

An overview of Asian equity markets

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This study overviews the development of 11 Asian equity markets, namely, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand. Prior to the onset of the global financial crisis, the Asian stock exchanges were generally bullish, underpinned particularly by China's robust economic performance. Innovations in financial products and services have been growing in importance, as stock exchanges in these countries have been making a concerted effort to introduce new features and best practices, with the objectives of raising market efficiency, enhancing service quality, and generally bringing operations up to par with international standards. But the potential to realize or support market efficiency can only be possible within an adequate legal framework, a sound market infrastructure, and appropriate corporate governance mechanisms. Thus, many challenges are still to be overcome in the region.

Introduction

This paper provides an overview of 11 Asian equity markets, namely, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand, to see how they have responded to the substantial changes in the investment scene in Asia over the past decade. Today, investment activities are not constrained by national boundaries, and all Asian markets are clearly much more closely integrated into the international financial system, although not perfectly integrated due to particular national factors.

As international capital seeks its most efficient outlets, China and India have emerged as the hot spots for global investing. Foreign interest in both countries is likely to be sustained as a result of their rise to the status of economic powerhouses. To give further

impetus to the development of Asian markets, regional integration of capital markets has evolved to facilitate cross-border capital flows and to avoid being marginalised in the face of growing competition and rapid consolidation among global exchanges. Although financial integration is still in its early stages, the potential benefits of scale, capacity, and liquidity are being delivered by the regional integration of stock exchanges, thus creating a conducive environment for effective competition in global markets. However, a sustained effort towards deeper collaboration among the countries is a necessary step towards full-fledged regional financial integration, as there remains room for greater progress to be made with respect to regulations, practices, products, intermediaries, capital controls, and regional infrastructure.

Given Asia's growing participation in international financial markets, there will be more

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opportunities for growth but greater vulnerability to external shocks and market volatility. While Asian equity markets are not immune from global financial turbulence, the region has considerable growth momentum commensurate with its rising economic weight in the global economy. Although the region was hit extremely hard during the recent global financial crisis, it has rebounded fast. According to the IMF, Asia's economic landscape has changed significantly as the world economy slowly recovers from the global financial crisis. Throughout the region, industrial production has rebounded, financial pressures have eased, consumer and business sentiment has largely improved, and strong fundamentals have again come to the fore. In addition, inflows of syndicated loans, equity market inflows, and external equity and bond issues by emerging Asian economies have returned to pre-crisis levels. Together, they have contributed to a strong rebound in the region's equity markets (IMF 2008). Thus, despite optimism being dampened by the recent crisis, investor sentiment about the long-term prospects for Asia remains positive.

Since Asian equity markets have undergone profound changes during the past decade, this paper documents and analyses these changes so that readers have a better understanding of the recent developments in the region's equity markets. In the second section, whenever applicable, the New York Stock Exchange (NYSE) and the World Federation of Exchanges are used as benchmarks to gauge the performance of Asian markets. Market performance is discussed in terms of market size and market development, new investment funding, market concentration, trading volume and liquidity, price earnings (P/E) ratios, price book value (P/B) ratios, and gross dividend yield, listing requirements and

listing costs, brokerage fees and other transaction costs, and trading hours and trading days. The discussion is inspired by Rhee and Chang's (1992) study that focused on the micro-structure of Asian equity markets. The third section describes the latest innovations in Asian equity markets with respect to equity derivatives, repo markets, margin trading, international cross-listings, and financial integration. The fourth section concludes.

Profiles of 11 Asian equity markets

Market size and market development

As of December 2007, there were 14,760 firms listed on the stock exchanges of the 11 Asian countries. Together, they accounted for 31.7 per cent of all listed firms in the world.¹ Of the 11 Asian exchanges, only seven allowed foreign firms to list. Singapore, by far, attracts more foreign listings than its Asian counterparts. Foreign firms account for 38 per cent of all listed firms in Singapore, followed by Japan with one per cent, and less than one per cent for the remaining five countries. This contrasts with the NYSE Group's 18.3 per cent. Interest in Singapore as an Asian listings platform arises partly out of its advantageous location, which functions as a spring board to the developed markets of the west and markets within the Asia Pacific region, and partly because of its political and financial stability, low corruption, pro-business policies, tax-friendly framework, well-established legal systems, market transparency, and efficiency.

As of January 2008, a total of 138 out of 292 (47.3 per cent; numbers not reported in Table 1) foreign companies listed on the Singapore Exchange (SGX) were from China.² Foreign

- 1 The world figure of 46,509 listed firms is based on information from the World Federation of Exchanges (WFE). All world rankings are based on data collected by WFE for the 53 regulated exchanges in the world.
- 2 The attractiveness of SGX to Chinese companies from Mainland China arises from a combination of three reasons. First, the Memoranda of Understanding the SGX has signed with provincial and municipal authorities in China are reaping results. Second, the strong growth of the Chinese economy, the implementation of financial reforms in China, and the surge in capital-raising activities for growth companies in China have generated interest in the SGX as an international listing venue for their capital-raising needs, which has been fostered by the road shows and investment forums organized in China by the SGX. Finally, as Ngiam (2006) pointed out, the prelisting period for SGX is about one-quarter that for listing in China.

Table 1
Number of listed firms and market capitalisation (as of December 2007)

Country	Number of listed firms			Rank	Total domestic market capitalisation (US\$ billion)	Rank	Ratio of market capitalisation to GDP (%)
	Domestic	Foreign	Total				
China(SSE)	860	0	860	16	3,694.3 (23.6%)	6	113.6
Hong Kong	1,232	9	1,241	11	2,654.4 (16.9%)	7	1,284.1
India (BSE)	4,887	0	4,887	1	1,819.1 (11.6%)	10	165.5
Indonesia	383	0	383	28	211.7 (1.40%)	33	48.9
Japan (TSE)	2,389	25	2,414	6	4,330.9 (27.7%)	2	98.8
Korea	1,755	2	1,757	9	1,122.6 (7.20%)	17	117.3
Malaysia	983	3	986	13	325.3 (2.00%)	25	174.4
Philippines	242	2	244	39	103.0 (0.70%)	40	71.5
Singapore	472	290	762	18	539.2 (3.40%)	22	334.2
Taiwan	698	5	703	19	663.7 (4.20%)	21	173.2
Thailand	523	0	523	23	197.1 (1.30%)	35	80.2
Total	14,424	336	14,760		15,661.3 (100%)		
USA (NYSE)	1,876	421	2,297	7	15,650.8	1	113.1
World			46,509		60,874.4		

SSE = Shanghai Stock Exchange, BSE = Bombay Stock Exchange, TSE = Tokyo Stock Exchange; NYSE = New York Stock Exchange.

Sources: World Federation of Exchanges and International Monetary Fund.

firms do not seem to have a preference for listing on the Tokyo Stock Exchange (TSE), the world's second largest equity market. One reason is that a decade in the deflation doldrums and depressed trading prompted many foreign firms to leave the Japanese market. Besides, disclosure problems caused by the uniqueness of Japanese accounting standards and the emergence of the International Financial Reporting Standards (IFRS), high legal fees, more stringent listing standards of the TSE as compared with the NYSE, and the lack of interest in foreign stocks by Japanese investors, have made the TSE less popular among foreign companies (Misawa 2005; CFO Asia 2006).

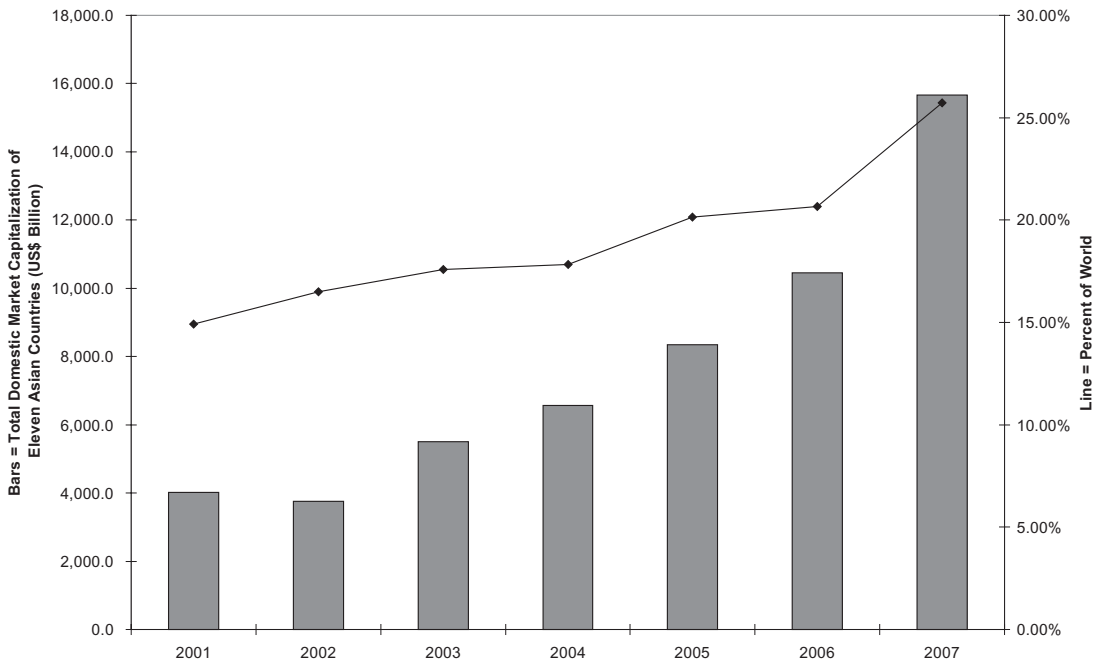
Table 1 also shows that nine of the 11 Asian stock markets ranked among the top 25 markets in the world in terms of the number of listed companies. The combined market

capitalisation of all 11 exchanges amounted to US\$15.66 trillion, 25.7 per cent of the world's market capitalisation as at the end of 2007 (see Figure 1). In contrast, the NYSE Group alone accounted for 25.7 per cent of global market capitalisation. Figure 1 also shows that the stock market capitalisation of the 11 Asian countries has been growing rapidly.

Another indicator of stock market development is the ratio of market capitalisation to GDP. The ratio ranges from Hong Kong's 1,284.1 per cent and Singapore's 334.2 per cent, to less than 100 per cent for Japan and 48.9 per cent for Indonesia. The ratios for Hong Kong, Singapore, Malaysia, Taiwan, India, Korea, and China are all greater than 100 per cent, which indicates the large amount of money, both domestic and foreign, that has been invested in the stock markets in these countries.³⁻⁶

3 Currently, there are six independent exchanges in Japan: two in Tokyo and the remainder in Osaka, Nagoya, Fukuoka, and Sapporo. In Table 1, Japan (TSE) represents the Tokyo Stock Exchange, the largest of the six in Japan. It had 85 per cent of all listed companies in Japan, 88.9 per cent of the trading value, and 99 per cent of the market value as of the end of 2007.

Figure 1
Asian markets' share of world market capitalisation (2001–07)



Source: World Federation of Exchanges.

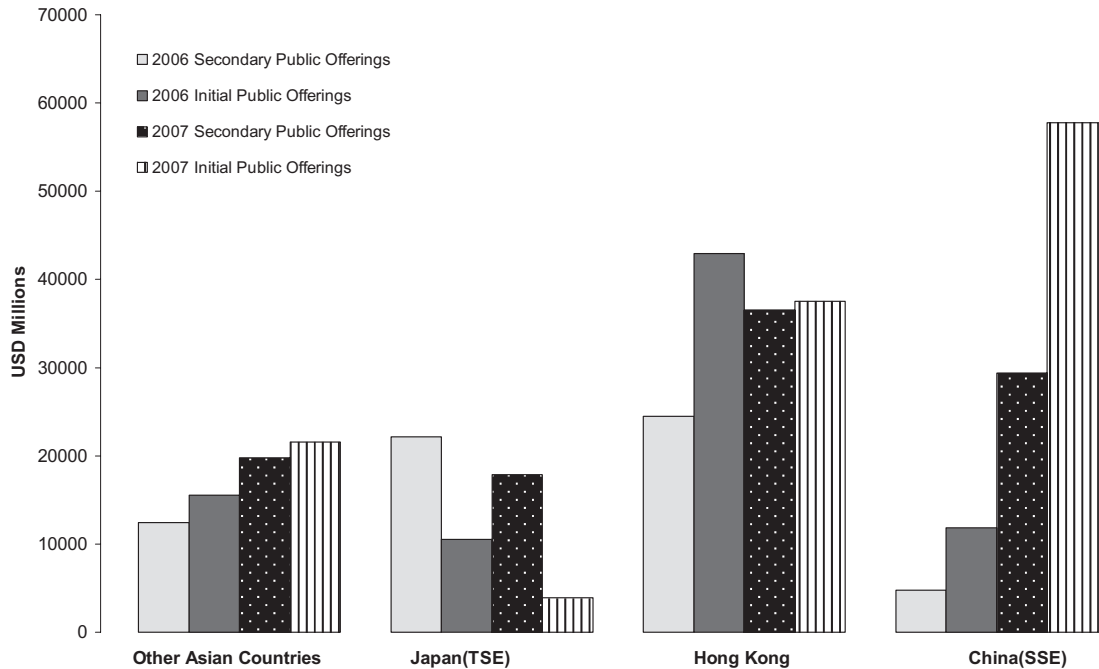
New capital raised by Asian equity markets in 2006 and 2007

Figure 2 shows new equity capital raised by firms in the Asian countries in 2006 and 2007. China and Hong Kong stand apart from all others in their fund-raising activities. In recent years, Hong Kong's role as the fund-raising platform for mainland enterprises has

been remarkable. The year 2006 was a bumper year for Hong Kong, with IPOs (initial public offerings) of Mainland stocks accounting for 88.2 per cent of the total amount of US\$43 billion raised through IPOs during the year, surpassing New York to become the world's second-largest IPO market after London [Securities and Futures Commission (SFC) of Hong Kong 2007].⁷ Hong Kong also provides

- 4 India has 22 recognized stock exchanges operating under government regulations. In Table 1, India (BSE) is the Stock Exchange in Mumbai, popularly known as the BSE (Bombay Stock Exchange). Another premier stock exchange in India is the National Stock Exchange (NSE). Together, they account for most of the country's trading volumes.
- 5 There are two exchanges in China: Shanghai and Shenzhen. In Table 1, China (SSE) is the Shanghai Stock Exchange, which had 56.2 per cent of all listed companies, 65.9 per cent of the trading value, and 82.5 per cent of the market value in China as at the end of December 2007.
- 6 The Indonesia Stock Exchange (IDX) was formed by the merger of the Jakarta and Surabaya exchanges. Full operation of IDX began in January 2008.
- 7 The spectacular performance of Hong Kong in 2006 was attributed to mainland enterprises' strong appetite for funds, the weak performance of Chinese stock markets, which halved in value between 2001 and 2005 (Lau 2007), the absence of a significant institutional investor base, the limited amount of funds that could be raised in the Chinese stock markets, and the high volatility of the markets that made executing substantial fund-raising activities in China difficult. As a result, large and high-quality mainland enterprises preferred to list overseas (IFC, World Bank Group 2002), and Hong Kong became the first choice for Chinese issuers, given its ongoing financial integration with the mainland, world-class infrastructure, strong legal system, efficient and transparent market, and geographical proximity and cultural affinity with the mainland (IMF 2007).

Figure 2
New capital raised by secondary public offerings and initial public offerings in 2006 and 2007



Sources: World Federation of Exchanges and website of the Tokyo Stock Exchange.

favourable conditions for fund-raising through secondary public offerings, but in recent years, the majority had been raised by non-Mainland companies (Arculli 2006). As the Chinese authorities launched a structural reform program in 2005 to improve market liquidity and transparency, large overhangs of non-tradable shares have been transformed to tradable shares.⁸ The use of incentives to give a high priority to reform-compliant firms that needed to raise capital, combined with the fact that numerous large profitable Chinese companies were directed by the Chinese government to list locally as a means of enhancing the profile of the domestic capital markets (Yi 2008), meant that these Chinese

companies raised a total of US\$87 billion in 2007 through both secondary public offerings and IPOs.

Market concentration, trading volume, and liquidity

Table 2 uses market concentration, trading volume, and turnover ratio to capture stock market trading intensity, or momentum, to gain an insight into the prevailing market sentiment in the Asian stock markets. The 5 per cent market value shows the share of domestic market capitalisation accounted for by 5 per cent of the most heavily capitalised domestic companies; the 5 per cent trading value repre-

8 Nontradable shares entitle the holders to the same voting and cash flow rights assigned to the tradable shareholders. However, the shares cannot be traded publicly even if the firm is listed.

Table 2
Market concentration, trading volume, and turnover ratio (as of December 2007)

Country	5% Market value (%)	Rank	5% Trading value (%)	Rank	Trading volume of domestic shares (US\$ billion)	Rank	Ratio of trading value to market capitalisation (%)	Rank
China (SSE)	73.6	10	31.6	48	4,028.6 (24.0%)	6	109.0	17
Hong Kong	74.4	9	70.3	17	2,129.8 (12.7%)	10	80.2	22
India (BSE)	87.0	2	64.9	21	343.8 (2.1%)	23	18.9	42
Indonesia	66.0	22	65.8	20	114.6 (0.7%)	33	54.1	28
Japan (TSE)	62.1	28	61.9	26	6,409.9 (38.3%)	3	148.0	11
Korea	81.8	5	70.7	16	2,005.3 (12.0%)	12	178.6	6
Malaysia	69.3	15	48.9	41	166.5 (1.0%)	27	51.2	30
Philippines	55.1	40	49.1	40	29.2 (0.2%)	40	28.3	40
Singapore	43.5	47	34.4	46	381.3 (2.3%) ^a	22	70.7	25
Taiwan	60.6	30	39.9	45	1,007.2 (6.0%)	17	151.8	10
Thailand	67.6	19	59.0	28	117.9 (0.7%)	32	59.8	26
Total					16,734.1 (100.0%)			
USA (NYSE)	57.2	37	26.4	51	27,293.1	1	174.4	7
World					89,925.5 ^b		147.7	

SSE = Shanghai Stock Exchange, BSE = Bombay Stock Exchange, TSE = Tokyo Stock Exchange; NYSE = New York Stock Exchange.

^a Figure includes both trading volumes of domestic and foreign companies.

^b In this figure, American Stock Exchange and Singapore Exchange include both trading volumes of domestic and foreign companies.
Source: World Federation of Exchanges.

sents 5 per cent of the most traded domestic shares compared with share trading value; and the turnover ratio gives the total value of shares traded in relation to the market capitalisation. Table 2 shows that India, Korea, Hong Kong, China, Malaysia, and Thailand were among the top 20 most concentrated stock markets in the world in terms of market value. Trading activities in Korea and Hong Kong were centered on a few listed companies, with 88 out of 1,755 domestic firms (from Table 1) accounting for 70.7 per cent of the trading value in Korea, followed by Hong Kong with 62 out of 1,232 domestic firms accounting for 70.3 per cent of the trading value. Liquidity, which is measured by the turnover ratio, exhibits a negative correlation with market concentration for India, Singapore, Taiwan, and Japan. The lowest turnover ratio of 18.9 per cent for India can be attributed to the high proportion of untraded companies listed on the BSE.

Overall, Table 2 shows that most Asian stock markets are characterised by high market concentration with moderately high to moderate liquidity. Schmiedel (2001) argues that market concentration and market quality are positively correlated with market efficiency; Mala and White (2006), on the other hand, find that high concentration is not desirable as it can adversely affect liquidity. If liquidity is important for economic growth, liberalisation policies, and the level of global integration (Jun et al. 2003), then the question arises as to the attractiveness of the Asian stock markets for institutional investors, since they are reluctant to invest in less liquid markets. Our explanation is that although stock markets dominated by a few large companies provide fewer opportunities for risk diversification and active portfolio strategies, the sheer market capitalisation of the more than \$15 trillion of the Asian stock markets bestows on the investing public the ability to mobilise capital and diversify risk on a region-wide basis. Besides, moderate levels of trading activities in some countries may be attributed to a buy-and-hold strategy rather than a speculative strategy being pursued by investors in the region. However, each Asian country does need to strengthen its institutional framework to broaden its investor base,

as this is a key resource for a vibrant equity market.

Price earnings (P/E) ratio, price book (P/B) value ratio, and gross dividend yield

As shown in Table 3, China and India with P/E ratios of 59.2 and 29.1, respectively, had much higher multiples than their Asian counterparts. Interestingly, they also reported the lowest dividend yields. In stark contrast, Thailand had the lowest P/E ratio, accompanied by the second highest dividend yield. In general, high P/E and P/B ratios suggest that the market expects higher earnings growth in the future, and views the corporations and their growth prospects more favourably than indicated by their present net asset values. If this rationale holds, then, when faced with a larger investment opportunity set and an increasing reinvestment rate stemming from solid economic growth, China and India would need to reduce dividend payouts to increase their plow-back rates so that profitability will go up steadily. This may explain their high P/Es and P/Bs and low dividend yields observed in 2007. However, unless corporate managers can provide sharply higher real growth in earnings, dividends are the main source of the real return investors expect from stocks. In practice, high dividend yield stocks generally outperform those with lower yields and high dividend yield stocks that possess one or more value characteristics, such as low P/E ratios and/or low P/B ratios produce the best returns. For this reason, stocks in Taiwan and Thailand hold the most promise of higher returns for investors.

Listing requirements, initial listing fees, and annual listing fees

On average, Hong Kong, Japan, and Singapore have tougher listing standards and higher listing fees than the other countries. They also enjoy the prestige of being among the leading stock exchanges in the region. Nevertheless, the empirical evidence on the effects of listing requirements and fees on the attractiveness of

Table 3
Price earnings ratios (P/E), price book value ratios (P/BV), and gross dividend yields (%)
(as of December 2007)

Country	P/E ratio (times)	P/BV ratio (times)	Gross dividend yield (%)
China	59.2	6.26	0.3
Hong Kong	22.5	2.81	2.2
India	29.1	7.90	0.7
Indonesia	16.9	5.57	1.9
Japan	28.3	1.30	1.4
Korea	16.8	2.18	1.4
Malaysia	18.1	2.51	2.7
Philippines	15.5	2.76	2.6
Singapore	18.0	2.19 ^a	2.9
Taiwan	15.3	2.56	4.2
Thailand	12.6	2.46	3.3
USA ^b	16.8	2.70	1.8

^a The P/BV ratio for Singapore is as at end-December 2006.

^b Calculations are based on the Russell 3000 Index.

Sources: World Federation of Exchanges, Fact Books published by various stock exchanges for the year 2007, International Monetary Fund's 'Global Financial Stability Report, April 2008', and website of Russell Investments.

stock exchanges is mixed. Strict listing requirements and high fees can be an obstacle for an IPO (Ritter 1987). Probably due to the high standards, high-growth firms have a strong preference for being listed on the second board where the listing thresholds are less stringent. High minimum standards for market capitalisation, number of shareholders, etc., have a positive effect on liquidity, and more liquid markets with lower trading costs may attract foreign listings (Pagano et al. 2001), yet other exchange compliance rules such as accounting and disclosure standards and tougher governance practices are generally viewed as a cost that may deter foreign listings (Biddle and Saudagaran 1989; Saudagaran and Biddle 1992; Bancel and Mittoo 2001; Pagano et al. 2002; Licht 2003a; Zingales 2007).

Some researchers argue that while listing on an exchange that imposes tighter governance and disclosure standards increases the costs for firms, the higher standards can improve the quality of corporate governance and information dissemination, thereby attracting investors, investment funding, visibility, and growth of the shareholder base (Coffee 1999; Reese and Weisbach 2002). Theoretical and

empirical examination of initial listing decisions by Foucault and Parlour (2004) and Corwin and Harris (2001) suggest that large IPOs will list on an exchange with higher listing fees and lower trading costs. Higher listing fees reflect a premium that firms pay to list on a higher quality market (Easley and O'Hara 2007). Others assert that listing firms consider multiple factors when choosing an exchange. Listing decisions may be influenced by geographical and cultural proximity, alternative trading venues, and product market considerations (Saudagaran 1988; Portes et al. 2001; Pagano et al. 2002; Parlour and Seppi 2003).

Estimated brokerage fees and other transaction costs

Table 4 summarises estimated brokerage fees and other transaction costs for the stock exchanges covered, assuming a total investment of US\$10,000. Estimated costs include stamp duties, transaction levies, trading fees, transfer fees, clearing fees, registration fees, and value added taxes (VAT). Since commission rates in Hong Kong, Japan, Singapore, and

Table 4
Estimated brokerage fees and other transaction costs in 2007–08 (US\$)

Country	For investment of US\$10,000
China (SSE) ^a	45.00
Hong Kong	11.22
India (BSE) ^b	262.50
Indonesia	1,110.00
Japan (TSE)	Negotiable
Korea ^c	30.00–50.00
Malaysia	73.91
Philippines	3,629.41
Singapore	704.00
Taiwan	14.25
Thailand ^d	725.00
USA (NYSE)	Negotiable

SSE = Shanghai Stock Exchange, BSE = Bombay Stock Exchange, TSE = Tokyo Stock Exchange; NYSE = New York Stock Exchange.

^a Fees are calculated for B shares.

^b Fees are calculated for shares in demat form.

^c The commission rates determined by securities companies in Korea range between 0.3 and 0.5 per cent of the total transaction value.

^d From 2012 brokerage fees will be fully negotiable in Thailand.

Sources: NOMURA's 'Global Market Guide, 2008 Edition' and the website of the Korea Securities Dealers Association.

the USA are negotiable between brokers and clients, or brokerage houses determine their own rates, these costs are omitted from the estimates for these countries. Therefore, the estimates for these countries show the lower-bound estimates of the fees paid by the buy-side investors. Overall, investors in Asian stock exchanges enjoy relatively low transaction costs with the exception of Philippines, where close to two-thirds of the investment value is used to shoulder part of the costs of the operation of various regulatory bodies. This may partially explain Philippines' second lowest market turnover among the Asian stock exchanges.

Trading hours and trading days

The comparison between trading hours in 2000 and 2008 in Table 5 shows that most Asian

stock exchanges have lengthened their trading hours since 2000. The increasing institutionalisation of security holdings, the progress in communications and computer technology, the development of electronic trading facilities and cross-border cooperation of trading systems, the proliferation of online brokerage firms, and the increase in cross-border trading have resulted in a wide range of alternatives for investors. This flexibility, in turn, has put pressure on the physical exchanges to extend their hours of trading to withstand the intensifying competition.

Compared with Rhee and Chang's (1992) study, we find that the ongoing efforts of Asian exchanges to renew and upgrade their market structures and trading systems over the past decade have resulted in increased market sizes of stock exchanges, higher trading volumes, lengthened trading hours, and lower trading costs in most countries, whereas companies across the region have exhibited lower P/E ratios in general and have produced mixed results on gross dividend yields.

Financial innovations and the dynamics of Asian equity markets

Equity derivatives

According to Fratzscher (2006) and Jobst (2008), equity derivatives have flourished on Asia's exchanges and have experienced the fastest growth of all traded derivative products in the region over the past decade, accounting for over 40 per cent of the worldwide ETD (exchange-traded derivatives) equity turnover. At the same time, there is an emerging trend for some Asian derivative markets to migrate from the unregulated and less transparent over-the-counter (OTC) markets towards regulated ETD markets. Thirteen of the largest 50 derivative exchanges in the world are now in the Asian-Pacific region, with exchanges in Korea, India, China, Hong Kong, and Malaysia and Japan's Osaka Securities Exchange showing phenomenal growth rates (Fratzscher 2006). Mature markets such as Japan, Hong

Table 5
Trading hours in local time and trading days (as of June 2008)

Country	Trading hours (2000) ^a	Weekly trading hours (2000)	Trading hours (2008) ^b	Weekly trading hours (2008)	Remark
China (SSE)	M-F: 10:15-11:45, 13:00-15:30	20 hours	M-F: 09:15-09:25 (opening call auction) 09:30-11:30 (continuous auction) 13:00-15:00 (continuous auction) 15:00-15:30 (block trading)	23 1/3 hours	Acceptance of Internet orders permitted. Execution of Internet orders not available.
Hong Kong	M-F: 10:00-12:30, 14:30-15:30	17 1/2 hours	M-F: 09:30-10:00 (pre-opening session) 10:00-12:30 (morning session) 12:30-14:30 (extended morning session) 14:30-16:00 (afternoon session)	33 1/3 hours	
India (BSE)	M-F: 09:30-16:00 ^c	32 1/2 hours	16:00-16:10 (closing auction session)		
Indonesia	M-F: 10:00-12:00	10 hours	M-F: 09:55-15:30 M-F: 09:10-09:29:59 (pre-opening session)	27 11/12 hours 25 2/3 hours	
Japan (TSE)	M-F: 09:00-11:00, 13:00-15:00	20 hours	M-Thu: 09:30-12:00 (session I) 13:30-16:00 (session II) Fri: 09:30-11:30 (session I) 14:00-16:00 (session II)	42 1/2 hours	Trading hours vary according to the types of trading, such as single stock trading, basket trading, closing price trading, and off-auction own share repurchase trading. ^d
Korea	M-F: 09:40-11:40, 13:20-15:20	20 hours	M-F: 08:00-09:00 (pre-opening morning session) 09:00-11:00 (morning session) 12:05-12:30 (pre-opening afternoon session) 12:30-15:00 (afternoon session) 08:20-16:30 (ToSTNet Trading) ^d	51 2/3 hours	
Malaysia	M-F: 10:00-11:00, 11:15-12:30, 14:30-16:00	18 3/4 hours	M-F: 07:30-08:30 (prehours session) 08:00-09:00 (order placement for opening call auction)	30 hours	
Philippines	M-F: 09:30-12:15	13 3/4 hours	09:00-15:00 (regular session) 15:10-18:00 (afterhours session)	13 1/3 hours	
Singapore	M-F: 10:00-12:30, 14:--16:00	20 hours	M-F: 09:00-12:30, 14:30-17:00 M-F: 09:30-12:10 M-F: 08:30-09:00 (pre-open routine) 09:00-12:30 (morning session) 12:30-14:00 (adjust phase) 14:00-17:00 (afternoon session) 17:00-17:06 (preclose routine)	43 hours	

Table 5
(Continued)

Country	Trading hours (2000) ^a	Weekly trading hours (2000)	Trading hours (2008) ^b	Weekly trading hours (2008)	Remark
Taiwan	M-F: 09:00–12:00	15 hours	M-F: 08:30–09:00 (pre-regular trading) 09:00–13:30 (regular trading) 14:00–14:30 (off-hour trading) 13:40–14:30 (odd-lot trading) 09:30–09:50 (block trading) 11:30–11:50 (block trading) 13:35–17:00 (block trading) M-F: 09:30–T1 ^c (pre-opening I) T1–12:30 (morning session) 14:00–T2 ^c (pre-opening II) T2–16:30 (afternoon session) 16:30–T3 ^c (call market) T3–17:00 (off-hour trading)	42 1/12 hours	There are random opening times between 09:55 and 10:00 for calculating opening prices in the morning trading session, and between 14:25 and 14:30 for calculating opening prices in the afternoon trading session. Closing time varies between 16:35 and 16:40 for the calculation of the days' closing prices. ^c There are four crossing sessions: single stock closing price trading, which starts at 16:15 and ends at 17:00, with the remaining three sessions, basket trading, guaranteed price trading, and volume weighted average price (VWAP) trading, all start at 16:00 and end at 18:30. ^f
Thailand	M-F: 08:30–17:00	42 1/2 hours	M-F: 09:30–16:00 EST (regular trading) 16:00–18:30 EST (crossing sessions) ^f	45 hours	
USA(NYSE)	M-F: 09:30–16:00	32 1/2 hours			

SSE = Shanghai Stock Exchange, BSE = Bombay Stock Exchange, TSE = Tokyo Stock Exchange, NYSE = New York Stock Exchange.

^a Sheng and Tu (2000).

^b Websites of Asian Stock Exchanges and the NYSE.

^c Pinegar and Ravichandran (2000).

Kong, and Singapore offer a broad spectrum of derivative products: foreign exchange (mostly in OTC markets), interest rate, credit (in OTC markets), equity, and commodity products. India and Malaysia specialise in equity futures; while Korea and Taiwan concentrate mostly on index products.⁹ By contrast, derivatives markets in China, Indonesia, Philippines, and Thailand are much less well-developed or do not exist (Jobst 2008).

Jobst (2008) claims that the leading Asian derivative markets are characterised by well-designed trading infrastructures, which provide domestic and foreign institutional investors with low-cost market access to ETD instruments, and reliable legal and tax regimes to ensure fair and equitable treatment of cash and derivatives trades. Ngugi et al. (2003) find that the modernisation of trading systems leads to greater price efficiency and lower volatility. Likewise, Fratzscher (2006) reports a strong correlation between existing derivative products and the underlying derivatives infrastructure in Asia, and interprets it as a sign that the leading markets have already established best practices in their underlying infrastructures.

Although derivative products reduce uncertainty, offer cheaper financing tools for corporations, enhance liquidity, and facilitate price discovery in the underlying asset markets, they often imply substantial leverage and entail sizable risks to be managed, especially in areas where latent systemic vulnerabilities to excessive risk-taking extend across institutions and national boundaries in an environment of large cross-border flows and trade integration (Fratzscher 2006; Jobst 2008). Two cases in point: Kregel (1998) highlights the role played by certain types of structured derivatives in the unexpected declines and excessive volatility of currency and asset markets in the Asian crisis. Similarly, while the collapse of the US sub-prime mortgage market was the spark that ignited the recent global financial crisis, the factors at the root of the crisis include a large

expansion of credit fueled by financial innovation that allowed the securitisation of payment streams generated by a wide variety of assets and the failure of regulation and supervision to keep pace with financial market developments and innovations (Yehoue 2009).

Recently, Mazouz et al. (2009) have argued that Asian markets appear more efficient following the Asian financial crisis, while the IMF has acclaimed Asia's impressive recovery from the recent global downturn. Driessen et al. (2009) argue that financial crises are often viewed as episodes of unusually high correlations that affect investors' welfare negatively by lowering diversification benefits and by increasing market volatility, and show empirically that a trading strategy that sells correlation risk by selling index options and buying individual options has more attractive risk-return properties than other option-based strategies. However, the large correlation risk premium embedded in the strategy cannot be captured by investors who are subject to realistic transaction costs and margin requirements.

Some Asian derivative markets are sponsoring domestic retail trading of derivatives through Internet-based trading infrastructures. But Jobst (2008) cautions that domestic retail demand is speculative in nature and entails substantial risks in times of financial stress. Therefore, market structures that are designed to encourage a balanced mix of speculative trading and genuine long-term institutional hedging, such as strategic partnerships among exchanges, modern trading platforms with lower trading costs to capture a higher fraction of foreign institutional investors, and new hedging tools, are needed in the region.

Jobst (2008) also points out that the viable use of derivative markets for risk shifting and price discovery of equity depends critically on high-trading volumes in deep and wide cash markets to ensure efficient price formation. But some emerging derivative markets with chronic

⁹ India has been particularly successful in offering single stock futures, while Korea has been remarkably successful in offering equity index options (Jobst 2008).

¹⁰ A straddle involves buying a put and a call with the same strike price and time to expiration, and profits from a large move in the stock price in either direction.

illiquidity problems in cash markets, inadequate legal and regulatory frameworks, shortcomings in existing trading infrastructures, such as the lack of efficient settlement mechanisms, coupled with a limited understanding of risk management techniques, pose significant challenges to financial stability and the expansion of equity derivatives markets across the region. Jobst suggests reducing the potential system-wide failures through greater emphasis on disclosure and transparency, and with well-functioning exchanges that ‘... impose appropriate margin requirements and position limits, administer centralized clearing and settlement, engage in vigilant market surveillance, and mutualize risks through loss-sharing arrangements, capital deposits of members, and international excess-of-loss insurance’ to ensure market integrity and safeguard the collective interests of market participants.

Additionally, the current practice of using price limits as a circuit breaker to protect financial systems from disruptions caused by short-term surges in volatility, a sound credit culture that supports professional credit rating agencies in establishing standards for risk assessment, price competitiveness across different asset classes in regional capital markets, solid accounting standards, and investor sophistication, would foster and complement development of the derivative markets. Dutt and Wein (2003) note that although traditional futures margining systems in Asian markets presumably produce lower margin requirements, success is not guaranteed. Other factors to ensure success include hedging demand, contract design, and competition with substitute products. For example, Baptiste et al. (2000) concluded that a significant cause of the lack of success in trading single stock futures on the Hong Kong Futures Exchange (HKFE) was that the HKFE contract multipliers were set to 1,000, making the dollar value generally inaccessible to retail investors.

With respect to price limits, Brennan (1986) shows that futures price limits alone may help alleviate the default risk, lower the margin requirements, and reduce the total costs for market participants, while Chou et al. (2003) establish that the imposition of spot price limits

can further reduce the default risk and lower the effective margin requirements for a futures contract that is already under price limits. In addition, the common practice of imposing equal price limits on both the spot and futures markets, such as is practised in stocks and index futures of the Tokyo Stock Exchange and the Taiwan Stock Exchange, yields a lower futures contract cost and lower margin requirements than when not imposing spot price limits. Further, Chou et al. suggest that in the event of a sharp price change in the futures market, it may be optimal for policymakers to raise the margin requirements and the price limits in both markets.

Chan et al. (2009) examine the informational role of options under different market conditions in the Taiwan stock index options market and present evidence that the equity market is the preferred place to trade information during an up-trend market, whereas out-of-the-money (OTM) options are more likely to be the favoured tools of informed traders in a bear market. Chan et al. suggest that the liquidity and leverage associated with OTM options, coupled with the short-sale constraints and the 7 per cent daily price limits in Taiwan’s equity market, make OTM options particularly appealing to informed traders during a downtrend market.

Cleeton (1987) discusses various options strategies that would make insider trading transactions in options difficult to detect from a regulatory standpoint. Kregel (1998) observes that it is the role of most derivative packages to mask the actual risk involved in an investment, circumvent guidelines that are framed to protect the interests of unsophisticated retail investors, and increase the difficulty in assessing the final return on funds provided. As a result, even the most sophisticated operators in global financial markets have difficulties in evaluating such instruments, and their regulators are no more successful in discovering or imposing prudent limits. Finally, Jobst (2008) stresses the necessity of implementing the appropriate regulations based on a set of coherent principles for deeper and more sophisticated capital market development and of achieving prudential supervision of the insti-

tutions active in equity cash markets. Given the growing interdependence of financial markets, which entails more complex and comprehensive cross-border investment strategies, concerted policy efforts across the region to improve market rules, trading standards, and risk-management practices are indispensable prerequisites for the attainment of sustainable equity derivative trading in Asia.

Equity repo markets¹¹

In recent years, securities lending has emerged as an increasingly vital component of the domestic and international securities markets. Its growth is attributable to factors such as the need for alternative financing techniques, enhanced yield opportunities through the generation of stock loan fees and cash reinvestment income, increased recognition as a way to improve market liquidity and efficiency, and the widespread use of derivatives and hedging techniques to support trading and arbitrage strategies. Ghosh and Revilla (2007) point out that almost all jurisdictions across the East Asian region have fairly advanced clearing and settlement systems with recommended features to minimise the various risks associated with pre-settlement and settlement of securities. However, it is the complementary infrastructure such as well-functioning repo markets, securities lending, margin trading, and derivatives markets that make significant differences among East Asian countries. For example, a necessary element for efficient short selling to take place is a robust securities lending system to be formally established and efficiently operated, but currently, stock lending is not so prevalent in a couple of the East Asian countries.

Repo markets, where loans are secured against securities for securities dealers to meet collateralised short-term financing needs, are among the least developed in the money markets across the region. Impediments to their development include the lack of an

appropriate legal framework or a master agreement that would provide certainty about which counterparty owns the collateral in the event of a default, the lack of arrangements that would allow the use of a wider spectrum of securities as collateral, and restrictions on short selling of securities. Although restrictions on short selling in many Asian countries are being eased, there are still limits on the types of institutions that are permitted to short sell securities, and outright prohibitions against naked short selling (Loretan and Wooldridge 2008).

For countries to successfully introduce stock lending mechanisms, Ghosh and Revilla (2007) suggest that wide participation by stock lenders such as stock brokers, securities depositories, custodial banks, individuals, and institutions not only facilitates short sales, but also prevents abnormal short squeezes. More recently, the International Securities Services Association concluded that a solution to stem the 'failure of a counterpart to pay or deliver or a delay in settlement' is to encourage 'easier access to stock borrowing'. In addition, as the smooth running of a margin-lending facility also requires a deeper money market than otherwise, banks should be encouraged to use repo operations to manage liquidity in the banking system, and market participants should be allowed to use repos as an alternative funding instrument to enhance their flexibility in managing settlement risks and trading strategies. For example, in response to the recent global financial crisis, the Bank of Korea has stepped up repo operations to increase domestic liquidity by broadening eligible collateral, expanding the number of counterparties, and providing funding support to those financial institutions contributing to the Bond Market Stabilization Fund.

The underdevelopment of repo markets in many Asian countries poses a challenge for local regulators, who must undertake measures to open up the collateral and repo markets to benefit from the advantages of

11 In the equities markets, what is known as securities borrowing and lending play a role analogous to the role played by repo markets.

cross-border collateral trade. However, Ghosh and Revilla (2007) caution that if stock lenders and borrowers are under different supervisory jurisdictions, the need to develop a set of comprehensive and coherent regulations applicable to different categories of stock lenders and borrowers in terms of their legal risks, counterparty risk exposures, and collateral management processes poses a grave challenge to policymakers. Moreover, with a wider range of complex financial products being used as collateral, it is increasingly difficult to assess the probability of default when accepting and trading these complicated instruments. Ghosh and Revilla emphasise that it would be equally important to strengthen the corporate governance and risk management capacity of the institutional stock lenders and borrowers before they invest a greater proportion of their assets in the securities markets. Also, the expansion of the various facets of their asset base needs to be complemented by measures that facilitate cross-border investments and financial integration.

Recently Menkhoff et al. (2006) have investigated the collateral-based lending decisions of Thai banks and found that the incidence and degree of collateralisation are clearly higher in Thailand than in more mature markets. Thai banks use collateral to reduce the higher credit risks of relatively young and small corporate customers, thus improving credit availability in the opaque information environment of an emerging market. However, collateral-based lending seems to go along with lock-in situations, where housebanks demand more collateral from borrowers than do non-housebanks. Further, information about *ex post* default is not significantly related to the degree of collateralisation, indicating that collateral-based lending does not lead to a more aggressive lending policy.

In China, there are two major repo markets: the interbank repo market and the exchange-traded repo market. Fan and Zhang (2007) claim that the reasons for participants to trade in the interbank market are diverse, while in the exchange repo market, the reasons for borrowing are mostly related to stock trading. Specifically, during periods when hot IPO

shares are issued, a natural source of cash for IPO subscriptions is the exchange-traded repo market, which is widely accessible to most investors (except for banks) who own treasuries. However, the reliance on the repo market for funding IPO purchases causes large fluctuations in the exchange repo rates.

Freixas and Holthausen (2005) show that cross-country bank lending appears to be subject to market imperfections, leading to persistent liquidity shortages and interest rate differentials; therefore, a high level of cross-border information is essential for an integrated international interbank market to exist. A repo market, on the other hand, is able to achieve liquidity smoothing across borders. However, the secured nature of the repo reduces banks' incentives for peer monitoring. Freixas and Holthausen also established that the combination of the two markets does not always yield a more efficient allocation, as it may lead to the collapse of the unsecured, integrated interbank market.

D'Avolio (2002) discusses the market for borrowing and lending US equities, and shows that while loan market specials (stocks with high lending fees) and recall events (when borrowers must return securities to lenders) are rare on average, high loan fees and recall risk increase with the divergence of belief among non-lenders, lenders, and short sellers. Also, days on which recalled borrowers might be forced to cover shorts are marked by extraordinary trading volume and intra-day volatility. Duffie et al. (2002) emphasise the search process faced by borrowers and lenders, and show that if lendable securities are difficult to locate, significant specialness (high lending fees) may push the initial price of a security above even the most optimistic buyer's valuation of the security's future dividends. Eventually, due to the rapid reduction in unfilled shorting demand, the bargaining power of lenders worsens and the lending fees and price diminish.

Margin trading

Of the 11 Asian stock markets, the implementing mechanisms for margin trading and secu-

rities borrowing and lending (SBL) facilities are in different stages of development. For example, margin transactions in China and India are still at a nascent stage, while Japan and Taiwan have been using them extensively. Generally, approved securities companies and/or securities finance corporations in Asia can provide margin trading facilities to their clients. The eligibility criteria for stockbrokers, clients, and stocks vary across countries, with differing degrees of stringency, depending on the stage of market development, the sophistication level of the investing public, the risk management and compliance level of stockbrokers, stock liquidity, stock volatility, price level, and credit policy of the monetary authorities, among other things.

Margin requirements typically range from 30 to 150 per cent for most Asian equity markets. Banks and brokerage houses in Hong Kong and securities companies and securities finance corporations in Korea are allowed to set their own requirements. The margin requirement for a short position is typically more stringent than for a long position. Loan duration, which may be open-ended or limited to a certain period, ranges from six business days to one year across the countries. Close supervision is enforced by means of daily marking-to-market and margin calls to protect stockbrokers against possible losses and to help clients manage their risk exposure.

Vital to margin trading is a legal framework for SBL that has been created in each of the 11 Asian equity markets. The SBL market is regulated as part of the margin regulations that govern both margin purchases and short sales. In some markets such as Korea, Malaysia, Taiwan, and Thailand, the local depositories have managed to capture a major share of the SBL markets, while in other markets, such as Hong Kong and Singapore, the SBL markets are dominated by global intermediaries. The local depositories capture at best a marginal segment of smaller players, as the larger players seek counterparties who have a global offering; local depositories that only have local

stocks to offer may not cater to their global practices.

Endo and Rhee (2006) show that developing countries have generally lagged well behind developed countries in adopting margin trading (margin purchases and short sales), and that the discrepancy is even larger for short sales relative to margin purchases. Hong Kong SFC Research (2008) also shows that short selling is far less prevalent in Asia than in US and UK markets, partly because the lower liquidity in Asian markets makes it difficult for short selling to pick up. The stringent short-selling regulations may also have inhibited short-selling activities. Further, the lack of an efficient stock lending system in a couple of the East Asian countries effectively makes short selling impractical for both financial and operational reasons.

But short-selling activities may grow alongside the continued development of the stock and derivative markets in the region. For instance, short-selling activity in Hong Kong has been growing significantly in recent years, despite its strict regulatory regime. The growth is largely underpinned by the increase in market-making activity,¹² and the listing and associated short selling of Mainland stocks in Hong Kong.

While margin trading provides liquidity and serves as a necessary trading tool for the efficient functioning of financial markets, short selling has been seen as one of the reasons for the recent increase in global market volatility. Although some regulators in Asia have introduced short-selling measures with different degrees of stringency to stabilise the stock markets, there is no clear relationship between short-selling activities and market volatilities (The Hong Kong SFC Research 2008). More precisely, Diether et al. (2009a,b) claim that there is no empirical support for the assertion that short-sellers exacerbate downward momentum. They sell short following positive momentum, thus reducing volatility. Similarly, Charoenrook and Daouk (2005) demonstrate that when short selling is possible, aggregate

12 Market makers may short sell the underlying stocks of options and futures to hedge their market-making positions.

stock returns are less volatile, and there is greater liquidity. Consistent with these findings, Ho's (1996) study shows that short sale restrictions in the Singapore market in the period 1985–86 increased volatility. To the contrary, Chang et al. (2007) documented higher volatility and less positive skewness of individual stock returns in Hong Kong when short sales are allowed.

The impacts of margin trading on securities markets across the world have at times been controversial. Some researchers have supported the view that speculation induced by margin trading can destabilise the market through feedback trading (Allen and Gale 1991, Hardouvelis 1992, Fortune 2001, among others) and short selling, and, in particular, makes the market susceptible to price manipulation. These potential risks of leverage trading seem greater in emerging markets than in highly liquid developed markets. This is because an emerging market with chronic illiquidity and asymmetric structure (margin purchases are practised but short sales are unproportionately restricted or prohibited to prevent excessive speculation and volatility) may be more susceptible to long-run deviations of stock prices from their fundamental values, rapidly deteriorating liquidity in a declining market, and a prolonged delay in market recovery (Endo and Rhee 2006).

However, other research findings highlight the merits of margin trading (Seguin 1990, Bris et al. 2003a,b, among others). Specifically, margin trading facilitates speculation, arbitrage, hedging, market making and dealing. It is also likely to enhance the liquidity of stock markets in emerging economies. Besides, the success of the price discovery mechanism depends on market liquidity. Accurate and continuous price discovery generally makes capital and risk reallocation efficient in an economy (Endo and Rhee 2006). Empirical studies of the US and Asian markets also indicate that eliminating short-sales restrictions helps improve the efficiency of price discovery. In other words, in an efficient price discovery process, the price of a security should fully reflect all current and past information, and should adjust to new information instantaneously

(Fama 1991). Thus, when short sale constraints are relaxed, overvaluations become less severe, suggesting that short sellers move prices toward fundamentals. For example, Diether et al. (2009a) find that short sellers target overvalued stocks and help correct prices by increasing short-selling activities. Wu (2007) shows that the price of a stock with higher shorting volume tends to remain more closely related to its fundamental value. Chen (2005) reports that the speed of price adjustment of market-wide information is significantly higher for shortable stocks than non-shortable stocks in Hong Kong. Aitken et al. (1998) observe that short interest information is captured quickly in the prices of Australian stocks. Chang and Yu (2004) and Chang et al. (2007) find that short sales restrictions tend to cause stock overvaluation in Hong Kong, and that the overvaluation effect is more dramatic for stocks for which wider dispersion of investor opinions exists. Likewise, Nagel (2005) claims that constraints on short selling can lead to an optimism bias in prices, because short-sale constraints can prevent pessimistic opinions from being expressed in prices.

Li and Fleisher (2004) find that the dispersion of domestic analysts' forecasts is negatively correlated to stock returns in China's A-share market, where short-sales restrictions are binding, and not significantly related to the returns of B shares, where short-sales restrictions are not binding. This suggests that short-sales constraints are an impediment to price discovery, particularly when the news is bad. Boehmer et al. (2008) show that on average, short sellers are important contributors to efficient stock prices. Christophe et al. (2009) show that short sellers are informed traders and benefit from upcoming analyst downgrades by shorting shares prior to the announcement. Reed (2003) finds that securities with short-sales constraints have a larger price reaction when private information becomes public. Further, Cohen et al. (2007) present evidence suggesting that increases in shorting demand have economically large and statistically significant negative effects on future stock returns, and that the shorting market is an important mechanism for private information

revelation. Asquith et al. (2005) also assert that the short sale literature provides consistent evidence that high short interest is followed by lower stock returns. Bris et al. (2007) claim that while short sales restrictions are nearly as old as organised exchanges, there is little empirical evidence on whether they prevent or facilitate market crashes, or whether they hinder or promote rational price discovery.

Although there are few empirical studies on Asian markets, several findings are noteworthy. In particular, Hirose et al. (2009) have shown that margin purchases in Japan are dominated by individual investors, while short selling activities are conducted by both institutional investors and individuals. The authors argue that margin buying tends to reflect individual investor sentiment, and helps predict future stock returns because these investors appear to follow positive feedback trading behaviour for small-firm stocks and negative feedback trading behaviour for large firm stocks (that is individual investors buy more on margin of small firms that were 'up', and they buy more on margin of large firms that were 'down'), and their high levels of margin buying tend to precede positive excess returns. On the other hand, there is no evidence of positive feedback behaviour for margin selling. How individual Japanese margin traders can so effectively time the market is an intriguing topic that warrants further research.

Shu et al. (2005) report that margin-trading investors in Taiwan may be forced to sell their losers when adverse price movements trigger margin calls, therefore they tend to exhibit less disposition effect than non-margin-trading investors who have a tendency to realize their gains too soon and hold onto losers too long. Chen and Rhee (2010) present evidence that short sales significantly enhance market efficiency in Hong Kong because short sales speed up the price adjustment to not only private/public firm-specific information, but also to market-wide information, and these findings remain robust in both 'up' and 'down' market conditions. The Hong Kong data clearly show that short sales enhance information efficiency by reducing trade continuity and increasing quote reversals.

Lastly, the efficacy of margin requirements as a policy tool to control excessive speculation is debatable. Luckett (1982) shows that the presence of margin calls is an effective regulatory tool for preventing a precipitous fall in stock prices. Hardouvelis (1988) concludes that an increase in margin requirements tends to mitigate stock market volatility. On the contrary, Ferris and Chance (1988) show that lowering margins reduces market volatility. Other empirical studies either fail to support the effectiveness of margin requirements (Salinger 1989, Schwert 1989, Seguin 1990, among others), or suggest that an active margin policy is not justifiable (Hsieh and Miller 1990; Seguin and Jarrell 1993; Fortune 2001). Endo and Rhee (2006) conjecture that the findings of these studies may not hold for some emerging markets in Asia due to the fact that the design and operation of the infrastructure necessary for margin transactions and SBL activities in the region are country-specific. Ghosh and Revilla (2007) suggest that it may be better for Asian countries to consider allowing both margin purchases and short sales, and ensuring that pertinent features of margin trading within reasonable bounds of safety and soundness are in place.

International cross-listing

The expansion of cross-listings has facilitated the globalisation of financial markets and allowed firms from emerging markets to access more developed capital markets. The benefits for firms that pursue overseas listings have been extensively analysed in the literature. The benefits most often cited are the lower cost of capital (see for example, Hail and Leuz 2009), increased shareholder wealth and higher valuation (see for example, Roosenboom and van Dijk 2009), access to more developed markets (see for example Silva and Chavez 2008), enhanced investor recognition (see for example, Sarkissian and Schill 2005), better information environments, access to superior liquidity services, an expanded global shareholder base, and better corporate governance (see for example, Purfield et al. 2006), improved investor protection or legal bonding

(see for example, Doidge et al. 2007), lower voting premiums (Doidge 2004),¹³ and more access to external finance (see for example Lins et al. 2005).

Purfield et al. (2006) assert that although cross-listing can be thought of as a channel for companies to achieve integration with global capital markets, cross-listings within the Asian region by and large remain modest,¹⁴ with the exception of the China–Hong Kong SAR link. Although Hong Kong and the USA are the two major listing destinations for Chinese firms, Yang and Lau (2006) find that Chinese firms prefer listing in Hong Kong more than in the USA because Chinese firms listed in Hong Kong have a better information environment than those listed solely in the USA. However, the largest Chinese firms prefer to have both a Hong Kong and a US listing. Yang and Lau also find that Chinese firms with a Hong Kong listing are generally not financially constrained, but those that choose to list in the USA usually are constrained. One explanation is that Hong Kong analysts provide significantly more accurate forecasts, and their forecasts and recommendations are of higher investment value than their distant counterparts (Malloy 2005). Additionally, different investment interests in Chinese stocks and the different costs of acquiring relevant information about Chinese stocks between Hong Kong and US investors may result in lower external financing costs for Chinese firms accessing the Hong Kong capital market (Yang and Lau 2006). Cross-listing decisions of Chinese SOEs, on the other hand, are best explained by the political connectedness of the CEO (Hung et al. 2007; Su and Chong 2007).

Karolyi (2006) and Doidge et al. (2009) claim that the New York and London exchanges have attracted the lion's share of foreign listings during the past decade, and that recently, there has been a significant slowdown in the pace of new international cross-listings and in the fraction of global trading on overseas exchanges. But they also find that new listings on the US and London markets are not keeping up with the pace of de-listings due to mergers/acquisitions, distress, and restructuring, or failure to meet exchange-listing requirements. Furthermore, the composition of US cross-listings has also changed over the past decade. The number of companies from the UK, Australia, South Africa, and Japan has diminished, while the number of companies from emerging economies has increased. Likewise, Halling et al. (2008) present estimates that indicate that the attractiveness of US markets for the trading of cross-listed stocks has diminished for developed market companies, while it has increased for emerging-market companies.¹⁵

Numerous studies have recently sought to rationalise the rapidly changing and increasingly complex world of cross-listings. These studies explore new risk factors that globalisation of equity issuance and trading can create that relate to agency conflicts among controlling shareholders, management, and public investors; information asymmetries, and the growing role of analysts and media; complexities of multi-market trading for liquidity and price discovery; and other transparency and corporate governance problems (Karolyi 2006). Some of the interesting findings may be summarised as follows:

- 13 Doidge (2004) shows that voting premiums, which are a proxy for the private benefits of control, are lower for cross-listed firms, and that this difference is larger for firms from countries with poor outside investor protection. This indicates that US cross-listing reduces the private benefits of control, and increases the protection afforded to minority shareholders.
- 14 Many Asian companies cross-list on US, London, and European bourses. For example, companies from India often list on London and other European bourses, while in US markets, Kalimipalli and Ramchand (2006) document that private placement issues account for the largest portion of the total ADR issues, with the rest coming from level i, level ii, and level iii issues. Some of these ADR issues also qualify as GDRs, as they are simultaneously issued in European markets. Companies from Korea and Taiwan prefer to list on US and European exchanges. Firms with a primary listing in Hong Kong opt to pursue Rule 144a private placements and level 1 OTC listings (Doidge et al. 2009). Japanese firms are well represented in ordinary listings on London Stock Exchange's Main Market (Doidge et al. 2009). Chinese firms' listings on stock exchanges outside of Mainland China include US, Hong Kong, Singapore, and London.
- 15 As far as Asian firms are concerned, most prominently, firms from India, Korea, and Taiwan.

If cross-listings are one form of intermediation to mitigate the effects of segmented or imperfect markets, then as Karolyi (2006) states:

... once markets become more integrated, the demand for intermediation becomes weaker and so does the integrating effect of cross-listings. At that point, cross-listings may still be sought out but for other reasons, such as credible legal bonding, enriching the information environment, and so on. No formal research initiative of such dynamics in the motivations for cross-listings exists to my knowledge.

Chandar et al. (2009) examine the local market effects of cross-listings in response to a currency crisis, both in the country in which the crisis originates, as well as in countries that experience contagion effects. They document that cross-listed firms in Thailand, Malaysia, Philippines, Singapore, Indonesia, Hong Kong, and Korea generally react less negatively to a currency crisis than firms that are not cross-listed, and the pattern is most striking in the post-crisis period.

Doidge et al. (2009) assert that cross-listing on a US exchange can increase the scrutiny of gatekeepers, such as analysts, media, and underwriters; and the increased transparency can impose indirect constraints on the extraction of private benefits by controlling shareholders. Lang et al. (2003, 2004) also show that information intermediaries (that is, media/analyst coverage and analysts' earnings forecasts) provide the most value for firms that come from countries with the least protection for minority shareholders or firms that have large family or management group-dominated large blockholders. But other researchers argue that valuation changes around cross-listings may have more to do with more stringent US laws, disclosures, and potential threats of enforcement or civil actions and less to do with the scrutiny of gatekeepers (Doidge et al. 2009). Other factors such as geography, language, and culture can also add complexity to the information environment (Karolyi 2006). In addition, the evidence on higher valuations of firms that cross-list has been criticised as biased due to sample selection and omitted variables (Doidge et al. 2009).

Piotroski and Roulstone (2004), Chan and Hameed (2006), and Fernandes and Ferreira (2008) suggest that greater analyst coverage or stricter disclosure associated with US exchange rules can foster the production of market-wide information rather than firm-specific information, thus crowding out private information collection for emerging-market firms. As pointed out by Easley et al. (1998) and Roulstone (2003), analyst activity is not necessarily a good proxy for private information trading, because analysts are 'showcasing' devices and they do not have significant firm-specific information.

To improve the information environment, regulators must complement disclosure standards with other policy initiatives to encourage investment in the production of private information and minimise crowding-out effects. It is also worth noting that if firm-specific return variation measures the rate of private information incorporation into prices via trading (French and Roll 1986; Roll 1988), then Fernandes and Ferreira (2008) show that across Asia, only Hong Kong and Singapore present median firm-specific return variation that is greater for cross-listed firms than for non-cross-listed firms. In other words, stock prices of cross-listed firms adjust quickly and more strongly to the release of important private information, but only in developed markets.

Lang et al. (2006) document that the accounting data of cross-listed firms from weak investor protection environments are of lower quality and provide less timely recognition of losses, and generally are more aggressive in terms of earnings management even though they are required to follow nominally similar accounting standards as US firms. Leuz (2006), on the other hand, argues that disclosure quality differences between cross-listed and US firms can arise because cross-listed firms are allowed to exercise considerable discretion in their disclosure activity. Further, Ball (2001) and Lang et al. (2006) assert that an accounting standards system alone is not sufficient to improve actual financial reporting and disclosure. A wide range of other changes in the country's economic, legal, and political infrastructure is required to improve the quality of

financial reporting, which, in the end, is determined by the actions of managers, regulators, and auditors.

Bailey et al. (2006) present evidence that trading volume and return volatility around earnings announcements by non-US companies from developing Asia are economically and statistically larger once they list their shares on US markets. These findings challenge the conventional wisdom that increased disclosure should lead to less informed trading, and that firms from less developed markets are more likely to experience the most dramatic information environment change upon listing in the USA, thus requiring further investigation of this puzzle.

Karolyi (2006) argues that market-makers from more than one market competing for order flow in cross-listing shares can enrich and complicate the price discovery process. Besides, firm and country-level attributes such as firm size, ownership structure, exchange-rate volatility, investment restrictions, and transaction costs contribute to the complexity of the multi-market trading, liquidity, and joint dynamics of stock returns in the competing markets. Competition for order flow from multiple markets does affect how information is captured into prices, and price determination seems to occur primarily in the market that attracts most of the order flow.

Evidence suggests that the higher the fraction of global trading that takes place in the new markets (often the US exchanges), the greater the new markets' contribution to price discovery. Blouin et al. (2005) assert that the ADRs' home country markets play a more important role in price discovery than US markets, while Karolyi cautions that 'price discovery does not necessarily originate in the markets with the highest relative turnover, but rather where the informed traders are going with limited market impact'. Besides, whether the effect can be labeled permanent or transitory remains an open question.

Studies by Xu and Fung (2002) and Su and Chong (2007) have shown that for Chinese cross-listed stocks, the Hong Kong Stock Exchange contributes more than the NYSE to the price-discovery process. The NYSE's con-

tribution is even smaller if the stock is also listed on the Mainland exchanges. Su and Chong claim that price discovery is an explainable function of trading volume, as more valuable information is likely to be released in the Hong Kong market due to the close economic, linguistic, and geographical proximity between China and Hong Kong, as well as the fact that informed traders with larger order flows trade by stealth against numerous counterparties. Xu and Fung find that there is a significant mutual feedback of information between the US and Hong Kong markets, and stocks listed on the NYSE play a bigger role in volatility spillover.

Wang and Jiang (2004) examine a group of stocks cross-listed on the China stock exchanges as A shares and on the Hong Kong Stock Exchange as H shares. They find that A-share returns are subject to risk and investor sentiment specific to the Mainland stock markets, while H-share returns are subject to the market-specific risk and investor sentiment in both the Hong Kong and Mainland stock markets.

Likewise, Ding et al. (1999) investigate price discovery of a large Malaysian conglomerate traded both in Kuala Lumpur Stock Exchange and the Stock Exchange of Singapore. They find that nearly 70 per cent of the price discovery occurs in the home country, and that 26–32 per cent can be attributed to the Stock Exchange of Singapore. Kadapakkam et al. (2003) examine the Indian stocks dually listed on the London Stock Exchange as GDRs. They find that the London and Mumbai markets contribute almost equally to the price-discovery process, and that the GDR market's contribution to price discovery increases with the foreign institutional investment of the firm and the size of the GDR issue. Strikingly, firms that switch their primary listing location can expect the trading characteristics of their shares to become similar to those of the new market (Lau and McInish 2003); while Baruch et al. (2007) show that the distribution of a cross-listed stock's trading volume across exchanges depends on its correlations with other assets traded on the domestic and foreign exchanges.

Karolyi (2004), Levine and Schmukler (2006), and Halling et al. (2008) show that cross-listing in the USA negatively affects the liquidity of local stocks by diverting trading activity from local markets. Halling et al. further suggest that in countries with poor enforcement of insider-trading rules, home market liquidity is vulnerable to the opening of a new trading venue in a more investor-friendly legal environment. Companies based in developed markets can expect a more active US market if they are small, highly volatile, and technology-oriented, while for emerging-market companies, US trading volume is negatively related to volatility and technological intensity. However, Liu (2007) claims that the long-term impact of international cross-listing on home-market liquidity, as measured by trading volume or bid-ask spread, should be an open empirical question. Liu finds no long-term liquidity enhancement for cross-listed stocks.

Domowitz et al. (1998) and Bacidore and Sofianos (2002) argue that the effect on liquidity is more complex and depends on the level of home market integration. Specifically, Domowitz et al. posit that the quality of information linkages influences the liquidity impact of cross-listing. When the information linkages between the local and ADR markets are of good quality because of open financial markets or close commercial ties, listing abroad generates an inter-market competition effect that benefits the liquidity of cross-listed firms, and this liquidity advantage is positively related to firm size. However, when the quality of information linkages is low, order flow migration effects dominate, and cross-listed firms do not present a liquidity advantage (Silva and Chavez 2008). In fact, for cross-listed stocks in non-linked economies, trading during common hours can result in less efficient trading if adverse selection is a problem (Domowitz et al. 1998). Further corroborating this notion, Bacidore and Sofianos (2002) and Bacidore et al. (2005) show that the NYSE provides more liquidity for cross-listed non-US stocks with more transparent home informational environments when the home market is open, but for non-US stocks with opaque

domestic information environments, the NYSE provides less liquidity when the home market is open.

More recently, researchers have explored efficiency issues. In this regard, Eun and Sabherwal (2003), Liu (2007), and Foucault and Gehrig (2008) show that international cross-listings enhance home-market stock pricing efficiency, as the newly discovered information feeds back into home-market prices, making the home-market return generating processes more efficient. Moreover, Liu finds that the benefit of efficiency enhancement applies equally well regardless of home-market development status or the cross-listing location in the USA. Yet Chandar et al. (2009) argue that if domestic investors would, on average, be better off investing in cross-listed firms at the expense of noncross-listed firms, then cross-listing may not be the best way to achieve improvements in domestic markets. This is because efficiency gains from financial market liberalisation may not come from developing the breadth and depth of domestic stocks traded exclusively in domestic markets. Thus, more explorations of the efficiency impacts of international cross-listing should be worthwhile.

Foerster and Karolyi (1998) show that stocks have narrower spreads and greater trading volume as a result of cross-listings, while Clarke and Shastri (2001) and Bacidore and Sofianos (2002) find that on average, non-US stocks from the emerging markets traded on the NYSE have wider spreads, less depth, and greater transitory volatility than US stocks (or stocks from other developed markets) on account of the higher information asymmetry and adverse selection risks for which NYSE specialists and other liquidity providers require additional compensation. Chan et al. (2005) find that a higher ADR premium is related to higher local stock market illiquidity, whereas Arquette et al. (2008) find that the discounts attached to US ADRs and Hong Kong H-shares relative to their Shanghai A-share counterparts can be attributed to expected exchange rate changes and differences in investor sentiment.

Karolyi (2006) argues that several Asian countries have corporate governance systems

that expose minority shareholders to expropriation by controlling shareholders, and entry into the US markets forces the firms to comply with a stricter regime of corporate governance. But companies with higher private benefits of control and weaker home-country legal protections for investors tend to cross-list less frequently in countries with stronger legal protections because of constraints on the consumption of private benefits by controlling shareholders associated with a US exchange listing (Doidge et al. 2009), while those that do are rewarded with significant valuation premiums. Lel and Miller (2008) also find that US securities laws and regulations improve the corporate governance of cross-listed firms, thus substantiating the notion that the functional convergence of legal systems to a higher global standard is possible.

But Licht (2001, 2003b) and Lang et al. (2006) claim that the SEC is not effective in enforcing corporate governance rules for foreign issuers and maintains a 'hands-off' policy for the most part. Siegel (2005) also finds that US regulatory responses to cases of 'asset tunneling' have been weak. However, other evidence suggests that even though legal actions against foreign firms and their insiders are few, the numbers are biased downward because many cases are settled outside court. Besides, Coffee (2002) and Benos and Weisbach (2004) suggest that measuring the incidence of legal actions may understate the deterrent benefit of laws. All in all, despite the various new research initiatives outlined above, Karolyi (2006) claims that there is a unifying theme in these new research initiatives in that they emphasise the growing importance of corporate governance issues in the overseas cross-listing decisions due to the fact that US listing choices tend to be significantly associated with a governance benefit (Doidge et al. 2009).

Coffee (2002), however, counters that from corporate governance and legal perspectives, legal bonding is 'not a complete shield for minority shareholders' even though it is difficult to disentangle the bonding hypothesis from alternative cross-listing hypotheses. Roosenboom and van Dijk (2009) also assert that bonding may play a role too for non-US

exchanges, although to a lesser extent. Along this dimension, Chung (2006) investigates the relationship between the liquidity of cross-listed securities and country-level investor protection mechanisms, and finds that ADRs of firms operating in good investor protection environments tend to have both lower information asymmetry costs and higher liquidity levels. Chung further shows that net selling pressure during the Asian financial crisis seemed to be higher for ADRs originating from countries with relatively weak investor protection mechanisms, and that even after cross-listing, home country investor protection regimes matter in determining information costs and liquidity; thus, questioning the bonding hypothesis that legal protections provided by cross-listing cause firms to change their governance corporate structure to protect minority shareholders.

Bailey et al. (2006) and Marosi and Massoud (2008) find that the number of foreign firms exiting US capital markets has been increasing—despite the difficulties they face in deregistering from the SEC—owing to the fact that the passage of the Sarbanes-Oxley Act in 2002 (SOX) has reduced the governance benefits of a US listing and registration, particularly for small and thinly traded foreign firms with strong insider control from weak governance countries. On the other hand, governance improvements in emerging countries such as South Korea may have provided impetus for firms to deregister (Marosi and Massoud 2008).

But Doidge et al. (2007, 2009) argue that the loss of capital market competitiveness due to SOX has been limited. Further, Hail and Leuz (2009) show that the cost of capital reductions remains after the passage of SOX, and that they are sustainable for many years after the cross-listing. In contrast, they do not find significant cost-of-capital effects for cross-listings on the London Stock Exchange. Similarly, Doidge et al. (2009) find that the valuation premium for US cross-listings persists, and that it has not fallen in recent years, while a listing in London does not offer comparable valuation benefits. Also, firms that list in London do so for reasons other than for a governance benefit. Doidge

et al. (2009) claim that if anything has changed in the aftermath of SOX, it is that non-listed firms have become smaller and are therefore less likely to list on US exchanges, as well as in London.

Financial integration

Prasad et al. (2003), Baele et al. (2004), Pauer (2005), Yu et al. (2007), and Rim and Setaputra (2008) argue that financial integration among economies enhances financial efficiency, improves the capacity of the economies to absorb shocks, stimulates economic growth via risk sharing, reduces transaction costs through greater economies of scale and scope, and fosters development through more efficient allocation of capital within a more robust market framework. On the other hand, intensified financial linkages in a world of increasing capital mobility may harbour the risk of cross-border financial contagion (Yu et al. 2007; Rim and Setaputra 2008). Torre et al. (2007) also suggest that financial integration could cause significant migration of domestic trading to international markets, which may adversely affect the liquidity of medium-sized firms in the local market and their ability to raise equity capital. Furthermore, the rise in Asian stock market synchronisation, which stemmed from market liberalisation measures, institutional reforms, and 'convergence' in post-Asian crisis policy measures (Candelon et al. 2008), may imply that diversification benefits would significantly decline as financial markets become more integrated, due to the presence of common features that limit the amount of independent variation (Chen et al. 2002; Rim and Setaputra 2008; Candelon et al. 2008).

Although economists and finance specialists agree that there are potential gains from international portfolio diversification,¹⁶ empirical studies of the dynamic interdependencies among international share price indexes have not provided consistent results and questions

regarding the degree of risk diversification and the extent of market efficiency remain open to debate. For example, Fooladi and Rumsey (2006) show that with higher global integration, diversification benefits persist; whereas Chen et al. (2002) and Driessen and Laeven (2007) suggest that diversification benefits have declined for most countries. Also, Chuang et al. (2007) show that the benefits for emerging market investors from diversifying in East Asia is low.

Bekaert and Harvey (2002, 2003) assert that the preponderance of empirical evidence suggests that even after market integration has taken place, emerging markets are still relatively less informationally efficient than developed markets. Besides, even though expected returns decline, and correlations and betas increase, there is no obvious association between market integration and volatility in emerging markets. To lend further support to this argument, other researchers maintain that the impact of global financial integration has been surprisingly limited (Stulz 2005), that financial market integration is not accompanied by financial efficiency (Chai 2003), and that international financial integration *per se* does not seem to stimulate economic growth (Edison et al. 2002).

In another strand of research, a consensus has not yet emerged on the extent of financial integration in East Asia. Yu et al. (2007) observed that a lot of progress was made between 1994 and 2001 towards greater integration among Asian equity markets. Since then, integration appears to have stalled. Asian markets have by and large remained weakly integrated. However, the degree of integration differs between countries, with integration being greater in more mature markets (Japan, Hong Kong, Singapore, and Korea) than in emerging economies (India, China, and Thailand).

Kim, Lee et al. (2006) attribute the weak integration among countries to factors such as

16 Solnik (1974), Errunza (1983), and Eun and Resnick (1984) recommend that stock portfolios be diversified internationally to reduce country-specific risk. In this context, Ajayi and Mehdiian (1995) and Bowman and Comer (2000) underscore the importance of adding stocks from emerging markets to a portfolio of stocks from developed markets in order to achieve efficient portfolio diversification.

low incentives for portfolio diversification, low degree of development and deregulation of the financial markets, and the instability inherent in the monetary and exchange rate regimes across the region.¹⁷ Kim et al. (2006) and Moshirian (2007) conjecture that it is uncertainty about the economic future of the global financial system that drives segmentation in the international financial markets. Others point to the lack of progress in developing trading links between Asian equity markets (Comerton-Forde and Rydge 2006; Yu et al. 2007), the lack of identification of regional interests among the governments and business sectors of Southeast Asia (Severino 2009), the lack of harmonisation of minimum acceptable international standards (Yu et al. 2007), the lack of success in policy coordination across jurisdictions (Jeon et al. 2006), and even country differences in economic structure, infrastructure, and maturity level of individual equity market.¹⁸

Thus, various impediments must be overcome before a coherent regional strategy to increase the diversity of financial intermediation channels and to promote the stability and efficiency of financial intermediation across Asian countries could be implemented (Comerton-Forde and Rydge 2006; Yu et al. 2007).¹⁹ However, there are caveats to bear in mind: (1) market integration alone cannot assure the lowest possible prices and the expected dynamic economic growth effects as market imperfections, in particular informational imperfections, prevail (Kleimeier and Sander 2000); (2) even if there is strong political will to achieve financial integration, it will take years to remove the obstacles (Yu et al. 2007); and (3) an adequate legal environment by itself might not be sufficient for financial market integration, because barriers to integration, such as cultural differences in consumer behaviour, including preferences for types of

credit and investment or for investment horizons, can exist even after full legal implementation (Mitchell 1991; Zimmerman 1995; Kleimeier and Sander 2000).

Contrary to previous findings showing weak linkages among Asian markets, Tai (2007) claims that the stock markets of India, Korea, Malaysia, Philippines, and Thailand have become fully integrated and that market liberalisation has reduced the cost of capital and price volatility for most of the countries. Some researchers believe that the financial markets of East Asia are more integrated than is often suggested, but that it is due to greater financial integration with the global market than with regional markets (for example, Jeon et al. 2006). Others maintain that US influence remains strong, especially after the Asian economic crisis (Yang et al. 2003; Wongswan 2006; Rim and Setaputra 2008).

Worthington et al. (2003) argue that Asian markets were highly integrated before and after the Asian crisis, and that the relationships between developed and emerging stock markets have become weaker. Yet Daly (2003) finds that the level of financial market integration in the Southeast Asia was qualitatively the same before and after the Asian crisis. Another interesting line of research suggests that financial time series across countries may deviate from each other in the short run, but that countries' stock prices may exhibit a significant long-run relationship, which provides some evidence of long-term financial integration (Chen et al. 2002; Rim and Setaputra 2008). In other words, market integration is a gradual process.

The presence of strong economic ties, the advancement of computerised trading systems, the formation of trading blocs such as ASEAN, investors' tastes and preferences, and regional and global cooperation all contribute to making the geographical divide among

17 Fidora et al. (2006) cite real exchange rate volatility as one of the factors slowing the process of financial integration.

18 For instance, Severino (2009) states that although ASEAN has adopted a blueprint for fast-tracking regional integration, progress has been slow. Country attributes such as institutional quality, human capital, patterns of savings and investment, imperfections in capital markets, investment restrictions, investor protection, foreign exchange regulations, and political risk appear to slow the process of regional and global integration (Moshirian 2007; Driessen and Laeven 2007).

19 Kose et al. (2006) show that without specific reforms, financial and economic integration may lead to more challenges such as volatility and even financial crises.

national stock markets less obvious over time (Gelos and Sahay 2000; Chen et al. 2002; Kawai 2005; Rim and Setaputra 2008). Yu et al. (2007) argue that intra-regional financial integration appears to lag behind the strong intra-regional economic links, and that such asymmetric development in economic and financial integration may affect the region's financial stability. Specifically, while some countries welcome foreign investors as a means to improve the quantity and quality of financial intermediation, critics have pointed to the risks of a more unstable credit supply, particularly in times of financial turmoil and economic downturn, as foreign banks are reported to react somewhat more pro-cyclically to changing local economic conditions than do domestic banks. Adiab et al. (2007) acknowledge that foreign capital flows may have negative effects on economic growth for some countries, and that financial integration does not always contribute to an increase in economic growth, particularly in developing countries.

Conclusion

Claessens et al. (2009) note that although the recent global financial crisis had several features in common with previous crises, there were four new dimensions: the widespread use of complex and opaque financial instruments; the ever-increasing interconnectedness among the world's financial markets, with the USA at the core; the accumulation of high levels of leverage in financial institutions; and the central role of the household sector. Claessens et al. stress that, in addition, regulatory shortcomings were also a key contributor to the financial crisis, and they identify lessons that can be learnt from the crisis with respect to financial stability, some of which include: (1) the strengthening of national regulation and supervision systems across a broad range of countries; (2) the mandate of monetary policy should include not only price stability but also macro-financial stability; (3) the application of appropriate regulation empowering financial institutions to be counter-cyclical, with institu-

tions building up buffers in good times in order to be able to draw them down in bad times; and (4) the removal of tax incentives that encourage the build-up of leverage.

Other useful financial reforms cited include more accountability on the part of government and industry, more legislative oversight and transparency, sound accounting and auditing practices, efficient contract enforcement, as well as significant reforms to Basel II, due to the fact that credit ratings and sophisticated risk-management models have been proven to be discredited. Importantly, too, Demirguc-Kunt and Serven (2009) point out that 'the goal of financial regulation and supervision is not to reduce financial institutions risk-taking, but to manage the safety net so that private risk-taking is neither taxed nor subsidized'. For most Asian countries, this all means that the key challenge now lies in the implementation and enforcement of the regulations that are already in place and in reforms of the legal system. At the same time, significant discrepancies, such as in market infrastructure, corporate governance, accounting and auditing, and some aspects of banking supervision and regulation, must be resolved in order to establish efficient financial markets that accord with international standards and practices.

Another major challenge in developing the securities markets in the region is to enhance their liquidity and efficiency. Policymakers will need to address factors that affect market efficiency and liquidity, which in turn are affected by the size and heterogeneity of the investor base, by the explicit and implicit transaction costs, and by the availability of information with which to price securities accurately. Still, since financial innovations have an important role to play in promoting efficiency in the financial intermediation process and thereby support economic growth, policymakers need to strike a balance between financial regulation and innovation. In other words, the challenge ahead is to make rules to protect and promote financial stability without stifling productive financial innovations. While leverage facilitates the efficient operation of financial markets, rigorous risk management is also important to maintain these risks at prudent levels.

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