0.000		F:13.044	0.000		F:26.106	0.000	
	χ^2:127.485	0.000	0.178	χ^2:65.222	0.000	0.048	χ^2:234.950	0.000	0.302
Indonesia	F:35.864	0.000		F:9.590	0.000		F:14.914	0.000	
	χ^2:143.457	0.000	0.179	χ^2:47.948	0.000	0.030	χ^2:134.223	0.000	0.035
Korea	F:32.279	0.000		F:34.784	0.000		F:19.606	0.000	
	χ^2:129.118	0.000	0.192	χ^2:173.921	0.000	0.103	χ^2:176.454	0.000	0.205

Table 6. Continued

Equations:

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] \quad \forall_m \qquad (1)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (2)$$

$$E[R_{mt}|\Omega_{t-1}] = \delta_{w,t-1}Cov[R_{mt},R_{wt}|\Omega_{t-1}] + \delta_{m,t-1}Var[residual_{mt}|\Omega_{t-1}] \quad \forall_m \qquad (3)$$

$$\delta_{w,t-1} = e^{(k_w^{`} Z_{w,t-1})} \quad (4); \qquad \delta_{m,t-1} = e^{(k_w^{`} Z_{m,t-1})} \quad (5)$$

	(i) Price of world market risk ($H_0 : k_w^{`} = 0$)			(ii) Price of local market risk ($H_0 : k_m^{`} = 0$)			(iii) Price of world market risk and Price of local market risk ($H_0 : k_w^{`} = 0$ and $H_0 : k_m^{`} = 0$)		
	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2	Wald Test	P-value	Adj-R^2
Philippines	F:27.190	0.000		F:71.150	0.000		F:16.938	0.000	
	χ^2:108.759	0.000	0.107	χ^2:355.751	0.000	0.042	χ^2:152.440	0.000	0.136
Thailand	F:35.215	0.000		F:18.450	0.000		F:21.404	0.000	
	χ^2:140.860	0.000	0.163	χ^2:73.799	0.000	0.065	χ^2:192.634	0.000	0.241

Note: The table reports Wald statistics, P-values and adjusted R^2. Local market turnover rate is included in the model as an extra control variable. P-values are based on a χ^2 distribution with degrees of freedom (df) equal to the number of regressors. HAC standard errors and covariance that are robust to heteroscedasticity and serial correlation are used in all the estimations.

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