
ADB
ASIA CAPITAL MARKETS MONITOR
APRIL 2009
Asian Development Bank

The *Asia Capital Markets Monitor* (ACMM) reviews recent developments in emerging Asia's stock, bond, and currency markets along with their outlook, risks, and policy implications. This inaugural issue features a special section "Bringing Life to Asian Money Markets." The ACMM covers the capital markets of the People's Republic of China; Hong Kong, China; India; Indonesia; Republic of Korea; Malaysia; Philippines; Singapore; Taipei,China; Thailand; and Viet Nam.

Download the ACMM at: asianbondsonline.adb.org/features/asian_capital_markets_monitor/ACMM-complete.pdf

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Emerging Asian Capital Markets

Highlights

Global and Regional Environment

- Amid global recession, financial markets are showing signs of stabilizing as aggressive policy measures gain traction.
- Equities worldwide have seen a bear market rally since mid-March, with volatility easing if still elevated.
- Markets may have reached bottom, yet the road to recovery will likely be long and hard.
- Long-term government bond yields have started edging up, as record bond issuance to fund financial rescue and fiscal stimulus packages test government creditworthiness.
- Money market spreads have gradually narrowed with extensive liquidity injections, though they remain high compared with pre-September 2008 levels.

Emerging Asia's Market Performance and Outlook

- The financial outlook for emerging Asia is less bleak than for other regions, with net private capital inflows to the region's capital markets expected to remain positive this year, if down sharply from their 2007 peak.
- Equity markets across emerging Asia show signs of a tentative recovery, as valuation indicators have begun to look attractive.
- Any sustained recovery, however, could be delayed as uncertainty over the severity and length of the global financial crisis and recession weighs down investor sentiment.
- Local currency bond issuance should expand in 2009 as fiscal policy moves center stage in the fight against recession and government bond issuance rises to finance fiscal stimulus packages.
- Rising bond yields associated with increased government bond issuance may raise funding costs of fiscal stimulus packages.
- Most emerging Asian currencies fell sharply against the US dollar given massive deleveraging and heightened risk aversion.
- Growing cross-border transactions, rising trend in investment flows, and speculative positioning drive emerging Asia's non-deliverable forwards markets.

Acronyms, Abbreviations, and Notes

ABCP	asset-backed commercial paper
ABM	Asia Bond Monitor
ABS	asset-backed securities
ABMI	Asian Bond Markets Initiative
ADB	Asian Development Bank
ALBI	Asian Local Bond Index (HSBC)
ASEAN	Association of Southeast Asian Nations
ASEAN+3	ASEAN plus People's Republic of China, Japan, and Republic of Korea
ATM	at-the-money
BI	Bank Indonesia
BIS	Bank for International Settlements
bp	basis points
BNM	Bank Negara Malaysia
CDS	credit default swap
CP	commercial paper
CPI	consumer price index
EMBI	JP Morgan Emerging Market Bond Indices
EU	European Union
FDI	foreign direct investment
FDIC	Federal Deposit Insurance Corporation
FX	foreign exchange
G3	eurozone, Japan, and United States
G8	Group of 8
G20	Group of 20
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
GDP	gross domestic product
HKMA	Hong Kong Monetary Authority
IT	information technology
IMF	International Monetary Fund
IPO	initial public offering
Korea	Republic of Korea
LCY	local currency
LIBOR	London Interbank Offered Rate
MAS	Monetary Authority of Singapore
MBS	mortgage-backed securities
MSCI	Morgan Stanley Capital International
MDB	multilateral development bank
NIE	newly industrialized economy
NDF	non-deliverable forward
OECD	Organisation for Economic Co-operation and Development
OIS	Overnight Index Swap
OREI	Office of Regional Economic Integration
OTC	over–the-counter
PBOC	People's Bank of China
PRC	People's Republic of China
q-o-q	quarter-on-quarter
RBI	Reserve Bank of India
repo	repurchase agreement
saar	seasonally-adjusted annualized rate
SBV	State Bank of Viet Nam
US	United States
US Fed	United States Federal Reserve
WTO	World Trade Organization
y-o-y	year-on-year
YTD	year-to-date

Note: To conform with market practice, the *Asia Capital Markets Monitor* uses two-letter official ISO Country Codes and three-letter currency codes rather than ADB's standard symbols.

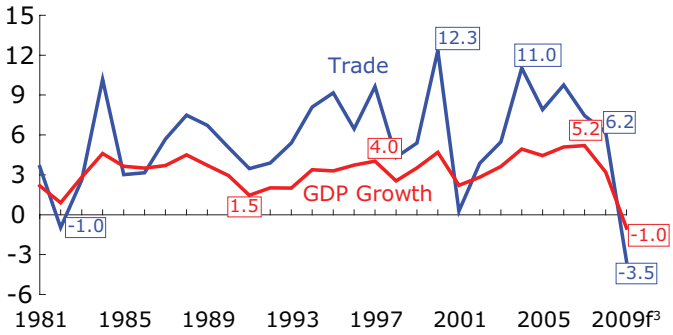
Special Section: Bringing Life to Asian Money Markets

- Money markets are central to capital allocation, the efficient distribution of liquidity among financial institutions, and the hedging of short-term risks; they act as an aggregator and clearing house for liquidity and are key to price discovery for financial instruments.
- Although the relative underdevelopment of money markets in emerging Asia helped insulate the region from the worst effects of the global financial turmoil, all major money markets experienced some degree of dislocation.
- Building vibrant, resilient money markets in the region will require authorities to ensure market confidence, depth, and liquidity, while consistently updating the supervisory and regulatory environment.
- Despite the diversity among emerging Asian markets, there is a common architecture that can enhance the development of money markets:
  - A transparent and robust legal and regulatory framework;
  - Prudent regulation and effective risk management practices; and
  - Continued liberalization of domestic financial markets and better cross-border collaboration.

The *Asia Capital Markets Monitor* April 2009 was prepared by ADB's Office of Regional Economic Integration and does not necessarily reflect the views of ADB's Board of Governors or the countries they represent.

Emerging Asian Capital Markets at a Glance

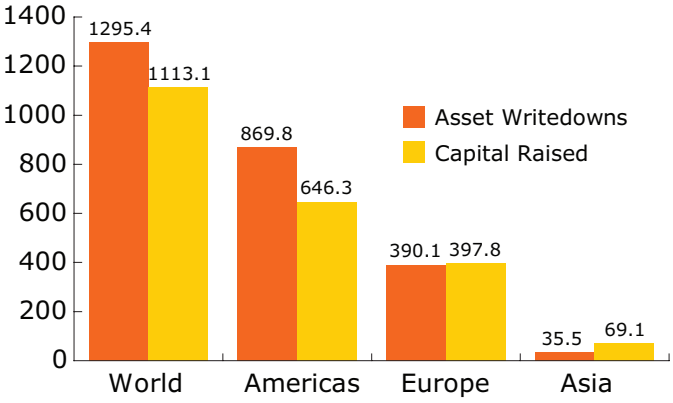
Figure H1: World GDP[1] and World Trade Volume[2] (y-o-y change, %)



[1]GDP = gross domestic product. [2]Export Volume. [3]f = forecast.
Sources: *Asian Development Outlook 2009*, Asian Development Bank; *World Economic Outlook Database* (Oct 2008), *Global Economic Policies and Prospects for the G20 Meeting of the Ministers and Central Bank Governors*, International Monetary Fund.

Global economic activity slows at an alarming speed, recession sets in, and trade volumes plummet.

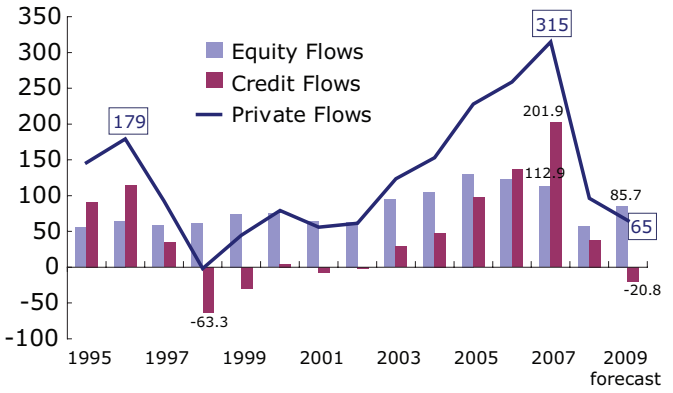
Figure H2: Writedowns and Capital Raised by Major Banks since July 2007
(USD billion, as of 31 Mar 2009)



Source: Bloomberg.

The global banking system remains the weakest link in the chain of global financial and economic crises.

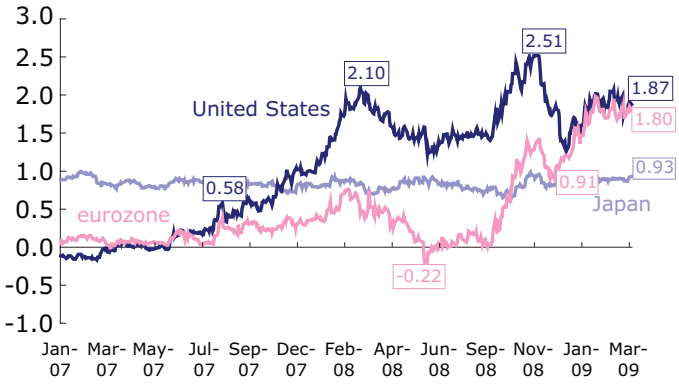
Figure H3: Net Private Capital Flows—Emerging Asia[1] (USD billion)



[1]Refers to People's Republic of China; India; Indonesia; Malaysia; Philippines; Republic of Korea; and Thailand.
Source: Institute of International Finance.

For emerging Asia, the financial outlook is less bleak than for other regions, with net private capital inflows to the region's capital markets expected to remain positive this year.

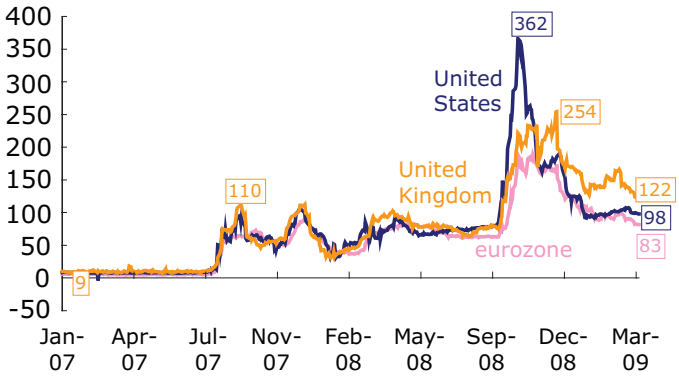
Figure H4: 10-year and 2-year Government Bond Yield Spreads
(% per annum)



Source: Datastream.

A sharp rise in government bond supply to finance financial rescue and fiscal stimulus packages is starting to put upward pressure on long-term bond yields.

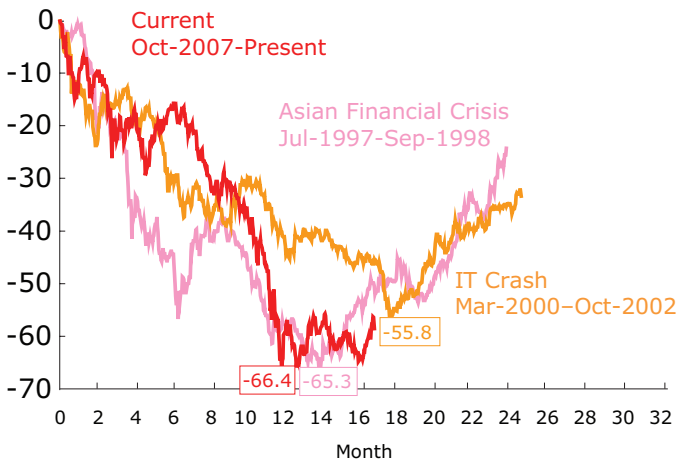
Figure H5: 3-Month LIBOR minus OIS[1] Spreads (basis points)



[1]OIS=Overnight Index Swap.
Source: Staff calculations based on Bloomberg data.

Money market spreads have gradually narrowed with extensive liquidity injections, although they remain elevated compared with pre-September 2008 levels.

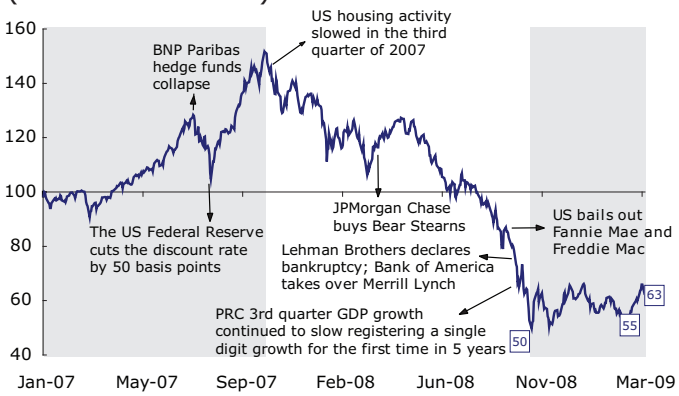
Figure H6: Bear Markets in Asia[1]
(% change)



[1]Based on Morgan Stanley Capital International (MSCI) Asia (excluding Japan) index.
Source: Bloomberg.

Emerging Asia's equity markets show tentative signs of stabilizing after being hit hard by the global financial crisis.

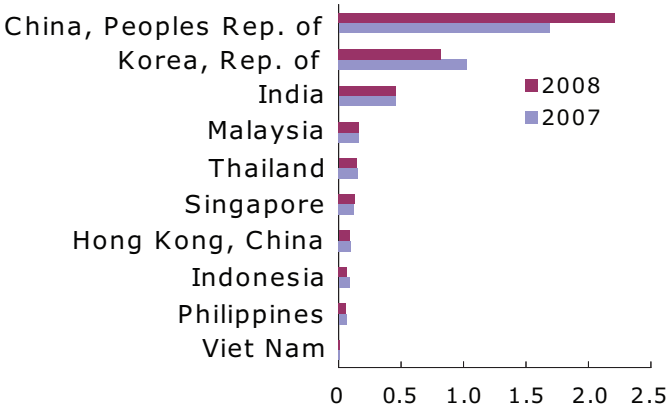
Figure H7: MSCI Indexes—Emerging Asia[1]
(2 Jan 2007 = 100)



[1]Refers to People's Republic of China; India; Indonesia; Republic of Korea; Malaysia; Philippines; Taipei,China; and Thailand. [2]PRC=People's Republic of China.
[3]GDP = Gross domestic product.
Source: Morgan Stanley Capital International (MSCI) Barra.

Equity markets across emerging Asia show signs of a tentative recovery, as valuation indicators have begun to look attractive; still, the road to sustained recovery could be long and hard.

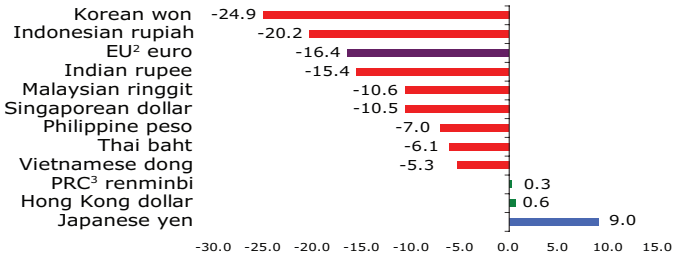
Figure H8: Total Bonds Outstanding—2007 and 2008 (USD trillion)



Source: AsiaBondsOnline and Reserve Bank of India.

LCY bond issuance is expected to increase in 2009 as fiscal stimulus packages have become a primary tool of governments across the region in the fight against recession.

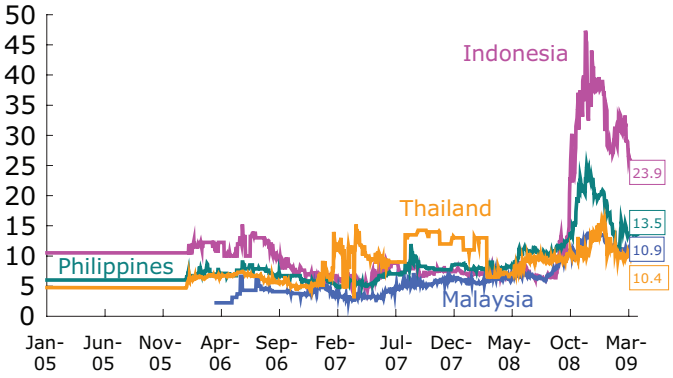
Figure H9: Regional Currencies[1]
(1 July 2008 to 30 March 2009, % change)



[1]Latest closing as of 30 March 2009, based on the USD value of local currency. Negative values indicate depreciation. [2]EU = European Union.
[3]PRC = People's Republic of China.
Source: OREI staff calculations based on Reuters data.

Most emerging Asian currencies fell sharply against the US dollar amid massive deleveraging and heightened risk aversion; while they have stabilized somewhat lately, volatility remains high.

Figure H10: Implied Volatility of Exchange Rates—ASEAN-4
(3-month ATM[1])



[1]At-the-money.
Source: Bloomberg.

Foreign exchange volatility is at its highest level in a decade; although the current global credit crisis influenced volatility less than past financial crises.

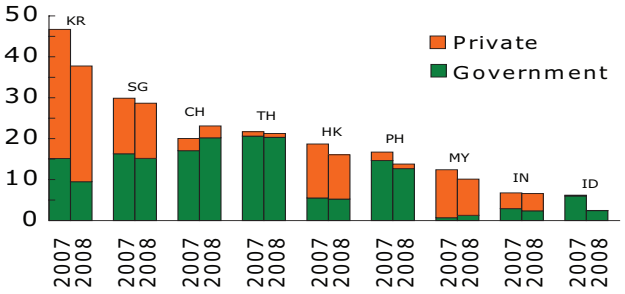
Table H1: Average Daily NDF Turnover
(USD million)

	2008—2009	2003–2004
CNY	1,000	50
INR	800	20-50
KRW	3,000	700-1,000
IDR	400	50
PHP	500	20-30
MYR	500	

Source: Deutsche Bank.

Growing cross-border transactions, a rising trend in investment flows, and speculative positioning drive emerging Asia's non-deliverable forwards markets.

Figure H11: Outstanding Short-Term Debt Securities[1] (% of GDP)[2]



Note: KR=Republic of Korea; SG=Singapore; CH=People's Republic of China; TH=Thailand; HK=Hong Kong, China; PH=Philippines; MY=Malaysia; IN=India; ID=Indonesia.
[1]Debt securities with remaining maturity up to 1 year, including those issued in domestic and international markets. Private sector debt covers securities issued by financial institutions and the corporate sector. Domestic securities for 2008 are as of September 2008. [2]Fiscal Year 2008 gross domestic product data for India is World Economic Outlook estimate; for Rep of Korea estimate from published fiscal year budget ratios.
Sources: OREI Staff calculations based on data from Bank for International Settlements; CEIC; *World Economic Outlook Update* Oct 08, International Monetary Fund.

Money markets require further development to effectively allocate capital, efficiently distribute liquidity among financial institutions, and hedge short-term risks.

Emerging Asian Capital Markets—A Regional Update

1. Global and Regional Environment[1]

Global Financial Market Developments

Amid global recession, financial markets are showing signs of stabilizing as aggressive policy measures gain traction.

Having traversed rough waters in 2008 and early 2009, global financial markets are starting to show signs of stabilizing, with stock prices around the world edging upward and credit conditions improving, albeit slowly. Since February, global economic indicators have been sending some signals that a recovery might be underway **(Figures 1.1a, 1.1b, 1.1c, 1.1d)**. Extensive policy actions to prevent a major downturn and restore market confidence are also gaining traction, especially with the latest plan by the United States (US) Treasury to buy up toxic assets from banks. The recent quantitative easing by the US Federal Reserve (US Fed) is also providing some relief to credit markets, tentatively halting the markets' downfall.

Equity markets worldwide have experienced a bear market rally[2] since mid-March after the major sell-offs in mid-September.

A synchronized downturn in major industrial countries and the growing spillover effects on emerging market economies have weighed heavily on global equity markets. The year-end rebound was cut short when most equity markets around the globe experienced renewed weakness after worse-than-expected earnings reports and fresh economic data pointed to a deeper-than-expected recession in early 2009. But attractive valuations are starting to draw investors' attention in a very low (and in some cases zero) interest rate environment. Price–earnings ratios have dropped as well, even as earnings expectations declined further in early 2009. Equity valuations in emerging markets also fell to very low levels, particularly in Central and

[1] This section was prepared by Cyn-Young Park. For any inquiries, please contact cypark@adb.org.

[2] A bear market rally refers to an increase in equity prices during a primary downward market trend, or "bear market."

Figure 1.1a: Baltic Dry Index[1]

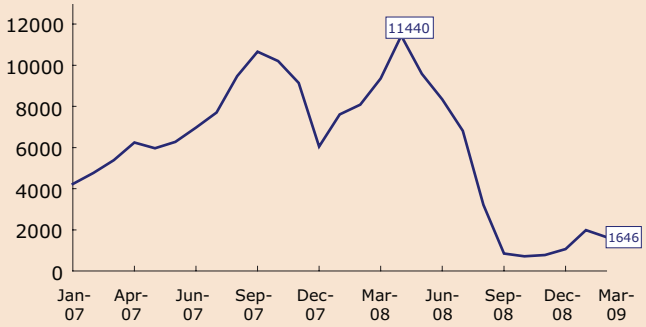


Figure 1.1b: Copper Future Prices (USD per lb)

Figure 1.1c: JPMorgan Global Manufacturing Output Index[2]

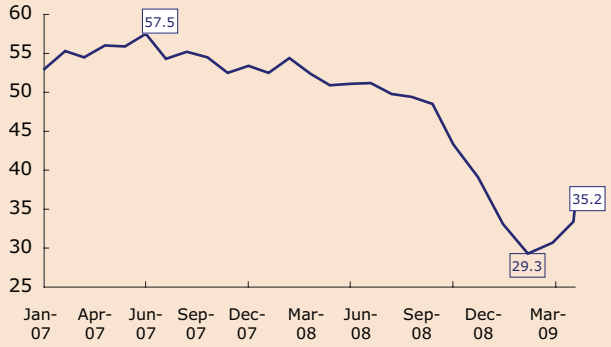
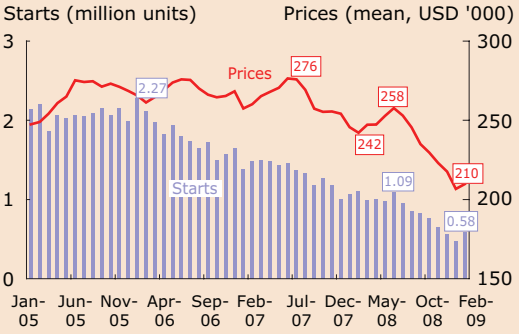


Figure 1.1d: Private Housing Starts and Prices[3]—US



[1]The index indicates the price of moving major raw materials by sea. [2]A component of the JPMorgan Global Manufacturing Purchasing Managers' Index (PMI), which serves as an indicator of global manufacturing business conditions, based on data collected from surveys around the world. A reading above 50 indicates an increase in the variable since the previous month and below 50, a decrease. [3]Seasonally-adjusted levels.
Sources: Bloomberg, Datastream, JPMorgan, CEIC.

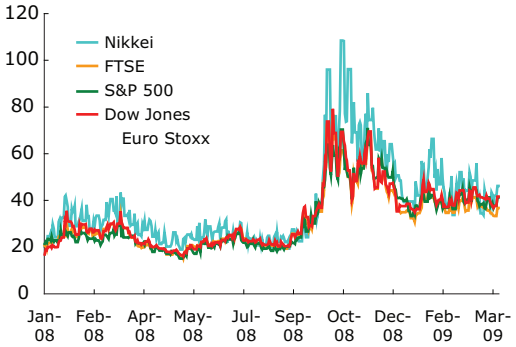
Figure 1.2: MSCI Indexes (2 Jan 2007 = 100)

Source: Morgan Stanley Capital International (MSCI) Barra.

Eastern Europe, where the global credit crunch severely hit the banking sector and the real economy. Recent improvements in investors' risk appetites, however, have lifted emerging market stocks. While the Morgan Stanley Capital International (MSCI) World Index fell 4.6%, the MSCI Emerging Markets Index rose 12.2% year-to-date **(Figure 1.2)**.[3] Even as most markets plunged—led by the decline in the financial sector in January and February—some emerging markets made noticeable comebacks. The top year-to-date performers include the People's Republic of China (PRC) (33.9%), Peru (41.9%), and Russia (49.7%).

[3] The last date used for daily market movements throughout the publication is 10 April.

Figure 1.3: Implied Volatilities[1]



[1]Calculated from a weighted average of the volatilities of the two options closest to the at-the-money strike.
Source: Bloomberg.

Volatility has come down from the highs of late 2008, although it remains elevated as uncertainty over the severity and duration of the economic downturn continue to be a concern to global investors.

Volatility in equity markets hit historic highs in October 2008 in the wake of the Lehman Brothers bankruptcy and subsequent deterioration in global economic conditions **(Figure 1.3)**. As markets gradually adjusted to the cyclical downturn amid mounting evidence of a global recession, volatility fell from its peak. Indeed, even as new instances of banking weaknesses and a wave of bad economic news triggered another sell-off in January and February, volatility in equity markets remained within a relatively modest range. Nonetheless, it is still high by historical standards, reflecting market anxiety over the lack of clear signals of a firm recovery.

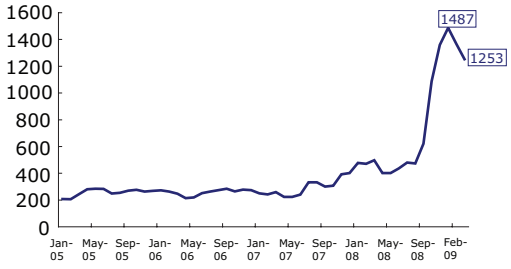
Figure 1.4: Global Investment Grade Spread[1] (basis points)

[1]JP Morgan Investment Grade Spread.
Source: Bloomberg.

Credit risks have fallen from their record levels yet remain high as the quality of corporate and sovereign credit has taken a beating, and banks continue to face stress.

Despite some improvement due to extensive policy support, including the US Treasury's recent plan to clean up balance sheets of troubled banks, credit markets in general remain under stress amid continued weakness in banking systems and investor anticipation of additional defaults. Investment grade corporate bond credit spreads increased to levels not seen since the Great Depression **(Figure 1.4)**. Although they have narrowed since, corporate credit spreads remain wide—implying higher returns on bonds, which finally made an appeal to investors in an environment of rapidly falling interest rates early in 2009. With extensive government support, investment grade corporations, particularly banks with government guarantee programs, were able to issue bonds worth USD824.4 billion in the first quarter of 2009. Several emerging market sovereign and corporate borrowers also saw this trend, issuing some USD18 billion in foreign currency bonds during the same period. However, the situation for lower-rated borrowers remains extremely difficult amid continuing deterioration in credit quality **(Figure 1.5)**. Some emerging market sovereigns—including the Baltic States (Estonia, Latvia, and Lithuania), Hungary, Russia, and Ukraine—have experienced rating downgrades on worsening economic conditions since October. Among them, Hungary, Latvia, Belarus,

Figure 1.5: Global Speculative Grade Spread[1] (basis points)



[1]Difference between yields on global corporate AAA bonds and global speculative grade bonds.
Source: Datastream.

Ukraine, and Serbia have turned to the International Monetary Fund (IMF) for rescue.

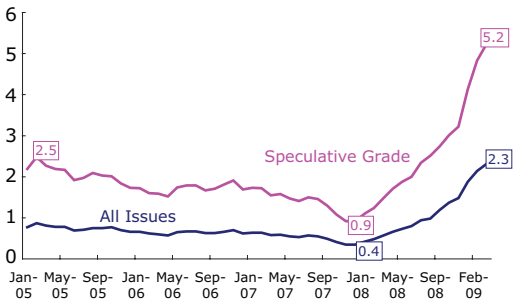
The perception of default risks has improved in recent months yet remains elevated amid deepening global recession, with credit default swap spreads widening across the board.

Reflecting rising default risks **(Figure 1.6)**, benchmark credit default swap (CDS)[4] indexes have increased markedly. Although they are down from their late 2008–early 2009 peaks, they remain very high by historical standards **(Figure 1.7)**. US investment grade CDS spreads rose by 223 basis points (bp) between June 2007 and March 2009, and US high-yield spreads were up 820 bp over the same period. CDS spreads in other major markets also moved upward in tandem with the US market. CDS spreads are a key measure of risk aversion. With continued financial woes and rising default rates on high-yield borrowers, CDS spreads for financials, high-yield corporates, and emerging market sovereigns have widened even further. Credit default swaps on the benchmark Markit iTraxx financial index, which references the subordinated debt of 25 European banks and insurers, rose 266 bp to 406 between October 2008 and March 2009, as markets remained anxious that Western European banks may also face credit downgrades, given their high levels of exposure to Central and Eastern Europe. In addition, the Asia iTraxx investment grade index (excluding Japan) widened to 664 bp in March 2009 from 35.6 bp in October 2007.

In money markets, spreads remain elevated compared with the pre-September period, although they are gradually improving following extensive policy measures.

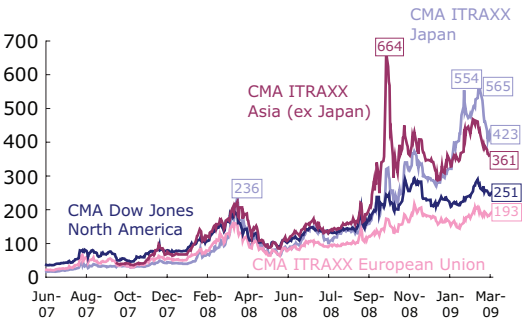
Interbank funding pressure remains elevated, although London Interbank Offered Rate (LIBOR)–Overnight Index Swap (OIS) spreads—which reflect a combination of credit and liquidity risks—have come down from the historic highs seen in mid-September when the Lehman Brothers bankruptcy sparked a crisis of confidence **(Figure 1.8)**. That collapse caused collateral

Figure 1.6: Global Bond Default Rate (%)



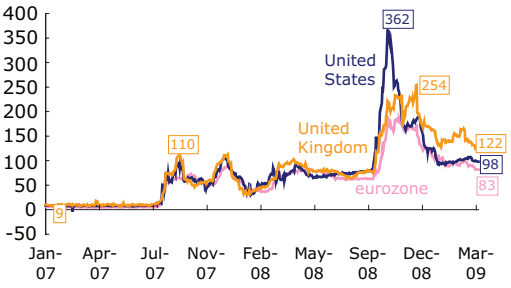
Source: Datastream.

Figure 1.7: Credit Default Swap Indexes (investment grade, senior 5-year)



Source: Datastream.

Figure 1.8: 3-Month Libor minus OIS[1] Spreads (basis points)



[1]OIS=Overnight Index Swap.
Source: Staff calculations based on Bloomberg data.

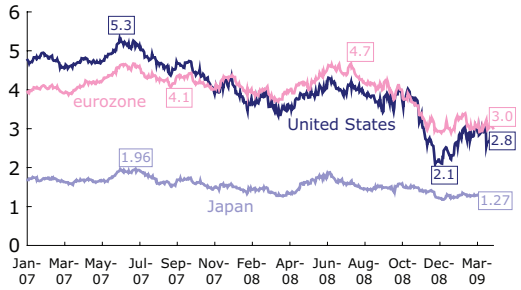
[4] A credit default swap (CDS) is a credit derivative contract, in which the buyer makes periodic payments to the seller and, in return, receives a payoff in the event of specified credit incidents—typically a default. A CDS contract is often compared with insurance because the contract provides protection against defaults or re-structuring of the underlying financial instrument.

damage to money market funds, which were heavily exposed to Lehman Brothers debt through commercial papers and other short-dated debt. A flurry of liquidations and redemptions of prime money market funds caused liquidity to drain and key short-term money market rates to jump. A surge in counterparty credit risks associated with the Lehman Brothers bankruptcy exacerbated liquidity conditions. Heightened concerns over financial stress and the contractionary effect of continued funding pressures prompted major central banks to inject huge amounts of liquidity. Many governments also infused capital into national banking systems and provided guarantees for bank debt. The 3-month US dollar LIBOR-OIS spread has been narrowing gradually since late last year, partly reflecting the effects of such unprecedented policy interventions.

A sharp rise in supply of government bonds to fund financial rescue and fiscal stimulus packages is starting to put upward pressure on bond yields.

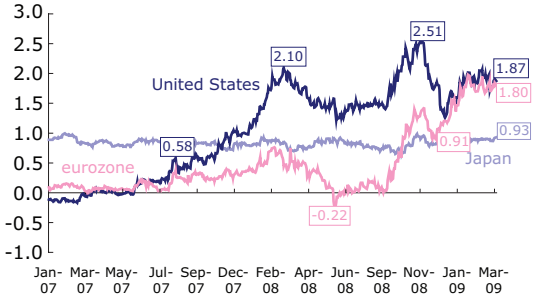
Beginning late last year, long-term government bond yields reversed their downward trend **(Figure 1.9)**. Uncertainties surrounding the global economic outlook and worsening financial turmoil had boosted government bonds globally over the past 2 years, as investors sought safer assets amid the deepening financial crisis. However, as governments around the world continue to unveil fiscal stimulus packages, supply concerns have started to push yields up, especially at the long end of the curve. Yields on 10-year US Treasury notes rose by 68 bp between December 2008 and March 2009. During the same period, 10-year government bond yields also climbed from 2.9% to 3.2% in the eurozone, and from 1.2% to 1.3% in Japan. In an effort to bring down long-term borrowing costs and short-circuit the impact of financial constraints on real economic activity, on 18 March the US Fed announced a USD300 billion Treasury purchase program over a 6-month period. After the initial euphoria, however, the rally in US Treasuries was stunted as investors mulled over the plan's effectiveness and long-term effects on inflation. Meanwhile, aggressive monetary easing in the US, Europe, and Japan has sent short-term government bond yields lower, with yield curves steepening sharply in recent months **(Figure 1.10)**.

Figure 1.9: 10-Year Government Bond Yields (% per annum)



Source: Datastream.

Figure 1.10: 10-year and 2-year Government Bond Yield Spreads (% per annum)

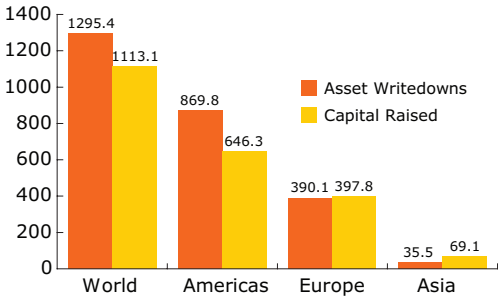


Source: Datastream.

The global banking system remains the weakest link in the chain of global financial and economic crises, curtailing lending to consumers and businesses, and thus aggravating real economic activity.

With extensive help from central banks and governments, bank funding pressures have eased somewhat, as reflected in the decline in LIBOR-OIS spreads and an increase in bond issuance. Large capital injections have also contributed to the relatively high capital ratios in the banking sector. For example, Tier 1 risk-based capital ratios for all Federal Deposit Insurance Corporation (FDIC)-insured commercial banks in the US reached 9.8% in 2008, well above the 6% regulatory requirement. However, write-downs continue to rise while loan losses are expected to increase further. Banks worldwide have thus far reported nearly USD1.3 trillion in write-downs **(Figure 1.11)**. Reported and expected loan losses continue to push banks to raise capital. But the sharp decline in their share values and the recent deterioration in global credit conditions have made it challenging for banks to raise fresh private capital. Meanwhile, strained banking systems continue to curtail lending to consumers and businesses, aggravating real economic conditions.

Figure 1.11: Writedowns and Capital Raised by Major Banks Since 3Q07
(USD billion, as of 31 Mar 2009)

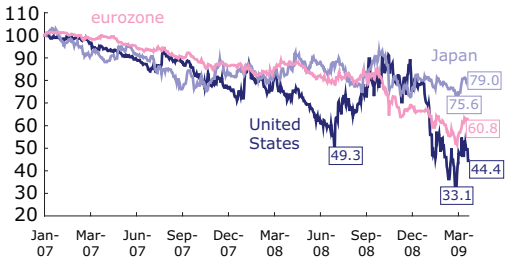


Source: Bloomberg.

Bank rescue efforts also face new challenges, as investors increasingly scrutinize the nature of capital injections and, in particular, their effect on shareholder rights.

In response to persistent bank weakness, financial sector shares continue to underperform broad market indexes **(Figure 1.12)**. Increased government stakes in the banking sector have also weighed down financial shares. The most common choice of official capital injection has been preferred shares, thus subjecting the common shareholders to greater potential losses. Exacerbating the situation are concerns that additional capital infusions may dilute the rights of existing shareholders (for example, through restrictions on dividend payments). As it becomes increasingly evident that further government intervention will be necessary—via additional capital injections or nationalization—financial shares have suffered even more. For example, the US Government converted a large share of its Citigroup holdings in preferred shares, which it received in exchange for an earlier capital injection, into common shares in late February to stabilize the troubled bank and arrest the

Figure 1.12: Ratio of Financial Stock Price Index to Overall Stock Market Index—G3
(2 January 2007 = 100)



Source: Bloomberg.

rapid decline in its share price. But this dealt a blow to financial shares, as the conversion pushed the US Government's equity in Citigroup to 36%, reducing existing shareholders' stake to just 26%. Investors, who were wary of a similar pattern at other troubled banks, fled financial shares in general. As a result, policymakers now face an even greater dilemma as potential rescue measures could discourage the flow of private capital into their respective banking systems unless the conditions of official capital injections and the modalities for recapitalization are carefully formulated.

Building on policy measures initiated thus far, more decisive and credible interventions are required to restore financial stability and revive economic growth.

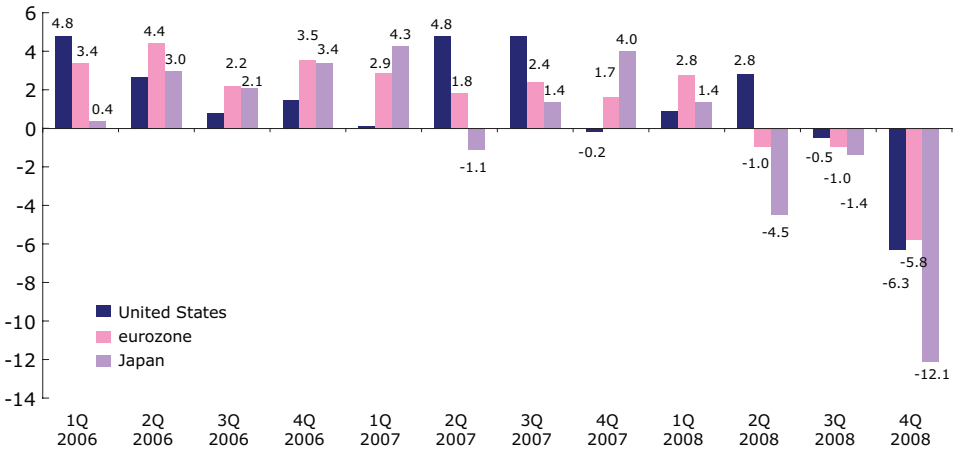
Despite some encouraging signs of stabilizing in recent months, the situation remains extremely tenuous. Uncertainty about the depth and breadth of the current crisis continues to roil financial markets, requiring further measures aimed at stabilizing economies. The workout of bad loans in ailing banks continues to be a major hurdle in arresting financial instability. The US Treasury, in coordination with the US Fed and FDIC, announced a plan in late March—the first of several programs expected to help banks clean up their balance sheets by fixing a value on damaged mortgages and related securities. As recent experience suggests, competing considerations must be balanced in choosing whether preferred or common shares are used in the event of additional official capital injections. These include the impact on incentives for raising private capital, the upside and downside risks to taxpayers, and the degree of effective control authorities wish to assert over bailed-out institutions.

Global and Regional Economic Outlook

The world economy continues to slide, but the slowing pace of decline offers hope that the economic nadir may be near.

In 2009, global output is expected to drop for the first time since World War II, with the prolonged financial crisis pushing the global economy into recession. The IMF projects the world economy will contract between 0.5% and 1.0% in 2009. Gross domestic product (GDP) in advanced countries is expected to

Figure 1.13: GDP[1] Growth (SAAR[2], %)



[1]GDP = gross domestic product. [2]SAAR = seasonally-adjusted annualized rate.
Sources: Eurostat (eurozone), Bureau of Economic Analysis (US), and Economic and Social Research Institute (Japan).

decline between 3.0% and 3.5% in 2009, following lackluster growth of 0.8% in 2008.[5] Yet, the speed and magnitude of the economic slide appears to be easing, as aggressive policy measures gradually take effect. Recovery is still expected to begin in early 2010.

A synchronized downturn continues worldwide, with the G3 economies (eurozone, Japan, and US) mired in recession.

The US economy shrank 6.3% in the fourth quarter of 2008 (quarter-on-quarter [q-o-q], seasonally-adjusted annualized rate [SAAR]), the most rapid decline since 1982 **(Figure 1.13)**. It is almost certain that the first quarter of 2009 will see another sharp contraction. US consumer spending retrenched amid the deep housing slump and growing job losses **(Figures 1.14a, 1.14b)**. In both the eurozone and Japan, the recession is deepening as exports collapse, industrial production plunges, and unemployment surges. The process of financial deleveraging exacted a heavy toll on asset prices and credit conditions. The crisis may have wiped out well over USD50 trillion in

[5] International Monetary Fund. 2009. *Global Economic Polices and Prospects.* Note prepared for the Group of Twenty Ministers and Central Bank Governors. 13-14 March. Available: http://www.imf.org/external/np/g20/031909a.htm

Figure 1.14a: United States Consumer Confidence Index[1] (1985 = 100)

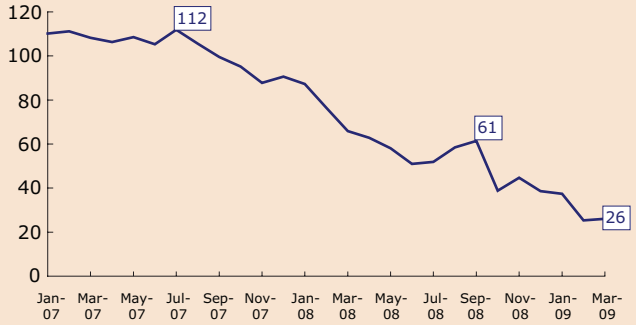
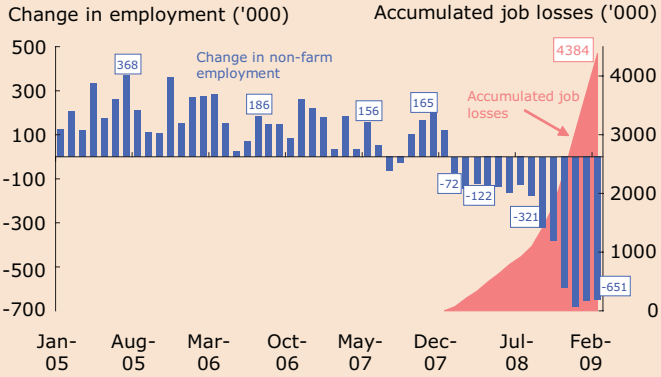


Figure 1.14b: Change in Non-Farm Employment and Accumulated Job Losses[2]



[1]Based on the *The Consumer Confidence Survey* conducted by The Conference Board. [2]Accumulated job losses since December 2007; 2009 figures are preliminary.
Sources: OREI staff calculations based on data from the US Department of Labor, Bureau of Labor Statistics, and Datastream.

Figure 1.15a: Growth in Retail Sales—United States (y-o-y,%)

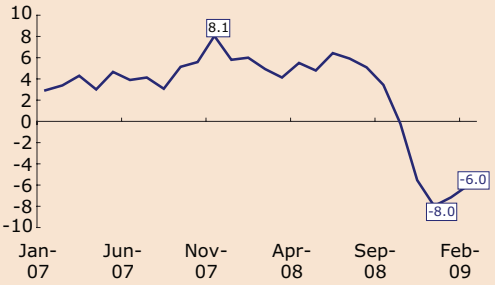
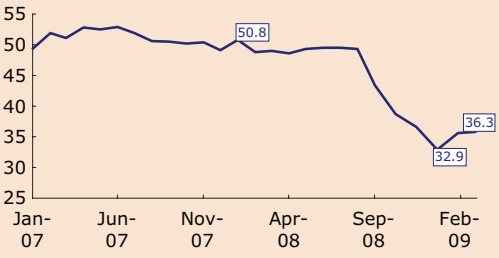


Figure 1.15b: Index of Manufacturing Activity[1]— United States



[1]Data survey from the Institute for Supply Management. The index is a summary measure showing the prevailing direction and scope of change. An index above 50% indicates that the manufacturing economy is generally expanding; below 50% indicates that it is generally declining.
Sources: US Census Bureau, Institute for Supply Management.

financial wealth worldwide.[6] With the global credit crunch still broadening, banks are tightening lending to businesses and households, further aggravating economic activity. The negative feedback loop between the real and financial sectors continues, dampening the outlook even further. However, some US economic indicators point to a bottoming out of the current down cycle **(Figures 1.15a, 1.15b)**. Aggressive monetary easing and fiscal stimulus appear to have borne some fruit, although a clear turnaround remains subject to the effects of recent initiatives to clean up bank balance sheets and ensure the resumption of credit.

Emerging Asia has been hit hard by the global financial crisis and economic downturn, although it probably remains the best performing region amid a deepening global recession.

Aggregate GDP growth in the region is set to decelerate further this year as the global recession deepens **(Table 1.1)**. The region's economy experienced a visible slowdown in the final quarter of 2008, as a sharp falloff in G3 import demand had a

[6] Loser, Claudio M. 2009. *Global financial turmoil and Emerging Market Economies: Major contagion and a shocking loss of wealth?* Available at: http://www.adb.org/Media/Articles/2009/12818-global-financial-crisis/Major-Contagion-and-a-shocking-loss-of-wealth.pdf. ADB. March 2009.

Table 1.1: Annual GDP Growth Rates (%)

							ADB Forecasts[1]	
	2003	2004	2005	2006	2007	2008	2009	2010
Developing Asia	**7.1**	**7.9**	**8.1**	**8.9**	**9.5**	**6.3**	**3.4**	**6.0**
Emerging Asia [2,3]	**7.2**	**8.0**	**8.0**	**8.9**	**9.6**	**6.3**	**3.1**	**5.6**
ASEAN 5[2]	**5.7**	**6.0**	**5.5**	**5.7**	**6.3**	**4.8**	**1.6**	**4.3**
Indonesia[4]	4.8	5.0	5.7	5.5	6.3	6.1	3.6	5.0
Malaysia[5]	5.8	6.8	5.3	5.8	6.3	4.6	(0.2)	4.4
Philippines[6]	4.9	6.4	5.0	5.4	7.2	4.6	2.5	3.5
Thailand	7.1	6.3	4.6	5.2	4.9	2.6	(2.0)	3.0
Viet Nam	7.3	7.8	8.4	8.2	8.5	6.2	4.5	6.5
Newly Industrialized Economies	**3.2**	**6.0**	**4.8**	**5.6**	**5.6**	**1.8**	**(3.3)**	**3.4**
Hong Kong, China	3.0	8.5	7.1	7.0	6.4	2.5	(2.0)	3.0
Korea, Rep. of	3.1	4.7	4.2	5.1	5.0	2.5	(3.0)	4.0
Singapore	3.8	9.3	7.3	8.4	7.8	4.6	(5.0)	3.5
Taipei,China	3.5	6.2	4.2	4.8	5.7	0.1	(4.0)	2.4
China, People's Rep. of	10.0	10.1	10.4	11.6	13.0	9.0	7.0	8.0
India[7]	8.5	7.5	9.4	9.6	9.0	7.1e	5.0	6.5
Japan	1.4	2.7	1.9	2.0	2.4	(0.6)	(3.5)	1.1
United States	2.5	3.6	2.9	2.8	2.0	1.1	(2.4)	1.6
eurozone[8]	0.8	2.1	1.7	2.9	2.6	0.8	(2.6)	0.5

[1]Forecasts are from Asian Development Outlook 2009. [2]Aggregates are weighted according to gross national income levels (atlas method, current USD) from World Development Indicators (World Bank). [3]Includes ASEAN5, NIEs, People's Republic of China, and India. [4]GDP growth rates from 1999–2000 are based on 1993 prices, while growth rates from 2001 onward are based on 2000 prices. [5]Growth rates from 1999–2000 are based on 1987 prices, while growth rates from 2001 onward are based on 2000 prices. [6]Figures for 2004–2006 are not linked to the GDP figures prior to 2003 due to National Statistics Office revisions of sectoral estimates. [7] For fiscal year April–March. [8]Refers to year-on-year growth, seasonally adjusted data. e = estimate
Sources: ADB; Eurostat website (eurozone); Economic and Social Research Institute (Japan); Bureau of Economic Analysis (USA).

negative effect on exports and industrial activity in emerging Asia **(Figures 1.16a, 1.16b)**. The impact of the global downturn has been more immediate and dramatic for the region's more open, newly industrialized economies (NIEs): Hong Kong, China; Republic of Korea (Korea); Singapore; and Taipei,China. Aggregate GDP of the NIEs is projected to contract for the first time since the height of the 1997/1998 Asian financial crisis. A significant slowdown is also likely for five Association

Figure 1.16a: Export Growth[1] (y-o-y, %)

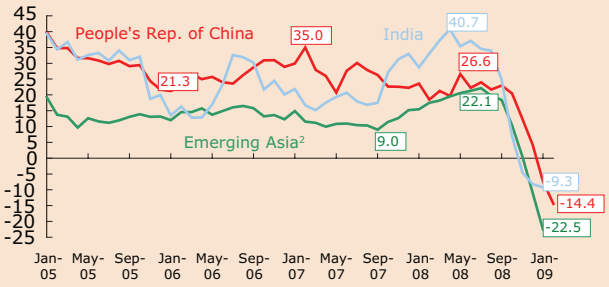
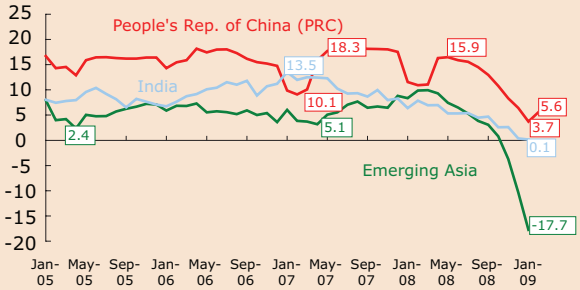


Figure 1.16b: Industrial Production Growth[3] (y-o-y, %)



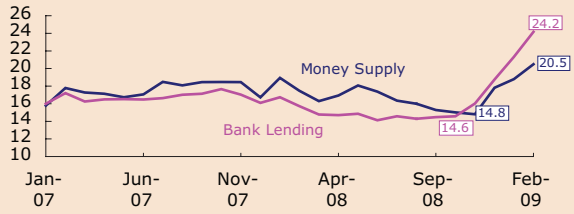
[1]3-month moving average (USD value). [2]Refers to Hong Kong, China; Indonesia; Korea, Rep. of; Malaysia; Philippines; Singapore; Taipei,China; Thailand; and Viet Nam. [3]3-month moving average.
Source: OREI staff calculations based on CEIC data.

of Southeast Asian Nations (ASEAN) economies: Indonesia, Malaysia, Philippines, Thailand, and Viet Nam. However, their low direct exposure to troubled assets coupled with relatively resilient domestic demand have cushioned these economies from the worst effects of the crisis, despite their heavy reliance on external demand for economic growth. In the PRC, the world's third largest economy, growth is expected to slow to 7.0% this year primarily due to the precipitous drop in export demand. The government's fiscal stimulus package, however, has started to gain traction. For example, fixed-asset investment rose 26.5% (y-o-y) in the first 2 months of the year, just below the 4-year average of 27% **(Figures 1.17a, 1.17b, 1.17c, 1.17d)**. GDP growth in India is also expected to slow significantly as exports and private investment weaken, and policy support is constrained by limited fiscal headroom.

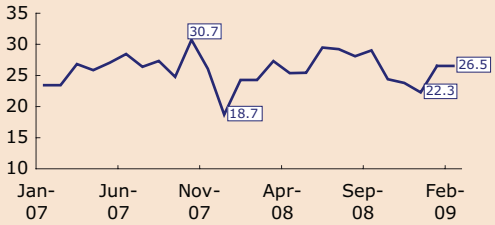
The near-term outlook for the global economy remains grim, despite some tenuous signs of stabilization; significant downside risks remain given the uncertainty surrounding resolution of problem assets and the effectiveness of stabilization policies and economic stimulus.

Although major economies have taken extraordinary policy measures to support growth and stem the spillover effects of the financial crisis, most pundits now predict that a tangible economic recovery will not be felt until early 2010, rather than during the second half of this year, as earlier expected. Downside risks still abound. Despite extensive policy actions taken by governments worldwide, it remains unclear whether these

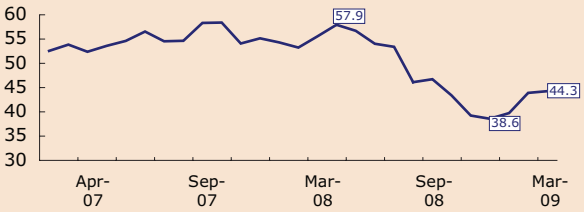
Figures 1.17a: Growth in Money Supply[1] and Bank Lending—PRC[2] (y-o-y, %)



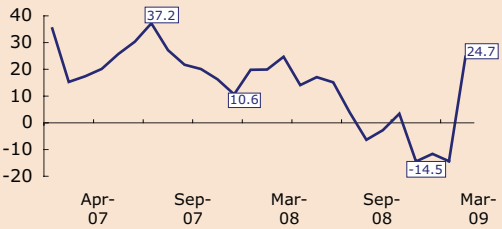
Figures 1.17b: Growth in Urban Fixed Assets Investment—PRC (y-o-y,%)



Figures 1.17c: CLSA Manufacturing Output Index[3] —PRC



Figures 1.17d: Growth in Vehicle Sales—PRC (y-o-y,%)



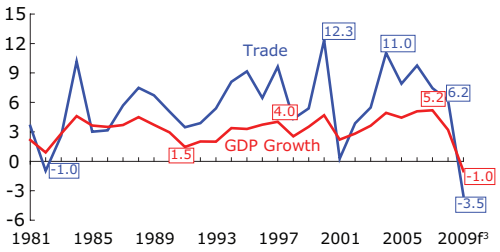
[1]Refers to M2. [2]PRC = People's Republic of China. [3]A component of the CLSA Purchasing Managers' Index (PMI), which serves as an indicator of manufacturing business conditions. A reading above 50 indicates an increase in the variable since the previous month and below 50, a decrease.
Sources: CEIC database, Datastream.

measures are effectively working their way through the global financial system. Rising defaults and continued deterioration of economic conditions could prolong and intensify financial stress, particularly with global banking systems struggling to repair balance sheets and recapitalize.

Trade remains a potent channel for the international transmission of shocks, leading to a downward spiral through declines in world demand, industrial production, and trade activity.

With G3 demand down sharply, world trade and production have plummeted since the last few months of 2008 **(Figure 1.18)**. Weakening growth performance by large emerging market economies, including oil-exporting economies, has also battered world trade. Reductions in trade impede growth in emerging Asian economies, where exports remain an important engine of growth. In addition, emerging Asia's intraregional trade has proven very vulnerable to changing demand conditions in major industrial countries. Emerging Asia's production networks have been seriously affected, with the PRC's role as a regional

Figure 1.18: World GDP[1] Growth and World Trade Volume[2] (y-o-y change, %)



[1]GDP = gross domestic product. [2]World Export Volume. [3]f = forecast.
Sources: *Asian Development Outlook 2009*, Asian Development Bank; *World Economic Outlook Database* (Oct 2008) and *Global Economic Policies and Prospects for the G20 Meeting of the Ministers* and Central Bank Governors, International Monetary Fund.

assembly hub for final products destined for G3 markets. A large proportion of the intermediate goods used by the PRC in the assembly of these final products are supplied by ASEAN and the NIEs.[7] It is almost certain that a firm recovery of the region's export-dependent economies will depend on recovery in global demand, given these tight trade linkages.

The two main risks to the outlook are (i) that the world economy stagnates once the recession bottoms out, or (ii) stabilization and stimulus measures fail to break the vicious feedback loop between financial crisis and economic recession.

Beyond normal transmission channels of trade and finance, unexpected economic weaknesses could surface if the recession is unduly prolonged. Some of the more noticeable weak spots include (i) Central and Eastern European financial systems, which could worsen dramatically with spillovers into Western Europe, further destabilizing the global banking system; (ii) subprime credit sectors, which are expected to face increasing defaults during the recession; and (iii) pension and other institutional investors, whose balance sheets have been significantly hurt by the financial crisis and falling share prices. With the global economic downturn and increasing job losses, concerns over a re-emergence of protectionism are also rising. While most governments remain committed to free trade, several countries have instituted what amount to export subsidies, raised tariffs, employed competitive exchange rate depreciations, or granted preferential treatment for domestic products.[8]

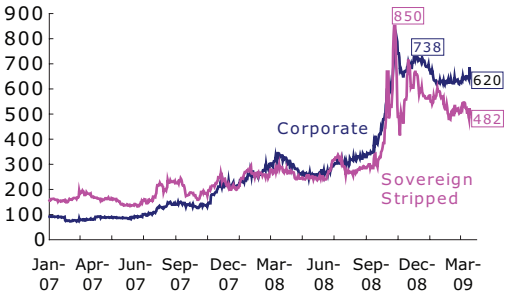
[7] See "Uncoupling Asia: Myth and Reality" Asian Development Outlook 2007. Available at: www.adb.org/documents/books/ADO/2007/part01-uncoupling.pdf

[8] See Newfarmer, Richard and Elisa Gamberoni. 2009. *Trade Protection: Incipient but Worrisome Trends*. World Bank. 17 March. Available: http://siteresources.worldbank.org/NEWS/Resources/Trade_Note_37.pdf.

Capital Flows and External Finance

External funding conditions for emerging Asia have deteriorated sharply amid the intensifying global credit crunch and continued deleveraging, although external positions remain relatively sound for most economies in emerging Asia with total foreign reserves reaching USD3.4 trillion in 2008.

Figure 1.19: Emerging Asia Bond Spread[1] (basis points)



[1]Refers to JP Morgan Emerging Market Bond Indices (EMBI) Asia corporate and sovereign-stripped spreads (over corresponding US zero coupon rate).
Source: Bloomberg.

Emerging Asia's external financing has become more costly and less available, as the global credit crunch broadens and risk-averse investors require greater compensation for taking risks. Credit spreads on emerging Asia's sovereign and corporate bonds have widened substantially **(Figure 1.19)**. The deterioration in asset quality and the economic downturn have also reduced external funding opportunities. Overall, emerging Asia boasts generally healthy external positions on the back of persistent current account surpluses and high levels of international reserves **(Figures 1.20a, 1.20b, 1.20c)**. Nonetheless, some of the region's economies face continued difficulties in tapping international funding markets and/or rolling over their foreign debts. Tougher external financing conditions pose challenges for the countries that rely heavily on external funding sources, particularly on a short-term basis, and have low international reserves. In countries where strong capital inflows in past years led to excessive credit growth and high leverage, domestic banking systems remain particularly vulnerable to a sharp reversal in capital flows. As part of measures to

Figure 1.20a: Net Financial Flows, Current Account, and Forex Reserves—Emerging Asia[1]

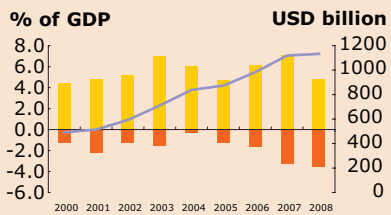


Figure 1.20b: Net Financial Flows, Current Account, and Forex Reserves—PRC[3]

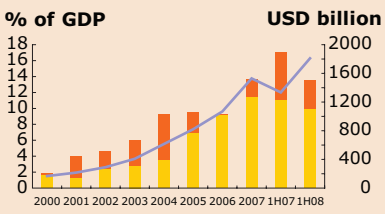
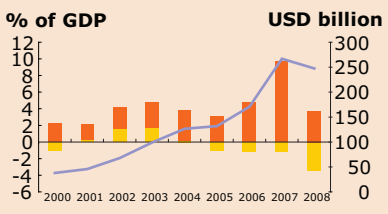


Figure 1.20c: Net Financial Flows, Current Account, and Forex Reserves—India



Current Account to GDP | Net Financial Flows to GDP[2] | Forex Reserves less gold

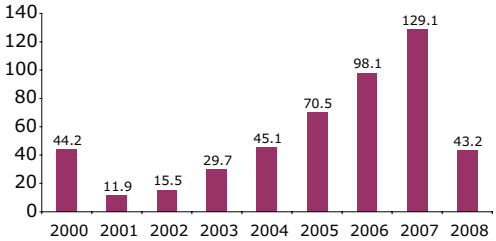
[1]Emerging Asia Hong Kong, China; Indonesia; Korea, Rep. of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. [2]GDP = gross domestic product.
[3]PRC = People's Republic of China.
Sources: International Financial Statistics, International Monetary Fund; and national sources from CEIC database.

support vulnerable countries during the crisis, the IMF recently announced the creation of a new flexible credit line for countries with very strong fundamentals, policies, and track records of policy implementation. This is part of the new global financial architecture envisioned by global leaders during the recent G20 summit in London to build a stronger and more resilient global financial system beyond the current crisis. Under this new system, multilateral financial institutions such as the IMF, Asian Development Bank (ADB), and World Bank are expected to play greater roles **(Box 1)**.

With difficult external financing conditions, international issuance by emerging Asia has dropped sharply.

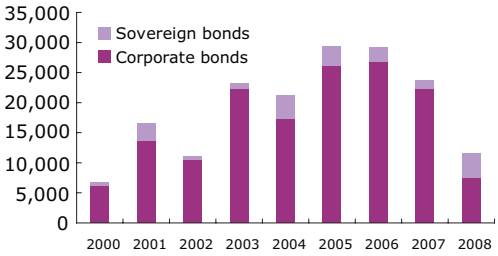
Total international equity issuance by the economies of emerging Asia in 2008 amounted to USD43.2 billion, about one third of the USD129.1 billion offered in 2007 **(Figure 1.21)**. Bond issuance was also weak, with total corporate and sovereign eurobond issuance falling to USD11.6 billion in 2008, down from USD23.7 billion the previous year **(Figure 1.22)**. During the last quarter of 2008, the region's eurobond issuance virtually came to a halt. As the dust gradually settled from the financial panic associated with the Lehman Brothers collapse, the attractive pricing of emerging Asian issuers started to catch investors' attention. A flurry of new deals in emerging Asian debt and equity markets were announced in January. On the equity side, the Bank of China and China Construction Bank made initial public offerings (IPOs) at heavy discounts compared with the most recent trading prices. On the debt side, the Export–Import Bank of Korea sold USD2 billion worth of bonds and the Philippines issued sovereign bonds worth USD1.5 billion. While an extremely challenging environment is expected to persist in 2009, similar bursts of activity can be expected throughout the year as sellers price their offerings aggressively to attract demand amid very low interest rates.

Figure 1.21: International Equity Issuance[1]—Emerging Asia[2] (USD billion)



[1]Refers to announced issues; issues that involve a combination of domestic and international tranches are considered in total as international issues. [2]Includes China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Rep. of; Malaysia; Philippines; Taipei,China; and Thailand.
Source: Bank for International Settlements.

Figure 1.22: Corporate and Sovereign Eurobond Volume—Asia[1] (ex Japan) (USD million)



[1]Refers to China, People's Rep. of; Hong Kong, China; Indonesia; Republic of Korea; Macao, China; Malaysia; Philippines; Singapore; Taipei,China; Thailand; and Viet Nam.
Source: Dealogic.

Box 1: Reshaping the Global Financial Architecture

The scale of the current global crisis suggests that it is unlikely to be contained within national borders. With increasing globalization, financial stability has become a global public good, as certain aspects of crisis prevention and resolution require stronger global cooperation and supervision; and collective action at the global, regional, and national levels.

"Global financial architecture" refers broadly to the institutional, regulatory, and supervisory framework governing global financial systems and markets. In the wake of frequent financial crises in the 1990s, the international community came together with a desire to build a system that would be more resilient to sudden shocks and crises. Reflecting the structural weaknesses of emerging market economies, reforms focused on unwinding external imbalances and improving flexibility in their foreign exchange regimes. A set of measures was also proposed to help prevent crises and strengthen regulatory and supervisory frameworks. However, these efforts remained largely confined to the national level.

Ten years later, the world faces the worst financial crisis since the Great Depression. Confronted by the threat of a financial meltdown and global recession, the leaders of the G20 nations met and agreed to take actions to stop the spread of the crisis' effects and shore up the slowing global economy **(Table B1)**. The G20 also recognized the inadequacy of the existing institutional set-up for financial rules and regulations, and proposed reforms of global financial architecture that seek to reduce and control threats of a systemic financial meltdown in the future.

Table B1: Group of 20 Leaders Agree on a USD1.1 Trillion Package

The Group of 20 (G20), which has held annual meetings since its inception in 1999, has emerged as a hub in forging a global solution to a global crisis. At its 2 April meeting in London, G20 leaders announced a variety of measures to tackle the global economic crisis and agreed to meet again in New York in September to follow-up on progress made. The action agenda is summarized below:

1) Implement tougher financial regulations
   - establish a new Financial Stability Board to replace the Financial Stability Forum
2) Clamp down on tax havens
   - implement sanctions against tax havens and publish a list of countries that do not abide by international standards for the exchange of tax information
3) Increase lending via MDBs to assist developing countries
   - increase resources available to the International Monetary Fund (IMF) to USD750 billion, including a new overdraft facility (or special drawing rights allocation) of USD250 billion
   - support the world's poorest countries by increasing lending capacity of MDBs, including the Asian Development Bank (ADB), by up to USD100 billion
4) Support global trade by providing greater access to trade finance
   - raise USD250 billion to support trade finance over the next 2 years, which will be made available through export credit and investment agencies, as well as through MDBs
5) Avoid protectionist policies
   - notify the World Trade Organization (WTO) of any measures that constrain worldwide capital flows
   - request the WTO to monitor and report publicly on such constraints on a quarterly basis

Sources: Various reports, newspaper accounts.

There are five broad principles that should be considered for reforming the global financial architecture:

- First, a new global financial architecture should include a governance system that is fair and inclusive. Developing countries, in particular, should have greater representation in the reform process and institutional design to reflect the growing presence of their economies in the world economy and financial markets. A governance system with greater representation from the developing world will also offer legitimacy for any global institutional set-up and support its operations effectively. With the growing presence of developing countries in the global financial markets, the current crisis presents an opportunity to craft a truly international framework that will reflect the evolution of the global economic and financial landscape.

- Second, the regulatory and supervisory framework needs to be comprehensive—leaving no loopholes—and have adequate enforcement powers. The global regulatory system must be based on a tightly-weaved network of national and regional authorities that are empowered in each respective jurisdiction to sanction and penalize violators. The current crisis has its origin in excessive risk-taking by private sector institutions associated with regulatory deficits in industrial economies with more mature financial systems. The magnitude of the current crisis shows the gravity of regulatory lapses, regardless of the types of financial products and financial institutions involved, or the jurisdiction where they took place. An institutional set-up for financial regulation at the global, regional, and national level could also be considered to have truly comprehensive coverage with respect to regulatory jurisdiction.

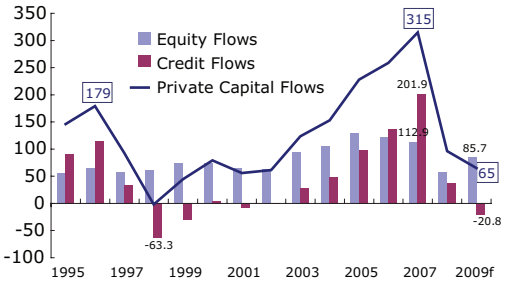
- Third, a more systemic macro-prudential approach needs to be introduced to the financial regulatory and supervisory system. Macro-prudential surveillance focuses on risks to the financial system as a whole. Such risks may be cross-cutting, affecting a number of firms and markets, although they may be concentrated in a few key areas at times. Effective macro-prudential oversight at the global level would require coordination of global macroeconomic policies through the ups and downs of economic and financial cycles to avoid a build-up of financial excesses and to sustain economic stability. Strengthening regional cooperation through monitoring and surveillance initiatives within existing regional arrangements can also provide additional resilience, even against large external shocks.

- Fourth, a new global financial architecture needs to address the pro-cyclicality of financial systems with the involvement of prudential regulators, macro-prudential supervisors, and related standard-setters. Macro-prudential measures, including forward-looking risk evaluation and adequate liquidity provisioning, can help avoid pro-cyclical effects such as large financial swings that have destabilizing effects on an economy. However, regulatory and supervisory policies, such as capital standards, accounting rules, and other regulatory restrictions, should not themselves put unjustified pressure on financial institutions or inappropriately inhibit lending during economic downturns. Guiding principles in efforts to reduce pro-cyclicality include (i) limiting the costs of financial distress in the contraction phase, and (ii) restraining the build-up of risk during the expansion phase. It is important to establish buffers in the system during periods of expansion and to provide for their controlled run-down when strains materialize.

- Fifth, a new global financial architecture should consider a lender-of-last-resort facility. Previous experience shows that private financing tends to dry up during times of crisis and multilateral development banks (MDBs) often step in to provide essential liquidity. An area of particular concern is trade finance, as a sudden reduction in the commercial credit available to exporters often transmits the effects of financial stress directly to the real economy, which delays the recovery process in many developing countries. Increasing the lending capacity of MDBs to deal with such situations can be part of an effective crisis response. For cash-strapped businesses, the rules on conditionalities may also need to be relaxed to facilitate their access to these credit lines.

The financial outlook for emerging Asia is less bleak than for other regions, with net private capital inflows to the region's capital markets expected to remain positive this year, albeit down sharply from their 2007 peak.

Figure 1.23: Net Private Capital Flows —Emerging Asia[1] (USD billion)



f = forecast.
[1]Refers to India; Indonesia; Malaysia; People's Republic of China (PRC); Philippines; Republic of Korea; and Thailand.
Source: Institute of International Finance.

Net private capital flows to emerging Asia are expected to reach USD64.9 billion in 2009, down from USD96.2 billion in 2008 and USD314.8 billion in 2007, according to the Institute of International Finance **(Figure 1.23)**. The decline in capital flows can be largely attributed to a sharp drop in foreign commercial bank lending in the region, which totaled a net repayment of USD25.3 billion in 2009 after a net inflow of USD29.8 billion in 2008. Changes in net equity investments are expected to be less dramatic, although net portfolio equity flows turned sharply negative in the second half of 2008 as global investors redeemed and repatriated funds quickly as a way of repositioning their portfolios away from risky emerging market assets or to use resources to offset losses elsewhere. Portfolio flows are expected to recover later this year on the back of more attractive prices and a relatively positive growth outlook for the region, although the rebound will be slow and unlikely to happen until the second half of the year. Authorities have introduced various measures to support local stock and bond markets, while generally continuing their efforts to liberalize and deregulate their financial markets **(Table 1.2)**. On the other hand, foreign direct investment (FDI) flows are traditionally more stable than other components of private capital flows.

Monetary Policy and Exchange Rates

Global monetary policy has become expansionary amid the deepening global recession and moderating inflation.

The US Fed has kept its policy rate within a range of 0% to 0.25% since December 2008 after having made 10 cuts totaling 500 bp since September 2007. In addition, it made a drastic shift to "credit easing" in March by initiating a plan to buy up to USD300 billion worth of government debt and an additional USD750 billion of mortgage-backed securities, bringing total purchases to over USD1 trillion to help boost bank lending and promote economic recovery. Other major central banks around the world have also been active. The European Central Bank has cut its

Table 1.2: Emerging Asia Capital Market Regulatory and Policy Changes (2007–present)

Economy	Regulations
China, People's Rep. of	**Bond Market** • Allowed locally-listed banks to buy and sell bonds on the stock exchanges on a pilot basis [Jan 09] • Released official rules to allow shareholders of listed companies to issue exchangeable bonds [Oct 08] • Allowed corporations (including foreign firms) to issue securities in the interbank bond market [Apr 08] **Equity Market** • Reduced the stamp duty on stock trading from 0.3% to 0.1% to stabilize the stock market [Apr 08] • Released Guiding Opinion on the Transfer of Stock Shares with Terminated Sales Limits to regulate the transfer of shares that have already undergone equity division [Apr 08] • Reached an agreement with the Financial Services Agency of Japan on the Qualified Domestic Institutional Investor system [Feb 08] **Foreign Exchange Market** • Started using the yuan as the settlement currency in trading with neighboring territories [Dec 08] • Tightened restrictions on the inflow of foreign exchange and its conversion into yuan, and ended practice of linking the yuan solely to the US dollar [Aug 08]
Hong Kong, China	**Bond Market** • Enhanced market liquidity/price transparency by launching electronic trading platform, E-BOND [Dec 08] • Launched an electronic trading platform for government bonds [Dec 07] **Equity Market** • Issued revised Advertising Guidelines for marketing materials for investment funds [Jan 09] • Introduced five-digit stock codes to offer more stock code capacity to support future market growth and provide flexibility to standardize and rationalize stock code classification [Apr 08] • Established Hong Kong Shari'a Advisory Council to vet Islamic financial instruments [Nov 07] **Foreign Exchange Market** • Approved Hong Kong Exchanges and Clearing Limited proposal to allow exchange participants to transfer their clearing and settlement obligations in the Central Clearing and Settlement System to another (third party) clearing participant [Nov 07]
India	**Bond Market** • Increased foreign institutional investor (FII) limit on rupee-denominated corporate bonds from USD6 billion to USD15 billion [Jan 09] • Amended Securities Contracts Regulation Act to include securitized instruments [May 07] • Amended the Reserve Bank of India Act to develop and regulate market for corporate bonds [Jan 07]

Table 1.2 continued.

Economy	Regulations
	Equity Market • Increased the limit for overseas investments by mutual funds from USD5 billion to USD7 billion [Apr 08] • Implemented new derivatives trading measures, including: (i) started US dollar-denominated futures trading [Feb 08]; (ii) allowed trading of options contracts on indices and stocks with a longer life/tenure (up to 5 years) [Jan 08]; and (iii) launched exchange-traded currency futures [Aug 08] • Launched Securities Lending and Borrowing Scheme to facilitate short selling of securities [Apr 08] • Imposed initial public offering (IPO) grading as a compulsory requirement for companies [May 07] **Foreign Exchange Market** • Opened forex swap facility for public/private sector banks with foreign branches or subsidiaries [Nov 08] • Liberalized the External Commercial Borrowing Rules; and raised interest rate ceilings of selected deposits [Nov 08] • Pledged to continue sale of USD through agent banks to augment supply in the domestic foreign exchange market [Sep08]; and introduced special market operations to meet forex requirements of public sector oil marketing companies [May 08]
Indonesia	**Bond Market** • Formed a bond pricing agency to provide reference prices for government and corporate bonds [Jul 08] • Passed the Islamic Shari'a Bill to enable the Government to sell Islamic bonds [Apr 08] • Formalized the consolidation of the Jakarta Stock Exchange and Surabaya Stock Exchange [Nov 07] • Released new municipal bond rules and standards; and eligibility rules for mutual funds [1H 07] **Equity Market** • Allowed companies to buy back 20% of their shares without the need for shareholder approval [Oct 08] • Issued guidelines governing the offering and management of Real Estate Investment Trust (REIT) or real estate stocks to develop the structured finance market [1H 2008] • Revised rules and procedures on licensing procedures of securities companies [Sep 07] • Mandated strict background checks on clients with high risk of money laundering [Aug 07] • Required publicly-listed companies to submit periodic financial statements and annual reports [1H 2007] **Foreign Exchange Market** • Required commodity exporters to use letters of credit issued by local banks to keep the foreign currency proceeds with a bank onshore to reduce capital outflows [Jan 09] • Banned banks from selling derivatives and structured products related to speculation deals [Dec 08] • Limited the purchase of foreign exchange above $100,000 to those who can justify transactions [Nov08]

Table 1.2 continued.

Economy	Regulations
	• Increased foreign exchange swaps tenor to a maximum of 1 month [Oct 08] • Eased the foreign currency reserve requirement from 3% to 1% [Oct 08] • Started to recycle foreign exchange receipts from oil [Sept–Oct 08]
Korea, Rep. of	**Bond Market** • Formation of a KRW10 trillion bond market stabilization fund with local banks' contributions [Dec 08] • Amended the Regulation on Supervision of Securities Business to facilitate exchange and off-exchange securities trading and bond investment by foreign investors [Dec 07] • Required securities companies to report to the Korea Securities Dealers Association standardized bids and offers for all off-exchange traded bonds in real-time [Jul 07] • Amended the tax law on high-yield funds pursuant to the reduction of tax rate for funds that invest 10% or more of assets in speculative-grade corporate bonds and commercial papers [Mar 07] **Equity Market** • Banned short selling of all listed stocks and allowed listed companies to buy back 10 times more of their own shares from the market [Sep 08] • Allowed life insurers to be listed on the stock markets [Apr 07] **Foreign Exchange Market** • Introduced a competitive auction swap facility [Oct 08]
Malaysia	**Bond Market** • Removed mandatory credit rating requirement for convertible/exchangeable bonds and sukuk [Mar 09] • Allowed the listing of sukuk or debt securities denominated in ringgit and foreign currencies in Bursa Malaysia, with listing fees waived until 2010 [Dec 08] • Accorded specific flexibilities to expedite the issuance of foreign currency-denominated bonds and sukuk, including tax exemption for foreign currency-denominated sukuk issued locally [Mar 07] **Equity Market** • Implemented measures to reduce time-to-market in raising funds, including: exempted unlisted public companies from having to obtain prior approval for issuances and offerings of equity securities [Mar 09] • Passed the Capital Markets and Services Act 2007, which consolidated the Securities Industry Act 1983, Futures Industry Act 1993, and a section of the Securities Commission Act 1993 [Sep 07] • Introduced a single licensing regime and statutory provisions to recognize Islamic products [Sep 07] • Introduced trading halt to reduce suspension period and enhance market efficiency [Aug 07] **Foreign Exchange Market** • Liberalized the Foreign Exchange Administration rules with regard to (i) limits on foreign currency and ringgit-denominated credit facilities [Apr 07], (ii) borrowings in foreign currency/ringgit by residents [May 08], 3) forex transactions for real estate financing purposes [May 08], and 4) forex transactions of Islamic banks/takaful operators and management of Islamic funds onshore [Sep 07]

Table 1.2 continued.

Economy	Regulations
Philippines	**Bond Market** • Implemented regulations governing over-the-counter (OTC) trading to prohibit securities dealers from dealing directly with the public [Dec 07] **Foreign Exchange Market** • Approved the 3rd phase of reforms in the forex regulatory framework, including (i) lifting Bangko Sentral ng Pilipinas (BSP) approval requirement for foreign loans with maturities longer than one year for re-lending; and (ii) improving monitoring of foreign exchange flows [Jan 09] • Implemented the 2nd phase of forex reforms, including: (i) increasing the amount allowed for foreign exchange purchases from banks by residents for non-trade current account transactions and outward investments; and (ii) expanding the use of forex swaps involving the peso [Dec 07] **Equity Market** • Implemented the revised Rules on Listing By Way of Introduction on April 2009 [Apr 09] • Required listed companies to engage the services of an underwriter [Mar 08] • Approved revised rules on short selling [Oct 07]
Singapore	**Bond Market** • Announced the completion of sovereign-rated sukuk facility [Jan 09] • Admitted banks as clearing members of its securities market [Jun 08] • Announced that income from shari'a-compliant financial activities will be given a concessionary 5% income tax rate; incomes from qualifying sukuks are exempt from tax [Feb 08] • Amended the Property Fund Guidelines to include: enhanced disclosure requirements on the use of short-term, yield-enhancing arrangements; improved guidance on permissible fixed-term management contracts; required real estate investment trusts to invest at least 75% of assets in income-producing real estate; and removed 5% single party limit for investment-related securities [Sep 07] **Equity Market** • Revised initial IPO distribution to require (i) primary listing to have at least 500 public shareholders, and (ii) secondary listing to have at least either 500 local or 1,000 worldwide shareholders [Mar 09] • Removed limit on the number of new shares from the conversion of outstanding convertibles [Mar 09] • Introduced the following new measures to facilitate fund raising efforts: (i) allowed issue up to 100% of share capital via a pro-rata renouncable rights issue; (ii) allowed listed issuers to undertake placements of new shares priced at discounts of up to 20%, subject to certain conditions; (iii) allowed placements to certain shareholders without specific shareholder's approval; (iv) allowed underwriters to include non-major shareholders of the issuer as sub-underwriters; and (v) approved "when-issued" trading of rights shares to commence on the next business day after the close of rights offer [Feb 09] **Foreign Exchange Market** • Extended until Oct 09 the temporary reciprocal currency swap line with the US Federal Reserve [Feb 09]

Table 1.2 continued.

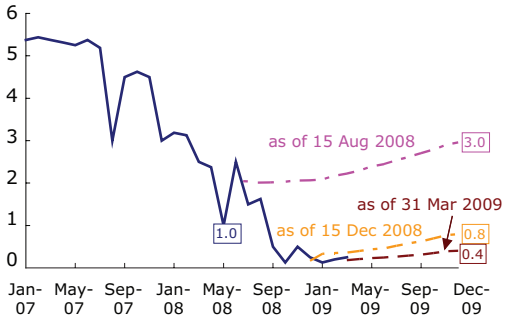
Economy	Regulations
Taipei,China	**Bond Market** • Allowed insurers to make loans to outside parties to issue bonds with capital characteristics [Dec 08] • Launched the Electronic Derivative Trading System (EDTS) [Mar 07] **Foreign Exchange Market** • Amended the Regulations Governing Securities Investment Trust Funds to provide investors with a wider range of financial instruments [Dec 08] • Promulgated the Regulations Governing Foreign Exchange Business of Insurance Enterprises to regulate foreign exchange business conducted by insurance companies [Apr 07] • Allowed authorized banks to link foreign exchange derivatives to domestic equities [Apr 07] **Equity Market** • Allowed companies to set the issue price at a larger discount [1Q 09] • Modified the specifications and settlement procedures for equity option contracts [Jan 09] • Amended the Regulations Governing the Offering and Issuance of Securities by Foreign Securities Issuers to encourage more foreign firms to list in Taipei,China [Jan 09] • Amended regulations governing published information in annual reports and prospectuses [Jan 09] • Allowed domestic securities firms and banks to trade in derivatives linked to domestic equities with offshore overseas Chinese and foreign nationals that have not registered in Taipei, China [Nov 08] • Amended several regulations to ease trading with Mainland China Area [Sep 08] • Eased restrictions on securities dealer stock borrowing and lending (SBL) transactions [Sep 08] • Approved the following measures: (i) allowed privately-placed foreign mutual funds and unit trusts to borrow securities [Mar 07]; and (ii) allowed foreign investors to engage in trading of over-the-counter (OTC) equity derivatives, and domestic enterprises to issue overseas marketable securities [Apr 07]
Thailand	**Bond Market** • Revised rules governing the issuance of short-term debt securities to allow greater flexibility [2008] • Amended regulations on securities borrowing/lending/short selling to improve risk management [Apr 08] • Enacted the Trust for Transactions in Capital Market Act, which enables the establishment of a trust to reduce default risks in cases where securities issuers face financial hardship or bankruptcy [Jan 08] • Amended the Securities Law to enhance investor protection as well as SEC's independence, operational flexibility and supervisory effectiveness [Dec 07] **Equity Market** • Launched new product, single stock futures, as an additional alternative investment [Nov 08] • Approved the increase in the quota of foreign securities investments to USD30 billion [Mar 08] • Approved measures to curb shares manipulation by requiring brokers to keep records of transactions for 5 years and communication records between brokers and investors for at least 1 month [Feb 08]

Table 1.2 continued.

Economy	Regulations
	• Approved the multi-class investment of mutual funds to increase alternatives for fund establishment and offer local investors wider options to diversify benefits [Jul 07] **Foreign Exchange Market** • Lifted the 30% unremunerated reserve requirement (URR) on short-term capital inflows [Feb 08] • Eased measures to manage capital flows, including (i) easing the URR measure on Thai corporations' foreign currency borrowing and on non-residents' investments in property funds; (ii) increasing the limit for purchase of properties abroad from USD1 million to USD5 million; and (iii) raising the limit and expanding the scope for investment and lending abroad for Thai companies [Dec 07] • Increased allowable outward foreign direct investment by listed companies to USD100 million per year and allowable remittances by residents to USD1 million per person per year [Jul 07] • Relaxed exchange control regulations on capital flows and holding of foreign currency such as allowing institutional investors to increase offshore investments to USD50 million [Jan 07]
Viet Nam	**Bond Market** • Issued regulation providing Hanoi Securities Trading Center a legal framework to undertake the management of government bond trading [Jul 08] • Expanded State Treasury's outstanding bonds by 16% and allowed market to determine rates [Nov 07] • Required banks to specify the use of funds for capital expansion; and authorized a one-year trial with credit default swaps [2007] **Equity Market** • In response to stock market decline in 2008, (i) adjusted daily trading band four times, (ii) strengthened prudential/disclosure norms, (iii) delayed IPOs, (iv) postponed equitization of state-owned enterprises, and (v) invested in the stock market [2008] • Imposed 3% ceiling for total lending of stock collateralized loans and introduced capital gains tax [2007] **Foreign Exchange Market** • Widened the dong's trading band to 0.75% [Dec 07] and to 1.0% [Mar 08]; and allowed the dong to fluctuate by 2% [Jun 08], 3% [Nov 08], and 5% [Mar 09]

refinancing rate to 1.25% through cumulative rate cuts totaling 300 bp since October 2008. The Bank of Japan also joined the global monetary easing cycle, by twice cutting its benchmark interest rate by 20 bp to reach 0.1%. These aggressive moves have been accompanied by other policy measures to unfreeze money and credit markets, including massive liquidity support, interbank lending guarantees, and recapitalization of distressed banks. The target US federal funds rate is expected to remain near zero until December 2009, given the federal funds futures **(Figure 1.24)**. Underpinning the widespread expectation of continued low interest rates, inflation remains low.

Figure 1.24: US[1] Federal Funds Rate and Futures Rates (%)



[1]US = United States.
Source: Bloomberg.

Monetary authorities in the region have dramatically shifted their stance from tightening to easing since mid-September, as the spillover effects from the global financial crisis hit the real economy, with inflation easing across the region.

Policy rates have been cut across the region in light of the deepening global recession and its increasing spillover effects on the region's economies. The People's Bank of China was first to lower interest rates. After 5 years of tightening monetary policy to fight inflation, the PRC abruptly reversed course in September 2007; cutting interest rates by 27 bp, lowering reserve requirement ratios, and lifting restrictions on bank lending. Since then, the PRC's benchmark interest rates have been cut five times by a total of 216 bp **(Figures 1.25a, 1.25b, 1.25c)**. In India, moderating inflation provided room for the Reserve Bank of India (RBI) to reverse its earlier tightening stance and pursue expansionary credit policies beginning in October 2008. The RBI's key policy rates and reserve requirements have been reduced between October 2008 and March 2009, with the repurchase and the reverse repurchase rates currently at 5.0% and 3.5%, respectively. The monetary authorities in the NIEs have also loosened their policy stances and introduced various measures to stabilize financial markets, including deposit guarantees, liquidity injections, foreign exchange market interventions, and financial assistance packages. Interest rates have been cumulatively cut in Korea and Taipei,China, by 300 and 237.5 bp, respectively. In October 2008, the Monetary Authority of Singapore announced a shift in policy to zero percent appreciation of the Singapore dollar. Many ASEAN economies also lowered interest rates

Figure 1.25a: Policy Rates[1]—India and People's Rep. of China (PRC) (% per annum)

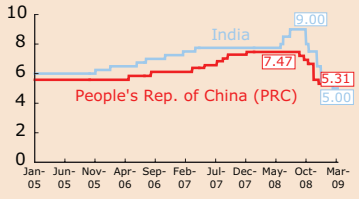


Figure 1.25b: Policy Rates[2]—ASEAN-5 (% per annum)

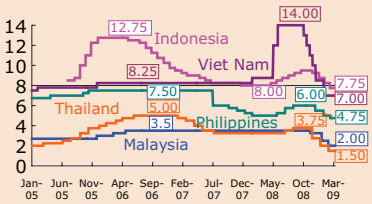
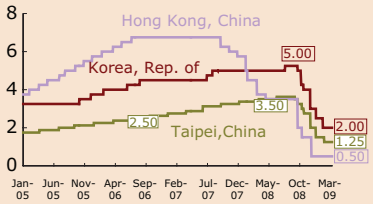


Figure 1.25c: Policy Rates[3]—NIEs (% per annum)



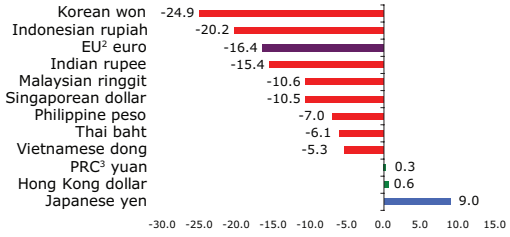
[1]One year lending rate (PRC) and repurchase rate (India). [2]BI Rate (Indonesia); overnight policy rate (Malaysia); reverse repurchase (repo) rate (Philippines); 14-day repo rate (before 17 Jan 2007) and 1-day repo rate from 17 Jan 2007 onwards (Thailand); prime rate (Viet Nam). [3]Hong Kong base rate (Hong Kong, China); Korea base rate (Republic of Korea); official discount rate (Taipei,China).
Sources: Bloomberg and Datastream.

against the backdrop of moderating inflation and slowing growth. In November, for the first time since 2003, the Malaysian central bank, Bank Negara Malaysia, cut its overnight policy rate by 0.25% to 3.25%. Since then, Indonesia, Philippines, Thailand, and Viet Nam have all followed suit.

The US dollar has renewed its safe-haven status amid heightened uncertainty surrounding the severity of the financial crisis and global recession; regional currencies weakened against the US dollar, while volatility spiked in foreign exchange markets.

Since the beginning of 2009, despite the deteriorating growth outlook in the US, the US dollar has advanced more than 5% against the euro and 8% against the yen. A significant deterioration in global financial conditions and investors' perception that policy measures may be inadequate for an early resolution of the banking sector's troubles reignited a flight-to-safety in the first quarter of this year. Meanwhile, further weakening in the eurozone economy, and hence the prospect of narrowing interest rate differentials with the US, has weighed down the euro. The Japanese yen benefited from the unwinding of carry trade during the early stages of the financial crisis in 2008, but suddenly changed course as the prospect for Japan's economy deteriorated sharply, which diluted the yen's status as a safe-haven currency. Most currencies in the region depreciated sharply against the US dollar in the latter half of 2008 **(Figure 1.26)**. Many authorities attempted to counter this by intervening in foreign exchange markets or by arranging/extending currency swap lines. The relatively thin currency markets in the region were battered by depreciations and the lack of effective hedging mechanisms. Foreign exchange reserves have been depleted in some countries, while costs for businesses affected by foreign exchange volatility rose in many of the region's economies.

Figure 1.26: Regional Currencies[1]
(1 July 2008 to 30 March 2009, % change)



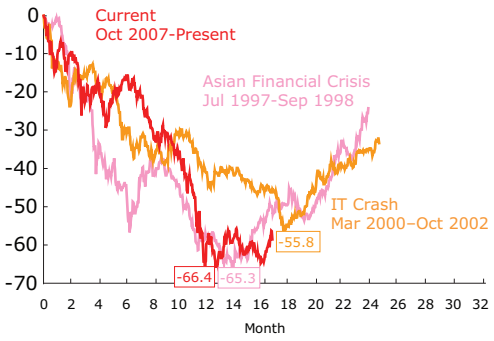
[1]Latest closing as of 30 March 2009, based on the USD value of local currency. Negative values indicate depreciation of local currency. [2]EU = European Union. [3]PRC = People's Republic of China.
Source: OREI staff calculations based on Reuters data.

2. Emerging Asia's Equity Markets[9]

Recent Performance and Outlook

Emerging Asia's equity markets are showing some signs of stabilizing following a dismal year in which they were hit hard as the global financial crisis intensified.

Figure 2.1: Bear Markets in Asia[1]
(% change)

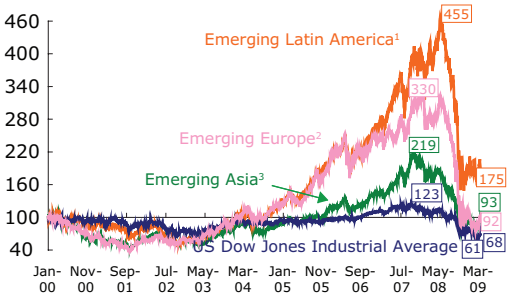


[1]Based on Morgan Stanley Capital International (MSCI) Asia (excluding Japan) index.
Source: Bloomberg.

Emerging Asia's equity markets plunged to their lowest levels in 10 years, losing 66.4% in the US dollar value from their October 2007 peak to a market trough one year later **(Figure 2.1)**. The global financial crisis, which deepened drastically in September following the failure of Lehman Brothers (and other institutions) and the growing evidence of economic slowdown in industrial countries, exacted a heavy toll on emerging Asian equities. The current crisis exceeds two previous crises in the region in terms of the speed and magnitude of equity price declines. Markets have been moving sideways since the October 2008 trough. Although there has been a slight pick up recently, clear signs of a turnaround remain elusive.

Recent developments in emerging Asia's equity markets can be identified in three distinctive stages: exuberance, fear, and skepticism.

Figure 2.2: MSCI Indexes
(2 Jan 2000 = 100)

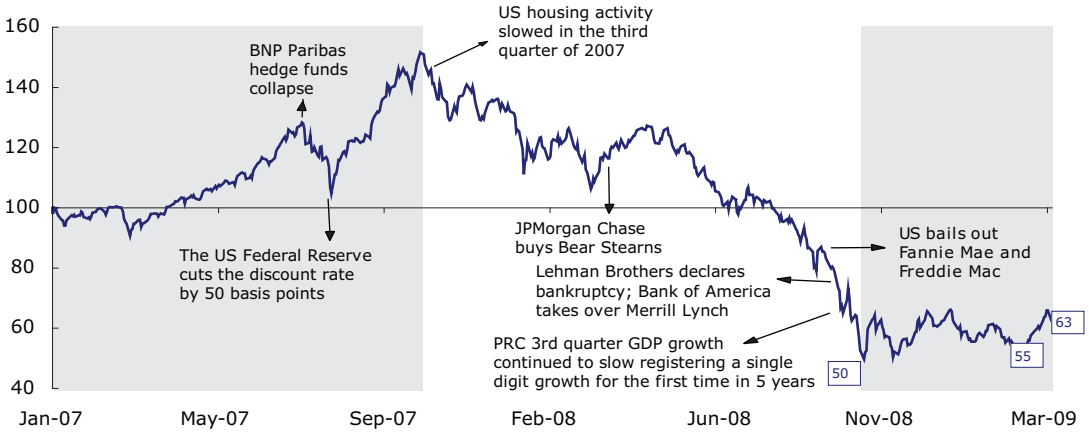


[1]Includes Argentina, Brazil, Chile, Colombia, Mexico, and Peru.
[2]Includes Czech Republic, Hungary, Poland, Russia, and Turkey.
[3]Includes China, People's Rep. of; India; Indonesia; Korea, Rep. of; Malaysia; Philippines; Taipei,China and Thailand.
Sources: Morgan Stanley Capital International (MSCI) Barra and Datastream.

An extended period of a price run-up in emerging Asian markets, which began around 2003 as the global economy rebounded from the information technology (IT) slump in 2001–2002, ended in a devastating decline amid broadening global financial turmoil. Still, the region's boom and the corresponding bust appear modest compared with other emerging markets **(Figure 2.2)**. Recent trends in emerging Asian equity markets can be identified in three distinct phases **(Figure 2.3)**. The first stage was *exuberance*. Shaking off the initial market sell-off related to the United States' (US) subprime mortgage crisis in August 2007, emerging Asia's equity markets continued to advance through October 2007 on a relatively sound economic outlook for the region and swift responses by the US Federal Reserve (US Fed) and other central banks, which allayed

[9] This section was prepared by Cyn-Young Park. For inquiries, please contact cypark@adb.org.

Figure 2.3: MSCI Indexes—Emerging Asia[1]
(2 Jan 2007 = 100)



[1]Includes China, People's Rep. of; India; Indonesia; Korea, Rep. of; Malaysia; Philippines; Taipei,China; and Thailand. [2]PRC = People's Republic of China. [3]GDP = Gross domestic product.
Source: Morgan Stanley Capital International (MSCI) Barra.

fears of massive spillovers from the US subprime crisis. The second stage was *fear*. Selling resumed in late 2007 as the global financial crisis continued to unfold and investors began to question emerging Asia's economic resilience in the face of a US-led global slowdown and rising global inflation. As the September 2008 collapse took its final toll on investor confidence, by mid-October the fear of recession dominated equity price movements—macroeconomic data confirmed that economies across emerging Asia were slowing. The third stage is *skepticism*. Investors remain cautious amid heightened uncertainty about the depth and length of the current crisis and global recession. Asian equities began to recover in late November and sustained their upward trend through December. However, in early 2009, investors turned more skeptical over an early recovery, as more financial weaknesses were uncovered and concerns over Central and Eastern Europe grew. Nevertheless, attractive valuation of the region's equities has kept markets afloat.

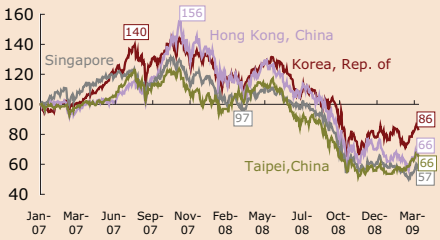
Broad market indexes across emerging Asia, which have moved sideways since late November, are showing signs of a tentative recovery.

Most of the region's broad market price indexes have trended down since the onset of the global crisis **(Figures 2.4a, 2.4b, 2.4c)**. Viet Nam's VNINDEX plunged 66% in 2008, registering the biggest price decline in the region for the year **(Table 2.1)**. Among the worst performers were the region's largest stock

Figure 2.4a: Composite Stock Price Indexes—Emerging Asia[1], India, and PRC (last daily price, 2 January 2007 = 100, local index)

Figure 2.4b: Composite Stock Price Indexes—ASEAN-5[4] (last daily price , 2 January 2007 = 100, local index)

Figure 2.4c: Composite Stock Price Indexes—NIEs[5] (last daily price, 2 January 2007 = 100, local index)



[1]Includes China, People's Rep. of; India; Indonesia; Korea, Rep. of; Malaysia; Philippines; Taipei,China; and Thailand. [2]Daily stock price indexes of combined Shanghai and Shenzhen Composite, weighted by their respective market capitalization (PRC). [3]MSCI = Morgan Stanley Capital International. [4]Daily stock price indexes of JCI (Indonesia); KLCI (Malaysia); PCOMP (Philippines); SET (Thailand); and VNI (Viet Nam). [5]Daily stock price indexes of Hang Seng (Hong Kong, China); KOSPI (Korea); STI (Singapore); and TWSE (Taipei,China).
Source: OREI staff calculations based on Reuters and Bloomberg data.

markets, such as the People's Republic of China (PRC) and India, where broad market indexes fell 52.2% and 56.8%, respectively. Elsewhere, losses ranged between 40% and 53%. In the PRC, India, and Viet Nam, where stock prices appeared to be overvalued following a boom prior to the global financial crisis, the correction occurred between late 2007 and early 2008. But for most other markets, losses were concentrated in the latter half of 2008, particularly during September and October when the economic slowdown became more evident. Prices continued to decline in the first quarter of 2009 on a slew of weak economic data and poor earnings reports, but the pace and magnitude of the decline have eased visibly this year. The persistent decline in prices reflects repeatedly-revised earnings prospects amid slowing economies and investors' heightened risk perceptions. However, some markets still mounted a rally in late 2008. Elsewhere, the price declines have been increasingly offset by intermittent rebounds since late 2008. Although most of the year-end rallies fizzled in early 2009 on renewed financial worries and a deepening global recession, many market indexes are edging upward again. The PRC market advanced 33.9% since January, after making a strong rebound from its November 2008 low.

Table 2.1: Growth of MSCI[1] Index (end of period, %)

	Local Currency Terms									
	1Q08		2Q08		3Q08		4Q08		1Q09	
	y-o-y	q-o-q	y-o-y	q-o-q	y-o-y	q-o-q	y-o-y	q-o-q	y-o-y	q-o-q
China, People's Rep.of	26.9	(23.8)	(1.6)	(4.6)	(48.1)	(26.0)	(52.2)	(11.2)	(36.5)	1.3
Hong Kong, China	10.4	(19.3)	0.4	(5.0)	(37.6)	(23.9)	(53.2)	(19.7)	(42.5)	(0.9)
India	19.7	(25.7)	(9.0)	(14.2)	(27.5)	(6.6)	(56.8)	(27.4)	(40.4)	2.4
Indonesia	45.3	(8.3)	21.1	(5.6)	(22.0)	(25.3)	(50.8)	(23.8)	(42.5)	7.1
Korea, Republic of	16.1	(9.1)	(2.5)	(2.5)	(24.5)	(12.6)	(40.6)	(23.3)	(29.3)	8.2
Malaysia	0.1	(12.9)	(14.3)	(7.9)	(25.7)	(14.4)	(40.8)	(13.8)	(31.1)	1.4
Philippines	(9.9)	(17.5)	(37.2)	(19.6)	(30.2)	6.9	(46.8)	(24.9)	(31.7)	5.9
Singapore	(5.7)	(11.5)	(17.5)	(4.0)	(36.0)	(19.1)	(49.5)	(26.6)	(45.3)	(4.2)
Taipei,China	5.3	(1.4)	(16.6)	(10.8)	(38.5)	(23.8)	(48.1)	(22.5)	(41.1)	11.9
Thailand	26.4	(4.5)	2.1	(7.4)	(29.1)	(22.8)	(48.7)	(25.0)	(48.9)	(4.8)
Viet Nam[2]	(51.8)	(43.8)	(61.0)	(21.4)	(56.4)	10.9	(66.0)	(30.5)	(48.3)	(10.5)
Asia (ex-Japan)	13.4	(15.1)	(7.0)	(6.7)	(35.9)	(19.7)	(49.2)	(20.2)	(38.0)	3.8

	USD Terms									
	1Q08		2Q08		3Q08		4Q08		1Q09	
	y-o-y	q-o-q	y-o-y	q-o-q	y-o-y	q-o-q	y-o-y	q-o-q	y-o-y	q-o-q
China, People's Rep.of	27.4	(23.7)	(1.3)	(4.7)	(48.0)	(25.7)	(51.9)	(11.0)	(36.2)	1.3
Hong Kong, China	10.9	(19.2)	0.7	(5.2)	(37.5)	(23.5)	(52.9)	(19.6)	(42.2)	(0.9)
India	29.6	(27.1)	(13.9)	(20.0)	(38.5)	(14.4)	(65.1)	(30.1)	(52.9)	(1.6)
Indonesia	44.1	(6.5)	18.6	(5.8)	(24.4)	(27.0)	(57.6)	(34.1)	(54.2)	1.0
Korea, Republic of	10.2	(14.1)	(13.9)	(7.7)	(42.7)	(24.3)	(55.9)	(26.5)	(49.4)	(1.5)
Malaysia	8.2	(10.0)	(9.5)	(9.8)	(26.4)	(18.7)	(43.4)	(14.2)	(39.5)	(3.8)
Philippines	4.0	(18.5)	(35.3)	(25.2)	(33.2)	2.0	(53.8)	(25.7)	(40.9)	4.2
Singapore	4.0	(7.5)	(7.2)	(2.6)	(33.5)	(23.1)	(49.5)	(27.2)	(50.4)	(9.2)
Taipei,China	14.7	5.3	(9.7)	(10.8)	(37.6)	(28.1)	(48.7)	(24.0)	(47.2)	8.3
Thailand	40.5	2.2	5.4	(12.8)	(28.2)	(23.7)	(50.3)	(27.0)	(54.3)	(5.9)
Viet Nam[2]	(50.9)	(44.1)	(60.5)	(24.8)	(59.4)	12.6	(68.8)	(34.1)	(50.9)	(12.0)
Asia (ex-Japan)	14.9	(13.1)	(6.9)	(7.2)	(40.5)	(24.8)	(52.0)	(20.8)	(41.5)	5.9

[1]MSCI = Morgan Stanley Capital International.
[2]Refers to the VN Index.
Source: Bloomberg.

With the collapse of equity prices, valuation indicators across emerging Asian equity markets have started to look attractive, underpinning the cautious optimism that the worst may be over.

On the valuation front, emerging Asian equities currently look attractive. Price–earnings ratios are now reaching the lows seen during the 2001–2002 recession **(Figures 2.5a, 2.5b, 2.5c)**. Following the 2003–2007 boom, the valuation of emerging Asian equities was higher than in most mature markets. At the onset of the global financial crisis, the collapse in equity prices was more drastic in emerging markets. This reflects the effects of re-pricing assets amid heightened risk aversion. The price-to-book values for emerging Asia equities have also fallen. Earnings remain high in many of the region's markets, albeit at reduced levels. Various valuation indicators suggest that the markets have reached bottom **(Table 2.2)**. However, given current economic conditions, the eventual recovery will likely be a long and drawn-out process.

Aggressive fiscal and monetary stimulus policies should help strengthen the current rally and contribute to better equity performance in the second half of 2009.

Emerging Asia's equity markets have outperformed mature markets since last year's trough, rising 25.7% through end-March, while the US Dow Jones Industrial Average fell by a further 4.9% during the same period. While mature markets continue to suffer losses arising from weak banking sectors, the

Figure 2.5a: Price–Earnings Ratio—Emerging Asia[1], India, and the PRC (%)

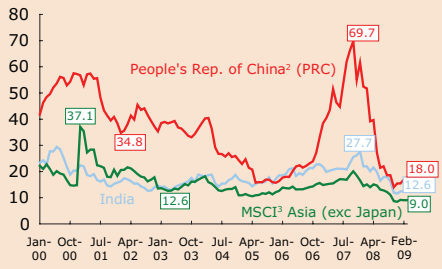


Figure 2.5b: Price–Earnings Ratio— ASEAN-4 (%)

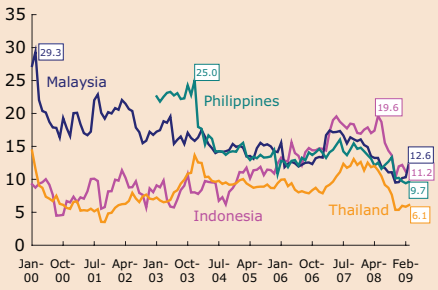
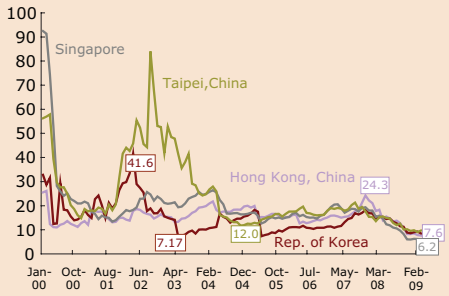


Figure 2.5c: Price–Earnings Ratio—NIEs (%)



[1]Includes China, People's Rep. of; India; Indonesia; Korea, Rep. of; Malaysia; Philippines; Taipei,China; and Thailand. [2]Price–Earnings Ratio of combined Shanghai and Shenzhen Composite, weighted by their respective market capitalization. [3]MSCI = Morgan Stanley Capital International.
Source: CEIC database and Bloomberg.

Table 2.2: Equity Valuation Indicators (end-of-period)

	Price-to-Book Ratio			Price–Earnings Ratio			EV/EBITDA[1]			Earnings per Share (y-o-y growth, %)		
	2007	2008	Mar-09	2007	2008	Feb-09	2007	2008	Mar-09	2007	2008	Mar-09
MSCI[2] Asia (ex Japan)	2.5	1.3	1.3	16.6	9.2	9.0	10.4	7.7	7.0	37.5	31.3	(36.7)
China, People's Rep. of	6.8	2.1	2.8	61.6	15.5	18.0	16.3	9.2	8.4	17.6	8.4	(10.2)
Hong Kong, China	2.7	1.4	1.3	21.1	8.5	7.6	16.6	12.7	8.5	27.8	(5.9)	(33.4)
India	6.1	2.1	2.2	27.7	12.4	12.6	13.0	12.8	13.3	29.0	37.4	(3.2)
Indonesia	3.9	1.6	1.6	16.9	12.2	11.2	9.4	5.0	10.5	34.3	10.1	(8.9)
Korea, Rep. of	1.6	0.9	1.0	16.8	9.0	8.5	11.2	8.2	8.5	n.a.	7.5	(21.0)
Malaysia	2.3	1.3	1.3	16.1	10.2	12.6	9.7	6.6	6.6	10.0	(4.5)	(22.0)
Philippines	2.7	1.3	1.4	14.8	9.7	9.7	9.2	6.9	6.4	19.8	(21.1)	(15.5)
Singapore	—	1.1	1.0	18.0	6.2	6.2	—	8.0	6.3	—	—	(25.2)
Taipei,China	2.0	1.1	1.3	15.3	9.8	9.7	12.1	8.7	8.8	62.6	(35.1)	(50.9)
Thailand	2.2	1.0	1.0	12.6	6.0	6.1	1.2	1.1	6.4	(40.5)	37.6	(21.9)
G3												
eurozone	2.1	1.2	1.0	12.9	9.5	9.2	16.6	14.8	15.6	13.3	(26.6)	(51.7)
Japan	1.6	1.0	0.9	18.0	12.9	24.5	10.3	8.8	9.2	(0.1)	(18.6)	(63.8)
US	2.8	1.9	1.8	17.3	13.6	10.3	12.0	9.4	9.0	1.3	(21.5)	(16.1)

[1]Refers to the ratio of enterprise value-to-earnings before interest, taxes, depreciation, and amortization (EBITDA). Enterprise value (EV) is the measure of a company's worth and is computed as market capitalization less cash and cash equivalent plus preferred stock plus debt. EBITDA is a measure of company's operating cash fow. [2]MSCI = Morgan Stanley Capital International.
Sources: CEIC database and Bloomberg.

region's stock markets are beginning to benefit from the widening valuation gap on the back of relatively resilient macroeconomic fundamentals. The region's policymakers have also been active by cutting benchmark rates and introducing large-scale stimulus packages across the region **(Table 2.3)**. Fortunately, many emerging Asia's economies have room for further monetary easing and fiscal spending, given decreasing inflationary pressures and relatively healthy fiscal positions. Against this backdrop, some of the region's markets (most notably the PRC), saw year-end rallies amid the global bear market. Barring other significant global disruptions, such as major corporate defaults in industrial countries or a sharp deterioration in Central and Eastern European economies, emerging Asian equities will likely remain on track for a slow recovery in the latter half of this year. The moderation in price declines is visible, but recovery will likely take time. The region's economic slowdown has only begun. But attractive valuations, relatively sound economic fundamentals, and active policy responses continue to provide reasons to

Table 2.3: Emerging Asia's Fiscal Stimulus Package Size and Composition

Country	Amount/Size	Highlights
China, People's Rep. of (PRC)	CNY4 trillion (12.6% of gross domestic product [GDP])	Implemented CNY4 trillion economic stimulus plan that includes CNY1.8 trillion for large-scale infrastructure projects (roads, railways, airports, and the national grid); CNY1.0 trillion for post-earthquake reconstruction in Sichuan province; CNY0.37 trillion for rural development and infrastructure; CNY0.35 trillion for environmental protection; CNY0.28 trillion for low-rent housing; CNY0.16 trillion for technical innovation; and CNY0.04 trillion for social services [Nov 08] Announced an investment of CNY850 billion over three years in healthcare reform [Jan 09] Implemented value-added tax reforms, effective 01 January 2009; reduced corporate tax burden [Jan 09] Announced CNY600 billion in spending on research and technical innovation; and one-off payment assistance to low-income households—poor rural dwellers and urban residents will receive CNY100 and CNY150 per household, respectively [Feb 09] Extended the subsidy scheme offering discounts of around 13% on retail products such as refrigerators, mobile phones, and washing machines [Feb 09]
Hong Kong, China	HKD59 billion (3.6% of GDP)	Approved HKD59 billion budget that includes HKD1.6 billion on initiatives to generate 62,000 jobs and internships over 3 years, HKD39.3 billion in capital outlays for infrastructure, HKD4.1 billion worth of salary tax reduction, HKD4.3 billion in waived property tax rates, HKD7.8 billion for education spending, and HKD1.9 billion on social services [Feb 09] Outlined a package of measures, in coordination with the PRC government, aimed at increasing cooperation on trade, financial, and infrastructure matters [Dec 08] Announced a HKD100 billion package of loan guarantees for small- and medium-sized firms [Dec 08]
India	All stimulus packages total about 1.5% of GDP	Approved first stimulus package worth INR200 billion that includes increased spending on infrastructure and social security programs, and improving access to credit and protecting employment in labor-intensive industries [Dec 08] Unveiled second stimulus package that includes injecting capital into banks and finance firms, removing cap on the cost of external borrowing, raising foreign institutional investor (FII) investment limits on corporate bonds, allowing additional borrowings by state governments, and providing benefits for exporters [Jan 09] Implemented third stimulus package amounting to about INR300 billion in foregone revenues by (i) lowering service and central excise tax rates; (ii) exempting customs duties for naphtha imports, and (iii) allowing states to deviate from fiscal consolidation targets by 0.5% beyond March 2009 [Feb 09] Reduced ad valorem central value addition tax on all products (except petroleum) by 4%, effective for the remainder of the current fiscal year [extended beyond 31 Mar 09] Increased living allowance of government employees from 16% to 22% [Feb 09]
Indonesia	IDR73.3 trillion (1.4% of GDP)	Approved an economic stimulus package worth IDR73.3 trillion that includes labor-intensive infrastructure development projects; corporate tax incentives, guarantees, and discounts; personal tax incentives and subsidies; pay increases for government employees; and direct cash transfers [Feb 09] Secured the commitment of Australia and Japan, and the Asian Development Bank (ADB) and World Bank to contribute to a standby loan facility totaling USD5.5 billion–6 billion [Feb 09]
Korea, Rep. of	KRW35.6 trillion (3.8% of GDP)	Passed a stimulus package that includes KRW15.6 trillion of expenditures and KRW20 trillion in tax cuts [Dec 08]

Table 2.3 continued.

Country	Amount/Size	Highlights
		Approved a supplementary budget of KRW28.9 trillion to fund public expenditures and make-up for revenue shortfalls [Dec 08]
Malaysia	1st package of MYR7 billion (1% of GDP)	Unveiled first economic stimulus package worth MYR7 billion to fund, among other items, construction of homes for low- and medium-income groups; subsidized loans to the private sector, especially along development corridors; repairs, upgrades, and maintenance for public facilities; and skills enhancement programs. Workers can opt to reduce their contributions to the Employees Provident Fund from 11% to 8% for 2009–2010 [Nov 08]
	2nd package of MYR60 billion (9% of GDP)	Announced second stimulus package worth MYR60 billion focusing on job creation (163,000 jobs), including: MYR25 billion in guaranteed funds to provide companies with easier access to capital; a MYR15 billion increase in direct budget spending, of which MYR10 billion is allocated for 2009; MYR10 billion for equity investments in various sectors by the Government's investment holding company; MYR7 billion for public–private partnerships and other off-budget projects, such as the low-cost carrier terminal at Kuala Lumpur International Airport and expansion of Pulau Pinang airport; and MYR3 billion in tax incentives [Mar 09]
Philippines	PHP330 billion (4.1% of GDP)	Unveiled a PHP330 billion Economic Resiliency Plan that includes: PHP160 billion to fund government employment, rehabilitate public buildings, provide social services, finance infrastructure development, and support various agriculture programs; a PHP100 billion infrastructure fund to be pooled from government corporations, financial institutions, and the private sector; PHP40 billion in corporate and individual income tax cuts; and PHP30 billion in temporary additional benefits from social security institutions [Jan 09]
		Announced re-integration services and livelihood assistance programs amounting to PHP250 million for returning/displaced overseas Filipino workers [Jan 09]
Singapore	SGD20.5 billion (8.2% of GDP)	Approved a fiscal stimulus package amounting to SGD20.5 billion that includes: SGD5.1 billion for employee training and job preservation; SGD5.8 billion in bank lending; SGD2.6 billion for tax measures and grants to improve cash flow and firms' competitiveness; SGD2.6 billion for cash, utility, and tax rebates (personal income, property, and Goods and Service credits); and SGD4.4 billion for infrastructure, health, and education [Jan 09]
		Announced SGD2.3 billion package to improve access to credit for businesses [Nov 08]
		Implemented an additional 50% increase in utility rebates and a second installment of growth dividends, on top of special transfers disbursed in early 2008 [Aug 08]
Taipei,China	1.1% of GDP[1] in both 2009 and 2010	Announced an economic stimulus package worth TWD500 billion to be spent over the next four years; for 2009 and 2010, the Government proposed spending programs of TWD150.66 billion and TWD160.67 billion, respectively [Feb 09]
		Approved the following tax cuts effective 2010: corporate income tax reduced to 20% and the three lowest personal income tax brackets lowered to 5%, 12%, and 20% [Mar 09]
		Announced tax deferral plan to allow unemployed individuals and companies facing financial difficulties to postpone paying their income tax for up to three months [Jan 09]
		Launched TWD85.7 billion in shopping vouchers (TWD3,600 per individual voucher) [Jan 09]
Thailand	THB158 billion (1.6% of GDP)	Approved a THB116.7 billion economic stimulus package that includes individual THB2,000 cash handouts for low-income earners; subsidies for education, utilities and transport; rural development programs; tourism promotion; low interest loans; and funding for small firms [Jan 09]
		Approved THB40 billion in tax cuts, mainly targeting small businesses, and the tourism industry and real estate market [Jan–Feb 09]

Table 2.3 continued.

Country	Amount/Size	Highlights
		Approved an additional THB1.07 billion for cash transfers for low-income households [Mar 09] Announced plan to increase 2009/2010 fiscal budget to THB390 billion, which is an increase of about 4% of GDP [Feb 09] Approved short-term credit facility allowing state enterprises to borrow up to THB200 billion from domestic commercials banks [Jan–Feb 09] Approved a THB1.57 trillion fiscal stimulus package for 2010–2012 as a part of Phase II of the Government's economic stimulus package for infrastructure projects [Mar 09] Unveiled plans to borrow USD2 billion through offshore loans from international financial institutions; the Government expects to receive the first USD1 billion in July 2009 [Mar 09]
Viet Nam	VND105 trillion (5.8% of GDP)	Announced a VND105 trillion economic stimulus package that includes public spending, tax breaks, and other measures; of which, VND17 trillion will be used to subsidize loans for companies that export, import, or produce products essential to the economy [Dec–Jan 08] Reduced corporate income tax rates by 30% for small- and medium-sized enterprises for the fourth quarter of 2008 and all of 2009, and cut by half the value-added tax on certain goods and services until end-2009 [Jan–Feb 09] Provided a one-time 4% interest rate subsidy on short-term bank loans (up to 8 months) for poor households and firms if the loan is contracted and disbursed between February and December 2009 [Jan–Feb09] Deferred the implementation of the new tax law until May 2009 to boost domestic consumption [Jan 09]

[1]Using World Economic Outlook Update (October 2008) estimates of GDP at current prices for 2009 and 2010.
Sources: *Asian Development Outlook 2009,* online news articles and government releases, and analyst reports.

believe that a recovery should be on its way. Experience shows that returns on emerging Asian markets outperform those on mature markets over the longer-term **(Table 2.4)**. The region's capital markets have large growth potential. Many of the region's economies also have sufficient financial strength to support necessary structural changes, and the region's financial systems have largely escaped the brunt of a full-blown credit crisis. There are other factors favoring emerging Asian equities over the long term, including demographic changes and a growing number of globally-managed funds seeking long-term investment opportunities.

Table 2.4: MSCI Returns Index[1] Growth

	1999-2007 Annual Average Growth (%)	Mar-09 (y-o-y change, %)
Asia (ex Japan)	**20.0**	**(43.9)**
China, People's Rep. of	22.6	(34.7)
Hong Kong, China	16.8	(40.1)
India	34.9	(52.3)
Indonesia	38.0	(52.6)
Korea, Rep. of	29.2	(48.5)
Malaysia	25.5	(42.5)
Philippines	11.7	(38.2)
Singapore	20.7	(48.2)
Taipei,China	9.3	(44.3)
Thailand	26.1	(52.4)
G3		
eurozone	10.9	(51.3)
Japan	8.2	(35.9)
US	4.7	(37.9)

[1]Morgan Stanley Capital International (MSCI) Returns Index is valued in US dollars and calculated on a gross basis. It is measured as the price index plus reinvested dividends.
Source: Bloomberg.

Market Capitalization, Issuance, and Turnover

Emerging Asian equity markets collectively lost 51% of their market capitalization since the onset of the financial crisis, after steady and robust growth during 2003–2007.

Emerging Asia's equity markets enjoyed a relatively long boom period that stretched from 2003 to 2007 on the back of robust economic growth and continued financial deepening. Stock market size grew rapidly relative to GDP across emerging Asia, with market capitalization-to-GDP ratios in many of the region's economies showing steady and robust growth until 2007 **(Table 2.5)**. The market capitalization-to-GDP ratios have since fallen in some markets and are now approaching lows not seen since the 2001–2002 economic downturn. However, many stock markets in the region still exceed their counterparts in major industrial economies in terms of market capitalization-to-GDP ratio.

The global financial crisis took a heavy toll on the region's initial public offering (IPO) markets, with new IPOs and private equity deals having virtually ceased since the latter part of 2008.

Capital raised through IPOs and secondary share offerings in local stock markets exhibited strong growth in the 5 years between 2003 and 2007. Total equity issuance in emerging Asia grew by an average of USD87.6 billion or 42.8% per year during the period **(Figures 2.6a, 2.6b)**. Stock markets emerged as a popular choice for accessing capital in the region's fast-growing economies—particularly in the PRC and India. IPOs by companies in the PRC and India—including those listed on stock exchanges in Hong Kong, China—accounted for more than half of the region's IPO activity during 2003–2007. The region's IPOs were initially driven by the privatization of the PRC's large state enterprises. Increasingly, offerings have been made by small private companies in the PRC, particularly in the retail and property sectors. The size of the deals has become smaller, while the number of deals has increased. Indian IPOs followed a similar trend beginning in 2004, which kept the region's IPO markets active through most of 2007. However, as the global financial crisis intensified in the latter half of 2008, IPOs and

Table 2.5: Market Capitalization

	Mar 2009		2008		2007				2004–2007
	USD billion	% of GDP	USD billion	% of GDP	USD billion	% of GDP	Peak (% of GDP)	Trough (% of GDP)	Annual Average[1] Growth (%)
Emerging Asia	**5770.2**	**61.6**	**5299.1**	**65.3**	**12099.6**	**163.2**	**163.2 (Dec 07)**	**55.1 (Feb 09)**	**48.01**
China, People's Rep. of	2347.4	49.2	1775.6	40.4	4459.5	127.8	127.8 (Dec 07)	16.5 (Jan 06)	112.9
Hong Kong, China	1293.7	541.4	1328.9	613.6	2653.6	1281.3	1429.2 (Oct 07)	277.6 (Mar 03)	40.1
India	598.3	44.3	637.3	58.1	1815.0	166.0	166.1 (Dec 07)	35.2 (Jun 04)	62.8
Indonesia	91.4	16.5	95.9	21.8	204.8	48.5	48.5 (Dec 07)	14.9 (Feb 09)	40.9
Korea, Rep. of	465.0	45.6	484.0	69.5	1103.3	114.0	126.1 (Oct 07)	37.5 (Feb 09)	37.1
Malaysia	175.3	75.8	186.3	89.3	324.4	168.5	168.5 (Dec 07)	75.5 (Feb 09)	20.1
Philippines	51.8	28.3	48.5	31.1	102.0	64.0	68.1 (Oct 07)	25.5 (Mar 04)	46.2
Singapore	225.1	107.4	248.0	142.4	498.0	286.8	313.9 (Oct 07)	102.3 (Feb 09)	31.5
Taipei,China	421.7	131.5	386.7	140.8	701.1	267.6	312.6 (Oct 07)	108.5 (Jan 09)	14.4
Thailand	92.0	22.6	99.0	28.0	212.9	56.7	57.1 (Oct 07)	22.3 (Feb 09)	18.4
Viet Nam	8.5	9.0	8.8	8.2	24.9	35.1	35.1 (Dec 07)	6.9 (Feb 09)	—
Memo									
United Kingdom	1745.7	63.8	1995.7	74.5	4046.9	144.2	147.9 (Apr 06)	60.7 (Feb 09)	14.5
Japan	2800.3	58.3	3264.8	58.8	4545.9	98.9	121.6 (Mar 06)	56.0 (Feb 09)	10.6
United States	9534.8	65.4	10606.3	74.4	17663.5	127.9	136.1 (May 07)	60.0 (Feb 09)	7.0

[1]Average does not include Viet Nam because data for the period is not available.
Note: Peaks and troughs were defined over the period Jan 2003–Mar 2009.
Sources: Bloomberg and *World Economic Outlook* (GDP 2009), International Monetary Fund.

Figure 2.6a: Equity Issuance— Emerging Asia[1]

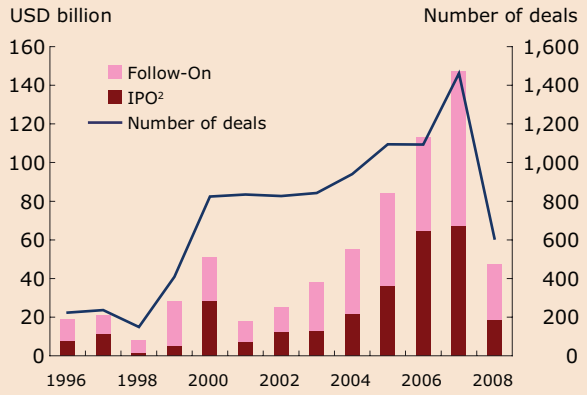
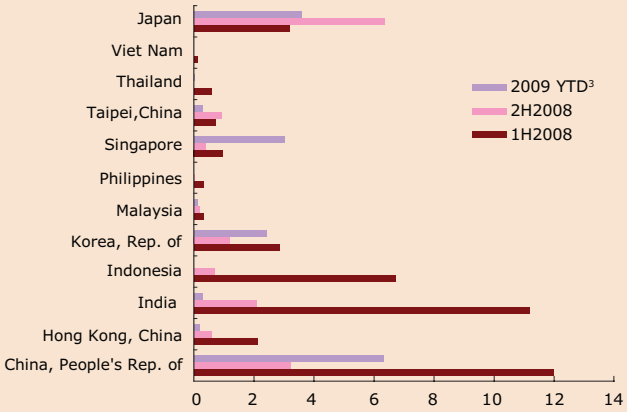
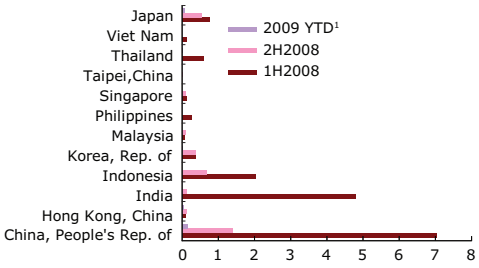


Figure 2.6b: Total Equity Issuance (USD billion)



[1]Includes China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Rep. of; Philippines; Singapore; Taipei,China; Thailand; and Viet Nam.
[2]IPO = initial public offering. [3]YTD = year-to-date.
Source: Dealogic.

Figure 2.7: Initial Public Offerings
(USD million)



[1]YTD = year to date.
Source: Dealogic.

private equity deals have been put on hold, reflecting heightened market uncertainty **(Figure 2.7).**

Reduced turnover in emerging Asia's stock markets and heightened price volatility reflect tightened liquidity as risk aversion remains high.

With significant increases in market size and trading activity, many emerging Asian equity markets now boast substantial depth and volume. Turnover—defined as the total value of shares traded divided by market capitalization—provides a measure of market liquidity. Turnover grew 54% per year on average between 2003 and 2007 **(Table 2.6)**. However, with the onset of the crisis, emerging Asian equity markets experienced a tightening in market liquidity. Price volatility reached highs in line with global market trends and turnover decreased sharply **(Figures 2.8a, 2.8b, 2.8c)**.

Greater foreign participation may have also contributed to the heightened sensitivity of emerging Asian equities to global events.

Capital flows to the region increased sharply during the emerging market boom, particularly in equity portfolio investments. Global investors became increasingly comfortable investing in local markets as emerging Asian equity markets grew, further contributing to the increase in portfolio investment flows to

Table 2.6: Equity Turnover (USD million)

	2008		2007		2007–2008	2003–2007
	Value[1]	Average Daily Turnover[2]	Value	Average Daily Turnover	Growth Rate (%)	Annual Average Growth (%)
China, People's Rep. of	3,828,428.06	15,648.90	6,172,502.74	25,506.21	(37.98)	129.32
Hong Kong, China	1,629,259.94	6,650.04	2,136,910.18	8,686.63	(23.76)	68.54
India	1,050,080.22	4,268.62	1,095,174.12	4,387.29	(4.12)	41.86
Indonesia	112,712.54	469.64	114,631.07	465.98	(1.67)	60.69
Korea, Rep. of	1,458,516.60	5,881.12	2,005,993.75	8,255.12	(27.29)	33.42
Malaysia	94,693.53	386.50	169,722.83	684.37	(44.21)	46.36
Philippines	17,216.56	69.99	29,171.98	119.56	(40.98)	66.92
Singapore	261,282.19	1,036.83	381,288.68	1,519.08	(31.47)	47.48
Taipei,China	837,774.60	3,364.56	1,010,064.72	4,089.33	(17.06)	11.85
Thailand	116,967.49	473.55	117,911.99	481.27	(0.80)	33.24

[1]Turnover value refers to transaction value for the period. [2]Average daily turnover is the turnover value divided by the number of trading days.
Source: World Federation of Exchanges.

Figure 2.8a: Implied Equity Price Volatility[1]—Emerging Asia[2], India, and PRC

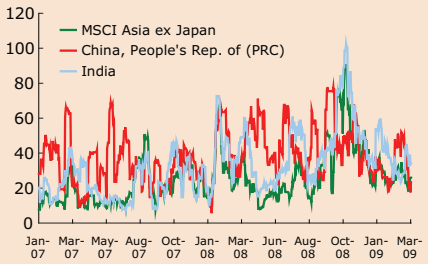


Figure 2.8b: Implied Equity Price Volatility[1]—ASEAN-5

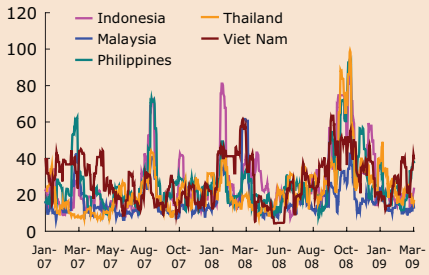
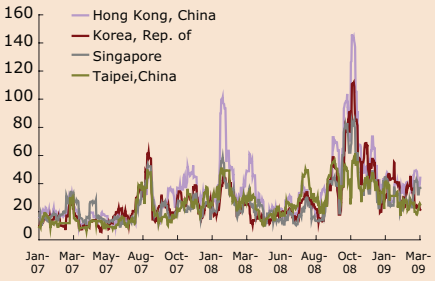


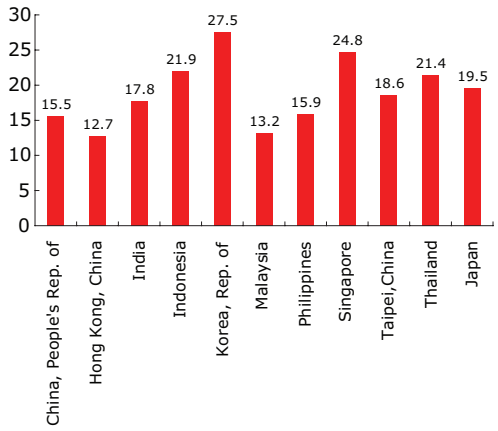
Figure 2.8c: Implied Equity Price Volatility[1]—NIEs



[1]Refers to 10-day price volatility. [2]Includes China, People's Rep of; India; Indonesia; Korea, Rep. of; Malaysia; Philippines; Taipei,China; and Thailand.
Source: Bloomberg.

the region and a related rise in foreign participation in local equity markets **(Figure 2.9)**. Although the increase in foreign holdings of emerging Asian equities may have contributed to the heightened sensitivity of emerging Asian equities to global events, the trend of greater foreign participation appears to have exerted a positive influence on deepening and broadening local equity markets. For example, listings of local companies on foreign stock exchanges—particularly in New York and London—have decreased sharply, as the ability of Asian companies to market themselves to foreign funds on their home markets has

Figure 2.9: Total Foreign Holdings of Equity—2003–2007 Average
(as % of total market capitalization)



Sources: International Monetary Fund, *Coordinated Portfolio Survey* and Bloomberg (Market Capitalization).

improved. Nevertheless, the degree of financial openness leaves emerging Asian equity markets vulnerable to a sharp reversal in portfolio investment flows, as seen during the current crisis.

Market Integration and Spillovers

The current crisis illustrates the close interconnectedness of global and regional financial markets in propagating shocks, with evidence of spillovers through the equity market channel seen by significantly high correlations between global, regional, and national market price movements.

The extent of market integration can be seen in the average cross-country equity price correlations **(Table 2.7)**. Interestingly, the average correlations for emerging Asian equity markets are generally higher between the region's markets than with the US market. The degree of economic openness also turns out to

Table 2.7: Average Simple Correlations of Equity Markets 1993–2009[1]

	PRC	HKG	TAP	SIN	KOR	THA	MAL	PHI	INO	IND	JPN	USA	Region[2]
PRC	1.00	0.10	0.07	0.16	0.07	0.06	0.09	0.06	0.07	0.12	0.05	(0.02)	0.09
HKG		1.00	0.45	0.73	0.46	0.48	0.43	0.46	0.42	0.37	0.42	0.45	0.43
TAP			1.00	0.54	0.37	0.36	0.32	0.34	0.24	0.28	0.35	0.26	0.33
SIN				1.00	0.68	0.53	0.52	0.45	0.48	0.58	0.55	0.54	0.52
KOR					1.00	0.46	0.31	0.36	0.41	0.36	0.39	0.33	0.39
THA						1.00	0.47	0.51	0.50	0.28	0.32	0.26	0.41
MAL							1.00	0.48	0.49	0.24	0.27	0.21	0.37
PHI								1.00	0.55	0.24	0.28	0.32	0.38
INO									1.00	0.24	0.26	0.24	0.38
IND										1.00	0.26	0.30	0.30
JPN											1.00	0.32	0.31
USA												1.00	0.29
Region													1.00

PRC = China, People's Rep. of: composite index of Shanghai A and Shenzhen A shares, weighted by market capitalization; HKG = Hong Kong, China: Hang Seng Index and Hang Seng China Enterprises Index, weighted by market capitalization; TAP = Taipei,China: Taiwan SE Weighted Index; SIN = Singapore: Singapore Straits Times Index; KOR = Korea, Rep. of: Korea SE Composite Index; THA = Thailand: Bangkok S.E.T Index; MAL = Malaysia: KLSE Composite Index; PHI = Philippines: PSE Index; INO = Indonesia: JSX Composite Index; IND = India: BSE 100; JPN = Japan: Nikkei 225 Stock Average; USA = United States of America: Dow Jones Industrial Average.
[1]Until Feb 2009. [2]This is taken as the simple average of the estimates for individual economies. However, as the starting dates of some indices are different, the number of estimates being averaged will increase over time. For instance, the index used for Singapore (Straits Times Index) did not begin until Sep 1999. In this regard, the general trend should be interpreted with caution.
Source: OREI staff estimates.

be an important element for financial contagion. The countries most affected during the current crisis include those with high foreign participation in local equity markets, banking systems that depend heavily on short-term foreign currency funding, and those with high levels of trade openness. For example, the stock markets in more open economies such as Hong Kong, China; Republic of Korea (Korea); and Singapore are more correlated than other emerging Asian markets with the rest of the equity markets in the sample. The results also show that the PRC market is by far the least correlated with other markets in the sample, although it is more correlated with the region's market than with the US.

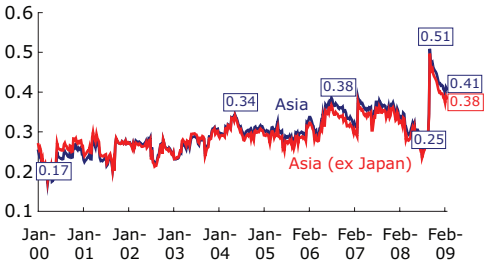
Assessing and monitoring the progress of financial market integration is important, as the degree of financial integration has implications for cross-border financial contagion.

There is no doubt that strong economic growth and financial deepening, such as robust credit growth and increasing market capitalization, have been driving forces in the rise of equity prices in emerging markets. The steady and robust increases in emerging Asian equity prices over the years immediately prior to the current crisis were also driven by underlying domestic fundamentals. However, emerging Asia's equity price movements are increasingly driven by global and regional factors, reflecting the growing degree of financial integration. Financial integration is a dynamic and multi-faceted process. Advances in information and communications technology, and the removal of barriers to cross-border activity have expedited financial market integration. As markets become increasingly integrated, any convulsion in global financial markets and significant developments in major industrial economies will likely influence the region's equity prices. Market integration has also accelerated at the regional level, resulting from conscious efforts by the region's policymakers since the 1997/1998 Asian financial crisis.

A simple model of Dynamic Conditional Correlation[10] can be used to measure cross-country equity market correlations and allow for time-varying characteristics.

In general, the conditional correlations between emerging Asian equity markets and the US, the region, and other regional equity markets have increased over time, given the growing internationalization of the region's equity markets. Conditional correlations rose sharply around September of last year, reflecting the spillover effects of the global crisis. Nevertheless, there are important variations in the cross-country correlations across different groups and individual countries. Key findings of the correlation analysis are listed below.

Figure 2.10: Conditional Correlations of Equity Markets—Asia[1] with the United States



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand.
Source: OREI staff estimates.

Asia and the US

- There is a noticeable upward trend in the Asia–US correlation, with the correlation parameter picking up sharply in the second half of 2008 and peaking during the second week of October 2008 **(Figure 2.10)**.

[10] The Dynamic Conditional Correlation model proposed by Engle (2002) and Engle and Sheppard (2001) is among a new class of multivariate models that allow for time-varying correlations between asset returns. This method calculates correlation between variables of interest as a function of the past observations of volatility within the variables and the correlations between them. The higher the time-varying correlation, the larger the co-movement between markets (BIS Papers No. 42).

The conditional correlations have been estimated by the GARCH(1,1)-DCC model using a two-step estimation procedure, following the methodology adopted by Fung, Tam, and Yu (2008). In the first stage, univariate GARCH models are estimated for each equity-return series. The standardized residuals from the first stage are used as inputs to estimate a time-varying correlation matrix based on the likelihood function.

The dynamic correlations are constructed as

$$R_t = (1-\alpha-\beta)\,\bar{R} + \alpha\,(\varepsilon_{i,t-1}\,\varepsilon_{j,t-1}) + \beta R_{t-1}$$

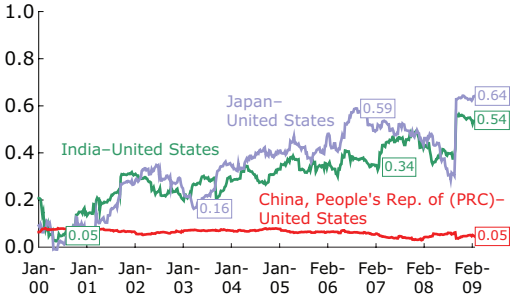
where α and β are key scalar parameters to be estimated, and R_t is the time-varying correlation matrix whose elements are defined as

$$\rho_{i,j,t} = \frac{q_{i,j,t}}{\sqrt{q_{ii,t}\,q_{jj,t}}}$$

$\bar{R}$ = unconditional expectation of $\varepsilon_i\,\varepsilon_j$

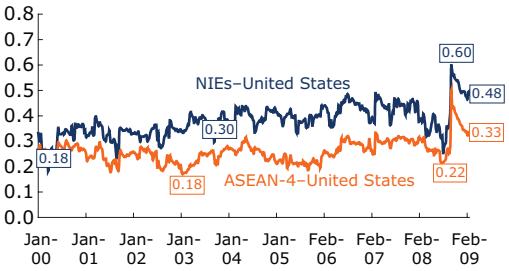
where $\rho_{i,j,t}$ is the conditional correlation between the asset returns of countries *i* and *j* at time *t,* and $q_{i,j}$ is the off-diagonal elements of the variance-covariance matrix.

Figure 2.11: Conditional Correlations of Equity Markets—India, Japan, and the PRC with the United States



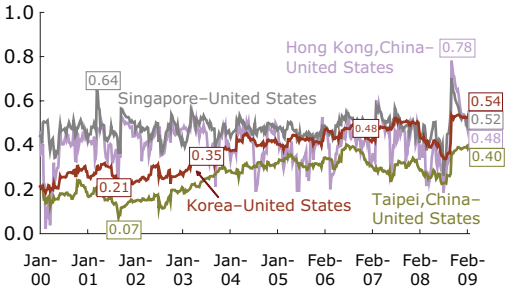
Source: OREI staff estimates.

Figure 2.12: Conditional Correlations of Equity Markets—ASEAN-4[1] and NIEs[2] with the United States



[1]Refers to Indonesia; Malaysia; Philippines; and Thailand.
[2]Refers to Hong Kong, China; Korea, Republic of; Singapore; and Taipei,China.
Source: OREI staff estimates.

Figure 2.13: Conditional Correlations of Equity Markets—NIEs with the United States



Source: OREI staff estimates.

- The equity market correlations between Asia's major equity markets (such as Japan and India) and the US have also increased substantially over time. The PRC market has the lowest level of correlation with the US **(Figure 2.11)**.

- The correlation with the US is higher among the newly-industrialized economies (NIEs) than the four middle-income ASEAN countries, but there is generally synchronized movement between these two groups of economies **(Figure 2.12)**.

- Among the NIEs, Korea and Taipei,China have seen a visible increase in their correlation with the US, while Singapore and Hong Kong, China's correlations have been largely stable at higher levels over the same period. Prior to 2004, Korea and Taipei,China were less correlated with the US than either Singapore or Hong Kong, China **(Figure 2.13)**.

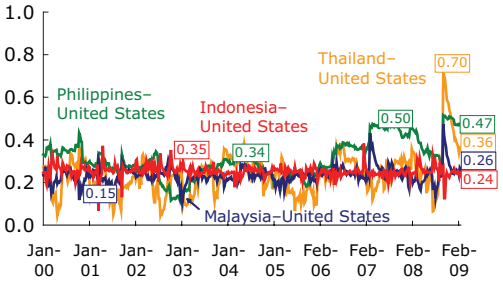
- Among the four middle-income ASEAN countries, correlations with the US move in a generally synchronized manner with little increases seen for Indonesia and Malaysia. Beginning in 2006, the Philippines began showing higher levels of correlation with the US than its neighbors **(Figure 2.14)**.

Individual Asian equities with the other Asian equities

- In general, the correlations between individual Asian equity markets have increased even more than those with the US. The average of cross-correlations among the region's equity markets is higher than the average of their correlations with the US market **(Figure 2.15)**.

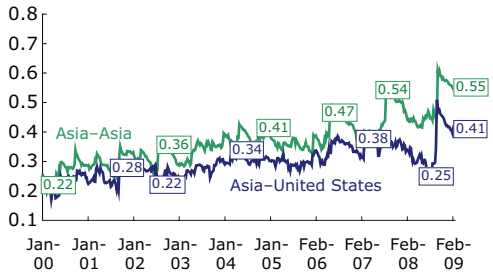
- Asia's major stock markets—including the PRC, India, and Japan—are increasingly integrated with the other markets in the region. The PRC market has the lowest level of correlation with the region, although it has risen significantly. Indian stock markets are increasingly correlated with other regional markets, with a noticeable rise in average correlation since 2004. In general, individual Asian equity markets shown high correlations with Japan and the average correlation between emerging Asian equity markets and Japan is higher than emerging Asia's correlation with the US **(Figures 2.16a, 2.16b)**.

Figure 2.14: Conditional Correlations of Equity Markets—ASEAN-4 with the United States



Source: OREI staff estimates.

Figure 2.15: Conditional Correlations of Equity Markets—Asia with Asia[1] and the United States



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. Asia–Asia correlation refers to the average of all the correlations between any two countries listed above.
Source: OREI staff estimates.

- Intraregional correlations show signs of increasing integration. The average of cross-country correlations has generally been higher among the NIEs, but market integration among the four middle-income ASEAN countries has been catching up fast, particularly since 2006 **(Figure 2.17)**.

Similar exercises have been carried out for the financial; industrial; and telecommunications, media, and information technology sectors to shed light on the impact of the global financial crisis on Asian equity markets.

Rather surprisingly, the conditional correlation between emerging Asia's financial shares and US financials is much lower than the correlation for broad market indexes **(Figures 2.18a, 2.18b)**. Although the origin of the crisis can be traced to the US subprime mortgage market, which spread rapidly to the global banking and financial markets, Asian banks were relatively shielded from immediate financial losses from US subprime mortgages and related credit derivative markets. The difference in financial sector fundamentals appears to be reflected in the relatively low correlations between emerging Asian and US financial shares. Nevertheless, the subsequent retrenchment in bank funding, credit markets, and investors' risk appetite was felt globally and eventually overtook emerging Asian markets. The average correlation among Asian financial shares is higher than the

Figure 2.16a: Conditional Correlations of Equity Markets—India, Japan, PRC, and US with Asia[1]

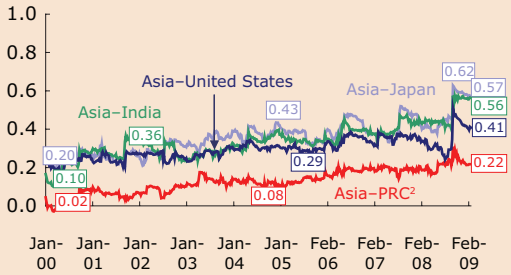
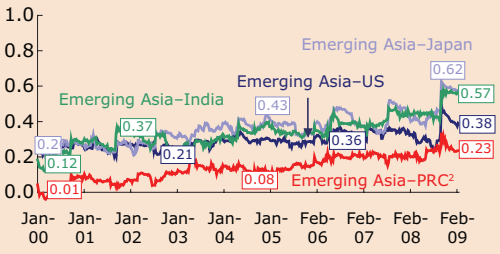
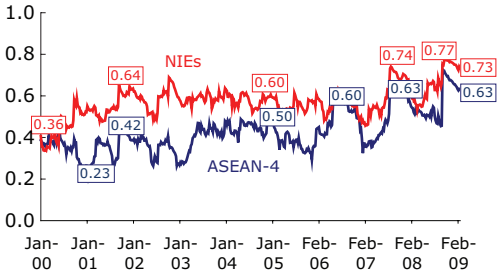


Figure 2.16b: Conditional Correlations of Equity Markets—India, Japan, PRC, and US with Emerging Asia[3]



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. Excluding China, People's Rep. of (in the case of China); and excluding India (in the case of India). [2]PRC = People's Republic of China. [3]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. Excluding China, People's Rep. of (in the case of China); and excluding India (in the case of India). [2]PRC = People's Republic of China.
Source: OREI staff estimates.

Figure 2.17: Intraregional Correlations of Equity Markets—ASEAN-4[1], NIEs[2]



[1]Refers to Indonesia; Malaysia; Philippines; and Thailand. [2]Refers to Hong Kong, China; Korea, Republic of; Singapore; and Taipei,China.
Source: OREI staff estimates.

average correlation with US financials **(Figures 2.19a, 2.19b)**. As the global financial crisis intensified with considerable knock-on effects on the real economy, the spillover to the region's equity markets has been mostly through the real sectors, including the industrial and telecom, media, and information technology (IT) sectors **(Figures 2.20a, 2.20b)**. For emerging Asia, the impact through the industrial sector appears to be the most substantial, given the region's high dependence on manufacturing and electronics exports. Again, the spillover was felt across the region. The average correlations among Asian industrials have been rising **(Figures 2.21a, 2.21b),** reflecting the region-wide impact of a global recession on industrial sectors.

Figure 2.18a: Conditional Correlations of Equity Markets—Asia[1] with the United States

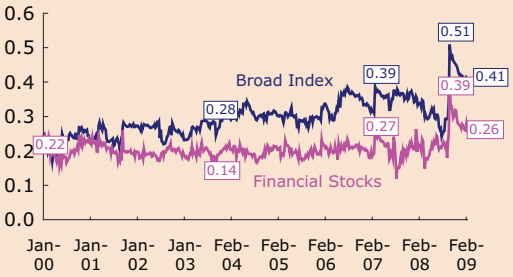
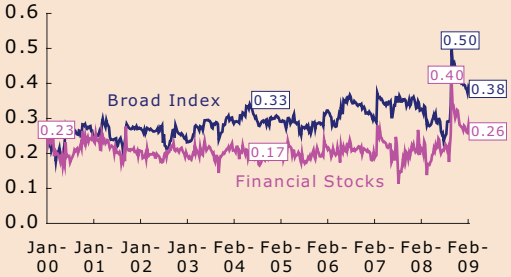


Figure 2.18b: Conditional Correlations of Equity Markets—Emerging Asia[2] with the United States



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. [2]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand.
Source: OREI staff estimates.

Figure 2.19a: Conditional Correlations of Financial Stocks—Asia[1]

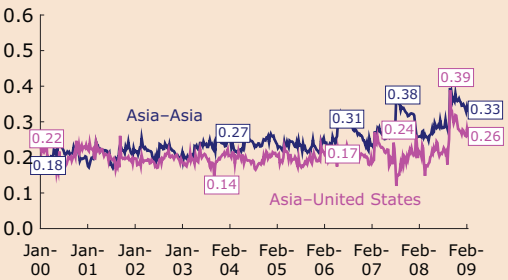
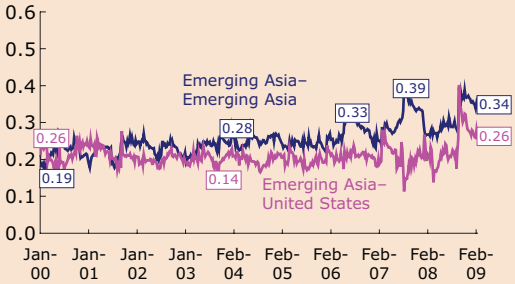


Figure 2.19b: Conditional Correlations of Financial Stocks—Emerging Asia[2]



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. [2]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand.
Source: OREI staff estimates.

Figure 2.20a: Conditional Correlations of Selected Equity Sub-Sectors—Asia[1] with the United States

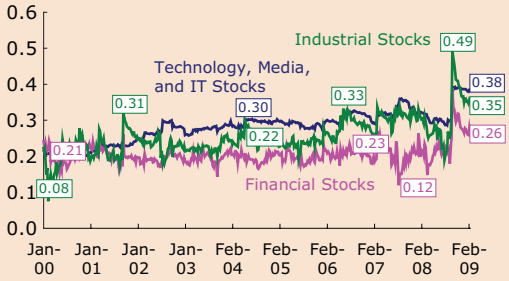
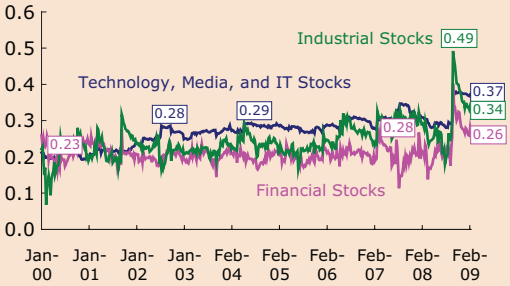


Figure 2.20b: Conditional Correlations of Selected Equity Sub-Sectors—Emerging Asia[2] with the United States



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. [2]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand.
Source: OREI staff estimates.

Figure 2.21a: Conditional Correlations of Selected Equity Sub-Sectors—Asia with Asia[1]

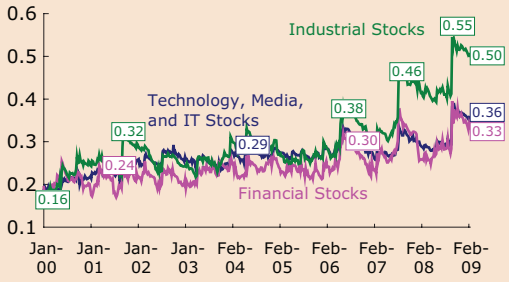
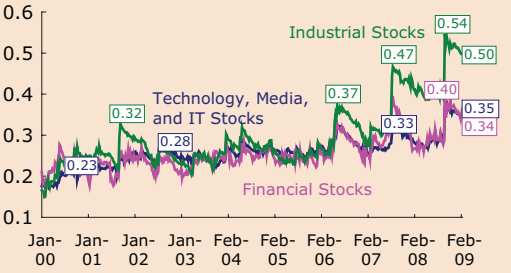


Figure 2.21b: Conditional Correlations of Selected Equity Sub-Sectors—Emerging Asia with Emerging Asia[2]



[1]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Japan; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. Asia–Asia correlation refers to the average of all the correlations between any two countries listed above. [2]Refers to China, People's Rep. of; Hong Kong, China; India; Indonesia; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; and Thailand. Emerging Asia–Emerging Asia correlation refers to the average of all the correlations between any two countries listed above.
Source: OREI staff estimates.

Challenges and Policy Implications

Although the markets may have reached bottom, the road to recovery will likely be long and hard.

The economies of emerging Asia will face substantial headwinds, at least for the remainder of the year. Slowing growth, declining current account surpluses, volatile capital flows, and depreciating currencies across emerging Asia all point to a number of macroeconomic policy challenges. The synchronized global downturn, with the G3 economies in recession, will

dampen hopes for a swift recovery among emerging Asia's highly export-dependent economies. In the context of a weak economy, earnings of emerging Asia's companies will likely be revised downward even further over the next few months. In addition, as the US economy deleverages by saving more and spending less, emerging Asian exporters will suffer. The region's economies have to rethink development strategies, as a significant reduction in the US current account deficit through a likely multi-year process of global rebalancing implies that they can no longer rely on exports for growth. Shifting to domestic demand-driven growth in emerging Asia is an essential element for a robust and sustainable recovery, but it presents a significant challenge to the region's policymakers.

There is a significant risk that emerging Asian markets will continue to move sideways with heightened volatility.

High volatility is expected to persist in the near term, as the markets face many uncertainties. These include the depth and length of the global recession; plans for bank recapitalization and the workout of bad assets; credit availability; the ability of the PRC to shore up its economy; and other potentially destabilizing forces such as the situation in Central and Eastern Europe, and political risks in some emerging Asian markets. Dysfunctional credit markets continue to wreck havoc on real economic activity globally. For the recent rally in emerging Asian markets to be sustained, the current negative feedback loop between credit markets and the real economy will need to be broken and volatility reduced. Global liquidity conditions and credit availability are important for the region's equity markets. The stabilization, if not recovery, of global banking and financial systems remains a crucial element for the sustained recovery of emerging Asian equities.

Reinforcing macroeconomic stability, together with prudent management of external positions and foreign exchange rates, is key to maintaining positive momentum.

The resilience of emerging Asia's equity markets is in no small part subject to the ability of the region's policymakers to shore up market confidence by maintaining a relatively healthy growth outlook, sound macroeconomic indicators, and stable

Table 2.8: Net Foreign Portfolio Investment in Equities (USD million)

	29-Mar-2009[1]	2008	1H2008	2H2008
India	(1,666.1)	(13,336.4)	(6,566.8)	(6,769.6)
Indonesia	(6.7)	1,801.1	3,582.4	(1,781.3)
Korea, Rep. of	(29.1)	(36,742.5)	(21,568.6)	(15,173.9)
Philippines	(147.5)	(1,135.3)	(400.8)	(734.5)
Taipei,China	(1,493.4)	(16,363.8)	(3,595.9)	(12,767.9)
Thailand	(148.4)	(4,942.0)	(1,658.6)	(3,283.5)
Viet Nam	2.0	340.3	357.9	(17.6)
Japan	(39,668.5)	(66,817.1)	(11,604.3)	(55,212.8)
TOTAL (ex Japan)	**(3,489.2)**	**(70,378.6)**	**(29,850.3)**	**(40,528.3)**
TOTAL (inc Japan)	**(43,157.7)**	**(137,195.7)**	**(41,454.6)**	**(95,741.1)**
Hong Kong, China	—	(4,327.8)[2]	(10,046.6)	5,718.7
Malaysia	—	(15,376.8)[2]	(6,567.3)	(8,809.4)
Memo items:				
TOTAL (w/HKG)[3]	—	(74,706.4)	(39,896.9)	(34,809.5)
TOTAL (w/MAL)[3]	—	(85,755.3)	(36,417.6)	(49,337.7)
TOTAL (w/HKG, MAL)[3]	—	(90,083.1)	(46,464.2)	(43,619.0)

[1]Year-to-date figures. Bloomberg data retrieved on 30 March 2009. [2]Net foreign and domestic portfolio investment in equities/shares and corporate securities. [3]Excluding Japan.
Sources: Bloomberg; CEIC; *International Financial Statistics,* International Monetary Fund; Bank Negara Malaysia.

external positions. Net foreign equity flows to emerging Asian markets continue to be negative, albeit at a lesser degree, amid continued deleveraging in global markets and high risk aversion **(Table 2.8)**. Emerging Asian equity markets, particularly those with high levels of foreign participation, remain vulnerable to a sharp reversal of foreign portfolio investment flows. Related currency weakness and the perception of further depreciation will also delay investment in the region's equity markets. Given their tight links to the global market—as seen in the empirical analysis—abrupt swings in global investor sentiment affect the performance of the region's equity markets. Sound macroeconomic management is a must, with help from sizeable stimulus packages and exhibitions of strong political will. A more flexible exchange rate policy is also important as it would help reduce pressure associated with one-way currency bets, while providing greater leverage to central banks in easing their

monetary stance. This will also reduce expectations for further depreciation and help stabilize investors' risk appetite.

The current crisis highlights the longer-term challenges of improving the structural resilience of emerging Asia's equity markets.

Despite the visible improvement in depth and breadth across emerging Asian equity markets, the persistence of major vulnerabilities suggests that further actions are needed to enhance market resilience. This requires active steps to foster deeper and more liquid domestic capital markets—including broadening the investor base; encouraging development of more diverse local financial products; improving legal, regulatory, and institutional frameworks; upgrading governance and transparency; and establishing more sound market infrastructure and institutions.

- **A broad and diverse domestic investor base helps improve the resilience of domestic equity markets.** In particular, a strong presence of institutional investors with long-term horizons—such as funded national pension schemes, mutual funds, and domestic insurance companies—can be a stabilizing force in domestic financial markets against short-term swings in global financial conditions and international investor sentiment. At the same time, the active participation of short-term oriented local investors, such as hedge funds and private equity funds, can improve market liquidity by diversifying investors' risk profiles and demand for financial instruments.

- **Developing diverse equity instruments and derivatives can attract more foreign and domestic investors.** Providing tools for currency hedging can cushion emerging markets from abrupt changes in exchange rate expectations during periods of market turmoil. Fostering a broad and diverse investor base can also increase market demand for more diverse local financial products. However, the introduction of more complex instruments and/or the development of derivative markets must be accompanied by appropriate regulation and increased market surveillance, and improved risk management at the firm level.

- **The benefits of well-established legal, regulatory, and institutional frameworks are immeasurable.** Further reforms need to be taken to enhance the legal and regulatory systems, with efforts to upgrade prudential oversight and accounting frameworks in accordance with international standards. The crisis has seen some discretionary interventions by the region's authorities to delay or limit the magnitude of price declines. But any temptation to artificially stabilize the market without resorting to formal regulations or following the existing structure of the market needs to be carefully balanced against possible reputational costs that can derail market development over the medium term.

- **A lack of market transparency and governance infrastructure impairs investor confidence.** A well-structured stock exchange can provide a venue for investors to share information and spread risks through market surveillance, adequate disclosure, margin requirements, and position limits. At the firm level, effective governance structures, adequate transparency of performance, and clear accountability all need to be established.

- **A well-functioning securities market requires adequate support systems, including sound market infrastructure and institutions.** Various auxiliary markets—such as repurchase agreements (repos), swaps, securities lending, and derivative markets—can improve market efficiency by reducing transaction costs and increasing liquidity. Other supportive infrastructure—such as trading, settlement, custody, and delivery systems—need to be effectively put in place to ensure smooth functioning of the securities market. However, establishment or enhancement of auxiliary markets needs to be carefully sequenced and properly regulated to avoid related risks to financial stability, while allowing for the full leverage of market innovation to strengthen domestic capital markets.

3. Emerging Asia's Bond Markets[11]

Bond Market Developments and Outlook

Growth in local currency bonds outstanding in emerging Asia fell sharply in the last quarter of 2008 as bond issuance by central banks and monetary authorities plummeted.

Driven mainly by growth in the first half of 2008, the value of local currency (LCY) bonds outstanding in emerging Asia reached an estimated USD4.1 trillion, up 14.7% (LCY base) at the end of 2008 from USD3.9 trillion at end-2007 **(Figure 3.1a).** The People's Republic of China's (PRC) LCY bond market continues to dominate, accounting for 54% of total bonds outstanding in the region. Excluding PRC growth in outstanding bonds, the region's bond markets expanded just 6.8% year-on-year (y-o-y) in 2008 (LCY basis—excluding currency effects). LCY government bond markets in the region—defined to include the liabilities of central banks and monetary authorities—grew 13.4% (LCY basis) to USD3.13 trillion at the end of 2008 from USD2.89 trillion at end-2007. However, government bond markets contracted in

Figure 3.1a: Total Bonds Outstanding—2007 and 2008 (USD billion)

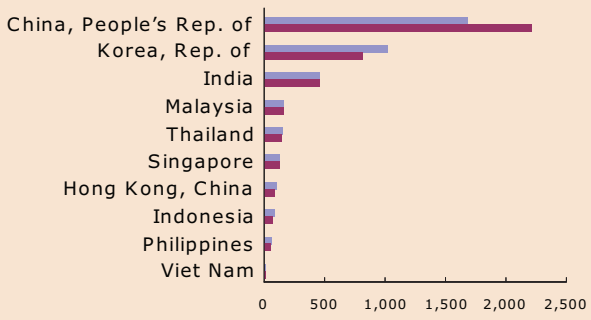


Figure 3.1b: Government Bonds Outstanding—2007 and 2008 (USD billion)

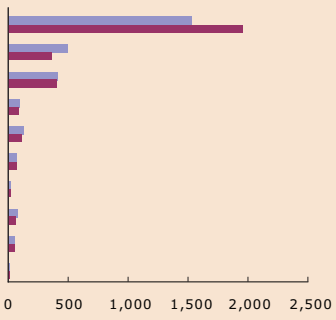
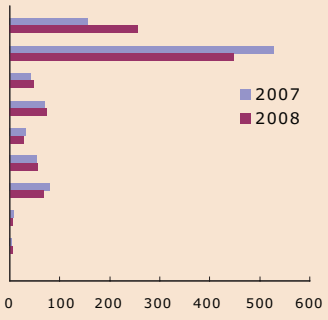


Figure 3.1c: Corporate Bonds Outstanding—2007 and 2008 (USD billion)



Sources: Asia Bonds Online and Reserve Bank of India.

[11] This section was prepared by Lotte Schou-Zibell. For inquiries, please contact lschouzibell@adb.org.

2008 in the Republic of Korea (Korea), Indonesia, and Malaysia **(Figure 3.1b)**. Corporate bond markets in emerging Asia grew 18.9% (y-o-y) at the end of 2008 **(Figure 3.1c)**. The PRC corporate bond market reported the largest increase in nominal terms. Rapid growth in corporate bond markets was also recorded in the Philippines, India, and Viet Nam, albeit from very low base levels. Corporate bond markets in Indonesia and Hong Kong, China contracted. A reversal in capital flows that stopped the need for sterilization, a slide in other emerging markets such as in Eastern Europe, and tight global credit conditions are among the main factors behind overall slower growth in the region's bond markets.

Bond markets in emerging Asia have shown tremendous growth, but on a global scale they remain relatively small.[12]

Generally low inflation is one of the major macroeconomic factors that enabled the development of LCY bond markets, despite an inflationary spike in 2007 and the first half of 2008. However, while there has been progress in local bond markets, not all bond market development has been equal. The aggregate numbers can hide huge differences, particularly in corporate bond markets. Relative to the size of the economy, corporate bond markets in the PRC and India are only about 6% and 5% of gross domestic product (GDP), respectively. Viet Nam has shown extraordinary growth in the corporate bond market in recent years, but it still comprises less than 1% of GDP. In contrast, corporate bond markets in Korea; Hong Kong, China; Malaysia; and Singapore are well-developed—with the corporate bond market larger than the government bond market in both Korea and Hong Kong, China. Compared with developed markets, the size of bond markets in emerging Asia remain relatively small, which can be interpreted as evidence of financial underdevelopment and a lack of reliable financial instruments **(Table 3.1)**.

[12] Eichengreen and Luengnaruemitchai (*Why doesn't Asia have a bigger bond market?* NBER Working Paper 10576, 2004) argue that Asia's strong fiscal balances may not have been conducive for the growth of government bond markets. They say the region's structural characteristics, and macroeconomic and financial policies, account for the differences in bond market development between Asia and the rest of the world.

Table 3.1: Size and Composition of Emerging East Asia's Local Currency Bond Markets (% of GDP)

	2007	2008		2007	2008
China, People's Rep. of			**Philippines**		
Total	47.9	52.4	**Total**	37.1	34.2
Government	43.5	46.4	Government	34.5	30.9
Corporate	4.4	6.1	Corporate	2.6	3.3
Hong Kong, China			**Singapore**		
Total	47.3	39.4	**Total**	72.0	66.8
Government	8.5	9.1	Government	40.3	37.8
Corporate	38.8	30.4	Corporate	31.7	29.0
India			**Thailand**		
Total	39.7	40.2	**Total**	55.2	52.4
Government	36.1	35.7	Government	44.2	41.9
Corporate	3.6	4.5	Corporate	11.0	10.4
Indonesia			**Viet Nam**		
Total	20.2	13.6	**Total**	13.8	14.2
Government	18.2	12.3	Government	13.4	13.7
Corporate	2.0	1.3	Corporate	0.5	0.6
Korea, Rep. of			**Emerging East Asia**		
Total	106.6	85.7	**Total**	54.1	52.1
Government	51.7	38.6	Government	40.5	39.6
Corporate	54.9	47.0	Corporate	13.6	12.5
Malaysia			**Japan**		
Total	84.6	76.0	**Total**	165.7	198.1
Government	48.9	41.4	Government	149.0	178.4
Corporate	35.8	34.6	Corporate	16.8	19.8

Note: 2008 GDP is from World Economic Outlook Database, October 2008, International Monetary Fund. Other GDP data from CEIC.
Sources: People's Republic of China (ChinaBond); Hong Kong, China (Hong Kong Monetary Authority); India (Bank for International Settlements); Indonesia (Indonesia Stock Exchange and Bank Indonesia); Republic of Korea (Bank of Korea and KoreaBondWeb); Malaysia (Bank Negara Malaysia); Philippines (Bureau of the Treasury and Bloomberg); Singapore (Monetary Authority of Singapore and Bloomberg); Thailand (Bank of Thailand); and Viet Nam (Bloomberg).

A sharp drop in issuance by central banks and monetary authorities led to a massive drop in LCY bond issuance in emerging Asia in 2008.

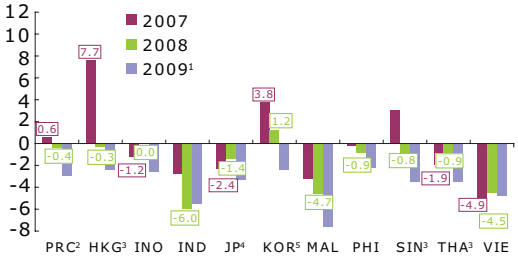
Total LCY bond issuance in emerging Asia (excluding India) declined 59% y-o-y in the fourth quarter of 2008 (LCY base—excluding currency effects) as a result of unfavorable market conditions that led to a slowdown in new government bonds. In particular, issuance by central banks and monetary authorities, plummeted in the last quarter 2008 as net capital inflows in

the first half of the year reversed into net outflows, halting the need for central bank sterilization. Some governments also postponed or cancelled planned bond sales as investors shied away from volatile global and regional capital markets. However, excluding issuance by central banks and monetary authorities, government issuance increased nearly 6%.[13] Driven by bond issuance by local companies in the PRC, corporate bond issuance in emerging Asia increased in the latter part of 2008 by 3%, but overall y-o-y corporate bond issuance fell 27% in 2008 in LCY terms. Excluding the PRC, y-o-y total LCY bond issuance declined by just 6%, government issuance was flat, and corporate bond issuance fell nearly 40% **(Table 3.2)**.

Local currency bond issuance should expand in 2009 as fiscal policy moves center stage in the fight against recession.

LCY bond issuance is expected to increase in 2009 as fiscal policy has become a primary tool in the fight against recession **(Box 2)**: (i) governments plan to use LCY bonds to help finance stimulus packages, (ii) government LCY bond sales are expected to hold up on demand for safe-haven assets, and (iii) companies are increasingly turning to LCY markets for refinancing and raising new capital. As the global financial crisis continues, governments across the region need to fund their stimulus packages and corporations need to refinance existing debt and search for additional financing beyond banks and equity markets **(Figure 3.2)**. To finance the huge fiscal stimulus and plug rising fiscal deficits, many of the region's governments have raised debt by issuing long-term government bonds or shorter-term notes and bills—excluding issuance by central banks and monetary authorities. The success so far this year of government debt sales and auctions show the appeal bonds have in preserving investors' capital and in generating a predictable stream of income in the current global economic downturn. Also, there is strong demand for safe-haven securities as investors shy away from high-yielding, riskier assets. Domestic companies are also likely to look at local markets to raise fresh funds (or for refinancing) as corporate bond spreads in major global markets remain high. Borrowing in local markets also allows companies to eliminate foreign exchange risk. Given the rise in yields at the long end of the curve, governments in emerging Asia tend

Figure 3.2: Fiscal Balance (% of GDP)



HKG = Hong Kong, China; IND = India; INO = Indonesia; JP = Japan; KOR = Republic Korea; MAL = Malaysia; PHI = Philippines; PRC = People's Republic of China; SIN = Singapore; THA = Thailand; VIE = Viet Nam.
[1]Budget estimates/ government targets for the year except for the People's Republic of China (maximum government estimate); and Japan (OECD Outlook estimate). [2]Includes central and local governments. [3]Fiscal year. [4]Covers general government operations. [5]Figures include social security contributions. 2008 balance as of November 2008.
Sources: *Asian Development Outlook* (various issues), Asian Development Bank; *International Monetary Fund Article IV,* International Monetary Fund; national sources; CEIC; *Economic Outlook 84 Database,* OECD website.

[13] Does not include issuance data for India.

Table 3.2: Local Currency (LCY)-Denominated Bond Issuance (Gross)

	Growth Rate (LCY base %)	Growth Rate (USD base %)		Growth Rate (LCY base %)	Growth Rate (USD base %)
	2008 y-o-y	2008 y-o-y		2008 y-o-y	2008 y-o-y
PRC			**Singapore**		
Total	(76.3)	(74.7)	**Total**	(3.8)	(3.7)
Government	(81.5)	(80.2)	Government	1.5	1.7
Corporate	(19.8)	(14.3)	Corporate	(89.2)	(89.2)
Hong Kong, China			**Thailand**		
Total	16.2	17.0	**Total**	71.3	46.3
Government	28.6	29.4	Government	93.2	64.9
Corporate	(49.4)	(49.1)	Corporate	(13.9)	(26.5)
Indonesia			**Viet Nam**		
Total	(49.5)	(58.1)	**Total**	(20.3)	(27.0)
Government	(50.0)	(58.5)	Government	(17.2)	(24.2)
Corporate	80.1	49.4	Corporate	(83.3)	(84.7)
Korea, Rep. of			**Emerging East Asia**		
Total	(19.9)	(40.5)	**Total**	(59.0)	(58.6)
Government	(17.7)	(38.9)	Government	(62.6)	(62.2)
Corporate	(30.0)	(48.0)	Corporate	(26.5)	(27.3)
Malaysia			**Less PRC:**		
Total	(35.4)	(38.3)	**Total**	(5.5)	(18.6)
Government	(17.4)	(21.1)	Government	0.1	(14.0)
Corporate	(58.8)	(60.6)	Corporate	(38.5)	(46.3)
Philippines			**Japan**		
Total	(32.9)	(41.6)	**Total**	(21.1)	(2.8)
Government	(34.6)	(43.1)	Government	(17.2)	2.0
Corporate	(23.7)	(33.6)	Corporate	(53.5)	(42.7)

PRC = People's Republic of China.
Notes:
1. The following are notes on data availability for each market:
Hong Kong, China: corporate bond issuance until Sep-08; 4Q08 figures based on AsianBondsOnline estimates; Korea, Rep. of: corporate bond issuance until Nov-08; 4Q08 figures based on AsianBondsOnline estimates; Thailand: government and corporate bond issuance until Nov-08; 4Q08 figures based on AsianBondsOnline estimates; Japan: government and corporate bond issuance until Nov-08; 4Q08 figures based on AsianBondsOnline estimates.
2. Calculated using data from national sources.
3. Corporate bonds include issues by financial institutions.
4. Bloomberg end-of-period LCY/USD rates are used.
5. For LCY base, Emerging East Asia growth figures are based on end-December 2008 currency exchange rates and do not include currency effects.
Sources:
People's Republic of China (ChinaBond); Hong Kong, China (Hong Kong Monetary Authority); Indonesia (Bloomberg); Republic of Korea (Bank of Korea); Malaysia (Bloomberg); Philippines (Bloomberg); Singapore (Bloomberg); Thailand (Bank of Thailand); and Viet Nam (Bloomberg).

Box 2: Funding Fiscal Stimulus Packages

The large fiscal stimulus packages being adopted in the region are intended to help cushion the effects of the global recession. Authorities from the People's Republic of China (PRC) to Malaysia have all flagged their intention to tap bond markets to raise funds to finance fiscal stimulus packages. But given the stressed conditions in global markets, the question is whether the borrowings required to finance the packages can be absorbed without putting upward pressure on interest rates.

An important issue at the current juncture is whether the heightened risk aversion and capital outflows from the region will create difficulties for financing the stimulus packages **(Table B2)**. Fortunately, conditions in most emerging Asian local currency bond markets remain relatively favorable. Reflecting the continued relative availability of funds in these markets, governments—and even some highly-rated corporate issuers—have been able to issue local currency debt. Across the region, local currency government bonds continue to be seen as the safe asset by domestic entities, even as the foreign demand for regional assets has been declining.

A potentially more relevant constraint for official debt issuance is the recent sharp steepening of local currency yield curves across the region. Even though the steepening partly reflects reductions in short-term interest rates, a number of countries have seen quite steep increases in longer-term yields. Higher yields and more limited funding opportunities at the long end of yield curves could complicate the funding of fiscal stimulus packages and have implications on both cost and effectiveness.

[1] This box draws heavily from a policy paper prepared by Charles Adams, Visiting Professor, National University of Singapore and Consultant, Office of Regional Economic Integration.

Table B2: Selected government borrowing requirements (USD billion)

	2008	2009
Emerging Asia[2] ex PRC, India		
Total borrowing requirements	69.7	133.7
Overall fiscal balance	(1.2)	(67.6)
Funding sources	69.7	133.7
LCY bonds outstanding[3]	1,479.9	–
FCY bonds outstanding[3]	288.8	–
People's Republic of China (PRC)		
Total borrowing requirements	34.0	172.1
Overall fiscal balance	38.7	(95.7)
Funding sources	34.0	172.1
LCY bonds outstanding	2,213.0	–
FCY bonds outstanding	21.9	–
India[1]		
Total borrowing requirements	59.5	68.5
Overall fiscal balance	(49.9)	(48.0)
Funding sources	59.5	68.5
LCY bonds outstanding	–	
FCY bonds outstanding	–	

– = not available. [1] Fiscal year. 2008 in this table refers to Apr 2008 to Mar 2009. [2] Refers to Hong Kong, China; Indonesia; Korea, Republic of; Malaysia; Philippines; Singapore; Taipei,China; Thailand and Viet Nam. [3] Excludes Taipei,China for which data is unavailable.
Source: Credit Suisse and OREI staff calculations.

to issue benchmark bonds in the middle of the curve. This can help market consolidation, particularly for markets that remain fragmented, as well as add depth and improve liquidity while better managing government debt. While this is good, bond markets across emerging Asia are still maturing and largely dominated by buy and hold investors (banks and contractual savings), and the risk premium on many bonds remains elevated, particularly for corporates.

In the event of bank stress, bond issuance by a government or a government agency, such as a deposit insurance fund, can be used to finance bank restructuring. In this context, bonds

Box 2: ...continued

To alleviate pressure on domestic bond markets, some countries like the Philippines, Indonesia, and Republic of Korea (Korea) have successfully tapped global markets to raise funds, but dollar borrowing costs remain elevated. Against this background, regional policymakers need to consider how best to structure and manage the debt issued to finance stimulus packages. There are a number of factors that national authorities might usefully take into account in their debt issuance programs. The most important consideration should be given to the potential to prudently shift debt issuance toward shorter and medium-term maturity structures with maximum liquidity—as investors in emerging Asian markets favor shorter-term maturities. At the same time, it might be prudent to weigh the implications of any broader seizing-up of liquidity in the region's bond markets should there be larger adverse spillovers from the global turmoil.

Prudent debt management calls for avoiding very short-term debt in favor of spacing out maturities along the yield curve in line with future demands on the budget. But current conditions in some of the region's financial markets may call for a slightly different approach when longer-term funding is either not possible or has become prohibitively costly. In such cases, some modest shifting to the medium- and shorter-term ranges of the yield curve may help expedite debt issuance without significantly raising rollover risk during the current unsettled conditions in global markets. Given the continued relatively abundant liquidity at medium and shorter-term maturities, national authorities still have scope to fund at these maturities even where the long end of the market has dried up. Some governments have already unveiled plans to issue in the 2–3 year maturity range.

Financing stimulus should continue to be based on regular auction schedules unless liquidity dries up. In line with normal practice, it will be especially important for the sizes, terms, and conditions of forthcoming auctions to be announced well in advance so as to avoid surprising the market. Issuance should also be made at the most liquid points on the curve.

In extreme circumstances where liquidity conditions in local bond markets become highly unfavorable, national authorities may consider directly issuing local debt to key local institutional investors, such as local banking systems. Such an approach provides a form of insurance in the unlikely event that regular issuance is not possible. Traditionally, banks and financial institutions have been major holders of government debt in emerging East Asia. For example, banks and financial institutions hold some 61% of outstanding government bonds in Korea. In the PRC, banks hold 52% of government bonds, while in Indonesia it is 49%. But such direct allocations should only be used in extreme circumstances as they can impose significant burdens on the purchasing institution, especially when they shift official financing risk to their balance sheets. Moreover, their frequent use can reduce investor interest in official debt and reduce its role as a benchmark for pricing private debt.

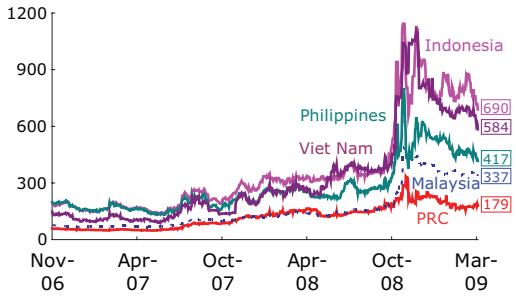
In sum, provided that fiscal stimulus packages do not threaten fiscal sustainability, financing the stimulus should not raise major issues for the region's policy makers. Demand for regional government bonds has remained relatively intact. In cases where domestic yield curves have steepened sharply and long-term liquidity has dried up, some judicious shortening of debt maturities to the 2–3 year range may help raise the financing required for stimulus packages while not adding substantially to rollover and interest rate risk. Upward pressure on longer-term yields may be lessened to some degree by national authorities as they put in place credible programs for withdrawing the fiscal stimulus as circumstances warrant.

are generally issued for two generic purposes: (i) to finance the government purchase of equity in banks, and (ii) to finance the government purchase of distressed assets from banks. For example, if a restructured bank is insufficiently profitable or has an embedded risk exposure arising from its bond holdings, the likely result will be the loss of public funds for recapitalizing and a need for subsequent intervention and more costly restructuring.

Emerging Asia's recent issuance in G3 bond markets (eurozone, Japan, and the United States)—in G3 currencies—can help fiscal and monetary stimulus take hold even if price discovery keeps risk premiums high.

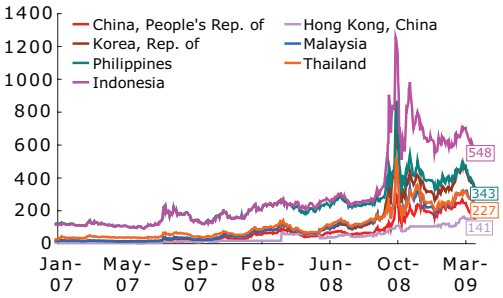
With short-term G3 interest rates near zero and comparatively wide and positive differentials to US dollar interest rates on offer in emerging Asia, several issuers, both sovereign and corporate, have issued G3-denominated debt despite the exchange rate risk. The Philippines successfully offered USD1.5 billion in sovereign bonds and the Export–Import Bank of Korea and Korea Development Bank issued two USD2 billion bonds. News reports suggest that some USD9–12 billion more are in the near-term pipeline.[14] Despite recent increases, the G3-denominated debt market in emerging Asia remains small (USD30 billion in a good year), and its contribution may be marginal, it is an important market for specific issuers. For example, the recent Philippine US dollar issue helped relieve pressure on the Philippine peso bond market, and also provided US dollar funds that could be used to service USD-denominated debt. Greater G3 currency issuance also aids in price discovery for LCY issues and complements LCY bond market development. It allows foreign investors to familiarize themselves with local names and their underlying credit quality. And it contributes to an environment where both foreign and domestic investors are comfortable with the credit and foreign exchange risks of a particular bond. However, current financial market conditions may slow progress. In addition, although the yield spreads of traded external debt instruments over US Treasuries[15] have tightened somewhat in recent months, they remain elevated, implying higher risk premiums than during the era of cheap credit and high growth **(Figure 3.3)**. Investors are also increasingly differentiating between government bonds with wider spreads on lower-rated sovereigns, such as those from Indonesia and the Philippines, with those considered investment grade. They also differentiate between government and corporate bonds. Although still higher than pre-crisis levels, credit default swap (CDS) spreads also tightened in recent months. Indonesian spreads remain especially high **(Figure 3.4)**. With USD3.1 trillion in foreign

Figure 3.3: JP Morgan EMBI Sovereign Stripped Spreads (basis points)



PRC = People's Republic of China.
Source: Bloomberg.

Figure 3.4: Credit Default Swap Spreads (sovereign bonds in USD, mid-spread in basis points)

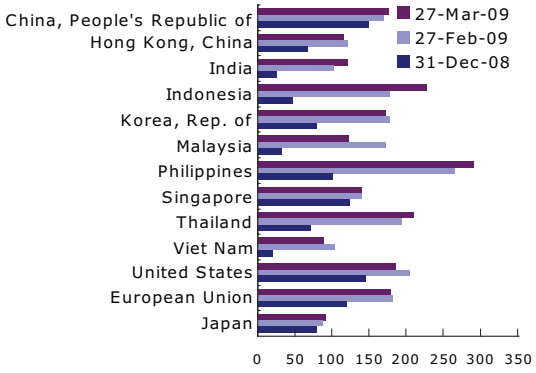


Source: Thomson DataStream.

[14] For more details see *Asia Bond Monitor*, 1st Quarter 2009.

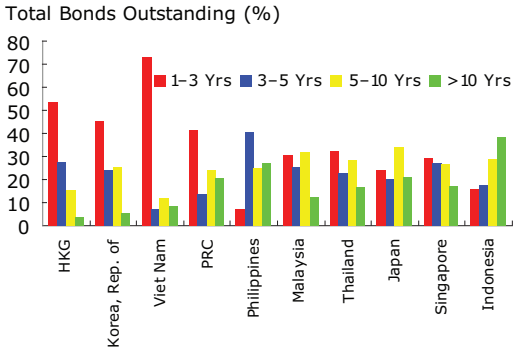
[15] "External" refers to foreign currency-denominated fixed-income bonds.

Figure 3.5: Yield Spread Between Two- and Ten-Year Government Bonds



Source: Bloomberg.

Figure 3.6: Asian Govt. Bonds: Maturity Profiles—Dec 08



HKG = Hong Kong, China; PRC = People's Republic of China.
Source: Asia Bonds Online calculations.

reserves, Asian central banks add an unprecedented level of liquidity to global capital markets.

Yield curves steepened in several markets over concerns over the impact of economic stimulus programs on the 2009 bond issuance programs of emerging Asian governments.

While fiscal policy remains the primary driver of sovereign issuance, yield curves steepened in several markets over concerns about the impact economic stimulus will have on 2009 bond issuance plans of emerging Asian governments **(Box 3)**. Government bond yields in emerging Asia generally rose at the long end of the curve. This followed the steepening of government yield curves observed in the US and Japan. The steepening yield curves were in part due to higher issuance so far in 2009 by governments and government-backed financial institutions, and in part due to worries that monetary policy easing may eventually lead to higher inflation and, therefore, higher long-term bond yields. In addition, credit spreads have widened on fears of further credit downgrades and a general risk aversion to weaker credit, even as interest rates generally decline from slower activity. Only in Viet Nam and Hong Kong, China did government yield curves flatten in March. In Singapore, yield curves were largely unchanged. (**Figures 3.5, 3.6**)

Turnover ratios—a measure of market liquidity—fell sharply across emerging Asia's LCY bond markets in 2008.

The turnover ratio[16] measures the extent of trading in the secondary market relative to the value of bonds outstanding—the higher the turnover ratio, the more active the secondary market. In 2008, turnover in government bonds was generally higher than corporate bonds, except in the PRC. Turnover ratios for LCY government bonds in 2008 were below 1.0 in the PRC, Indonesia, Korea, Malaysia; and the Philippines. This reflected a drop in trading volumes in the most liquid segment of the markets **(Figure 3.7a)**. Government bond markets in emerging

[16] Turnover ratio as a measure of liquidity should be interpreted with caution. While turnover represents the market conditions of a certain period in the past, it does not necessarily provide timely information about the condition of market liquidity. In addition, turnover does not reflect the state of effective supply and demand or trade orders that were not executed, despite having been explicitly placed in the market.

Box 3: Shaping Yield Curves

Government demand for capital is having a major impact on the shape of yield curves globally. But other factors—monetary policy, economic growth, inflationary expectations, flight to quality, competition for capital, and portfolio shift—also play an important role.

The yield curve shows the relationship between yields and tenor for a set of similar bonds, usually government securities, at a given point in time. A normal yield curve slopes upward as investors require higher compensation for investing in longer-dated maturities. But curves can also be flat or inverted under certain conditions. The slope of the yield curve—the spread between long- and short-term interest rates—is regarded as a good predictor of future economic activity. However, a combination of factors determines a yield curve's shape.

In the current environment of rising *fiscal expenditures*, yield curves tend to steepen. If the market believes a government will run large budget deficits for a prolonged period, participants are likely to demand compensation for the increased supply of longer-dated government bonds that will need to be sold to finance the deficits. Long-term rates will tend to rise at a faster pace than short-term rates, leading to a "steepening" yield curve. However, if the markets are concerned that an economy might have difficulty refinancing its debt obligations when they fall due, short-term interest rates may increase faster than long rates—leading to a "flattening" yield curve. Investors will demand greater compensation for the provision of short-term bridging finance, but longer-term interest rates may not rise at the same pace if investors believe that a fiscally-challenged government will reform itself over time and create a better investment environment. Such conditions are now present in Eastern Europe, where the refinancing of short-term debt obligations is proving difficult because of the global credit crisis.

Monetary policy is perhaps the single most influential factor shaping the yield curve. This is because a central bank's control of the short end of the yield curve has a major impact on longer-dated government bond yields. Nevertheless, market sentiment and investor expectations combined with policy actions often results in different yield curve shapes. If market participants expect a central bank to cut short-term policy rates, the yield curve will generally steepen as short-term rates fall proportionally faster than long-term rates. However, if market expectations are for a sustained series of rate cuts or for a move to an accommodative stance, then longer-dated bond yields may fall more quickly as investors look to purchase longer bonds in the expectation of making a larger capital profit because of lower yields. Under such a scenario, the curve will flatten.

A slower rate of *economic growth* impacts the yield curve largely because of associated monetary responses. In parallel with weaker economic activity, corporate funding demands decline and banks make fewer loans. Excess capital boosts demand for fixed-income securities—particularly short-term securities—bringing down real interest rates. While the market's perception of the length of subdued economic activity will determine the slope of the curve, shorter maturities generally tend to outperform longer maturities during an economic slowdown, thereby causing the yield curve to steepen.

Inflation expectations are a primary driver of long-term yields. The nominal interest rate equals the expected real interest rate plus expected inflation. Thus, an expectation of future higher inflation will push long-term yields higher, steepening the yield curve.

Flight-to-quality also plays an important role in the shape of the yield curve in times of political, economic, or financial uncertainty. Concerns over corporate defaults and personal bankruptcies cause investors to shift focus from the return *on* capital to the return *of* capital—away from equities and derivatives, and toward less risky, fixed-income assets. With investor risk aversion, participants tend to invest heavily in government debt, particularly short-term securities, which cause the curve to steepen as short-term securities outperform long-term government debt.

In addition, it must be remembered that all financial assets, including fixed-income instruments, *compete for capital*. During periods of sustained economic growth, bonds face more competition as they have a lower rate of return than other riskier asset classes. The yield curve will typically shift upward and steepen as the high rates of return available elsewhere cause fixed-income investors to demand higher–than-normal real rates of return, which are usually manifested at the long end where the real yields tend to be the highest.

Figure 3.7a: Government Bond Turnover Ratios

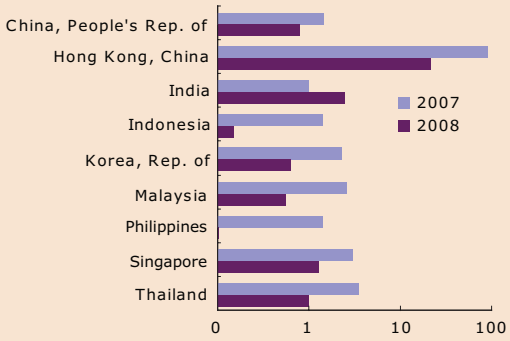
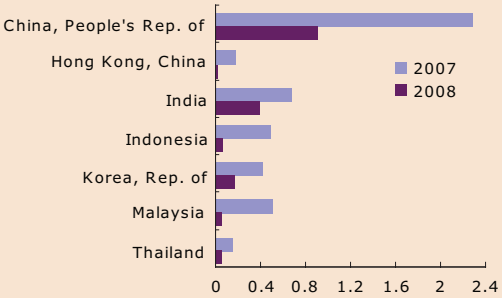


Figure 3.7b: Corporate Bond Turnover Ratios



Notes:
1. Calculated as local currency (LCY) trading volume (sales amount only) divided by the average LCY value of outstanding bonds during each 3-month period.
2. Philippine government bond turnover data until Nov-08.
Sources: People's Republic of China (ChinaBond.com); Hong Kong, China (Hong Kong Monetary Authority); Indonesia (Indonesia Stock Exchange); Republic of Korea (KoreaBondWeb and Bank of Korea); Malaysia (Bank Negara Malaysia); Philippines (Bureau of the Treasury); Singapore (Monetary Authority of Singapore and Singapore Government Securities); Thailand (Thai Bond Market Association and Bank of Thailand); Japan (Japan Securities Dealers Association); and India (Reserve Bank of India and the Clearing Corporation of India Ltd.).

Asia have been deepening with an increase in buy-to-hold investors as the growing contractual savings industry continues to search for scarce long-term LCY assets to match long-term liabilities. Liquidity in corporate bond markets was even lower, with lower-rated papers more difficult to transact **(Figure 3.7b)**. Turnover ratios for LCY corporate bonds were below 0.4, except in the PRC. This can be attributed to tight credit conditions, adverseness to trading higher-risk instruments, and concerns about overall liquidity in this market segment.

The participation of foreign investors is an important element for diversifying the risk profiles of investors for domestic LCY bond markets.

While the impact of foreign investor participation in LCY bond markets may be difficult to assess, the long-term commitment of cross-border investors affects market dynamics and the extent of cross-market contagion. Foreign investors that hold local bonds as part of a broadly-diversified international portfolio can help stabilize the local market when local investors become unduly risk averse. However, shifts in international monetary or financial conditions may lead to rapid changes in foreign investor interest. With foreign capital often invested in emerging market funds that straddle several emerging markets, it is also possible that a crisis in one economy can lead to a repatriation of funds from similar markets. Sudden nonresident sales of LCY bonds can have a disruptive effect on exchange rates. In addition, severe changes in capital allocation, as with the recent credit crisis, are likely to hurt exchange rates and LCY yields.

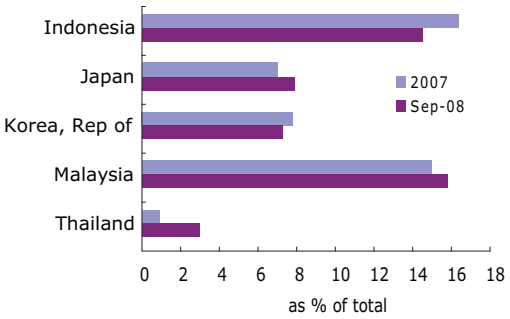
With continued market reform, enhanced confidence in LCY bonds as an asset class, and large potential for portfolio diversity, foreign holdings of LCY bonds have increased in most of emerging Asia.

Through September 2008, foreign investors increased exposure in emerging Asian LCY markets, with the exception of Korea and Indonesia, where foreign holdings were lower than at the end of 2007. Confidence in regional LCY bond markets shows the growing strength of bonds as an asset class and the impact of continued market reforms at the national and regional levels, including portfolio diversity through a wider array of LCY bonds. Many investors looking to temporarily offset currency risk choose to invest in emerging bond markets if they can avail of hedging

instruments. While liquid hedging instruments may not be strictly necessary for the formation of a bond market, they are critical to its long-run success. Being globally diversified will also better hedge long-term economic risks—what investors should be most concerned with in a crisis environment—as economic growth drives market risks and returns over time (**Figure 3.8**). While high yields help to attract foreign investors, economies with higher "investability" scores—based on capital controls, market liquidity and efficiency, regulatory quality and creditor rights, market infrastructure, taxation on bonds, and the size of the local institutional investor base—seem to attract a larger share of investment from abroad. Many conservative bond investors are reluctant to invest in international markets until a certain minimum investabilty score is reached.

Foreign participation in emerging Asian LCY bond markets can be underestimated due to missed reporting or underreporting of foreign holdings.

Figure 3.8: Foreign Holdings in Local Currency (LCY) Government Bonds
(as of September 2008)



Note: Data for Indonesia as of 10 Mar 2009; Thailand as of end of December 2008.
Source: National Sources.

Foreign holdings of LCY bonds can be underestimated because of either missed reporting or underreporting of foreign debt by local custodians.[17] In addition, some foreign investors invest in LCY bonds through structured debt securities—typically by combining a debt security or a basket of debt securities with a financial derivative or a basket of financial derivatives[18]—as a way of more efficiently managing investments in markets where liquidity is poor. This may underestimate the scale of foreign investment in LCY bond markets, conversely leading to an overstating of exposure to domestic financial institutions. Also, different markets use different criteria or definitions to compute statistics on foreign investor holdings of LCY bonds, the issuance of individual securities in many local markets is not always

[17] In CGFS Paper No. 28 *Financial Stability and Local Currency Bond Markets*, June 2007, discussions with private investors and authorities indicate that the underlying exposure of nonresidents is in some economies considerably larger than the data suggest.

[18] Examples of structured debt securities include credit-linked notes that combine a credit derivative with a regular bond; structured variable-rate notes as a variation of a standard variable-rate bond, in which the coupon payment is periodically reset by reference to an independent interest rate index, such as the London Inter-bank Offered Rate (LIBOR); and a variable-rate note that has a put option for the holder to sell the issue back.

aggregated in analytically useful ways, and historical data and aggregates are often unavailable.[19]

Structural weaknesses continue to drag on foreign participation in several emerging Asian LCY bond markets.

Poor performance in terms of market liquidity is one of the key characteristics of emerging Asia's LCY bond markets and one of the key reasons why foreign investors are reluctant to invest in local debt markets. Market liquidity remains the main challenge to improving markets' performance, and for fostering confidence in local markets and facilitating transparent and accurate asset valuations. The lack of a diverse investor base and available hedging products are important factors in explaining weak market liquidity (both in the government and corporate segments). In addition, problems in terms of the flow of timely information about bond issuers and imperfect market infrastructure also contribute to keeping market liquidity low. Well-functioning rating agencies are a component of the market infrastructure that is required to attract foreign investors. They play a critical role in promoting the development of bond markets in emerging economies, mainly by providing information to both issuers and investors, and increasing transparency through limiting information asymmetry between them. Capital account restrictions in several economies also limit the scale of foreign participation in LCY bond markets.

Risks to the Outlook

Uncertainty continues to cloud the outlook for LCY bond markets in emerging Asia.

Despite Asian financial institutions' limited exposure to subprime-related instruments and relatively healthy balance sheets, ripples from the global credit crunch continue to affect

[19] CGFS Paper No. 28 *Financial Stability and Local Currency Bond Markets*, June 2007. In May 2007, the G8 (Canada, France, Germany, Italy, Japan, Russia, United Kingdom, and US) released an action plan for developing local bond markets in emerging market and developing economies. As a result, *a Handbook on Securities Statistics* is expected to be the first publication of its kind that deals exclusively with the presentation of securities statistics. The objective of the *Handbook* is to improve information on securities markets. The *Handbook* develops a conceptual framework for the presentation of statistics on different types of securities issued and held. The intention is to contribute to the development of a framework that results in relevant, coherent, and internationally comparable securities statistics used in financial stability analysis and monetary policy formulation.

emerging Asia's LCY bond markets. The region's increased links with international financial markets over the past two decades have lowered borrowing costs in several economies, improved intermediation of the region's large savings, and brought greater prominence to regional financial centers. However, this has also brought crisis transmission to the region through several channels. First, because foreign investors increased holdings of Asian assets during the previous economic boom, crisis outflows have been substantial. Second, the increased reliance of banks on international wholesale funding made them particularly exposed to the process of global de-leveraging and the resultant shortage of US dollar funding. Third, because Asian corporates increased reliance on foreign funding (bond, equity, and loan issuance) during the boom, they are more exposed to refinancing risks now that access to foreign borrowing has dried up. Poor external funding conditions may lead Asian corporates to delay new external bond issuances, refinance at shorter maturities, or turn to domestic sources for funding at a time when domestic credit has also tightened.

Rising bond yields associated with increased government bond issuance may raise funding costs of fiscal stimulus packages.

Credit conditions have generally improved this year as massive amounts of government intervention and fiscal stimulus have begun offsetting some of the impact of de-leveraging and stunted economic growth. However, there are rising concerns over increasing fiscal deficits and government guarantees along with the implications for fiscal sustainability and sovereign credit ratings. Capital outflows from emerging Asia have accelerated as write-downs in major global financial institutions accumulate. The need for financial institutions to repair balance sheets and rebuild capital bases is likely to constrict fund availability to emerging markets and put downward pressure on regional asset markets, exchange rates, and foreign exchange reserves. They will also raise funding costs in external markets. Rising bond yields in global and several of the region's markets since early January—on concerns over the health of financial sectors, particularly banking—may also reduce the fiscal space needed to raise funds from LCY bond markets. This could cause difficulties in deficit financing for some of the region's more cash-strapped governments, with implications for medium- and long-term macroeconomic management. In addition, investor concern

over sustained fiscal deficits could push risk premiums higher and hurt some sovereign credit ratings.

Corporates face greater financing risks with borrowing costs remaining high and increased competition from government and government-backed financial institutions.

Refinancing risk remains a growing concern for corporates. Banks are more cautious about lending, causing credit growth to decelerate. While this pullback is perhaps more notable among global banks, domestic banks in the region are not immune. For issuers with weaker fundamentals, available options have diminished just as business is softening and financial strain is spreading. Corporates may also face increased competition from governments and government-backed financial institutions for access to capital markets. In many markets, government-backed companies remain dominant players in key sectors. State guarantees or implicit sovereign support will provide these firms with easier access to funds than private companies. Governments in the region are also creating special guarantees or liquidity-support programs for financially-stretched companies, including small- and medium-sized enterprises (SMEs), but this aid may be selective for certain key sectors.

Increased reliance on banks can crowd out bond financing and other alternative sources of capital for corporates.

Corporate bond markets in emerging Asia have grown very rapidly over the past decade, albeit in many cases from very low levels of initial market size. Efforts to recapitalize the banking sector or broader restructuring initiatives to reduce the dependence on bank financing following the 1997/98 Asian financial crisis played an important role in this growth transformation. Nonetheless, domestic bank financing remains the dominant source of finance for the corporate sector in most emerging Asian markets. On one hand, excessive reliance on bank finance can leave a potentially small number of decision makers controlling the allocation of capital, which diminishes access to alternative sources of funding and renders the real sector overexposed to financial sector shocks. On the other hand, in the current environment banks benefit from a lower cost of funds due to monetary accommodation, face less competition from securities

companies and can more carefully choose creditworthy customers, contributing to improved profitability and capital raising. Not only could more capital provide a cushion against the unexpected declines in creditworthiness and asset values, but it could also position banks well for expansion. The safer, more resilient financial system that emerges from the crisis is likely to be characterized by a greater reliance on bank financing, as borrowers and lenders take on board the weaknesses that have become evident in securities markets. It is also likely to offer more generous compensation for risk-bearing. For banks with plenty of capital, that adjustment process is likely to present the opportunity to pick up business that could prove quite profitable over time, if managed appropriately.

Policy Options

While the fundamental objective of debt management is to efficiently raise funds to meet the operational needs of government, an associated objective is to maintain a well-functioning government bond market that helps to keep the cost of debt low and benefits a wide array of domestic market participants.

Traditionally, banks and financial institutions have been major buyers (and holders) of government debt in emerging Asia, with financial intermediation dependent on banks. Therefore, prudent public debt management is one of the key challenges facing policymakers throughout the region in maintaining financial stability. The design and implementation of fiscal stimulus programs will need to emphasize transparency to support a well-functioning government securities market and be based on regular consultations with market participants to ensure the integrity and attractiveness of the market for dealers and investors. Prudence should also be maintained by managing the structure of government debt, raising funds for domestic operational needs using a variety of instruments, managing exposure to credit risk through diversification, and supporting a broad investor base.

The development of a reliable and liquid government benchmark yield curve is the foundation of any bond market.

Benchmark yield curves provided by government debt securities play a critical role in the development of liquid LCY bond markets and the overall credit curve. Benchmark yield curves also facilitate private sector issuance by serving as the basic reference for pricing private sector debt and by providing valuable information about expectations of likely macroeconomic development and market reactions to monetary policy. Arguably, other liquid securities with relatively low default risk could also be used as benchmark issues. However, the low credit risk and high liquidity features of government securities have made them natural providers of benchmark interest rates. To be really useful as a benchmark for pricing corporate bonds, the government bond market must be well-balanced in terms of maturity structure, with regular issuances of bonds with varying maturities.

The ability to attract both local and foreign investment is crucial to the development of LCY bond markets and a prerequisite for more sophisticated financial products and the diversification of risk exposure.

The factors that influence LCY bond market development are well established: (i) capital controls, (ii) market liquidity and efficiency, (iii) regulatory quality and creditor rights, (iv) market infrastructure, (v) taxation, and (vi) the size of the local institutional investor base. Rules and regulations must also be clear, transparent, consistent, and simple.

- **Prudently easing capital controls in tandem with measures to strengthen the domestic financial system can play a key role in shaping cross-border financial flows.**

  Capital controls can be a significant deterrent to investment in LCY bond markets as they limit foreign investor participation and narrow investor diversity. Bond markets operating in an environment where capital controls exist are frequently dominated by buy-to-hold investors. This leads to low turnover in the secondary market, wider bid-ask spreads, and higher bond yield volatility. Easing restrictions on capital

transactions—such as prohibition, quantitative limits, and approval procedures—can facilitate investment in LCY bond markets. Access to securities markets, domestic money markets, and derivative markets is also critical.

- **Improving market liquidity and efficiency can ensure the smooth functioning of the financial system and condition the activities of economic agents—including pricing, trading, and risk management.**

  While market liquidity is important for attracting investors, a major challenge to successfully managing fiscal stimulus is to support the development of liquid, well-functioning government bond markets. However, market liquidity is not always well-defined—largely because it is multi-dimensional. Adequate bond market liquidity allows buying and selling with little or no impact on price. Markets are often considered liquid when trading costs are low and volumes high. A highly-liquid market leads to low transaction costs for both issuers and investors. Conversely, when liquidity is low, financial market distortions intensify. Deep and liquid bond markets provide a safety valve by providing an alternative source of financing when access to bank credit tightens. Of equal importance is a regular and reliable database—a by-product of liquid markets—that offers participants a highly transparent way to determine the current market value of financial assets. By shifting the focus of bond markets to tapping the region's vast savings to meet long-term financing needs, for example in infrastructure—roads, ports, and power generation—bond markets can be better tied to development goals. The challenge is not to create a large inventory of illiquid bonds. Consolidating issuance along the emerging benchmark yield curves and lengthening maturities can help on this front. While the underlying premise of securitization is sound, governments in the region might look to alternative financing that encourage more liquid instruments—such as European-style, covered-bond systems for mortgages—in an effort to create a more liquid pool of corporate securities.

- **Strengthening regulatory quality and creditor rights can create access for market entry and investment, and contribute to the development and facilitation of cross-border bond transactions and settlement issues.**

  In response to problems associated with the opaqueness of complex derivative products and the lack of clarity on who holds what risk, there is a need to further strengthen transparency, vigilance, and accountability in investment products. Disclosure of complex financial products and of the financial conditions of firms should be improved. Transparency is also an important influence on the price discovery process and market liquidity. Regulators and market participants need to assess how transparency can be instituted across markets, especially for relatively new or illiquid instruments. This can be done by (i) providing greater clarity linking various investment entities and institutions, (ii) assessing contingency lines on funding channels that occur and the risks of credit exposure, (iii) determining whether capital charges on standby credit lines are sufficient, and (iv) defining accounting adequacy and legal parameters for guaranteeing adequate risk control. Because of a lack of transparency in some economies, it is difficult for regulators and investors alike to assess the vulnerability of financial institutions. In such an environment, there is an increased likelihood for rumors and innuendo to excessively influence markets.

- **Improved market infrastructure can contribute to (i) efficient management of clearing and settlement risks, (ii) efficient and sound procedures and controls for settlement and safekeeping, and (iii) efficient and effective asset servicing.**

  Clearing and settlement infrastructure in most domestic emerging Asian bond markets has improved significantly in the past decade. However, as cross-border bond transactions increase, there is an absence of planned market infrastructure at the regional level. For cross-border bond transactions, Asia has the disadvantage of being in earlier time zones than the rest of the world when using existing clearing and settlement infrastructure. This increases regional investors'

exposure to settlement, or "Herstatt", risks.[20] However, as the volume of cross-border transactions is low, the issue of Herstatt risk is currently not a serious concern. But as Asia's bond markets continue to grow and the potential volume of cross-border bond transactions increases, there is a strong case for emerging exchange-based futures contracts that allow for hedging LCY interest rate exposure. The ad hoc policy of licensing over-the-counter (OTC) derivatives in some markets has created a patchwork quilt of derivative products that are difficult to monitor in a timely manner. It is also almost impossible to assess systemic risk in the current environment. In addition, in emerging domestic and regional bond market infrastructure, economies should aim to achieve convergence toward global standards and international practices. This includes standards for financial reporting and auditing, market regulation and supervision, and credit rating agencies.

- **Removing discriminatory taxes—such as transaction taxes—as well as the withholding on interest and capital gains taxes can make the trading of LCY bonds less costly.**

  Taxes on bond investments—withholding, capital gains, and repatriation of funds—are difficult barriers to cross-border bond transactions in several economies as they reduce return and create complexity. Where taxes are clear and transparent, cross-border transactions are less problematic. Tax incentives can also contribute to greater investor diversity, which in many LCY bond markets is considered a major impediment to deepening LCY debt markets. However, views diverge on the value of tax incentives for increasing liquidity. Market makers from low tax environments tend to attach relatively little importance to further tax reform. Market makers in the corporate bond market tend to view tax incentives as more important because corporate bonds are not a mandatory investment as government bonds are for many participants, which makes them more sensitive to after-tax yield than government bonds.[21]

[20] Settlement, or "Herstatt" risk, is the risk that one party does not deliver a security or its value as per contract after the other party or counterparties already delivered security or cash value as per the trade agreement.

[21] On 16 March 2009, Korea announced a Proposal to Remove Withholding Tax on Interest Income and Capital Gains Tax.

- **Broadening the institutional investor base can contribute to increasing market liquidity and domestic savings and investment flows to the local market, and to primary and secondary market development.**

  The problem of broadening the investor base is a common theme in most emerging Asian LCY bond markets. Institutional investors play a critical role in global and local financial markets. Comprising mainly pension funds, insurance companies, and investment funds, they help develop depth and liquidity in these markets. A broad, diversified, and mature investor base with different investment views and time horizons can (i) provide an important source of stability and liquidity to financial markets, (ii) promote the efficiency of price discovery, (iii) play a key role in reducing volatility in capital flows to emerging markets, and (iv) stimulate sustainable economic growth.[22]

[22] See *Asia Bond Monitor* November 2008, Box 4, Broadening the Investor Base.

4. Emerging Asia's Currency Markets[23]

Overview of Recent Trends and Activities

Most emerging Asian currencies fell sharply against the US dollar since the global financial crisis intensified as massive financial deleveraging and heightened risk aversion stoked capital outflows and collapsing external demand cut export earnings.

The region's currencies weakened sharply against the United States (US) dollar in the second half of 2008 as demand for dollar funding surged amid the global credit crunch **(Figures 4.1a, 4.1b, 4.1c, 4.1d)**. Slower world growth also limited export earnings. For the Japanese yen, financial turmoil continued to boost demand for safe havens. The weakening of the Korean won in 2008 was far greater than other Asian currencies. At its recent nadir, the won had lost 38% of its nominal value against the US dollar compared with end-2007. The People's Republic of China (PRC) yuan stopped appreciating, but notably did not depreciate. The rest of the region's currencies—including the Indian rupee, Indonesian rupiah, Malaysian ringgit, Philippine peso, Singapore dollar, New Taiwan dollar, and Viet Nam dong—fell in a range from 6% and 20% against the US dollar between July 2008 and March 2009.

Volatility spiked in the region and remains high, adding strain to the region's economies, particularly in the trade sector.

Many of the region's currency markets remain dominated by domestic residents, with low foreign participation and narrow investment interests, leaving markets vulnerable to one-sided bets on their currencies. The lack of diverse foreign exchange products and effective hedging mechanisms in many of the region's markets also increases costs for businesses affected by foreign exchange volatility. The degree of the Korean won's reaction to the global credit crisis, was far out of proportion

[23] This chapter was prepared based on contributions by Cliff Tan, OREI consultant and Consulting Professor, Stanford University. For any inquiries, please contact sabymitra@adb.org.

Figure 4.1a. Exchange Rate Indexes—Eurozone and Japan
(local currency vis-à-vis USD; 2 January 2007=100)

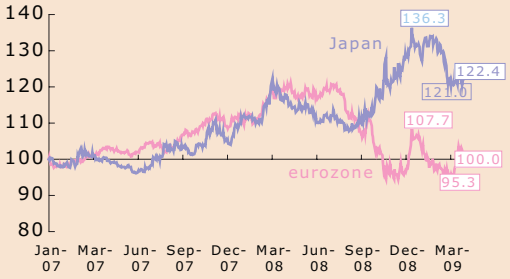


Figure 4.1b. Exchange Rate Indexes—India and PRC[1] (local currency vis-à-vis USD; 2 January 2007=100)

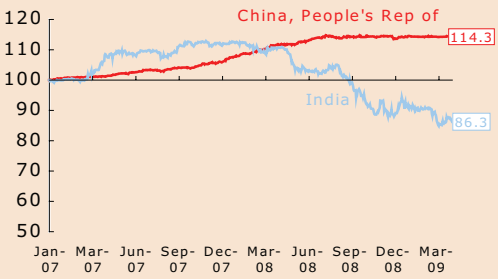
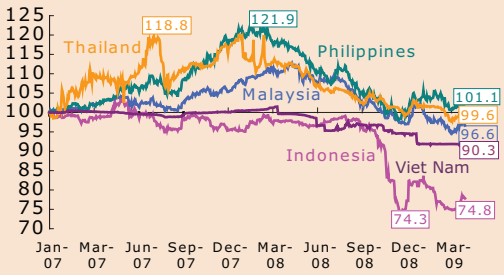


Figure 4.1c. Exchange Rate Indexes—NIEs (local currency vis-à-vis USD; 2 January 2007=100)

Figure 4.1d. Exchange Rate Indexes—ASEAN-5 (local currency vis-à-vis USD; 2 January 2007=100)



Source: OREI staff calculations based on Reuters data.

compared with that of other Asian currencies, with its volatility reaching nearly 60%. Toward the end of the first quarter in 2009, won volatility remains high at about 30%. Volatility remains high across the region **(Figures 4.2a, 4.2b)**, and coupled with overshooting in some currencies, led policymakers to intervene heavily in foreign exchange markets, leading to some depletion of external reserves.

The pace of depreciation has slowed visibly in recent months on signs of stabilizing economies and markets, although additional depreciation is still possible in the near term if global demand wanes further.

Many authorities have attempted to stem the speed and magnitude of currency depreciation by intervening in foreign exchange markets or arranging/extending currency swap lines (see Table 1.2). The Republic of Korea (Korea) and Singapore, which both

Figure 4.2a. Implied Volatility of Exchange Rates—ASEAN-4
(3-month ATM[1])

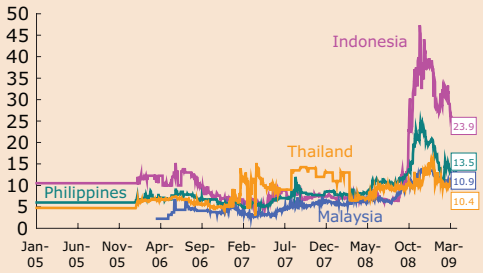
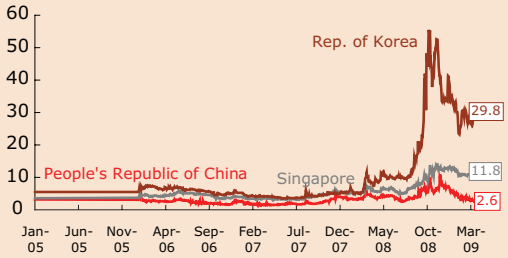


Figure 4.2b. Implied Volatility—PRC[2], Republic of Korea, and Singapore
(3-month ATM[1])



[1]At-the-money strike. [2]PRC = People's Republic of China.
Source: Bloomberg.

established separate USD30 billion swap arrangements with the US Federal Reserve (US Fed) in October 2008, extended their respective swap lines in February.[24] ASEAN+3 finance ministers also recently agreed to increase the foreign currency pool established under the Chiang Mai Initiative to USD120 billion from the initially proposed USD80 billion. The pace of depreciation has slowed in recent months on the back of these support measures together with some signs of stabilizing economies and markets. But the possibility of further depreciation cannot be dismissed in the near-term as deleveraging by foreign investors is expected to continue for some time and weaker exports reduce dollar earnings for many regional economies.

Foreign Exchange Returns and Volatility during the Global Credit Crisis

A continuous process of financial deleveraging during the global credit crisis weighed down most currencies in Asia with the notable exceptions of the Japanese yen and the PRC yuan.

As an asset class of its own, Asian currencies in general, would have yielded poor returns from mid-2008 through early 2009, following a year of strong performance. **Figures 4.3a, 4.3b, 4.3c, 4.3d** show cumulative returns in various currencies achieved through rolling a long forward position (at 1- or 3-month tenors) in each currency continuously from the end of 2006 through March 2009. The figures show cumulative returns in US dollar terms. At the onset of the US subprime crisis in 2007, global investors believed US credit woes would be more or less confined to the US. Thus, markets lessened risk in favor of major currencies, including the euro and Japanese yen (see Figure 4.1). Unwinding of yen-borrowed carry positions also favored the yen. Even emerging Asia's currencies attracted some safe-haven bids, particularly the PRC yuan, which saw significant appreciation. However, by mid-2008, markets recognized that the knock-on effects of US credit crisis would affect economies

[24] On 29 October 2008, the US Fed, Banco Central do Brasil, Banco de Mexico, Bank of Korea, and the Monetary Authority of Singapore (MAS) announced the establishment of temporary reciprocal currency arrangements (swap lines). This temporary swap facility was to provide US dollar liquidity in an amount of up to USD30 billion for each central bank in order to help improve liquidity in global financial markets and to mitigate the difficulties in obtaining US dollar funding in fundamentally-sound and well-managed emerging market economies. These reciprocal currency arrangements were originally authorized through 20 April 2009.

Fig 4.3a: Currency Returns: Yen and Euro (December 2006 = 100)

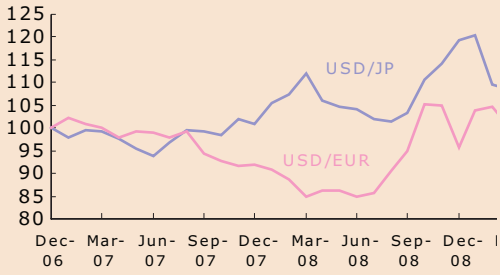


Fig 4.3b: Currency Returns: Yuan, Hong Kong Dollar, Rupee and Taiwan Dollar (December 2006 = 100)

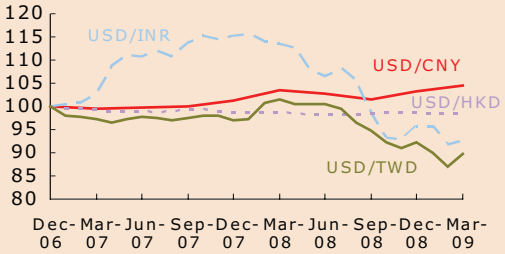
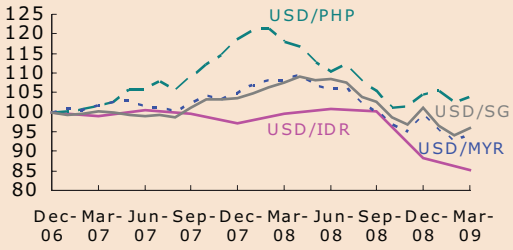
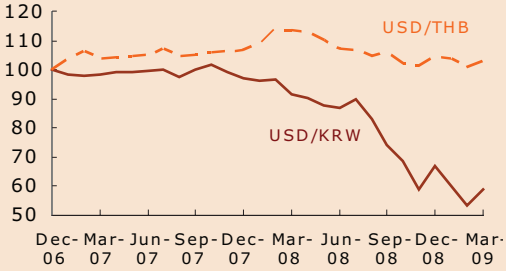


Fig 4.3c: Currency Returns: Peso, Ringgit, Rupiah and Singapore Dollar (December 2006 = 100)



Source: Reuters.

Fig 4.3.d: Currency Returns: Won and Baht (December 2006 = 100)



globally. Amid heightened uncertainty about a global recession, the US dollar's safe-haven status was renewed despite its domestic economic and financial problems.

The downward trend continued during the first quarter of 2009, but tentative signs of stabilization have started to emerge.

Apart from the yuan, Asian currencies yielded mostly negative returns in the latter half of 2008, a trend that continued into the first quarter of 2009. Returns on Indian rupee, which surged far ahead of the PRC yuan in 2007, saw a sharp reversal from early 2008 (see Figure 4.3b). This occurred despite a marked slowing in the pace of yuan appreciation during the latter half of 2008. Returns on the Philippine peso, which strengthened throughout 2007, have been mostly offset in the second half of 2008 with the intensified global crisis affecting the region's currencies (see Figure 4.3c). The closely-linked fortunes of carry positions in the Malaysian ringgit and Singapore dollar are also down. The main outlier is the Korean won, which saw the biggest loss among Asian currencies along with extreme volatility (see Figure 4.3d).

Despite the sharp rises in foreign exchange volatility, the magnitude of volatility increases during the current crisis pales in comparison to the 1997/98 Asian financial crisis.

The Generalized Autoregressive Conditional Heteroskedasticity, or GARCH, is a popular stochastic process used to characterize, estimate, and forecast the conditional volatility for the returns of a financial asset—in this case nominal exchange rates.[25] Foreign exchange (FX) volatility for the yen estimated by the GARCH (1,1) process jumped to a level not seen in over a decade at the height of the current crisis in September and October **(Figure 4.4a)**. The magnitude of this hike is even greater than during the "dotcom" bust, underscoring the greater impact of the current crisis. FX volatility for the Singapore dollar also shows a sharp increase during the crisis **(Figure 4.4b)**. The GARCH analysis illustrates how FX volatility during the current crisis

Fig. 4.4a: GARCH Annualized Volatility (USD to Japanese Yen)

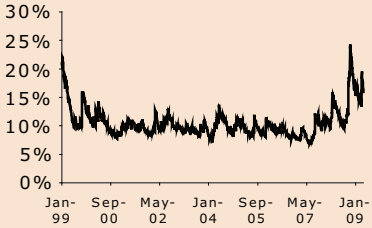


Fig. 4.4b: GARCH Annualized Volatility
(USD to Singapore Dollar)

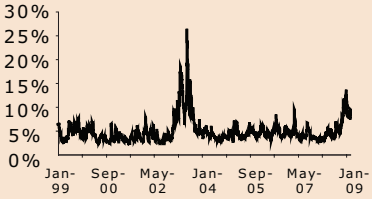


Fig. 4.4c: GARCH Annualized Volatility (USD to Korean Won)

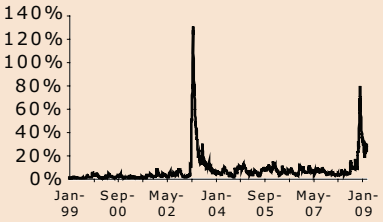


Fig. 4.4d: GARCH Annualized Volatility (USD to Thai Baht)

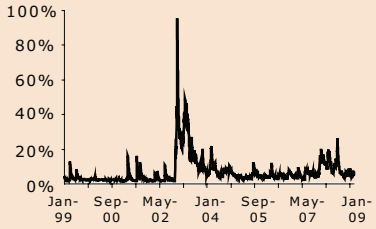
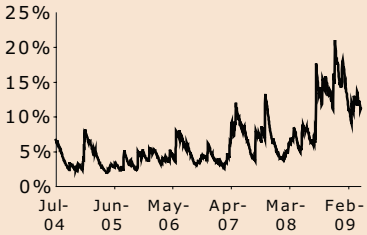


Fig. 4.4e: GARCH Annualized Volatility (USD to Indian Rupee)



Source: Author's computations from Reuter's data.

[25] The Generalized Autoregressive Conditional Heteroskedasticity (GARCH) is a popular stochastic process for modeling financial time series. GARCH (1,1) is the simplest form of the general GARCH process. A GARCH(1,1) model asserts that the best predictor of one-period ahead future variance is a weighted average of long-run average variance, today's predicted variance, and new information in the most recent squared residual. An overview of the GARCH model can be found in Engle (2001), "GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics," *Journal of Economic Perspectives*, 15:4 (Autumn), 157-168.

compares with that during the 1997/98 crisis for the previously crisis-affected economies **(Figures 4.4c, 4.4d).** Korea again led the way in volatility increase. However, the current rise in FX volatility is much smaller than that during the last financial crisis for both Korea and Thailand. For most Asian currencies, FX volatility appears to be a function of global factors. Nevertheless, FX volatility for India shows that domestic factors also play an important role. A significant rise in volatility in July appears to be linked to India's stock market collapse associated with heightened inflation concerns and anti-inflationary efforts.

Long-Run Valuation of Asian Exchange Rates and Outlook

Real effective exchange rates[26] for emerging Asian currencies suggest no clear direction for future currency movements despite the sharp depreciations during the current crisis.

Adjustments made for most emerging Asian currencies in response to the global shock have been significant. However, in the long term, they do not appear to be particularly undervalued **(Figures 4.5a, 4.5b, 4.5c)**. In fact, most currencies hit hard during the 1997/98 crisis have yet to recover pre-crisis levels. Among the crisis-hit currencies, only the Korean won reached the pre-1997 levels in terms of real effective exchange rate (REER) during 2006 and 2007, although it has fallen sharply since (see Figure 4.5c). The Indonesian rupiah also experienced a significant real appreciation since the 1997/1998 Asian financial crisis. Real effective exchange rates for the rest of the crisis-hit economies have remained roughly stable since 1999 (see Figure 4.5b). However, the currencies in Hong Kong, China and Taipei,China have seen persistent real depreciations since 1997. This may reflect the growing integration of these economies with the PRC. As the yuan strengthens, it induces a negative trend in the real exchange rates of the other two currencies.

[26] Real effective exchange rates are available from the Bank of International Settlements (BIS). The methodology employed by the BIS takes into account shifting trade direction over time and is similar to the methodology originally developed by the US Fed. The monthly data is available at http://www.bis.org/statistics/eer/index.htm.

Figure 4.5a: REERs[1]—PRC[2] and India (2000 REER = 100)

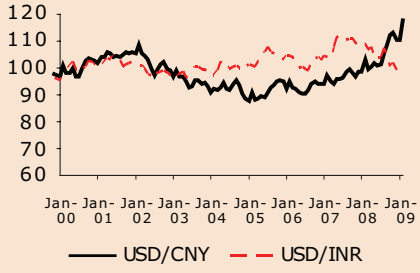


Figure 4.5b: REERs—Indonesia, Malaysia, Philippines, and Thailand (2000 REER = 100)

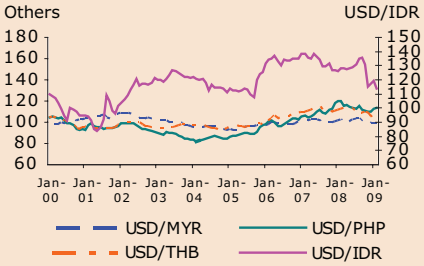
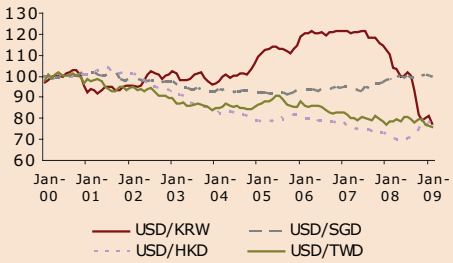


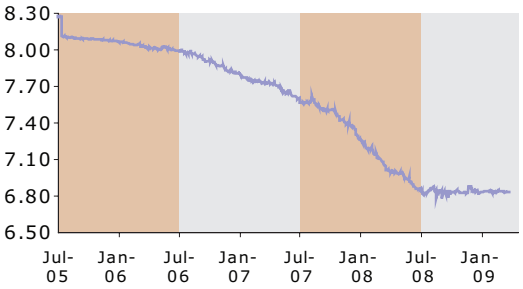
Figure 4.5c: REERs—Republic of Korea;Singapore; Hong Kong, China; and Taipei,China (2000 REER = 100)



[1]REERs = Real effective exchage rates, [2]PRC = People's Repubic of China.
Source: Bank for International Settlements

Continued real appreciation of the PRC yuan is expected to exert significant influence on the region's currencies, especially for those with increasing trade with the PRC.

Figure 4.6: PRC yuan after depegging



Source: Federal Reserve Board.

The PRC yuan has been appreciating in terms of REER since it reformed its exchange rate regime in July 2005. **Figure 4.6** shows the trajectory of the USD/CNY exchange rate following the PRC's decision to move to a managed float. The vertical lines show the anniversary dates of the policy change. Although it may be purely coincidental, each anniversary date appears to mark significant changes in the PRC's managed float. The yuan's pace of nominal appreciation against the US dollar was 3.5% through July 2006. It picked up in the second year to 5.2%, and increased again in the third year to 9.9%. The subsequent appreciation of the PRC yuan versus the US dollar was, however, only 8 basis points (bp) between July 2008 and March 2009. This movement of the yuan since mid-2008 seems to indicate that the PRC may have reverted to keeping the yuan stable against the US dollar rather than against the basket of managed float currencies. Indeed, the PRC may have been defending the yuan in the face of mounting depreciation pressures on the region's currencies. If the yuan's direction shifts dramatically, its impact on the region might be substantial. In the long run, the yuan is expected to see a continued real appreciation due

to the usual Balassa-Samuelson effect,[27] as the PRC economy's strong growth potential implies a persistently large real growth differential vis-à-vis its trading partners.

Asian FX Markets: Size and Structure

Asian foreign exchange markets enjoyed an unprecedented boom in the years leading up to the current global credit crisis.

Total FX volumes for "traditional" products (for example, spot, outright forwards, and FX swaps) for Asian currencies show tremendous growth since 2001, according to the latest Bank for International Settlements (BIS) triennial report **(Tables 4.1a, 4.1b)**.[28] Globally, the size of the FX market has been growing rapidly. By April 2007, total global FX volumes (excluding other over-the-counter [OTC] derivatives) amounted to almost 21 times global GDP (assuming 252 trading days a year), compared with trading flows that amounted to about 16.5 times global GDP 9 years earlier (see Table 4.1b). Available evidence since the 2007 BIS survey, however, suggests that global and Asian FX activity has begun to fade as the global credit crisis builds, after having grown strongly into 2008.[29] For example, a survey done by the US Foreign Exchange Committee in October 2008 shows a sharp drop-off in growth of FX swaps—which was the most important contributor to total FX volume growth in the 2007 BIS survey.[30]

[27] The Balassa-Samuelson effect refers to the observation that countries with higher productivity in tradable goods have higher overall price levels, when measured in the same currency. As a corollary, countries with rapidly growing economies will experience higher inflation, thus more rapid real appreciation of their currencies, as the price level of their non-tradable goods will converge rapidly to that of tradable goods along with economic growth.

[28] Note that in these surveys efforts are made to eliminate double-counting so total transactions observed across all counterparties will be roughly twice the daily averages shown.

[29] See Bank of England, Foreign Exchange Joint Standing Committee, "Results of the Semi-Annual FX Turnover Survey in October 2008;" Federal Reserve Bank of New York, Foreign Exchange Committee, "Semi-Annual Foreign Exchange Volume Survey, October 2008;" and Singapore Foreign Exchange Market Committee, "Survey of Singapore Foreign Exchange Volume in October 2008."

[30] Gabriele Gallati and Alexandra Heath (December 2007), "What Drives the Growth in FX Activity? Interpreting the 2007 Triennial Survey," *BIS Quarterly Review*.

The shrinkage in FX swaps and OTC derivatives volume suggest that creditworthiness concerns have spilled over into FX markets and are slowing growth, if not driving total volumes down altogether.[31]

In fact, the pace of the fall in swaps and derivatives could have been even greater, given widespread news of declines in cross-border mergers and acquisitions, and other capital flows.[32] With the advent of trade finance problems toward the end of 2008 and projections for reduced global trade in 2009, it appears likely that the next updated FX volume surveys in April 2009 will show an additional drop-off in volumes. Updated surveys since the latest BIS triennial report generally show a slowdown to October 2008, with more slowing expected.

The yen dominates trading in Asian currencies, but non-yen volumes have gradually increased to about 43% of total yen volumes.

Table 4.1a also combines information from the BIS survey to show how much each domestic currency (against all other currency pairs) is traded in its respective home market. Two-thirds of yen trading occurs outside of Tokyo, which befits its status as a global currency. But for the rest of Asian currencies, the majority of trading occurs within domestic boundaries.

Rapid growth in Asian FX volumes, together with increased competition, had driven bid-ask spreads in major Asian currencies (excluding Japan) to what appeared to be fairly efficient levels.

With the rise in electronic trading, which has expanded in Asia as in other parts of the world, there is reason to expect better price

[31] According to the BIS, FX transactions through electronic exchanges may have fallen 50% in 2008; cf. Paola Gallardo and Alexandra Heath (March 2009), "Execution Methods in Foreign Exchange Markets," *BIS Quarterly Review*.

[32] The Institute of International Finance (IIF) now projects net cross-border capital flows to emerging markets of USD165 billion in 2009, down from USD466 billion in 2008 and USD929 billion in 2007. IIF (27 January 2009), "Capital Flows to Emerging Market Economies."

Table 4.1a: FX Volumes by Product, Counterparty, and Currency in April 2007
(Daily Average in USD billion)

	Japanese Yen	PRC Yuan	Hong Kong Dollar	Indian Rupee	Indonesian Rupiah	Korean Won	Philippine Peso	Singapore Dollar	New Taiwan Dollar	Thai Baht
Spot	**205,958**	**8,981**	**15,715**	**9,012**	**1,434**	**15,222**	**1,275**	**8,491**	**5,486**	**1,206**
with reporting dealers	94,784	4,854	6,862	5,690	610	9,234	908	4,694	1,948	426
Local	19,570	4,456	2,556	4,843	248	7,350	705	1,118	1,089	268
cross-border	75,214	398	4,305	847	361	1,884	203	3,576	858	158
with other financial institutions	75,354	4,001	5,520	1,656	482	3,059	244	2,164	1,781	133
Local	27,870	3,812	1,346	579	343	834	180	908	1,366	40
cross-border	47,484	189	4,174	1,077	138	2,225	65	1,256	415	93
with non-financial customers	35,820	127	3,333	1,667	343	2,930	123	1,633	1,758	646
Local	22,680	99	2,706	1,537	317	2,577	108	1,158	1,482	606
cross-border	13,140	27	627	129	26	353	15	475	276	40
Outright Forwards	**61,453**	**4,572**	**6,022**	**5,815**	**1,292**	**10,013**	**1,123**	**2,962**	**4,724**	**847**
with reporting dealers	11,973	2,800	2,562	2,450	655	6,046	744	636	2,666	135
Local	2,873	507	1,142	814	175	862	128	132	469	69
cross-border	9,100	2,293	1,420	1,636	480	5,184	616	505	2,197	66
with other financial institutions	28,388	1,362	1,791	1,365	339	2,810	264	1,373	1,221	141
Local	12,966	415	371	494	141	899	109	553	390	26
cross-border	15,422	947	1,420	870	198	1,911	155	820	831	114
with non-financial customers	21,092	411	1,669	2,000	297	1,156	115	954	837	571
Local	15,023	198	1,410	1,755	263	802	81	701	314	529
cross-border	6,070	212	259	245	34	354	34	253	523	42
Up to 7 days	27,583	522	3,572	1,549	341	1,461	249	1,117	1,151	356
> 7 days up to 1 year	32,951	3,399	2,025	4,037	945	8,199	860	1,809	3,487	469
> 1 year	907	651	425	229	6	352	14	36	87	22
FX Swaps	**242,319**	**1,078**	**63,895**	**6,303**	**560**	**8,812**	**1,053**	**26,209**	**1,438**	**4,325**
with reporting dealers	114,868	336	44,685	5,191	353	6,610	820	17,032	724	3,019
Local	29,136	233	14,876	4,995	270	6,300	798	7,162	623	2,102
cross-border	85,731	103	29,809	197	83	310	22	9,871	101	917
with other financial institutions	90,513	740	15,460	742	131	1,541	230	7,447	469	895
Local	25,765	713	4,070	625	124	1,498	227	2,559	467	461
cross-border	64,748	27	11,390	117	7	43	2	4,888	2	434
with non-financial customers	36,939	1	3,750	370	75	661	3	1,731	245	411
Local	22,819	1	773	369	75	640	3	917	211	140
cross-border	14,120	—	2,978	1	0	21	0	814	34	271
Up to 7 days	185,837	473	45,203	2,179	306	2,524	463	21,317	141	2,337
> 7 days up to 1 year	54,156	568	17,369	3,961	254	5,548	589	4,755	1,207	1,948
> 1 year	2,326	37	1,323	162	—	740	1	137	89	40
Total	**509,731**	**14,631**	**85,632**	**21,130**	**3,286**	**34,047**	**3,451**	**37,663**	**11,648**	**6,378**
Domestic Market Volume	169,574	9,056	73,407	16,418	1,829	27,105	2,168	24,249	6,551	4,739

FX = foreign exchange, PRC = People's Republic of China.
Source: Bank for International Settlements (2007), *Foreign Exchange and Derivatives Market Activity in 2007,* Tables E.1 and E.7.

Table 4.1b: FX Volumes by Country April 1989–April 2007

	Daily Average (USD billion)							Growth Rate from preceding period (%)		
	Apr-89	Apr-92	Apr-95	Apr-98	Apr-01	Apr-04	Apr-07	Apr-01	Apr-04	Apr-07
PRC	—	—	—	—	—	1	9	—	—	800%
Hong Kong, China	49	60	90	79	67	102	175	(15%)	52%	72%
India	—	—	—	2	3	7	34	50%	133%	386%
Indonesia	—	—	—	2	4	2	3	100%	(50%)	50%
Japan	111	120	161	136	147	199	238	8%	35%	20%
Republic of Korea	—	—	—	4	10	20	33	150%	100%	65%
Malaysia	—	—	—	1	1	2	3	0%	100%	50%
Philippines	—	—	—	1	1	1	2	0%	0%	100%
Singapore	55	74	105	139	101	125	231	(27%)	24%	85%
Taipei,China	—	—	—	5	4	8	15	(20%)	100%	88%
Thailand	—	—	—	3	2	3	6	(33%)	50%	100%
United Kingdom	184	290	464	637	504	753	1,359	(21%)	49%	80%
United States	115	167	244	351	254	461	664	(28%)	81%	44%
Total Asia	**215**	**254**	**356**	**372**	**340**	**470**	**749**	**(9%)**	**38%**	**59%**
Total	**716**	**1,076**	**1,572**	**1,969**	**1,616**	**2,429**	**3,988**	**(18%)**	**50%**	**64%**
Global Nominal GDP	19,599	24,062	26,672	30,197	31,916	37,048	48,665	6%	16%	31%

FX = foreign exchange, GDP = gross domestic product, PRC = People's Republic of China.
Sources: Bank for International Settlements (2007), *Foreign Exchange and Derivatives Market Activity in 2007*, Tables E.16; International Monetary Fund, *World Economic Outlook Database,* October 2008.

discovery even as volumes rise further.[33] **Table 4.2** provides some information about Asian FX trading conditions based on two major market dealers. This presents a snapshot of FX trading markets across emerging Asia, which is arranged by rough order of efficiency, based on the average deal size and bid-ask spreads. The range of market development across Asia can be seen by looking at the variation in bid-ask spreads for standard FX options, which can be as low as 0.1 volatility units (vols) in Hong Kong, China or as high as 4.0 vols in onshore FX option market for the Indonesian rupiah. At 4.0 vols, it should be nearly

[33] Opcit. Gallardo and Heath (March 2009).

Table 4.2: FX Trading: Average Deal Size vs Bid-Ask Spreads (by product)

	Spot		Forwards		Options (Vanilla)	
	Avg Deal Size (USD million)	Bid-Ask Spreads	Avg Deal Size (USD million)	Bid-Ask Spreads	Avg Deal Size (USD million)	Bid-Ask Spreads (in vols)
USD/HKD	20	HKD0.0002 to 0.0005	120	HKD0.0003 to 0.0020; 2-5 Year Forwards may cost HKD0.0050 to 0.0500	50	0.1 to 0.5 vols
USD/SGD	5	SGD0.0005	5 to 50	SGD0.00005 for 1 Month; 0.0005 for 1 Year	10	
USD/KRW	10	KRW0.10 to 0.50	10 to 15	KRW0.01 for 1 Day; 0.10 for 1 Month: 0.20 for 2 Months; 0.30 for 3 Months; 0.40 for 6 Months; 0.50 for 9 Months to 1 Year; KRW1.00 and above for longer tenors	10 to 40	0.4 to 0.6 vols
USD/INR	5	INR0.0025 to 0.0100	5 to 10	INR0.0200 to 0.0500; INR0.1500 for USD100mn size	30	0.3 to 0.4 vols for up to 1 Year; 0.6 to 1.0 vol for > 1 Year
USD/CNY	5 to 10	CNY0.0005 to 0.0020	5 to 10	Offshore - CNY0.0020 to 0.0200; Onshore - 0.0050 to 0.0100 1 to 3 Months; 0.0100 to 0.0600 3 to 12 Months	20 to 30	0.2 to 0.8 vols
USD/TWD	10	TWD0.002 to 0.020	10	Offshore - TWD0.020 to 0.050; Onshore - TWD0.003 to 0.020	10 to 50	0.3 to 0.5 vols
USD/THB	3 to 7	THB0.020 to 0.030	2	THB0.050 to 0.080	30	0.4 to 0.5 vols
USD/PHP	2	PHP0.030 to 0.200 for USD2bn deal; PHP0.400 for USD50mn deal	3	PHP0.050 to 0.070 for 1 to 3 Months, PHP0.100 to 0.150 for 3 to 6 Months, PHP0.150 to 0.200 for 1 Year	10 to 20	1 to 1.5 vols
USD/IDR	3	IDR5-10; IDR10-20 for a USD80mn deal	5	IDR20 for 1 Month, IDR50 for 6 Months, IDR100 for 1 Year	10	1 vol (onshore FX option spreads may be up to 4 vols)
USD/VND	3 to 5	VND50; VND90 for USD10mn deal	5 to 7	VND150; VND300 for USD25mn deal		5 to 10 vols

Note: The bid-ask spreads in the table are generally the widest that are consistent with the reported observations of the two banks, with some judgement applied to rule out implausible numbers. (To simplify FX forwards, attention has been restricted to offshore non deliverable forward [NDF] markets—except for India and Thailand, where onshore liquidity is better.) Therefore, actual professional quotes for the various products listed in normal times will likely show somewhat narrower spreads than what is listed in the table.
Sources: Deutsche Bank. *Guide to Asian Local Markets* (14 January 2009) and Barclays. *Capital Asia Local Markets Guide 2008.*

impossible to find any customer willing to make transactions, given the unreasonably high transaction cost. Interestingly, there seems to be nearly a one-to-one correspondence between the level of efficiency of a currency market and its aggregate trading activities, as measured by the BIS.

It is generally true that, up to a certain threshold, market volumes rise as a function of volatility.

When short-term volatility rises, the demand for FX products is usually expected to rise. Even if markets turn truly chaotic, as they have recently, market volumes tend not to shrink. This was also true between 1998 and 2001, another turbulent time in FX markets. Unlike fixed-income markets, if long-term volatility rises, demand for FX products might rise, as long as the factor that drives up long-term volatility is not one that would hamper globalization in the form of trade and investment flows or financial innovation.

Policy Issues for Consideration

Domestic versus Global Factors

The recent behavior of Asian FX volatilities suggests that the influence of global factors have been a primary driver; yet domestic policy and micro-structure also affect currency volatility. The reactions of the region's currencies to the current crisis showcase the impact of global forces on the region's FX volatilities. Nonetheless, it is important to continue strengthening market infrastructure and institute proper systems and policies for the region's currency markets. Inappropriate and, at times, excessive regulation could hamper currency market development. For example, it would not be entirely implausible that regulations could eliminate a market (such as offshore hedging) in a country, and as a result, FX reactions to global shocks could be more dramatic than what they otherwise would have been.

Box 4: Learning from Earlier Mistakes—Republic of Korea and Thailand

Policy responses to recent currency challenges have varied widely across emerging Asia, reflecting the diversity of economic, financial, and political situations in individual economies.

There have been a series of refinements to regional foreign exchange (FX) markets since the onset of the crisis (see Table 1.2). Overall responses to the crisis can be grouped into three general categories: (i) establishing bilateral currency swaps within or beyond Asia, (ii) introducing measures to augment onshore US dollar supply, and (iii) issuing guarantees for foreign debt. Nevertheless, the various measures introduced were not always successful. Reviewing them will provide important lessons for the region's policymakers in formulating appropriate policy responses that can balance short-term stabilization and longer-term efficiency gains.

Republic of Korea

- The Republic of Korea (Korea) is one case where there is clear evidence of speculative excess, which might be partly attributed to conflicting and constantly shifting policy objectives, regardless of the relatively advanced stage of its FX market.
- In early 2008, shortly after the new government took office, the Korean won began to weaken more quickly against the US dollar. Initial market perceptions were that the depreciation of the Korean won in 2008 was part of the new government's effort to reflate the economy. By July 2008, however, the Government shifted gears and announced it would pursue a strong won policy to combat widespread inflationary concerns. This policy had a shelf life of about 2 months before global financial distress led the Government to use significant resources to unsuccessfully stave off a further weakening of the won. Foreign reserves fell nearly USD60 billion over the next 5 months before massive intervention was scaled back in December 2008.
- A rising share of non-tradables in Korea's consumer price index (CPI) basket cast a shadow over the effectiveness of controlling the exchange rate as a means to influence inflation. This may have undermined the credibility of the strong won policy to combat inflation. Even during the 1997/98 financial crisis, severe weakness in the Korean won did not feed into consumer price inflation.[1] Since then, the share of non-tradables in the CPI basket appears to have increased even further **(Table B4)**.
- For Korea, the lessons include standard prescriptions for policy credibility and stability as anchors for currency stability. Frequent changes in policies and lack of transparency may invite heightened volatility on their own, while additional speculative pressures could have unexpected and undesirable effects.

Table B4: The Share of Non-Tradables in Korea's CPI Basket

Base Year	% of Non-Tradeables
1995	53.33
2000	58.99
2005	62.73

Note: Non-tradables calculated as combined shares of food outside the home; housing rent; household services; medical care less medicines, less medical appliances; education and culture less stationery, less culture and recreation durables; transport and communications; and miscellaneous goods less toiletries and cigarettes.
Sources: CEIC; Korea National Statistical Office (Family Income and Expenditure Survey).

Thailand

- In December 2006, Thailand introduced a 30% unremunerated reserve requirement (URR, also popularly known as a Tobin tax) covering the first year of capital inflows. This was meant to slow the pace of appreciation of the Thai baht against the US dollar. The initial measure was almost immediately relaxed in the face of a large single-day equity market selloff. It was subsequently relaxed further (for hedged bond investments) before finally being rescinded in March 2008.
- The Thai baht continued to appreciate during the 15-month period that the URR was in effect. It rose about 12% against the US dollar for all of 2006 and over 18% in 2007.
- The period of URR control coincided with marked increases in USD/THB volatility. The period from end-2006 to mid-2008 shows a significant deviation in the pattern of USD/THB volatility, which jumped when the URR was imposed and appears to have fallen when rescinded.
- Other effects of the URR included: (i) increased financial costs for small- and medium-sized enterprises, which was in line with previous economic analyses suggesting that a Tobin tax tends to raise the cost of capital, primarily for smaller companies; (ii) decreased foreign investors' confidence in the Thai capital market; and (iii) reduced trading volume in the local bond market.
- Reviewing the performance of the Thai baht illustrates two major points: (i) despite strident official efforts, capital controls were unable to slow the baht's strength throughout 2007; and (ii) after controls were lifted, the currency behaved more stably despite ongoing political tensions.

[1]Ariel Burstein, Martin Eichenbaum and Sergio Rebelo (2005), "Large Devaluations and the Real Exchange Rate," Journal of Political Economy 113:4, 742-784.

[2]Anoma Srisukkasem and Somruedi Banchongduang, "BOT eases capital controls," The Nation, 18 December 2007.

Low Volatility versus Low Risk

Existing risk management tools continue to have their own defects, using volatility as a key measure of risk. Lower volatility does not necessarily mean lower risk. However, standard risk measures such as value-at-risk continue to treat low volatility as being low risk. Ironically, the Sharpe ratio, a popular measure of the risk-return relationship would point to carry trades as attractive strategies even as the world headed into the global credit crisis.[34] In the BIS triennial survey of 2007, the implied volatility for global FX was actually down from 2004. Using implied volatility to deduce risk is dubious.[35] GARCH methods are recursive, and as a function of past data, exhibit positive feedback, meaning that when volatility is low it tends to predict low volatility for the future. This also puts into question the value of using GARCH/VAR methods to predict future risk. Recognizing the importance of long-run downside risks, some economists have introduced new methods to incorporate low-frequency macro risks in pricing asset portfolios, but it remains to be seen how well these will work in practice.[36]

Central Bank Interventions versus Credibility

Despite temptations to manage risk and reduce FX volatility, central banks should bear in mind that their primary goal is to maintain price stability. Although many Asian central banks officially adopted inflation targeting, not all Asian central banks have successfully adhered to their inflation targets. It also appeared that many of the region's central banks have been slow in combating inflation and overheating in the months leading up to the global credit crisis, even as there was enough

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[34] Galati and Heath (December 2007), Graph 1. See also Jacob Gyntelberg and Eli M. Remolona (December 2007), "Risk in Carry Trades: A Look at Target Currencies in Asia and the Pacific," *BIS Quarterly Review.*

[35] One simple carry strategy is to adjust the leverage according to a ratio of carry-to-risk, where risk is measured by implied volatilities. Cf. Mark Pengelly, "Foreign Exchange – Carry On Regardless," *Risk*, August 2007.

[36] See Engle and Rangel(2008) "The Spline-Garch Model of Low Frequency Volatility and its Global Macroeconomic Causes", *Review of Financial Studies* 2008 21(3):1187-1222. The proposed model estimates equity volatilities as a combination of macro- economic effects and time series dynamics. The model specifies high-frequency return volatility to be the product of a slow-moving component, or low-frequency volatility. The low-frequency volatility is then modeled as a function of macroeconomic and financial variables, which is found to be greater when the macroeconomic factors of GDP, inflation, and short-term interest rates are more volatile or when inflation is high and output growth is low.

evidence to suggest that a moderate slowing in their economies was in order. Subsequently, the gyrations of the global economy made it necessary to make a sudden shift in monetary policy from fighting inflation to sustaining demand, which could have inflicted harm on the central banks' credibility. In other emerging market economies outside the region where central banks target inflation, it has become standard for some central banks to pre-announce FX interventions. Where such intervention amounts are judged consistent in the way they affect monetary conditions and ultimately inflation, markets have generally warmed to these strategies. It warrants further study whether such methods are desirable for emerging Asian economies.

Intra-Regional Cooperation versus FX Flexibility

For many Asian economies with tight trade and financial linkages, there may be merit in cooperating to maintain relative stability in intra-regional exchange rates. With the notable exceptions of the Japanese yen and the PRC yuan, most Asian currencies have tumbled against the US dollar since mid-September. But what's more worrisome is the heightened volatility and growing divergence in currency movements within Asia. Stabilizing currency movements among the region's trading partners can help fortify the accelerating trend of intra-regional trade and investment flows, and support the region's economic growth when the external environment deteriorates sharply. In fact, it would be useful to establish a mechanism to monitor intra-regional currency movements. After all, when the dust of the crisis settles and there is less demand for US dollars by global financial institutions, capital flows may naturally head to the region once more. In the face of heightened volatility, countries may be tempted to introduce some form of capital controls or use administrative measures to curb strong short-term capital flows and portfolio investments. Such attempts to arbitrarily limit FX flexibility, however, are potentially disruptive and may create distortions, only to lead to further instability in FX markets in the longer-term.

5. Asia's Non-Deliverable Forward Markets[37]

Trading volumes of Asia's currencies rise, but participation of nonresidents remains restricted.

Asia's foreign exchange markets have undergone significant transformation over the past decade. They have emerged as relatively flexible and market-oriented regimes from closed and fettered markets prior to the 1997/98 Asian financial crisis. While spot trading volumes of Asian currencies have posted a massive jump[38] in recent years, a distinguishing feature between trading Asian currencies and other international currencies concerns the participation of nonresidents. Most Asian currencies are traded onshore between residents, while international currencies are traded offshore between nonresidents. One factor restraining nonresident interest or participation in many Asian foreign exchange markets is the exchange rate restrictions and controls that are often imposed by authorities to ward off speculative activities. Such controls are implemented through measures that discourage offshore trading of currencies by placing restrictions on cross-border deliverability of a currency.

A surge in foreign fund inflows amid the existence of foreign exchange restrictions and controls has led to the creation of active and growing non-deliverable forwards markets.

Foreign exchange regulations and nonresidents' lack of access to onshore forward markets have led to the creation of active and growing non-deliverable forward (NDF) markets in many Asian currencies. NDF markets develop when onshore forward markets are not developed or have restrictions on access. Among Asian currencies, only the Hong Kong dollar and the Singapore dollar are not subject to exchange controls **(Table 5.1)**. There are active NDF markets in the People's Republic of China (PRC) yuan, Indian rupee, Indonesian rupiah, Korean won, Malaysian ringgit, and Philippine peso.

[37] This section was prepared by Sabyasachi Mitra. For any inquiries, please contact sabymitra@adb.org.

[38] Bank of Japan. 2008. *The Evolution of Trading Activity in Asian Foreign Exchange Markets.* Working paper, June 2008. In the three years to April 2007, the turnover of Asian currencies grew twice as fast as global turnover in foreign exchange markets.

Table 5.1: Foreign Exchange Restrictions in Emerging Asia

People's Republic of China	**Spot** Only licensed onshore counterparties are allowed. Currently, CNY spot can only be traded against USD, HKD, EUR, and JPY on CFETS—China's interbank foreign exchange (FX) trading system—conditional on submission of the required documentation. As of May 2005, EUR/USD, AUD/USD, GBP/USD, USD/JPY, USD/CHF, USD/HKD, and EUR/JPY were tradable. Certain kinds of conversion under non-trade and capital items require pre-approval from the State Administration of Foreign Exchange (SAFE). **Forward/Swap/Long-Dated Forward** Banks with a derivative license can apply for a separate license to trade USD/CNY forwards in the interbank market after they sign the Forward Master Agreement issued by CFETS. Banks are permitted to trade USD/CNY swaps after 6 months of trading forwards.
India	**Spot** Current account: No prior approval requirements, but participants must have documentary evidence of the underlying transaction for remittances. Capital account: All FX transactions on the capital account are subject to general or specific permission from the Reserve Bank of India (RBI). Capital repatriation is allowed with prior approval. **Forward/Swap/Long-Dated Forward** Regulatory: Per FX spot.
Indonesia	**Spot** Both buying and selling of IDR are permitted. Non resident accounts must not be overdrawn. IDR buying by a nonresident account has to be supported with relevant documents, including confirmation of purchase and later proof of purchase for the purchase of shares, credit agreement for the extension of loans, and proof of ownership for the conversion of dividends. **Forward/Swap** Non residents can only buy or sell IDR with supporting documents for underlying economic activities with a minimum tenor of 3 months and a maximum tenor equivalent to the maturity of investment. When doing an FX hedge, a top-up of the underlying is required should the mark-to-market value of the underlying fall below the FX trade amount. Synthetic swaps are prohibited. FX forwards with value date T+3 are allowed for securities and equities related trades.
Philippines	**Spot** Onshore banks may buy foreign currency (FCY)/PHP from both onshore and offshore counterparties without prior Bangko Sentral ng Pilipinas (BSP) approval or documentation. The limit on outward investments by residents is USD30 million per investor per year. Onshore banks may sell FCY/PHP to onshore or offshore counterparties provided there is an underlying business rationale supported by documentation for certain types of economic activity. **Forward/Swap/Long-Dated Forward** For deliverable outright FCY/PHP forwards, spot trading rules apply. For forwards and swaps, authorized agent banks may only enter into derivatives contracts with their customers for hedging eligible actual FX obligations or existing FX exposures. The minimum documentary requirements shall be presented on or before the deal date.
Republic of Korea	**Spot** Supporting documentation—including a declaration or approval of proper regulatory authority for a capital transaction such as a loan, guarantee, or investment—should be submitted to a foreign exchange bank prior to trading if there is to be physical delivery. The documentation handling process usually takes 1 to 2 days. **Forward/Swap/Long-Dated Forward** As per spot, hedging is permitted for underlying transactions with onshore banks.
Thailand	**Spot** No regulations. **Forward/Swap/Long-Dated Forward** For hedging purposes only. Offshore counterparties with underlying exposures can hedge with onshore banks. Underlying transactions must be verified every 2 weeks.
Viet Nam	**Spot** Documentation is required when corporate clients want to buy any foreign currency against VND from the authorized foreign exchange banks. According to the Foreign Exchange Ordinance, commercial banks are responsible for determining the necessary paperwork. Guidance on implementation of the ordinance is not yet available. Ceiling and floor rates are used to cap spot for USD/VND. **Forward/Swap/Long-Dated Forward** For FCY/VND, if a client buys FCY forwards, they are required to provide supporting documents, as per spot transactions. The USD/VND forward rates are also subject to forward ceiling rates. Restrictions for FX swaps are similar to FX forwards, except that no documents are required. There are no local rules governing FCY/FCY forward and swap transactions.

Source: Deutsche Bank.

Availability of NDFs allows hedging of exchange rate risks despite imposition of restrictions on foreign exchange trading.

An NDF is similar to a regular forward foreign exchange contract, except at maturity the NDF does not require the physical delivery of currencies, and is typically settled in United States (US) dollars—as the other currency is "non-deliverable." A forward foreign exchange contract is an obligation to purchase or sell a specific currency on a future date at a fixed price. In a forward contract, the specified rate agreed by counterparties is based on interest differentials between the two currencies and is derived so as to eliminate any possible arbitrage between the currency and interest rate markets. But this relationship does not hold for the NDF market.

NDFs are traded over-the-counter and outside the gaze of regulatory authorities.

NDFs are largely based on an implied market perspective.[39] In principle, NDFs work in very much the same way as forwards, the difference is on settlement due to restrictions on deliverability of the currency. In many markets, local authorities fear that if nonresidents are given access to onshore currency loans and deposits, and the ability to freely repatriate, it would spur speculation, lead to a spike in volatility, and in some cases, impact monetary policy. For these reasons, authorities resort to tightening restrictions to dampen speculative activities and reduce volatility. These restrictions have led to the creation of NDF markets. The availability of NDFs has allowed some hedging of exchange rate risks, even in the presence of currency restrictions. As opposed to standard deliverable forward contracts, Asian NDFs are traded over-the-counter (OTC) and outside the gaze of regulatory authorities. Market players say Singapore dominates as the trading center for Asia's NDFs, followed by Hong Kong, China and Tokyo, while London covers across these markets. New York tends to dominate the trading of Latin American NDFs. Indian NDFs are also traded in small volumes in Dubai and Bahrain. However, onshore banks in countries with exchange rate restrictions and controls can sometimes have indirect access to the NDF market through their offshore subsidiaries.

[39] Lipscomb, Laura. 2005. *An Overview of Non-Deliverable Foreign Exchange Forward Markets.* New York City: Federal Reserve Bank of New York.

Growing cross-border transactions, rapid investment inflows, and speculative positioning drives Asian NDF markets.

Interest in Asian NDF trading surged in the run-up to and wake of the 1997/98 Asian financial crisis as many economies tightened controls and slapped on exchange restrictions. Developing Asia recovered strongly after the crisis and emerged as the fastest growing region in the world. But even as foreign investment inflows surged, direct as well as portfolio, many economies in the region continued to restrict nonresident access to onshore money and foreign exchange markets. This made it difficult for foreign investors to hedge local exposures in domestic forward exchange markets, even where such markets existed. Nonetheless, the share of nonresident participation in Asian currencies turnover has increased to 51% in 2007 from 47% in 2004, according to the Bank for International Settlements (BIS) latest Triennial Central Bank Survey.[40] The market is driven by cross-border transactions and speculative positioning.

Turnover for Korean NDFs has been the highest despite deregulation of local markets.

Data on NDF trading volumes are very difficult to obtain. Most of it is based on surveys by trade bodies and individual market makers. According to market estimates and surveys, Korean won NDF trading dominates regional and global NDF trades. In our sample of six Asian NDFs, the Korean won accounts for over 48% of NDF turnover. Averaging trading volume in Korean won jumped to USD3 billion from about USD700–1000 million in 2003–2004 **(Table 5.2)**.[41] This is not surprising as foreign investor participation in Korean asset markets, which are open and largely deregulated, is the highest in the region and onshore players are also important players in the NDF market for won. An active NDF market in Korean won thrives (despite deregulation) along with a large and active onshore forward market. In the case of the Republic of Korea (Korea), there are still some residual restrictions on expatriation. But there are also a few reasons for such activities: (i) investment for speculative purpose tends to be offshore, and (ii) the offshore NDF market allows foreign

[40] Bank of Japan. 2008. *The Evolution of Trading Activity in Asian Foreign Exchange Markets.* Bank of Japan working paper series, June 2008.

[41] An April 2008 survey of the Tokyo Foreign Exchange Market Committee showed that PRC yuan NDFs and Korean won NDFs were the most actively traded NDFs in Tokyo.

Table 5.2: Average Daily NDF Turnover
(USD million)

	2008—2009	2003–2004
CNY	1,000	50
INR	800	20-50
KRW	3,000	700-1,000
IDR	400	50
PHP	500	20-30
MYR	500	

Source: Deutsche Bank.

investors to hedge risk in currency trading.[42] There is strong liquidity in the offshore won NDF market that feeds into overall won liquidity. In other words, there is increased influence of external factors, that is, offshore NDF market on domestic spot market. As onshore participants are allowed into the NDF market, liquidity, turnover, and positions in the NDF market influence spot won prices. It has been shown that after the reform of Korean exchange rate systems in December 1997, the mean spillover effect exists from NDF to the spot market and, also, the volatility spillover effect exists only in the same direction.[43] Foreign exchange traders say the daily average turnover for the Korean won is currently down to about USD1,500 million. The global credit squeeze and massive demand for dollar funding from Korean corporates and banks have also led to the drying up of liquidity, both onshore and offshore. This has been driven by heightened risk aversion and dollar funding needs of local banks and companies. But this trend is not just limited to Korea's NDF market. A similar liquidity squeeze is evident in other NDF markets as well.

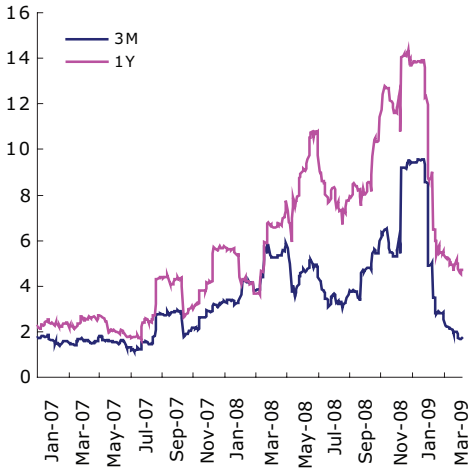
Yuan NDFs derive liquidity from speculative positioning by funds and hedging by multinationals.

After more than a decade of pegging the yuan to the dollar, the People's Bank of China (PBOC) announced in July 2005 a revaluation of the currency along with a reform of the exchange rate regime. But, still no offshore entities are allowed to

[42] http://english.mofe.go.kr/interaction/catch_view.php?bbsNo=727.

[43] August 2001. Information Flows between Non-Deliverable Forward (NDF) and Spot Markets: Evidence from Korean Currency. *Pacific-Basin Finance Journal* (Volume 9, Issue 4).

Figure 5.1: CNY NDF Volatilities (%)



Note: Volatilities calculated over 30-day rolling windows.
Source: Reuters.

participate in the onshore markets. As a result, the yuan NDF market has grown in recent years and derives its liquidity from a large varied class of speculators, who take positions on calls for an exchange rate, and multinational companies, which have large foreign direct investment in the PRC. The NDF market has been stable after the exchange rate regime reform, until the onset of the current global financial crisis **(Figure 5.1)**. Foreign companies investing in the PRC take positions on longer-dated NDFs, while speculators are more active in the shorter maturities. As a result, market makers contend, the long-end of the curve is more "well-behaved" than the short-end under normal market conditions. The PBOC announced it will allow more domestic banks to participate in its forward exchange market.[44] These initiatives aim to create a strong onshore market in which firms can hedge their foreign exchange exposure.[45] There are similar measures to create strong onshore forward markets in India. In the long-run, it is hoped that such markets can eventually replace the NDF market. NDF markets can be seen as a transitional phase in the process of moving to full convertibility from limited capital convertibility.

Interest in other NDF markets like the Indian rupee grows as foreign investor participation in regional economies and asset markets rise.

The Indian NDF market has also witnessed rapid growth driven largely by nonresident speculation on the Indian rupee, potential arbitrage opportunities between offshore and onshore forward markets, and hedging by multinationals.[46] Onshore financial institutions are not allowed to enter the NDF market. The Indonesian rupiah NDF market emerged in early 2001 after the central bank enforced policies to deter speculation and related derivative transactions. The Malaysian ringgit and Philippine peso markets have also gained liquidity in recent years. It is interesting to note that Malaysia's imposition of capital controls and the pegging of its exchange rate in the wake of the 1997/98 Asian financial crisis did not lead to an active ringgit NDF market.

[44] http://www.pbc.gov.cn/english/detail.asp?col=6800&id=60
http://www.pbc.gov.cn/english//detail.asp?col=6800&ID=76

[45] 2008. Volatility Transmissions between Renminbi and Asia-Pacific On-shore and Off-shore US dollar futures. *China Economic Review,* (19).

[46] Reserve Bank of India. 2006. Non Deliverable Foreign Exchange Forward Market: An Overview. Reserve Bank of India occasional papers, vol 27, no. 3, winter 2006.

Liquidity in ringgit NDFs increased in late 2004 on the back of growing expectations of ringgit revaluation that were triggered by broad-based US dollar weakness and speculation about a regime shift in the PRC yuan.

Recent trends in NDF markets usually reflect expectations about future spot prices and currency risk premiums, but do not capture country risk **(Figures 5.2a, 5.2b)**. Thus, care must be taken in interpreting these readings.

One way to analyze the regional NDF market[47] is to look at trends in liquidity, volatility, and correlations among Asian NDFs, and then assess the implication of the spread between the onshore interest rate of the home currency and its NDF-implied offshore interest rate.[48] One can divide data into two time periods to capture the impact of the ongoing global financial turmoil on Asian NDF markets.

Figure 5.2a: NDF Movements: CNY, KRW, INR

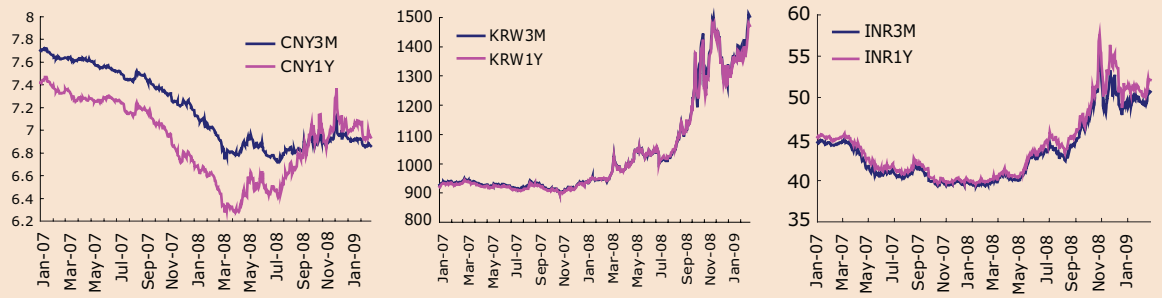
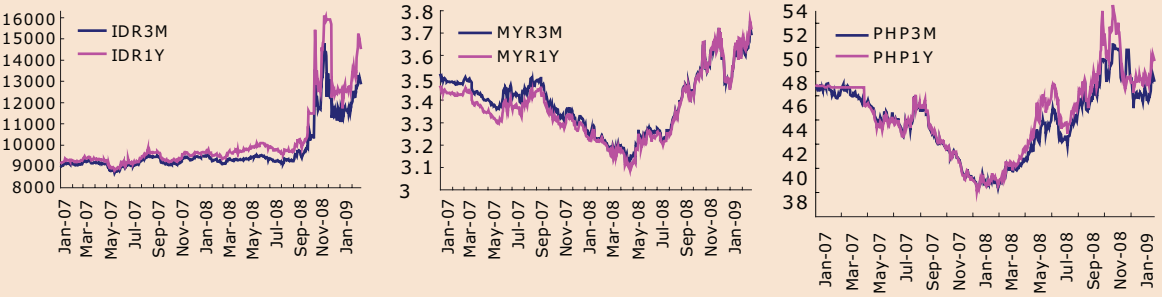


Figure 5.2b: NDF Movements: IDR, MYR, PHP



Source: Reuters.

[47] This section draws on a framework used in BIS. 2004. The Markets for Non-Deliverable Forwards in Asian Currencies. *BIS Quarterly Review* (June 2004).

[48] The exchange rates used are closing prices for bid and ask. The bid and ask spreads are average percentage spreads.

Liquidity in NDF markets tightens as the global financial crisis deepens; won and rupiah suffer most.

Examining bid-ask spreads, the larger NDF markets of the Korean won and PRC yuan exhibit tighter spreads (i.e. these markets are relatively more liquid), followed by the Indian rupee and Philippine peso. But the picture changes dramatically with the onset of the current global financial crisis **(Table 5.3)**. The Indonesian rupiah and Korean won are the currencies with the widest bid-ask spreads in 2009. This is not surprising as these two currencies have been among the most volatile in Asia over the past year, when both currencies saw active interventions by authorities in their respective spot markets.

Table 5.4 depicts volatility of spots and 3-month and 1-year NDFs. The Indonesian rupiah and Korean won have been the

Table 5.3: Bid-Ask Spreads for Asian NDFs (%)

	3-Months			1-Year		
	March-07	March-08	March-09	March-07	March-08	March-09
CNY	0.05	0.04	0.10	0.05	0.08	0.11
KRW	0.11	0.11	0.52	0.16	0.16	0.98
INR	0.22	0.17	0.21	0.44	0.37	0.36
IDR	0.49	0.22	1.91	0.88	0.48	1.37
MYR	0.14	0.14	0.19	0.35	0.19	0.26
PHP	0.20	0.24	0.20	0.08	0.36	0.57

Percentage spread = (Bid-Ask/Mid) x 100. Calculations based on quotes on 5 March 2007, 5 March 2008, and 4 March 2009
Source: Reuters.

Table 5.4: Asian Spot Rate, NDF volatilities (%)

	January-December 2007			January 2008-February 2009		
	Spot	3M	1Y	Spot	3M	1Y
CNY	1.6	1.9	3.0	2.1	4.7	8.5
KRW	4.6	3.9	3.9	25.9	23.7	23.2
INR	5.8	6.5	6.6	10.2	16.0	15.6
IDR	6.7	6.6	6.8	12.3	37.2	41.8
MYR	4.6	4.5	4.6	6.9	8.6	10.6
PHP	14.4	7.6	8.4	9.0	13.1	15.1

Annualized volatility = (standard deviation of daily returns) (annualization factor of 250^.5)
Source: Reuters.

most volatile Asian currencies in the wake of the global financial crisis. In 2008, and until February this year, with the exception of the Korean won, NDF volatilities have been higher than spot volatilities.

Co-movement between yuan NDF and Indian rupee NDF strengthened; with the correlation between Korean spot and NDF market being the strongest.

The association among Asian spots, NDFs, and forward markets was measured through a simple correlation exercise. There is fairly close co-movement among Asian spots and NDFs, rather than just among NDFs **(Table 5.5)**. However, it seems that for most NDFs, the correlation has somewhat weakened since January 2008. Yet, the correlation between the yuan NDF and the Indian rupee NDF has strengthened. The co-movement in the NDF market is stronger than correlation in the spot yuan and rupee markets. This is not surprising as trade relations between the two neighbors have grown rapidly in recent years, and the PRC is now India's largest trading partner. Both economies are gradually liberalizing their capital accounts, but place domestic financial stability as priority. At the same time exchange rate restrictions remain in place in both economies. This may have led to increased use of the NDF market by corporates and exporters for hedging exposures, and also by some participants to benefit from arbitrage activities. However, more detailed analysis is required to learn about market participants and their relationship in these two markets. There is a similar strong co-movement between the yuan NDF and the Malaysian ringgit NDF. The links between Asian NDFs, particularly with yuan NDF, are expected to increase as growing intraregional trade integration enhances financial market closeness.

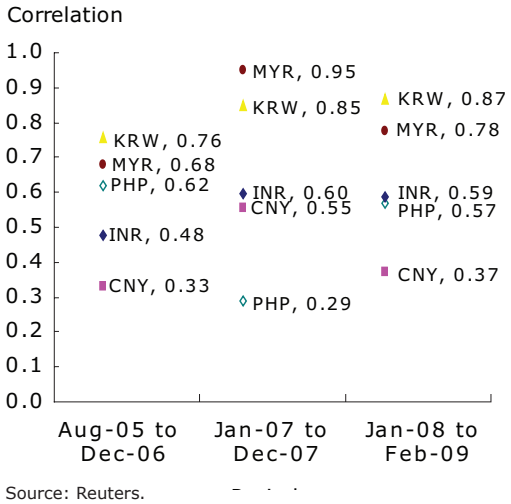
The relationship between Asian spot prices and NDFs strengthened for the Korean won and the Philippine peso in 2008 when compared with 2007 **(Figure 5.3)**. The co-movement between Korean won spot and NDF is the strongest among all Asian currencies. This reflects the strong liquidity flows and spillovers between the NDF and won spot markets, which are well-recognized by Korean authorities. In 2008, faced with capital outflows and a weakening of the won, Korean authorities announced that restrictions on NDF deals, which had been imposed in 2004,

Table 5.5: Correlations between 3-month Asian NDF Pairs

January-December 2007						
	CNY	KRW	INR	IDR	MYR	PHP
CNY	1.00	0.25	0.18	0.28	0.37	0.28
KRW		1.00	0.38	0.48	0.48	0.39
INR			1.00	0.41	0.36	0.40
IDR				1.00	0.70	0.64
MYR					1.00	0.68
PHP						1.00
January 2008-February 2009						
	CNY	KRW	INR	IDR	MYR	PHP
CNY	1.00	0.14	0.33	0.17	0.43	0.24
KRW		1.00	0.29	0.17	0.39	0.36
INR			1.00	0.20	0.31	0.35
IDR				1.00	0.24	0.19
MYR					1.00	0.28
PHP						1.00

Source: Reuters.

Figure 5.3: Spot to 3-Month NDF Correlations for Asian Currencies



Source: Reuters.

would be lifted.[49] This move was primarily aimed to boost local market liquidity and foreign inflows.

Euro and yen forwards influence Asian NDFs.

The other interesting observation is that both euro and Japanese yen forwards emerge as a likely influence on some Asian NDFs. The PRC yuan, Malaysian ringgit, and Philippine peso show the strongest correlation with the 3-month euro forward **(Table 5.6)**. These results differ from a 2004 BIS study[50] that showed the yen may have had a relatively higher common influence on Asian NDF markets than the euro. The BIS study showed that for the period March 2001–February 2004 the yen had a possible common influence. During that period, all Asian currencies in general strengthened against the US dollar in response to an appreciating yen or euro. However, this chapter's analysis shows

Table 5.6: Correlations of Asian Spot Rates and NDFs vs. JPY and EUR

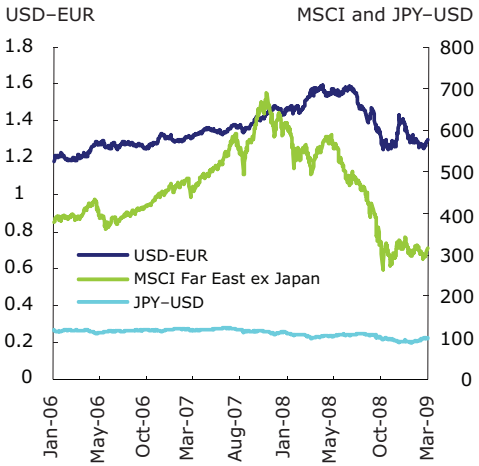
January-December 2007						
	JPY Spot	JPY 3M	JPY1Y	EUR Spot	EUR 3M	EUR1Y
CNY	0.07	0.03	0.02	0.07	0.20	0.22
KRW	(0.05)	(0.14)	(0.12)	0.13	0.37	0.28
INR	(0.11)	(0.24)	(0.24)	0.20	0.23	0.20
IDR	(0.05)	(0.21)	(0.23)	0.12	0.29	0.26
MYR	0.00	(0.23)	(0.23)	0.23	0.31	0.33
PHP	0.01	(0.19)	(0.18)	0.04	0.28	0.31
January 2008-February 2009						
	JPY Spot	JPY 3M	JPY1Y	EUR Spot	EUR 3M	EUR1Y
CNY	(0.05)	(0.07)	(0.11)	0.13	0.35	0.41
KRW	(0.14)	(0.22)	(0.17)	0.13	0.19	0.15
INR	(0.14)	(0.29)	(0.33)	0.31	0.28	0.31
IDR	(0.13)	(0.13)	(0.06)	0.16	0.25	0.21
MYR	(0.07)	(0.05)	(0.01)	0.21	0.35	0.28
PHP	(0.07)	(0.21)	(0.29)	0.18	0.27	0.32

Note: Correlations between: (i) the daily percentage returns of Asian spot rates and NDFs (3-month and 1 year), and (ii) the corresponding percentage returns of the yen (or euro) spot and forward rates of the same tenor (horizontal axis).
Sources: Bloomberg and Reuters.

[49] http://in.reuters.com/article/asiaCompanyAndMarkets/idINSEO848220080714

[50] BIS. 2004. The Markets for Non-Deliverable Forwards in Asian Currencies. *BIS Quarterly Review* (June 2004).

Figure 5.4: Euro–Risk Barometer



MSCI = Morgan Stanley Capital International.
Source: Bloomberg.

that the possible influence of euro on Asian foreign exchange (FX) spot markets may be greater for some Asian NDFs than the yen. According to market analysts, the euro has emerged as a relative risk barometer for equities in the region, where investor sentiments are largely influenced by movements of stock prices and fund flows into equity markets. The importance of the euro has increased in recent years. But the yuan and the ringgit do tend to move closely with the US dollar in the spot markets, even if offshore players probably see a risk for that to continue. And as the euro represents the other major currency in global markets, in addition to the US dollar, it is possible that for NDF markets, the yuan and ringgit are more influenced by the euro. The yuan and ringgit may be influenced by the combined effect of both the euro and investors' perception of respective domestic policies. The euro appears to have emerged as a risk barometer **(Figure 5.4)**. Plotting the euro and the yen against MSCI's Far East ex-Japan Index shows that the euro tracks the index more closely than the yen. A simple correlation exercise also confirms stronger co-movement between the euro than the yen with respect to the MSCI ex-Japan Far East Index.

Onshore interest rate and offshore implied interest rate differentials indicate depreciation pressures on most Asian currencies.

Lastly, an attempt is made to analyze the extent of market segmentation between onshore interest rates and offshore interest rates implied by NDFs. It is known that under the covered interest parity conditions, the forward exchange rate of the home currency, in the absence of capital controls, is linked by arbitrage to spot rate and interest rate differentials between the home currency and the US dollar. When there are no capital controls or foreign exchange restrictions, the following condition holds:

$$F = S\,(1+r)/(1+r^{s})$$

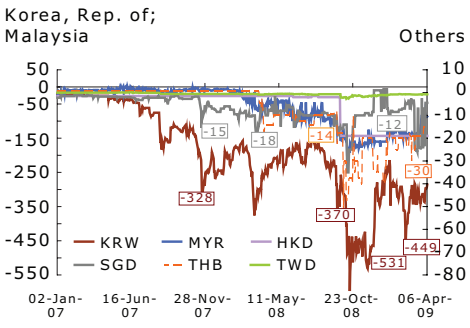
Where F is the forward rate, S is the spot rate, r is the interest rate on the home currency, and r^{s} is the US dollar interest rate. Its failure to hold implies (i) markets are inefficient and traders do not take advantage of arbitrage opportunities; and (ii) that restrictions and regulations, such as capital controls or exchange rate restrictions, exist.

So, if capital controls or exchange restrictions are imposed, foreigners will not have access to onshore markets. This often gives birth to NDFs:

$$NDF = S\ (1+i)/(1+r^{s})\ level$$

In the above equation, i is the implied yield on the home currency offshore. A large differential between i and r means that the arbitrage between offshore and onshore is effectively constrained by capital controls and that there are cross-border restrictions on FX transactions. The sign of the onshore–offshore yield differential can indicate market expectations of movements in currency pairs. An onshore interest rate above the NDF-implied offshore rate reflects underlying appreciating pressure on the home currency, but capital controls and restrictions limit capital inflows. On the other hand, if the onshore rate is below the NDF-implied offshore rate, it implies underlying depreciation pressure on the home currency. A zero spread implies the absence of capital controls and absence of any market pressure on the home currency, or both. Estimates of 3-month onshore–offshore rate spreads for six markets show that capital controls exist in varying degrees. Market analysts say depreciation pressure still persists on most currencies in the short-run. But the conclusions drawn from the move in rate differentials should be dealt with cautiously. While it is true that they reflect the expectations of nonresident participants, in most cases these markets are small and investors do not have complete information. As a result, they are not always very efficient.

Figure 5.5: Cross-currency basis swap spreads (1-year, basis points)



Source: Bloomberg.

However, it must be underscored that turmoil in global money markets since the second half of 2007 did spill over into FX markets. There was the impact of dislocations not only in the FX swap markets, but also in the longer cross-currency basis swap market. In Asia, this is most clearly manifested in the cross-currency basis swap market for the won **(Figure 5.5).** Faced with rising risk aversion and fear of "dollar shortage", banks and corporates swapped local currency into dollars up to their limits. As a result, basis swap spreads of all tenors for the won are significantly negative, which reflects the scarcity of the dollar in the local market.

Policy Issues

As the global crisis deepened and capital moved out of the region, policy intervention in NDF markets has been varied.

The global financial crisis has hit Asia hard. There has been a massive outflow of funds from the region as jittery foreign investors cut their exposure to high-yielding assets. The responses by regional authorities to such capital outflows have been varied.

As the credit crisis deepened and the Indian rupee came under pressure from foreign portfolio outflows and onshore US dollar shortages, authorities lifted or relaxed regulations to encourage capital inflows. On the other hand, in November 2008, Bank Indonesia slapped tighter restrictions on the purchase of foreign currency against the Indonesian rupiah by onshore participants. Purchases of foreign currency against the Indonesian rupiah must not be for speculative purposes. Also, documentation is required for foreign currency purchases above USD100,000 a month.

The Korean authorities have intervened forcefully in the spot market to smooth currency fluctuations. The authorities remain wary that derivatives may be used for speculative purposes or for manipulating the market. Nevertheless, they remain committed to lifting all restrictions on capital transactions and most restrictions on FX trades. At the same time, they have implemented initiatives to allow residents to invest in foreign assets. They have also stressed that there are no plans to introduce controls on offshore USD/KRW forward trading.

The PRC authorities have taken the approach that exchange controls will be reduced at a gradual pace to allow market forces to play a bigger role.

Market participants fear that if volatility spikes investors will retreat from emerging markets and currencies will depreciate faster. In response, authorities in the region may impose restrictions on FX transactions and nonresident participation to stem the outflow of capital. Authorities in many markets still remain wary of speculative activities, particularly in derivatives and offshore markets. However, restrictions can be

counterproductive to foreign investment inflows and the hedging activities of multinationals with long-term investment in key domestic markets.

Foreign exchange restrictions impact liquidity.

Exchange controls are having the desired impact as the onshore share of spot trading is about twice as high for Asian currencies compared with international currencies. These controls also restrict the participation of nonresidents in onshore markets. A similar scenario is in effect in the derivatives market. According to the BIS Triennial Survey 2007, for most Asian currencies, activity in over-the-counter (OTC) derivatives was about 1.5 times higher than spot market activity. For international currencies, it is nearly two to three times higher.[51] So while exchange restrictions have been somewhat successful in limiting speculative activities by constricting derivative trading, they also are causing fragmentation of FX trading between onshore and offshore markets. Such fragmentation can affect liquidity in FX markets.

Authorities take steps to strengthen onshore forward markets, but NDF remains a key gauge of market expectations.

Authorities in many markets, such as India and the PRC, are taking steps to build and strengthen onshore forward markets and ushering in new instruments for currency risk hedging. Such measures, when implemented, will become the main platform for speculation as well as hedging underlying exposure and overtime, substitute NDF markets. Until then, NDF markets will continue to provide companies, investors, and speculators a tool to hedge their exchange rate exposures in markets where local authorities restrict the access of nonresidents to onshore markets. Policymakers will have to continue monitoring NDF markets to gauge market expectations of domestic currencies as well as to ward off or curb speculative attacks, especially during periods of high volatility.

[51] Bank of Japan. 2008. The Evolution of Trading Activity in Asian Foreign Exchange Markets. Bank of Japan working paper series, June 2008.

6. Special Section—Bringing Life to Asian Money Markets[52]

Introduction—Money Markets in Emerging Asia

While the underdevelopment of domestic-focused money markets in emerging Asia helped insulate the region from the current financial turmoil, important lessons can be drawn on why integrated and developed money markets are desirable.[53]

Liquid money markets are critical to financial stability because market participants derive a significant portion of their funding from them. Money markets are integral to the financial infrastructure of industrial countries and are among the largest financial markets in the world. These markets serve as channels for the execution and transmission of monetary policy and as trading venues for the shortest-term instruments that anchor the entire term-structure of interest rates. The markets also play an important role in the credit evaluation process and in the large-value payments systems where trades are settled. The region's markets range from the international money centers of Singapore and Hong Kong, China—where local currencies trade alongside foreign currencies in deep and liquid markets—through emerging regional markets that are generally more domestically focused and at different stages of deregulation and development.

Money markets are central to capital allocation, the efficient distribution of liquidity among financial institutions, and the hedging of short-term risks.

Money markets can be defined as a market for deposits and short-term debt securities—such as banker's acceptances; commercial paper; repurchase agreements (repos); negotiable certificates of deposit; and Treasury Bills with a maturity of 1 year or less, and often 30 days or less **(Box 5)**. Money market

[52] This section was prepared based on contributions by Robert Rigg. For any inquiries, please contact lschouzibell@adb.org.

[53] While information has been sourced from a variety of industry participants, official statistics, and referenced publications, the topic here is viewed through a broad prism of issues raised by the Bank for International Settlements (BIS). BIS. 2009. Capital flows and emerging market economies. *Committee on the Global Financial System CGFS Papers* No. 33 (January 2009).

Box 5: Inside Money Markets

The main components of money markets are (i) the interbank market, (ii) the securities market, (iii) repurchase agreement (repo) and swap markets, (iv) derivatives, and (v) asset-backed traded securities.

(i) Interbank Trading

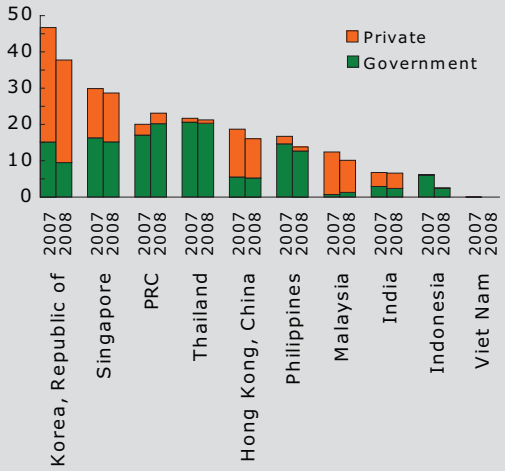
The market for interbank trading is the largest and most visible component of money markets. It is also an extremely efficient tool for managing liquidity and transmitting policy adjustments. Changes in price are transmitted instantly via banks dealing with each other in a less credit-constricted environment when compared to dealings with the non-bank and commercial sectors. At the onset of the current crisis, the interbank market reacted by limiting dealing lines with other banks to reduce exposure to institutions with suddenly doubtful creditworthiness. An interesting aspect was that credit concerns were not just in price but also in volumes—as credit and dealing lines were reduced or withdrawn. This affected access to United States (US) dollars and other currency funding by banks that had relied on short-dated foreign exchange (FX) swaps and uncommitted money market loans to generate funding to support longer-term assets, which were now less liquid and of a longer duration than the underlying funding. The reduced credit and dealing capacity put additional strains on a market already suffering from dollar illiquidity as short-term loans and swaps needed to be rolled over to generate the required longer-dated funding.

As the most immediate crisis effect came via foreign currency markets, domestic currency markets were less impacted. The large liquidity pool was swelled by additional funds diverted to the relative safety of short-term deposits and by central bank open market operations designed to inject further liquidity into the system. The interbank market—being the point of price discovery—reacted quickly to the stress with Overnight Index Swap (OIS) spreads blowing out dramatically for both the US dollar and regional currencies. In the Eurodollar market, the London Interbank Offered Rate (LIBOR)–OIS spread, having traditionally traded around 10 basis points, moved to an all-time high of 364 basis points in October 2008, before dropping back to around 100 basis points by January 2009.

(ii) Short-Term Securities: certificates of deposit, commercial paper, Treasury Bills, promissory notes, and Bills of Exchange

Regional short-term securities markets, while being normally dominated by Treasury Bills, also incorporate a range of bank certificates of deposit and commercial paper (CP) **(Figure B5)**. These securities are held by money markets as tradable assets, as a liquidity buffer, and for access to central bank funding through open market operations. The CP markets had been growing in importance as banks sought alternatives to vanilla lending, which uses up both balance sheet capacity and capital. Also, from the issuer's perspective, the CP market offers the advantage of more competitive pricing as the bank-to-borrower "one-on-one" status is replaced with a broader relationship with the marketplace—as multiple market participants trade or warehouse an issuer's paper. With the onset of the global financial crisis, money markets re-priced risk amid a liquidity shortage that led to a two-tier reaction. On one hand, risk aversion—and the need to hold highly liquid assets—had the effect of increasing demand for Treasury Bills while simultaneously reducing demand and liquidity for non-government paper. This is particularly true for CP, which caused spreads to widen significantly. The risk aversion seen in cash money markets spread through securities markets, which limited liquidity of commercial debt. This situation was magnified in longer-dated international capital markets where even highly-rated issuers could not raise funds and, in many cases, had to ultimately rely on a government guarantee in order to get an issue placed with investors.

Figure B5: Outstanding Short-Term Debt Securities[1] (% of GDP)[2]



PRC = People's Republic of China.
[1]Debt securities with remaining maturity up to one year, including those issued in domestic and international markets. Private sector debt covers securities issued by financial institutions and the corporate sector. Domestic securities for 2008 are as of September 2008. [2]Fiscal Year (FY) 20008 gross domestic product (GDP) data for India is World Economic Outlook (WEO) estimate; for Rep of Korea estimate from published FY budget ratios.
Sources: OREI staff calculations based on data from Bank for International Settlements (BIS); CEIC; WEO Update Oct 08, IMF.

In the lead up to the crisis, the Republic of Korea (Korea) had approximately 37% of its gross domestic product (GDP) equivalent issued in short-dated securities, with the majority being private sector paper and showing a maturity profile that would be at the basis of the problems that followed the worst of the liquidity squeeze as USD-denominated paper matured amidst the meltdown (See Figure B5.1). Singapore and Hong Kong, China also entered the period with relatively high private issuance as a percentage of total issuance, reflecting their position as international money centers. Malaysia's high private issuance was, on the other hand, primarily domestically based and denominated in local currency (LCY). A high ratio of government issuances over private paper could be seen in Indonesia, the Philippines, Thailand, and the People's Republic of China (PRC), which reflected the relative underdevelopment of their respective CP markets and the dominance of government securities.

Going forward, and with the twin effects of lower GDP growth and government fiscal stimulus, the expected impact of these combined events will likely show (i) a marked increase in government issuance relative to both GDP and private securities, and (ii) an absolute contraction in both onshore and offshore issuances by the private sector as markets contract.

Table B5: Transactions of Asian Currencies
(daily averages, USD'000 million)

Economy	FX Swap		Forwards		Spot	
	April 2007	April 2008	April 2007	April 2008	April 2007	April 2008
China, People's Republic of	0.0	0.3	3.4	4.8	0.1	0.0
Hong Kong, China	31.8	36.7	3.3	1.2	12.9	10.9
India	0.0	0.1	4.5	2.6	0.8	0.1
Indonesia	0.1	0.1	0.6	1.3	0.1	0.0
Korea, Republic of	0.5	4.2	13.1	4.8	1.8	2.6
Malaysia	0.0	0.4	1.7	2.9	0.6	0.0
Philippines	0.0	0.1	0.9	1.2	0.1	0.0
Singapore	4.6	13.4	1.3	1.2	5.5	5.2
Thailand	0.8	2.9	0.3	0.1	0.6	0.6
Viet Nam	—	—	—	—	—	—

— = no available data
Source: Results of Turnover Survey of Tokyo FX Market, Tokyo Foreign Exchange Market Committee; 26 July 2007 and 22 July 2008 reports.

(iii) Repo and FX Swap Markets

While interbank cash markets are largely uncollateralized, repo and FX swap markets are collateralized. A repo transaction involves an underlying instrument as the saleable security. An FX swap is effectively collateralized by the second currency leg of the transaction. The repo market's role expanded considerably as the current financial crisis unfolded, with central bank operations in the open market allowing a wider group of securities as acceptable for repurchase agreements. This followed moves by the US Federal Reserve in which it accepted a wider range of securities for open market transactions that would previously have rated below the acceptable credit standing for such transactions.

The repo market is often the primary means for central banks to inject liquidity into financial systems by adding flexibility to the marketplace in times of crisis. The development of interbank FX swap markets in parts of emerging Asia has been limited by capital controls and restrictions on nonresidents. In other cases, however, central banks have used swaps as a means of sterilizing market intervention in FX spot markets or for injecting additional liquidity. In the more developed markets of Singapore and Hong Kong, China, the swap markets for foreign currencies, in particular, are both broad-based and liquid. Arbitrage between money markets and FX swap markets ensure markets are aligned. Using swap and repo markets to inject liquidity greatly helped local markets cope with the stress caused by the credit freeze.

While the most substantial swap activity has been noted in Hong Kong, China, it is also evident in Singapore, but virtually non-existent in the other markets **(Table B5)**. Forward market activity is generally not well developed. The standout amount of forward activity in Korea in 2007 largely reflected export sales. In addition, spot transactions reflect the activities of financial centers such as Singapore and Hong Kong, China in the global marketplace.

(iv) Derivatives Markets

Outside Singapore and Hong Kong, China, which have international markets, the main domestic-focused derivative markets are in India, Korea, and Malaysia. Exchange-traded and over-the-counter (OTC) derivative markets elsewhere in the region are relatively small and undeveloped, although interest rate swaps (IRS) are present in Viet Nam. Forward rate agreements, IRS, futures, and options have not entered many emerging Asian markets. However, the importance of these instruments in offsetting exposure to market risk needs to be dealt with as risk management systems develop and require offsetting derivative contracts to mitigate risk exposure. OTC options, as opposed to exchange traded instruments, represent the main activity in the region for LCY derivatives. Exchange-traded interest rate futures are shown for only Hong Kong, China; Malaysia; and Singapore, but with only Malaysia having exchange-traded interest rates exceeding those traded through OTC markets and forward rate agreements.

(v) Asset-Backed Commercial Paper Markets

Securitized debt instruments underpinned the US subprime mortgage crisis, where loans were re-engineered into highly-rated debt securities and then on-sold to investors (the "originate-to-distribute" model). Investors primarily relied on credit ratings assigned by ratings agencies. However, as confidence eroded, so did investor interest forcing financial institutions to warehouse securities meant for distribution. This added to the drain on market liquidity as these institutions scrambled to fund the securities. More liquidity stress came just as concerns spread to other types of structured debt, which in turn further exacerbated the liquidity problem, thus leading to a vicious cycle. In addition to liquidity strains, loss of confidence led to rating downgrades for many forms of structured debt and Asset-Backed Commercial Paper (ABCP), leaving them unacceptable securities for collateralized money market transactions. This reinforced the downward spiral in value; fed the loop of liquidity strain, asset depreciation, and distressed sales or mark-to-market revaluations; and further eroded liquidity and confidence.

However, emerging Asia's domestic money markets were largely insulated from the direct fallout of structured- and asset-backed securities. Undeveloped markets in securitized debt in regional currencies was one reason, with the other being the twin focus on prime, or government, debt and the shorter-term horizon of money market investors.

Malaysia and Hong Kong, China have secondary mortgage markets. While the underlying loans supporting the market in no way resembled their US counterparts in either creditworthiness or volume, they were affected by events in the US and the subsequent global meltdown. At the same time, other countries, including Thailand, are currently examining ways of utilizing ABCP and securitized mortgages to provide deeper liquidity for mortgage origination as well as more competitive pricing. This market holds many opportunities for the emerging Asian markets to use the benefits of securitization to add liquidity and mobilize funding for numerous types of ABCPs. The current crisis should not detract from the recognition of the importance of this market in freeing up balance sheets and allowing previous illiquid assets to be securitized and traded. A properly constructed market with creditworthy security underpinning traded paper will offer many opportunities for enhancing loan origination and provide an investment opportunity for fund managers.

securities are generally considered safe investments that return a relatively low interest rate for temporary cash storage or short-term tenure. Bid-ask spreads are also relatively small due to the large size and high liquidity of the market. Despite their shorter-dated focus, it is important to note that money markets are a vital component of the larger financial system and cannot be seen in isolation from longer-dated debt markets.

A more accurate view of money markets is that they act as an aggregator of liquidity and facilitator of spot- and short-dated exchanges.

In addition to providing the clearinghouse function for liquidity and currency exposure, money markets are the primary transmission mechanism for changes in central bank monetary policy aimed at the real economy. Policy changes are transmitted through interest rate movements, the issuance of government debt securities, repos, exchange rate intervention, the sterilization of foreign exchange (FX) intervention, and other open market activities that central banks use to change policy or smooth volatility.

Developed money markets help facilitate modern financial systems by allocating resources to end-users quickly and efficiently—be they borrowers and issuers, or lenders and investors.

A properly functioning market has deep liquidity and a relatively free operating environment, allowing it to allocate resources more efficiently than thinner, more regulated markets that carry distortions. A money market's role is to allocate financial resources, generating an "efficient frontier" for capital distribution in which a demand and supply equilibrium brings optimum returns for each level of risk across a broad range of maturities and instruments. Accomplishing this requires market depth and liquidity, multiple participants, free information flow, and supportive regulatory and legal frameworks. Most short-dated money markets provide good examples of how depth and liquidity are important in re-channeling excess liquidity efficiently throughout the system.

Recent Money Market Developments—Financial System Liquidity

Despite some improvement, the relative underdevelopment of money markets in emerging Asia helped insulate the region from the core financial turmoil that rapidly spread beyond the US subprime market.

The liquidity crisis—coming on top of solvency concerns for many financial institutions—led to a severe distortion in money markets. US dollar liquidity dried up and a credit crunch effectively closed most international debt markets for all but sovereign guaranteed issuers. This led to an additional credit-driven contraction in the real economy as the downturn reduced consumption, production, investment, and expenditures. In an export-driven region, the crisis spillover came mainly via the external account as exports and investment flows collapsed alongside domestic demand.

Regionally, most banks were less affected than their North American and European counterparts.

This reduced impact is also in part due to the high savings of the household sector and large accumulated foreign reserves. While debt transmits a loss of confidence quickly and efficiently, high household and national savings provided a degree of financial insulation. To some extent, many of the less-developed Asian money markets were initially less impacted by the dollar illiquidity precisely because of the domestic nature of their markets. However, the money markets of Singapore and Hong Kong, China—as well as the Republic of Korea (Korea) market—were hit immediately as US dollars were suddenly withdrawn, leaving acute shortages for Eurodollar funding.

Notwithstanding the region's markets being better positioned, the crisis effects were significant.

The region's money markets were affected by the crisis through (i) reduced or withdrawn credit and settlement lines in the interbank market; (ii) reduced credits and effective closure of some capital markets to commercial borrowers; (iii) risk aversion by households leading to an increase in bank deposits, removing capital from both equity and longer-term debt markets; (iv) a

flight to quality to USD- and JPY-denominated securities, particularly Treasury Bonds and Notes; (v) currency volatility and large depreciations against the US dollar; and (vi) foreign banks downsizing or withdrawing from non-core markets, leading to reduced competition.

The wide diversity in domestic financial market development led to a wide range of crisis impact across the region; nonetheless, all money markets experienced some degree of dislocation.

The diverse nature of the region's markets and respective levels of globalization and regionalism left those with a low level of integration relatively better off than those with a higher degree of integration. Money markets in the **People's Republic of China** (PRC) had been opened and liberalized at a slower pace than many other economies in the region as reforms were implemented under a "controlled financial innovation" model and within a regulatory framework implemented by the Peoples Bank of China (PBOC). Previously, PRC money markets operated alongside kerb[54] markets that flourished despite official resistance. In the lending markets, private corporations often resorted to raising funds on the kerb markets as state-owned and -controlled banks favored lending to state-owned corporations at the expense of private borrowers. With recent banking system reforms, state-owned banks have been recapitalized, foreign bank access has been increased, and rules governing securities trading and ownership have been changed. As a market focused more domestically, PRC money markets have been less affected by the crisis than, for example, their more integrated counterpart in Hong Kong, China. The basis swap curves for the PRC; Hong Kong, China; and Singapore measure the 3-month interbank offer rate less the overnight index swap rate and show the immediate market impact of the Lehman Brothers collapse in 2008 **(Figure 6.1a).** These spreads are regarded as a measure of market "stress" and show elevated and rising stress levels in both Hong Kong dollars and Singapore dollars. However, they also show sharply falling spreads in the PRC, with its less integrated and more controlled market for official rates.

[54] "Kerb" is a casual reference to securities trading outside of regulated markets. The name derives from the historical practice of dealers continuing to trade on the pavement after stock exchanges closed.

Figure 6.1a: Basis Swap Spreads[1]
(weekly average, in basis points)

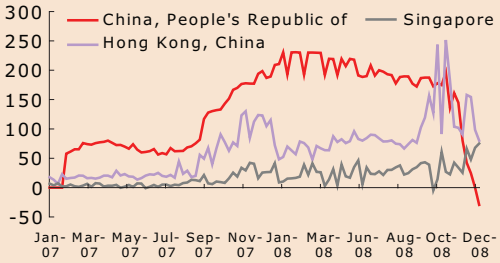
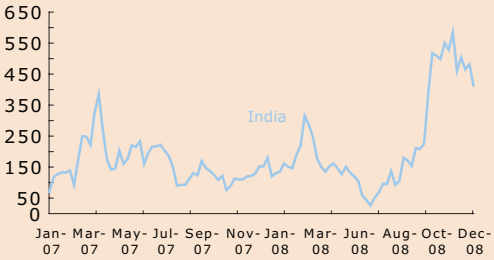


Figure 6.1b: Basis Swap Spreads[1]
(weekly average, in basis points)



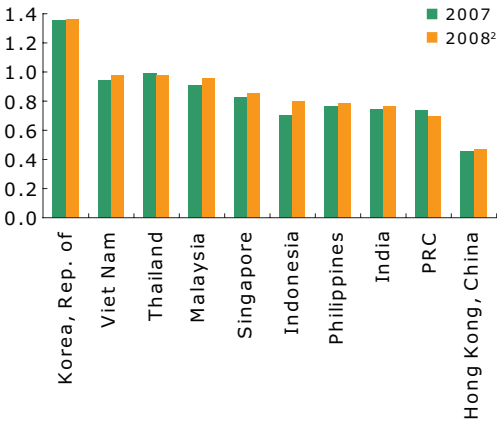
[1]Three-month interbank offer rate minus three-month overnight index swap rate.
Source: OREI staff calculations based on Bloomberg data.

India's money markets and financial system have been undergoing a period of liberalization since the 1990s, which has seen private banking grow strongly at the expense of the state-owned and -controlled commercial banks. Money markets developed a wide range of securities that traded in relatively large, liquid markets. With the onset of the global crisis, the established trend toward private commercial banks and market innovation reversed under the wholesale risk retreat. Risk aversion and worries over credit stress flowed through to the Indian TED spread—the difference between the 3-month Mumbai interbank offer rate and the yield on 3-month Treasury Bills—which rose rapidly and remained relatively elevated despite strong intervention by the central bank to lower rates and inject liquidity. Before easing, the Indian basis spread rose dramatically from a level of around 100 basis points to a high of around 550 basis points **(Figure 6.1b)**. The stress in the Indian market was exacerbated by the extreme risk aversion of investors and institutions as the impact of the crisis unfolded. This coincided with the transfer of activity back to the government-owned banking sector**.**

Indonesia's market, with its large number of smaller banks, was forced to maintain a relatively high interest rate structure by Bank Indonesia, which was concerned about currency depreciation and capital flight. In addition, a relatively high and growing loan-to-deposit ratio in the banking system meant that the impact on liquidity was quite severe, notwithstanding central bank efforts to inject liquidity through the repo window as well as arrange currency swaps with Japan and Korea, and most recently, the PRC.

Korea was severely hit by US dollar withdrawal as its money markets were heavy users of the shorter-dated FX swaps and cross currency swaps to fund strong domestic credit growth. One major cause of the outflows and the transmission of US dollar shortages to the domestic market was due to an arbitrage opportunity that allowed (mainly) foreign banks and international investors—including hedge funds—to swap short-dated US dollar loans into Korean won at levels substantially below domestic interest rates, and make substantial purchases of government paper and bank CDs. This arbitrage resulted from heavy forward sales of US dollars as major Korean exporters sought to lock in a forward rate, thereby providing an opportunity to generate won at effective interest rates well below those available in the

Figure 6.2: Loan-to-Deposits Ratios[1]



PRC = People's Republic of China
[1]Covers loans to the private sector and nonfinancial institutions and deposits (demand, time, savings, foreign currency, bond and money market instruments) of banking institutions or deposit money banks of each country. [2]Data for Hong Kong, China and Malaysia are as of November 2008, while data for the Republic of Korea and Viet Nam are as of October 2008.
Sources: OREI staff calculations based on data from CEIC; *International Financial StatisticsOnline database,* International Monetary Fund.

Figure 6.3: Interbank Claims[1]
(% of Total Banking System Assets)

PRC = People's Republic of China
[1]Includes amounts due from, and balances with, banks of all types under the banking system of each country.
Source: OREI staff calculations based on data from CEIC and national sources (for Philippines only).

domestic market. [55] This artificial distortion was felt as yields on short-dated paper fell with arbitrage purchases made prior to the crisis. As the crisis unfolded and dollar liquidity dried up, the arbitrage window closed and reversed, which resulted in won securities being sold. Yields subsequently rose when securities were rapidly offloaded to repay the US dollar loans during the crisis—despite official policy initiatives to lower interest rates. At the end of 2008, Korea was the only listed country with a loan-to-deposit ratio greater than 1.0, reflecting excess credit growth over and above that funded by deposits **(Figure 6.2).** This is consistent with the scenario of much higher private short-term debt issuance to fund the gap as shown in Figure 6.1. Hong Kong, China—with a loan-to-deposit ratio of around 50—shows the build up of domestic liquidity as deposits exceeded loans and resulted in large securities holdings by the money market. While these figures reflect the period through late 2008, it could be expected that these ratios may have fallen further as deposit funds continued to flow to the banking system and loan activity was curtailed due to risk aversion.

Malaysia's banking and money markets emerged from the 1997/98 Asian financial crisis much stronger. With 90% of bank assets in LCY rather than foreign-denominated assets, Malaysian markets have been better insulated from the global meltdown despite being an open economy with significant exposure to falling commodity prices. The money market has recently seen significant growth in both short-dated money market deposits and retail bank deposits. This growth has occurred against a backdrop of rapidly falling interest rates—the central bank, Bank Negara Malaysia, eased overnight interest rates from 3.50% in September 2008 to 2.00% in February 2009—and reductions in the Statutory Reserve Requirement from 3.50% to 1.00%, effective 1 March 2009.

The **Philippines** is one regional market with a well-developed money market and an excess of international interbank placements over its borrowings. However, foreign portfolio outflows, a high inflation rate, and a fiscal deficit combined to limit a policy response to the financial crisis. A widening of the rediscount window and interest rate reductions were the tools

[55] McCauley and Zukunft. 2008. Asian banks and the international interbank market. *BIS Quarterly Review (*June 2008).

used to keep liquidity moving throughout the system to support economic activity.

Singapore and Hong Kong, China, with globally integrated markets and the presence of large foreign banks, both felt the immediate effects of the global crisis. The Monetary Authority of Singapore (MAS), for example, arranged currency swap lines with the US Federal Reserve to free US dollar liquidity locally. However, both the Hong Kong dollar and Singapore dollar domestic markets were less affected than the more internationally traded currencies. In the Singapore dollar market, a tightly regulated regime under MAS licensing limited the fallout in LCY markets as the MAS acted in the open market to bring down domestic rates and provide liquidity. In the Hong Kong dollar market, massive liquidity had been built in the domestic currency, again limiting the impact on banks' HKD-denominated balance sheets due to the very low loan-to-deposit ratio and leaving the banks with a large pool of liquid securities. Additionally, the Hong Kong Monetary Authority (HKMA) entered into a currency swap with PBOC for CNY200 billion to provide liquidity to mainland banks in Hong Kong, China, while simultaneously providing Hong Kong, China banks with liquidity in the PRC. Interbank claims in the region show the Hong Kong, China and Singapore financial centers as having dramatically higher claims than their less integrated counterparts **(Figure 6.3).** This situation reflects liquidity in the system, the nature of the trend towards financial assets—the placement of excess funds with banks rather than with the corporate sector—as well as the safe haven status of both financial centers. In addition, it is likely that the relative size of the interbank claims in each market will have increased in the period beyond this table as credit was hoarded in the banking system and restricted to the non-bank and corporate sectors.

In **Thailand,** short-dated interest rates were reduced sharply as monetary authorities sought to limit the impact of the crisis on the economy. A major concern with monetary authorities and the Bank of Thailand was the reduced transmission of policy changes, with rate reductions reflected in wholesale money markets but not being passed through to retail and commercial end-users **(Figures 6.4a, 6.4b, 6.4c)**. A loan guarantee plan for small- and medium-sized enterprise (SME) lending was instigated to relieve quantitative constraints to the flow of credit. However, widening risk premiums being levied by banks remain

Figure 6.4a: Interbank Interest Rates[1] (%)

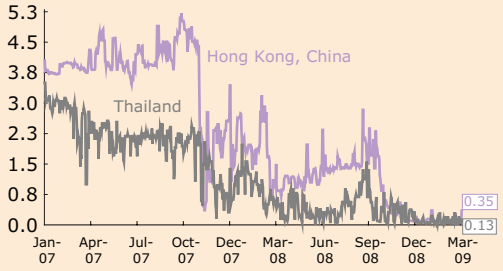


Figure 6.4b: Interbank Interest Rates[2] (%)

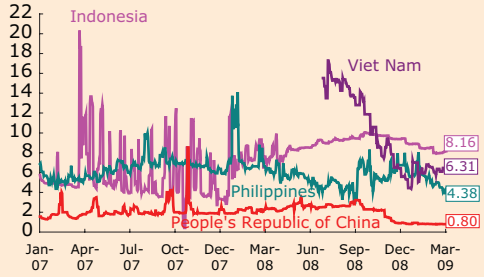
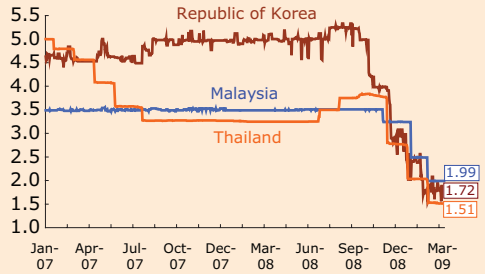


Figure 6.4c: Interbank Interest Rates[3] (%)



[1]Overnight interbank offer rate (IBOR); for Singapore used overnight deposit rate. [2]Overnight interbank offer rate (IBOR); for the Philippines used one-week IBOR. [3]Overnight interbank offer rate (IBOR); for Republic of Korea used overnight call rate; and for Malaysia used overnight deposit rate.
Source: Bloomberg.

a blockage to the full flow of rate reductions. The inefficiency in the transmission mechanism for wholesale money market rate reductions is one reason for the consideration of additional and expanded competition in the banking and money market sectors.

In **Viet Nam,** the crisis hit with substantial falls in foreign portfolio investment and stock market valuations. This occurred in an environment of high inflation and a current account deficit of 14% of GDP. To mitigate the slowdown effects, the State Bank of Viet Nam issued credit directives to the banking sector requiring credit to be extended and loans to be restructured, while at the same time operating in the open market to provide money market liquidity. Despite far reaching intervention by the central bank, the overall future is one of liberalization and progress toward market-driven financial system development.

Individual market stress varied substantially given diverse levels of market integration and development, differences in banking infrastructure, as well as a range of domestic factors.

While authorities lowered interest rates and injected liquidity in response to the financial crisis and strains on US dollar liquidity, the range of outcomes and immediate effects were quite diverse. Individual markets were stressed to varying degrees as a result of differing levels of integration and development, and a range of domestic factors, including a structural funding flaw in the case of Korea, and differences in individual banking infrastructure in each economy. The financial instruments utilized in each market have been largely the same, albeit with differing levels of importance and at different levels of development.

Development of Money Markets: Medium- to Long-term Challenges for Participants

(i) Market participants

Asian markets possess a more stable funding base from retail and institutional depositors as opposed to G3 markets, which are more dependent on wholesale debt issuance.

While remaining relatively unscathed from the subprime and structured product meltdown in the US, the region's markets were hit indirectly by the transmission of crisis spillover. Yet, most of the region's money markets remained in relatively good shape, with retail and institutional depositors viewing bank deposits as the preferred method of wealth preservation, thereby allowing the region's banking systems to be flush with short-dated liquidity. The safe haven status of bank deposits has also been enhanced by deposit insurance and guarantees provided by governments to cover demand deposits in many cases. Additionally, with much of the region having had strong current account surpluses and large foreign reserves, many sovereigns compared favorably with economies that had high fiscal and current account deficits combined with low domestic savings ratios. The high savings ratio in the region and the rush to safe haven bank and money market deposits resulted in the buildup of liquidity in the money market, leaving banks with an excess of short-dated funds. This difference is particularly sharp when compared with many G3 financial institutions that relied heavily on wholesale capital markets for funding rather than a local depositor base. The size and dynamics of the depositor base and the relatively high savings ratio in the region helped shore up local markets against currency shortages. From the viewpoint of bank balance sheets and liquidity, this situation appeared favorable. However, it came about at the expense of the real economy, as credit flows to the private sector were stunted in general due to heightened risk aversion and a broadening credit crunch.

While a changing market profile will cause each segment of the money market to adapt to new circumstances, the roles played by major participants can significantly shape future developments in the region's money markets as they develop and mature over time.

- **Government and Central Banks**

The primary responsibility of central banks is the implementation of monetary policy and its actions, policies, and regulatory framework.

These have a determining influence on the development and efficiency of the marketplace. They play a vital role in defining the direction and development of a country's financial market. In addition to its integral role in formulating monetary policy, central banks in many economies also play important roles in financial institution regulation, reserves management, interest rate and currency intervention to avoid volatility, open market sterilization, bond and note issuance, and repos.

Further development of the region's money markets and a broadening of the product suite will require authorities to increase supervision and methods of risk recognition.

With the arrival of the financial crisis, central banks acted swiftly to lessen the impact on their respective markets. A broad range of measures were taken to maintain market liquidity and encourage the flow of funds throughout financial systems. Policies included easing monetary policy to encourage lending and economic activity, arranging swap lines with other central banks to avoid foreign currency shortages, lending foreign currency directly to domestic markets, guaranteeing deposit insurance and bank lending, and injecting capital into some banks. Open market operations were also expanded with the opening and broadening of repo markets, in which a wider range of collateral was accepted to add liquidity to the system. Central bank actions were both timely and effective in lessening the impact of the crisis and in providing liquidity. Yet, further development of the region's money markets and a broadening of the product suite will require authorities to increase supervision and methods of risk recognition. Central banks and/or market

regulators will need to ensure that there is adequate reporting and monitoring of risk exposures within the financial system; and that financial institutions have robust capital positions, balance sheet strength, and risk management systems.

- **Banks and the Interbank Market**

The interbank market plays a key role as it has the funding platform and capability to import skill sets and product innovations to a developing marketplace.

In most of the region's markets, local banks dominate local currency dealings through access to a retail customer deposit base. This provides a source of cheap funds compared with funding platforms of many other participants. Foreign banks and new entrants without a local deposit base tend to be more reliant on wholesale and interbank swap markets to generate funding. In some instances, there may also be regulatory impediments to sourcing LCY deposits competitively. However, while local banks may have a competitive advantage in local currencies, the same is not necessarily the case in offshore markets. Whereas the region's banks can rely on their deposit bases for local currency, often their relative size or credit rating will make them less competitive relative to the larger foreign banks in international debt issuance markets, where longer-dated term funding can be sourced. Although these markets are now temporarily closed to all but prime names or to institutions with a sovereign guarantee, the relative advantage of larger global banks over the region's banks in the international capital markets remains an issue. With respect to the interbank market being the key funding platform, it has the capability to import skill sets and product innovations to a developing marketplace. The robustness of the competition in the interbank market provides a fertile patch for further improvements and product development that eventually seep down to the underlying real economy in the form of increased efficiency in capital allocation and competitive pricing.

- **The Corporate Sector**

The corporate sector can enhance development within a marketplace by changing the basis of banking relationships.

The corporate sector uses money markets as lenders and borrowers of excess liquidity, as well as being counterparties for FX, securities, and derivative transactions. The corporate sector is often represented by manufacturers or local subsidiaries due to a concentration of both light and heavy manufacturing throughout the region. Subsidiaries of multinational corporations often bring an existing global banking relationship to the region's market. While these existing relationships may be strong in the home market, their global bankers often have less capability with LCY transactions. As a result, these corporations often represent a potential customer base for local banks seeking profitable sales and spread retention dealings with corporate customers.

Competing banks in money markets placing a high value on corporate business are generally prepared to narrow trading spreads to start dealing with corporations.

While this competitiveness drives efficiencies toward the corporate user, the money market activity of corporations usually reflects the ebbs and flows of operating cash flows, rather than their longer-term structural funding requirements. These funding needs are more aligned to the longer-term nature of their direct investments in plant, machinery, and working capital. The corporate sector can also play a role in market development as well as act in its own self interest. While it is common for corporations to have strong one-on-one relationships with their primary banks (or alternatively to limit their dealings to a small number of domestic banks) the corporate sector can enhance development within a marketplace by expanding the panel of banks servicing their needs. This is especially true with foreign banks, which may import solutions and thereby intensify competition and product innovation in less-developed markets.

- **Fund Managers and Investors**

In line with the need for diversification in the pursuit of increased returns, fund managers and investors have sought new international markets and the opportunities they present.

Alongside international fund managers, locally based managers invest on behalf of pension funds and other pooled investment funds, representing a prime distribution channel for both shorter-dated money market instruments and longer-dated debt securities. Portfolio investors often have longer time horizons and a relatively high tolerance for the currency risk inherent in an internationally diversified portfolio. The risk associated with the holding of foreign currency-denominated securities may be factored in as just one component of the overall risk-return equation and allows this customer segment to effectively see a currency exposure as a separate and diversifiable risk position within a broader portfolio.

The international investor and funds management industry can add benefit and liquidity to markets previously focused primarily on their domestic investor base.

As a natural distribution point for money market securities, fund managers have the ability to shape market development given the "demand-driven" model of market development. Demand for higher yielding asset-backed commercial paper (ABCP), or similar instruments, will encourage banks to package assets for sale, while at the same time enhancing returns on an investor's portfolio. Additionally, the willingness of this segment to hold securitized debt frees up bank balance sheets for additional lending and asset generation.

As has been demonstrated, each of the four main operating segments within a money market has the ability to contribute to the future development of markets in emerging economies. At the same time, they provide improved efficiencies for themselves in the form of increased competition, product innovation, sharper pricing, and increased returns.

(ii) Imperfections and various paths for the region's money market development

International money markets in Singapore and Hong Kong, China stand out as the region's most efficient and liquid markets.

Singapore and Hong Kong, China both have broad-based participation by domestic and foreign banks, offering depth and liquidity as well as a developed investor segment. They also have efficient distribution channels between the main interbank markets and end-users. They are highly integrated into global financial markets and trade a wide range of instruments denominated in either domestic or foreign currencies. A common foundation of both markets is a strong and transparent legal and regulatory framework. They both have proactive monetary authorities (HKMA and MAS) that oversee regulations and operations in the open market in their central bank-like capacity. Government support through policy initiatives has also encouraged development and growth in the banking industry. Low tax regimes, the ability to import human capital, and a willingness to integrate their markets into the global financial sector contributed to both centers' becoming regional banking hubs. While the two international financial centers stand out as being extremely open and competitive with global money markets, it is not necessarily the only path to market efficiency.

In Malaysia, the focus has been on the domestic money markets, which has led to robust markets in ringgit-denominated cash and securities.

The Malaysian money markets have developed considerable depth and breadth since the 1990s. For example, the emphasis on the development of domestic currency trading and securities helped insulate the economy from the worst effects of the recent financial crisis—approximately 90% of bank assets are held in ringgit-denominated assets. Other developments include Islamic banking; the development of a liquid bond market populated by both domestic issuers and investors; reduced regulatory restrictions; the establishment of an offshore banking center in Labuan, and the recently released Financial Sector Master Plan, which in part is expected to encourage a greater presence by incumbent foreign banks as well as the entry of new foreign

banks. The financial markets are expected to be strengthened by these initiatives and the Malaysian development path could be seen as an example for other emerging markets looking to develop efficient money markets in their domestic currencies.

Elsewhere in the region, domestic money market development varies. However, there are a number of market structure issues that inhibit market advancement or interfere with the effectiveness of capital allocation.

- In Indonesia, for example, the difficulty that small banks, with limited capital bases—including rural banks—have in competing effectively with larger and better capitalized counterparts is obvious. This is particularly true given their inability to import the best available risk management practices and technology platforms that are essential for money market operations and allowing the benefits of more efficient systems to flow through to end-users.

- Blockages in the transmission mechanism of rate reductions in Thailand are an example of a market not functioning at its optimal level. While rates in wholesale money markets have reflected policy changes, the underlying real economy has not felt the full benefit because major banks fail to pass on the reductions to their customer base. They also impose internal quantitative restrictions on lending. A further opening up of the financial markets via lesser restrictions on foreign ownership of local banks and the issuance of more licenses—currently under consideration by the Finance Ministry—may assist in promoting competition in the domestic money markets and assist in unblocking the transmission mechanism.

- The funding gap and open arbitrage opportunity for funding local assets with short-dated foreign currency borrowings such as in Korea—which kindled both volatility in asset markets and at times generated price movements counter to official policy

aims for domestic monetary policy—showed the unexpected side effects of protracted imbalances in funding platforms. [56]

The existence of "kerb", or unofficial, markets in some countries reflects a misallocation of resources through the official marketplace.

The reluctance of some state-owned or-controlled banks in the PRC to lend funds to non-state enterprises based on their private ownership led to creditworthy corporations being forced to use unofficial markets to generate loans. These loans were at rates well above those based on creditworthiness. This was an example of a misallocation of resources away from an efficient user toward a more familiar but less efficient user of the same capital. The result is usually a restriction on markets operating efficiently and the artificial maintenance of traded prices beyond those expected under actual market driven demand and supply outcomes.

Confidence, market depth, and liquidity are key to ensuring the efficient allocation of capital throughout the system.

While each market has domestic considerations for fashioning its money market development, the key points common to all markets include the requirement for confidence, market depth, and liquidity. In looking at ways to generate both confidence and liquidity, it is helpful to understand the interrelationship between the two. It is very difficult to imagine a deep and liquid market that lacked the confidence of the financial community and similarly difficult to imagine a market that has the financial community's confidence but lacked depth and liquidity—particularly given the competitive nature of global financial markets and the pursuit of returns. The task of generating such conditions is made

[56] The heavy forward selling of US dollars by Korean exporters allowed an arbitrage opportunity to appear, whereby dollars could be swapped in the offshore forward and cross currency swap markets into won at levels up to 100 basis points beneath onshore CDs and government bonds. While authorities acted to limit short-dated dollar debt by imposing limits on foreign currency lending to domestic borrowers—and put a withholding tax in place—arbitrage players purchased substantial amounts of paper funded by the cheaper offshore forward market. The subsequent disruption in dollar liquidity saw the trades unwind with pressure exerted on both the won-funding markets as well as the securities markets, which saw high levels of volatility as assets were sold to unwind the trade. Similar in effect to the 1997/98 currency crisis, this disruption was caused by large capital outflows that derived from short-dated interbank loans. The arbitrage opportunity, despite authorities' efforts, had become massive, and its unwinding over a short timeframe exacerbated a volatile situation.

more difficult by the fact that confidence is an intangible that has no physical structure to be broken down and analyzed to understand how it is created. However, the essential elements of both confidence and liquidity are clearly evident when looking at any efficient market, financial or otherwise.

To ensure the existence of an efficient market that can function at its optimal level in allocating resources, market liquidity must have depth, breadth, and resilience.

Market liquidity captures the aspects of immediacy, breadth, depth, and resiliency in markets. Immediacy refers to the speed with which a trade of a given size and cost can be completed. Breadth, often measured by the bid-ask spread, refers to the costs of providing liquidity. Depth refers to the maximum size of a trade for any given bid-ask spread. Resiliency refers to how quickly prices revert to fundamental values after a large transaction. In looking at developing financial markets and the required measures to engender confidence and enhance liquidity, these issues must be considered against the background of the underlying needs of a particular market. They must be developed within the constraints of real demand from end-users rather than just intermediaries.

- A market's *depth* is a quantitative measure of participants and their ability to price and absorb abnormally large flows of business in either direction. From a money market perspective, the spot FX market for the major currencies is an example of a market that is very liquid and capable of absorbing large and unexpected flows.

- An alternate aspect of a market's *breadth* can also be considered from two different qualitative aspects. The first is the spread of competing interests in a market where there is a large pool of interested participants, although they are not necessarily coming from the same transactional direction. An example of this is where market breadth is enhanced by the participation of a range of parties—market makers and intermediaries, originators and sellers, investors, end-users and buyers—that interact for price discovery and balance out demand and supply. Another aspect of breadth is related to the range of alternative competing products to satisfy customer demand. This allows the buyer to find

the most efficient solution from the range of competing products. From a money market perspective, alternatives in investment products could be the differing returns available from deposits when compared with purchasing either CP, bank CDs, or Treasury Bills—all of which will provide a return on funds invested but with each one having its own separate characteristics.

(iii) The Funding Model

The funding model used by market participants and end-users in the real economy is at the core of most imbalances within financial systems; it is usually related to mismatching maturities, interest rates, or currency exposures.

The funding model used by market participants and end-users in the real economy is usually related to one or more aspects of mismatching maturities (liquidity), interest rates, or currency exposures. The causes may be an excess dependence on foreign currency borrowings, short-dated money market loans supporting longer-dated assets, or an over-reliance on one funding source. In a properly functioning and liquid interbank money market, the funding decision will be "price sensitive," whereby the cost or return will largely be the sole determinant of whether to fund in local or foreign currency. (Where a price differential exists and all else is equal, arbitrage traders will quickly eliminate any significant differential by borrowing in one market, swapping the currency and lending or investing in another, and bringing the markets into equilibrium.) This is particularly the case in interbank money markets where considerations of mismatching maturities within internal tolerances is an integral part of book management—and also where liquidity issues are less significant given the short-dated nature of the transactions and bank status of participants.

The differential may result from intentional regulations limiting market activity or from external factors that inhibit market efficiency.

Examples of these include (a) limited access to local currency for foreign banks based on regulation and the effective existence of a two-tier "onshore and offshore" market; (b) central bank rules that determine acceptable purposes for LCY transactions (such as trade-based dealings); (c) lack of liquidity in one currency and or thin market participation; (d) restricted access to foreign currency; and, (e) insufficient dealing, credit, or settlement lines between participants.

The creation of a currency exposure is as complicated as it is important for both end-users of the funds and the small investors who have limited portfolio diversification.

Where an efficient, open, and liquid short-dated market operates, the currency funding decision for interbank trading is a straightforward price consideration and is usually free from other factors. This is not necessarily the case outside interbank markets, where the situation can be quite different, particularly for corporate participants in the real economy. In contrast to the interbank borrower, a manufacturer will require funding to build and operate a plant, fund inventory, and provide working capital. In this situation, considerations are quite different from those of the short-term money market and its interbank users.

Factors to consider include: (a) which currency would offer the longer duration and best fits with the end needs of matching the durations of financial liabilities against financial or physical assets; (b) the ability of the non-bank or commercial borrower to access foreign currency funding efficiently; (c) whether the credit quality of the borrower is sufficient to access capital markets directly through bond issuance or is the borrower limited to bank loans; (d) depending on the currency of assets and cash flows, whether borrowing in another currency is an option, which could open foreign exchange exposures beyond what can be efficiently hedged; and (e) how to minimize interest rate exposure by determining which currency can provide longer-dated fixed rates rather than floating-rate exposure.

The real economy borrower will need to look at pricing as only one component of the decision making process.

This will ensure that funding is appropriate to his needs and financial risk is mitigated by transferring it to the lender or investor. For example, corporate funding through longer-dated, fixed-rate bond issuance in the currency of its cash flows will effectively be transferring the liquidity, interest rate, and currency risks to the buyer of the security for the duration of the bond; unlike a borrower of shorter-dated funds faced with multiple rollovers, each with a new interest rate setting.

In a mirror image of borrowers in the real economy, investors are faced with a similar situation in exposing investments to currency movements.

While a particular currency may offer higher rates of return than the local currency, there remains a similar risk to the kind experienced by the borrower in terms of currency volatility and its effect on absolute returns. While longer-dated portfolio investors may be able to incorporate this risk through a portfolio effect over a range of diversified exposures, the smaller investor will usually not have the benefit of diversification. The investor will expose expected returns to currency risks that may well overpower the benefit gained by the increased interest rate.

Policy Implications and Challenges—Bringing Money Markets Back to Life

Despite the diversity among emerging Asian markets, there is a common architecture that can enhance the development of individual markets.

- **A transparent and robust legal and regulatory framework** is a fundamental precondition for maintaining confidence in financial markets as participants look for certainty and enforceability of legal obligations. The regulatory environment will be enhanced by consistency in application to each market segment, which will provide the banking system with a clear roadmap of regulatory expectations and requirements. Prudent regulation and policy aimed at the appropriate bank capitalization in the marketplace is particularly important where a market includes

a large number of smaller financial institutions that may be encouraged to consolidate to achieve sufficient size in both capitalization and balance sheets.

- **A credible central bank policy and market activity supportive of policy objectives** are essential for market confidence. Information flows and the flexibility of open market operations are important to increase confidence in the central bank's willingness and ability to ensure the smooth functioning of the system. Liquidity injections and broadening acceptable securities for repos is a recent example of central bank policy flexibility.

- **Effective risk management processes**—applied at both the regulatory levels and by individual participants—are important to instill confidence in other market participants and the risk profile of the market itself. A risk management system that recognizes imbalances in a financial system and provides early warnings that can instigate policy responses can assist in building confidence. Cross-border collaboration with regional policymakers, regulators, and market participants will encourage mutual oversights and best practices.

- **Continued liberalization of domestic financial markets** and the encouragement of foreign bank and skilled labor to participate in local markets will create deep and functioning markets able to respond to the underlying financial needs of the economy. It also promotes the market's ability to efficiently allocate financial resources. Foreign bank competition within the domestic market also tends to enhance efficiency as technology and international practices are imported and find their way into domestic institutions and the local marketplace. In addition, a market looking to develop its financial system may more quickly import expertise rather than cultivate it domestically, thereby shortening the ramp-up period toward full development. A competitive taxation regime could also help drive regional competition for financial institutions to domicile themselves in one country over another.

- **Improved corporate governance** is crucial for the management of a financial institutions operations, for money market communication, and for boosting market confidence in financial institutions.

Liquidity in the region's money markets can be deepened by proactive financial policies and practices that encourage participation by a broad and diversified investor base.

- **Participation of broad and diversified investors** can contribute to the depth of financial markets. International banks can bring a different risk appetite as they break into new industry segments and develop a local customer base. Wider access of domestic institutions to the financial marketplace can also add depth by, for example, encouraging domestic investment vehicles and pension fund managers to use a broader set of investment products rather than simple money market deposits and government bonds. In particular, encouraging niche players that specialize in market sectors or have a particular strength can drive competitive pricing and depth in the market.

- **Product innovation** such as securitization of receivables or mortgage pools can provide a broader product range for alternative investments and drive efficiencies toward end-investors who will have a wider choice of competing products, as well as free-up the balance sheets of originating banks. Introducing derivatives and other hedging mechanisms can also help encourage liquidity and depth, while at the same time provide a mechanism to offset risk without liquidating underlying positions.

- **Effective market infrastructure and support systems**, such as trading and settlement systems, can better handle increased turnover and volumes, which will be required as markets grow and become more liquid. Such systems can also help facilitate information flows and technological advances—particularly for trading platforms that assist trading throughput—thereby increasing liquidity and putting downward pressure on volatility, and making risk management simpler.

- **A robust deposit base and stable funding platform**—giving attention to loan-to-deposit ratios—can help banks avoid imbalances and risks associated with too much dependence on wholesale funding markets. Enhanced credit, settlement, and market risk management systems can also increase confidence at the individual bank level, by ensuring

risks are within internal tolerances, and allow the banks to make full usage of lines extended to counterparties.

- **Effective distribution channels to secondary markets** can help offset securities and risk positions against an underlying real demand, and help reduce market risk of both parties and increase primary market operations.

- **Wider access to international capital markets** will help increase competition in onshore markets and drive both volumes and price efficiencies toward end-users.

Conclusion: Coming out of the Global Financial Turmoil Stronger

The transmission and impact of the financial crisis to otherwise healthy banking systems has highlighted the importance of addressing regulatory shortcomings and structural flaws that exist in some markets.

For a money market to function optimally in allocating financial resources, there needs to be deep and liquid markets operating with the broad participation of financial interests and a range of competing products and solutions. While the current crisis in the global banking system may tend to slow down market liberalization, a restricted market that does not encourage further development and competition is unlikely to be able to efficiently do its job. The underlying rationale remains the same. Consolidation of smaller banks, industry restructuring, and recapitalization may be necessary to strengthen the banking system and allow access to competing international markets. The benefits of more open and liberalized markets will be reflected in competitive pricing and access to financial solutions for the real economy for users who generate underlying economic activity and drive economic growth.

Improved liquidity management practices are central to ensuring that banks are aware of their structural liquidity position, measurement and modeling assumptions, and available buffers in the event of external shocks.

It is recognized that liquidity buffers are relatively expensive to maintain at elevated levels. However, the cost of holding short-dated cash and government paper as protection against unforeseen circumstances should be considered against the even more expensive alternatives. While it is not possible to predict every contingency, it is clear that widely used models and their implicit assumptions were deficient in dealing with the global financial crisis. In the future, models will need to be broadened and upgraded to consider a broader universe of potential outcomes. The logistics of providing the skill sets required in sufficient numbers for both regulators and market participants will undoubtedly prove to be both costly and challenging, particularly as the call for skilled supervisors and risk management practitioners rises with the increased demand. However, the financial crisis has demonstrated that these changes are both necessary and inevitable if a repeat of the current global turmoil is to be avoided.

Specific policy goals should include actions to ensure adequate consideration has been given to assumptions built into models.

These models should allow for exogenous and domestic shocks where possible:

- **Market participants should reassess assumptions about market liquidity conditions as well as the stability of secured funding that underlie existing risk-management practices.** The assumption that US dollar funding would be continually available at reasonable pricing, and could be rolled over indefinitely, was at the core of many funding models and structures. It obviously proved incorrect as multiple external demand shocks put that argument to rest. Future liquidity assumptions should be based on worst case scenarios and have alternatives available as committed facilities where appropriate to determine the adequate size of liquidity buffers. Liquidity models should consider differentials between securities types more than simply maturity patterns

in looking at liquidity availability, particularly between government and commercial securities. Stress testing for various levels of rated securities can help assess the stability of secured funding and to determine the risk that market liquidity for underlying collateral may become questionable. In such model-building, securities acceptable for repos could be included at full market value and variously rated CP could be given a discounted valuation for collateralization purposes.

- **Consideration should be given to extend temporary guarantees on a broad set of bank liabilities with the aim of reviving trade in money markets.** The extensive use of deposit insurance schemes and guarantees proved successful in protecting bank deposits from panic and for maintaining confidence between covered institutions and deposit types. Similarly, a guarantee covering wholesale international liabilities and debt issuance has allowed some global issuers to re-enter capital markets as 2009 unfolded and markets slowly thawed.

- **Develop stress testing for individual bank risk management models and the underlying assumptions of financial market regulators.** Regulation and supervisory guidance should be strengthened for money market participants with increased and more frequent supervision at the individual bank level, and particularly in regard to liquidity assumptions.

- **Strengthen financial market infrastructure and complement the supervisory efforts of regulators.** Measures may include the encouragement of markets for secured financing and OTC derivative markets to provide risk management tools and further liquidity options. Central banks can encourage development of markets and foster preferred banking practices by regulation or suasion of the regulated entities.

Asia Capital Markets Monitor April 2009

Asia's capital markets are starting to stabilize and the region's relatively resilient economies should help them recover as the global crisis ebbs and investor appetite returns, says the inaugural issue of ADB's Asia Capital Markets Monitor (ACMM). This new report reviews recent market developments in emerging Asia's stocks, bonds, and currencies along with the outlook, risks, and policy implications. It has a special section "Bringing Life to Asian Money Markets."

The ACMM was prepared by a team of economists from the Office of Regional Economic Integration (OREI) of the Asian Development Bank under the general guidance of Srinivasa Madhur. The team was led by Cyn-Young Park and the other primary contributors were Lotte Schou-Zibell and Sabyasachi Mitra. Robert Rigg and Cliff Tan also contributed to the report as OREI consultants. John Stuermer offered valuable inputs and research assistance together with members of AsiaBondsOnline, Asia Regional Integration Center and OREI's macro team.

The ACMM has been reviewed and approved by Jong-Wha Lee, Head of OREI.

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ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two thirds of the world's poor: 1.8 billion people who live on less than $2 a day, with 903 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

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