The international financial crisis: timeline, impact and policy responses in Asia and the Pacific[1]

Andrew Filardo, Jason George, Mico Loretan, Guonan Ma, Anella Munro, Ilhyock Shim, Philip Wooldridge, James Yetman and Haibin Zhu[2]

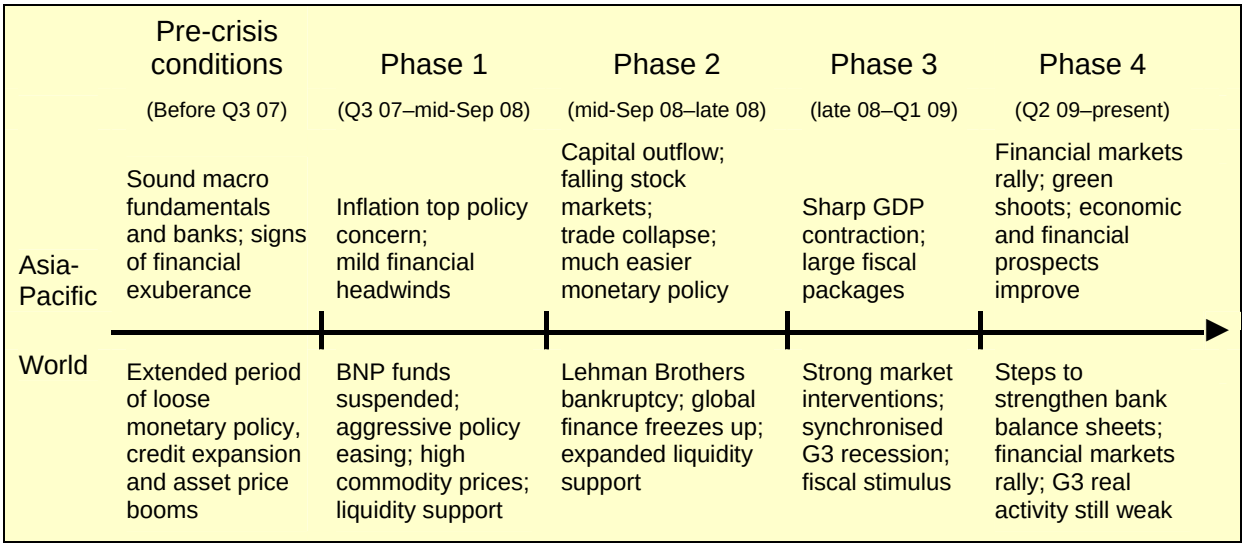
Introduction

This paper examines how the international financial crisis impacted Asia and the Pacific and discusses the implications of the crisis for central banks in the region. The paper consists of two parts. Part I presents a simplified timeline of the spillovers of the international financial crisis to the region, as well as some key factors that help explain cross-country differences in the impact of the crisis on Asia and the Pacific. Part II examines the effects of the crisis in more detail, exploring some of the policy challenges it poses through three lenses that correspond to the research priorities of the BIS Asian Research Programme (ARP): monetary policy and exchange rates, development of financial markets, and financial stability. The paper highlights the role of the research output from the ARP in illuminating these challenges for central banks. The focus throughout the paper is on twelve regional economies: Australia, China, Hong Kong SAR (hereafter Hong Kong), India, Indonesia, Japan, South Korea (hereafter Korea), Malaysia, New Zealand, the Philippines, Singapore and Thailand.

[1] This paper was written for the wrap-up conference of the Asian Research Programme by staff at the BIS Representative Office for Asia and the Pacific. Excellent research assistance was provided by Eric Chan, Clara García, and Marek Raczko. We thank Susan Black, Piti Disyatat, Luci Ellis, Prasanna Gai, Eloisa Glindro, Dong He, Janak Raj, Edward Robinson, Toshitaka Sekine, Sukhdave Singh, Grant Spencer, Tientip Subhanij, Seonghun Yun and our colleagues in Basel for comments. The views expressed here are those of the authors and not necessarily those of the BIS.

[2] Staff at the BIS Asian Research Programme.

Part I: Timeline[3]



This section provides an overview of what happened in the Asia-Pacific region, focusing on the impact and propagation of the international financial crisis to the region, as well as on the range of policy actions that were taken. It describes the four main phases of the crisis in Asia and the Pacific, and it concludes with a brief discussion of the factors that help to explain the diverse cross-country experiences in the region.

Pre-crisis conditions

The region as a whole came into the international financial crisis with a sound set of economic and financial fundamentals.

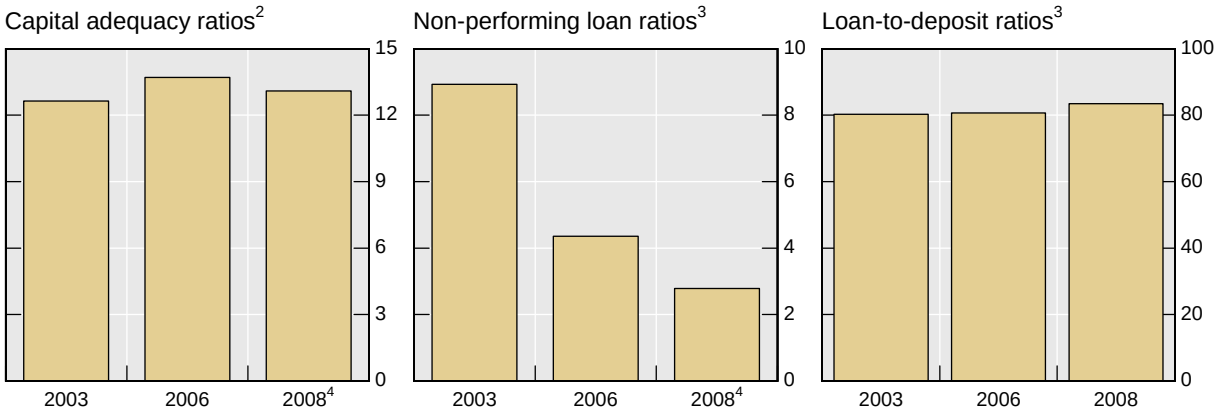
Banking systems were generally healthy (Graph I.1). Banking systems were strengthened due in large part to favourable economic conditions, as well as conservative bank regulators. Reported capital adequacy exceeded 10% of total risk-weighted assets in most economies, and non-performing loan ratios were low and declining secularly across the region. The traditional banking model remained dominant. Loan-to-deposit ratios of less than 100% in most economies reflected relatively low reliance on wholesale funding. At the same time, financial markets in the region benefited from improvements in the quality of payment systems and market microstructure. In bond markets, the range of issuers and both the maturity and liquidity of issues increased.

Inflation was well behaved, with underlying inflation trends low and relatively stable (Graph I.2, left-hand panel). Monetary policy had generally been viewed as successful in bringing inflation under control in the 2000s, especially in terms of core inflation. Even focusing on headline inflation, the rate of price change was low and stable in Korea, Malaysia, the Philippines and Thailand, while Indonesia had seen inflation drop from the high teens of previous years to a steady 6%.

[3] See the 2009 BIS Annual Report for a detailed description of the unfolding of the international financial crisis.

Graph I.1

Soundness of banking systems in Asia-Pacific[1]



[1] In per cent. Unweighted average for Australia, China, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore and Thailand. [2] Total capital as a percentage of total risk-weighted assets. [3] Definitions may vary across economies. [4] For 2008, latest available figure in GFSR is used.

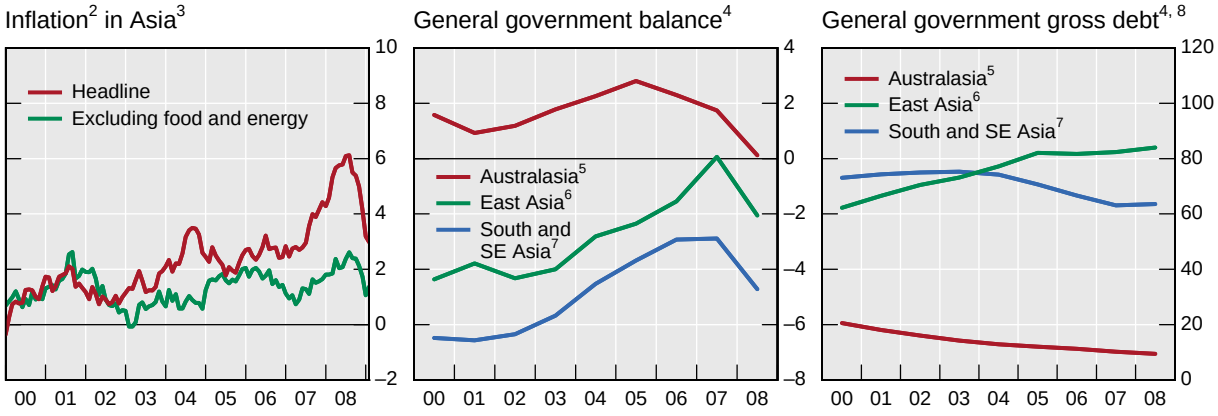
Sources: IMF Global Financial Stability Report; national data.

Government fiscal positions were healthy in most economies (Graph I.2, centre and right-hand panels). Consistently strong economic growth and sound medium-term fiscal frameworks kept deficits at bay and debt levels sustainable. Australia, China, Hong Kong, Korea, New Zealand, Singapore and Thailand enjoyed budget surpluses in 2007, and debt was falling as a percentage of GDP in all regional economies.

Official reserves were generally thought to be ample (Graph I.3). In many economies in the region, managed exchange rates and current account surpluses kept foreign exchange reserves flowing in. Indeed, reserve levels exceeded 100% of short-term external debt by mid-2007 in most economies in the region.

Graph I.2

Inflation and public finance in Asia-Pacific[1]



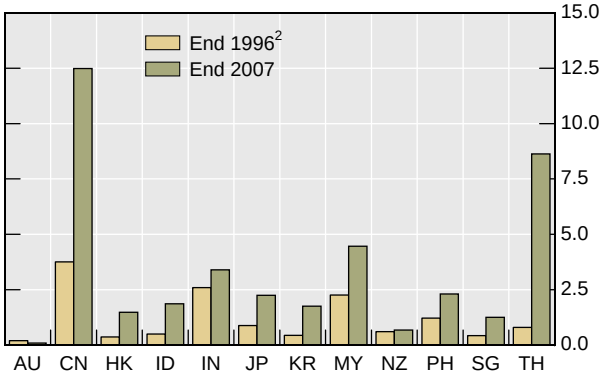
[1] In per cent; aggregates refer to weighted averages based on 2005 GDP and PPP exchange rates. [2] Twelve-month changes in consumer prices. [3] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore and Thailand. [4] As a percentage of GDP. [5] Australia and New Zealand. [6] China, Hong Kong SAR, Japan and Korea. [7] Singapore,, India, Indonesia, Malaysia, the Philippines and Thailand. [8] For China, net debt.

Sources: OECD; CEIC, © Consensus Economics; Datastream; national data; BIS calculations.

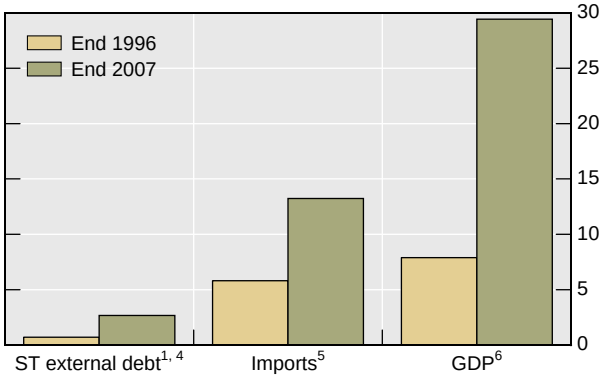
Graph I.3

Foreign exchange reserves

As a ratio of short-term external debt[1]



Measures of adequacy in Asia-Pacific[3]



AU = Australia; CN = China; HK = Hong Kong SAR; ID = Indonesia; IN = India; JP = Japan; KR = Korea; MY = Malaysia; NZ = New Zealand; PH = Philippines; SG = Singapore; TH = Thailand.

[1] Short-term external debt comprises consolidated international claims of BIS reporting banks with a maturity up to and including one year, plus international debt securities outstanding with a maturity up to one year. [2] For Japan, 1999. [3] Refers to the average over Australia, China, Hong Kong SAR, Indonesia, India, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand. [4] Ratio of short-term external debt. [5] Months of imports. [6] In per cent.

Sources: IMF; Datastream; national data; BIS.

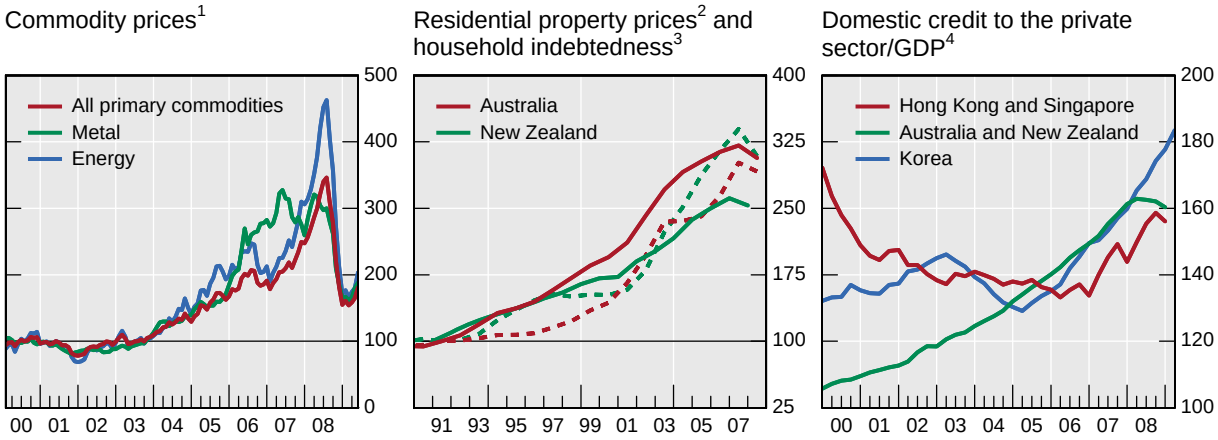
All these pre-crisis conditions reflected a decade of lessons learnt from the Asian financial crisis of 1997–98 and the subsequent efforts in the region to strengthen the foundations for sustained economic growth. It is important to remember the seminal nature of that crisis on the thinking of policymakers. The Asian crisis hit economies hard, as large capital inflows reversed course sharply in Thailand, Indonesia and Korea. Real GDP fell by more than 8% year on year in Hong Kong, Indonesia, Korea, Malaysia and Thailand, and by lesser amounts elsewhere. (See Box I for a comparison of the Asian crisis with the current international financial crisis).

Despite the underlying strength of the economic and financial fundamentals during the run-up to the current international financial crisis, there were several near-term risks to the outlook in the region (Graph I.4). For one, monetary policymakers were concerned about the possible consequences of the commodity price boom for inflation and inflation expectations, especially as spare economic capacity in the region, and globally, was declining. There were also economic and balance sheet adjustments in economies that had experienced asset price booms, particularly in real estate markets, and increasing household indebtedness and rapid credit growth in some economies. On the whole, however, such vulnerabilities by themselves were fairly limited.

On the international side, there were some additional reasons for concern. Cross-border financial activity in the region was booming. For example, the gross value of financial account transactions increased by a factor of more than three in Korea, Malaysia and Singapore in the two years prior to the international crisis, with most of the change accounted for by increased portfolio investment. This heightened potential vulnerability to capital reversals. A number of economies ran large and persistent current account imbalances, including deficits in Australia and New Zealand and surpluses in China and a few others.

Graph I.4

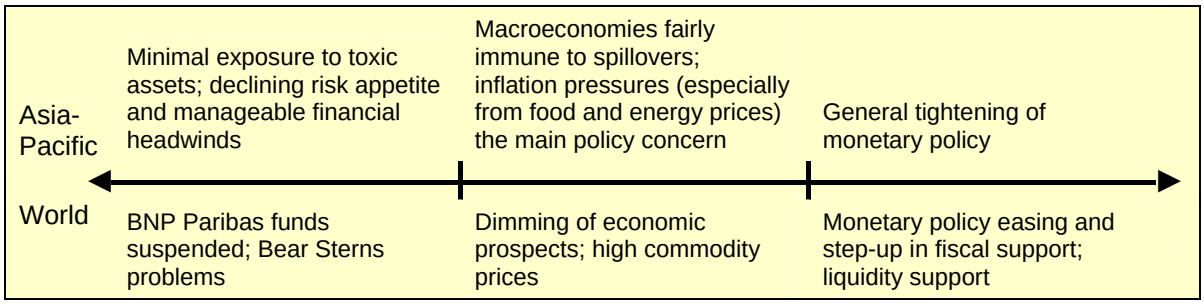
Selected vulnerability indicators



[1] 2000 = 100. [2] Dashed lines; 1991 = 100. [3] Solid lines; 1991 = 100. Total household debt as a percentage of household disposable income. [4] Weighted averages based on 2005 GDP and PPP exchange rates of the economies shown.

Sources: IMF; OECD; national data.

Phase 1: Initial financial turmoil (Q3 2007–mid-September 2008)



Up until mid-2007, global financial markets were still buoyant. Indeed, equity indices were hitting new highs, and rapid credit growth in the United States had led to a rapid expansion of assets associated with innovations in financial engineering, including those based on subprime mortgages that were to become infamous.

Early in the third quarter of 2007, however, global markets reversed course. The increasing inability of market participants to price some risky assets, highlighted by BNP Paribas's announcement to this effect on 9 August, signalled the start of the financial crisis. At first, the turmoil seemed isolated and manageable. But the breakdown in interbank markets soon necessitated large liquidity injections by many major central banks, including those in Australia and Japan, to help restore more orderly conditions.

Underlying the turmoil was an underpricing of risk, especially credit risk. Concerns initially focussed on structured credit products, particularly securities backed by US subprime mortgages, on the balance sheets of major financial institutions. These toxic assets themselves had little direct impact on banks in Asia and the Pacific, as the exposures to them were small. Initially, confidence about the region suffered, but as information indicating that the exposures were minimal spread in financial markets, Asia-Pacific economies were spared the worst. In Thailand, for example, banks held collateralised debt obligations (CDOs)

representing just 0.04% of their balance sheets. Those banks with some exposure to CDOs, such as banks in Singapore, held relatively safe assets and were generally much less leveraged than those in the United States and Europe. Therefore, they were not particularly vulnerable to a collapse in the valuations of structured credit products.

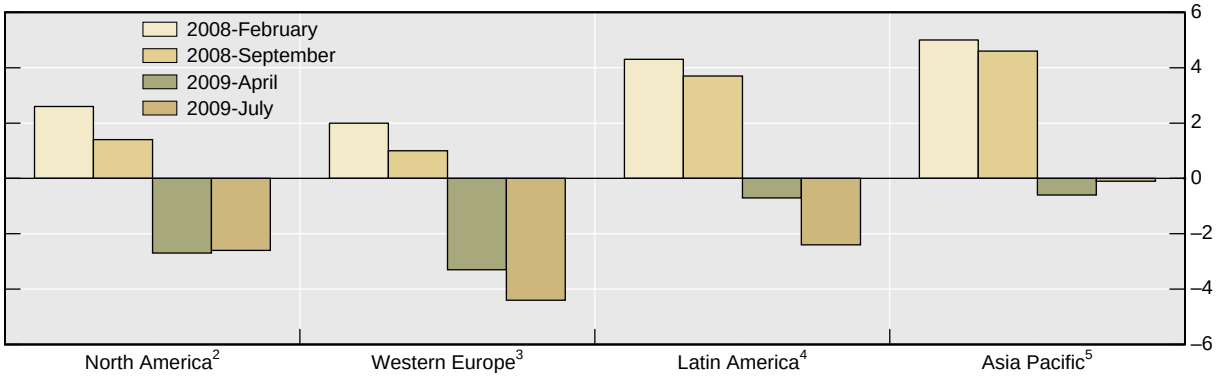
The initial turmoil did have some important indirect effects, as the risk appetites of global investors declined. Low-grade borrowers, such as those from India, Indonesia and the Philippines, lost access to markets. High-grade borrowers with large external financing requirements faced much higher funding costs over time. Australian and New Zealand banks recognised the changing risk profile of their funding early on and during Phase 1 extended the maturity of their foreign liabilities and prefunded maturing obligations.

Decreasing risk appetite also affected other markets in early 2008. Portfolio investment reversed course and became moderate outflows in Hong Kong, Japan and Korea, while the unwinding of the carry trade by institutional investors saw the yen reach 12-year highs against the US dollar in March 2008 following the takeover of Bear Stearns. Securitisation markets in Australia, important for funding housing credit, dried up.

Meanwhile, the relative resilience of Asia-Pacific economies led to suggestions that the region might decouple economically from the rest of the world. Such views were particularly prevalent as the pace of economic activity in the United States and Europe began to slow in early 2008 while prospects for Asia-Pacific economies remained strong (Graph I.5). Indeed, commodity prices continued their upward trajectory, with the price of oil finally peaking at nearly $150 a barrel in July 2008. Food prices were also surging on higher global demand; in July, prices stood around 50% higher than a year earlier. For economies in which food and energy prices were a major share of the typical consumption basket, the headline inflation pressures mounted.

Graph I.5

Consensus Economics GDP growth forecasts for 2009[1]



[1] GDP forecast for 2009; regional totals are weighted averages calculated using 2007 GDP weights, converted at average 2007 exchange rates. [2] Canada and the United States. [3] Denmark, the euro area, Norway, Sweden, Switzerland and the United Kingdom. [4] Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. [5] Australia, China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Sri Lanka, Thailand and Vietnam.

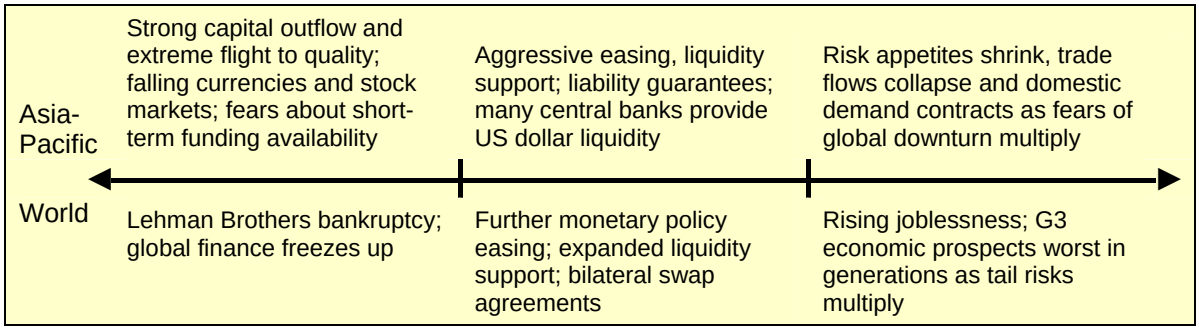
Source: © Consensus Economics.

Thus, despite the financial headwinds blowing from the United States and Europe, inflation pressures remained the key policy concern for many central banks through the middle of 2008. Accordingly, many central banks in the region pursued a tighter monetary policy stance. In India and Indonesia, for example, where inflation peaked at over 12% in August–September 2008, policy rates were raised by 175 and 125 basis points respectively in the first eight months of 2008. Smaller policy rate increases were seen elsewhere in the region.

There were exceptions. Malaysia, while concerned about inflation, emphasised the downside risks associated with the expected fallout from the global slowdown later in the year, and kept rates fixed even as inflation surged to 8.5%. Japan held its very low policy rate of 0.5% throughout this period as concerns about the financial headwinds and the durability of the incipient expansion weighed on the minds of policymakers. In July, however, the Reserve Bank of New Zealand started lowering its relatively high policy rates due to a slowing domestic economy and increased funding costs faced by banks.

By the end of this period, the downside risks to economic activity and the upside risks to inflation in the region were seen as largely balanced, given the policy adjustments in the middle of the year. True, additional policy actions were still being contemplated, as spillovers from the international financial crisis were materialising. Declining equity prices in Japan had also started to impact on banks' capital adequacy due to large cross-holdings. But banks in the region were still able to raise funds, despite some financial market segments still being effectively closed. But few were anticipating what was about to happen, in terms of both its swiftness and severity.

Phase 2: Sharp financial market deterioration (mid-September 2008–late 2008)



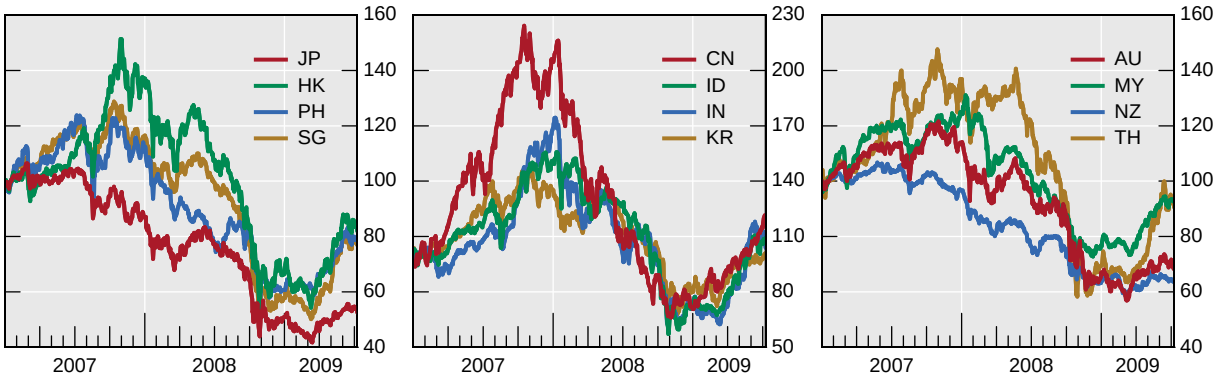
Together with the rest of the world, prospects for Asia and the Pacific abruptly changed in mid-September 2008 with the bankruptcy of Lehman Brothers. This phase of the crisis posed much stronger policy challenges to the central banks in the region than the earlier phase. The initial consequences were a crisis of market confidence and a dramatic collapse in risk appetites that spilled over to the region with unprecedented intensity. An extreme flight to quality led to massive sell-offs by international investors in many markets in the region. Excluding China, Asia-Pacific equity indices dropped an average of almost 40% in two months, with those in Japan falling 23% in just four consecutive days (Graph I.6). CDS indices in North America, Europe, Asia and the Pacific as well as the CDS spreads of major banks in all these regions jumped up immediately after mid-September 2008 (Graph I.7).

Capital flight from the region, together with the continued reversal of the carry trade, was accompanied by sharp depreciations (exceeding 20%) of the rupiah, won and Australian and New Zealand dollars. The rupee hit six-year lows in October, despite heavy intervention, and cash rates in India rose to almost 20%. As regional investors sought to reduce exposure to any but the most secure assets, borrowers struggled to roll over debt. The shortage of liquidity in the region, in turn, inhibited the ability of markets to intermediate funds smoothly, resulting in disorderly market conditions. This general market stress fed further regional contagion and a spike in counterparty risks.

Graph I.6

Equity prices in Asia-Pacific

Jan 2007 = 100



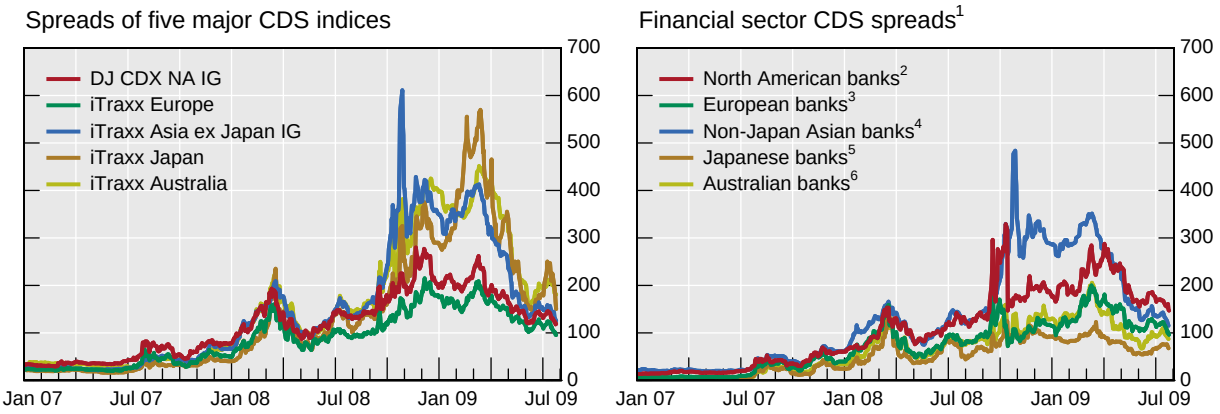
For an explanation of the economy abbreviations, see Graph I.3.

Source: Datastream.

Graph I.7

Changes in CDS spreads in the US, Europe and Asia-Pacific

In basis points



[1] Equally weighted average five-year senior CDS spreads. [2] Eleven banks headquartered in North America. [3] Twelve banks headquartered in Europe. [4] Seventeen banks headquartered in non-Japan Asia. [5] Three banks headquartered in Japan. [6] Four banks headquartered in Australia.

Sources: Datastream; JPMorgan Chase; Markit; BIS calculations.

Despite persistently high headline inflation, the combination of a deteriorating outlook, a rapid reversal in commodity prices and financial stability concerns led to an array of policy responses (Table I.1). Many of the actions were preventive in nature as downside tail risks multiplied. With respect to monetary policy, policy rates and required reserve ratios were cut sharply. By year-end, all regional central banks had aggressively eased the stance of monetary policy. In the case of New Zealand, the cumulative decline in the policy rate was 325 basis points. In addition, China, India, Indonesia and the Philippines had lowered reserve requirements.

Beyond these conventional monetary policy measures, additional steps to restore market confidence and to improve the performance of markets were also taken. Local currency liquidity support was expanded in many economies, with various measures focusing on extended maturity of financing and broadened eligibility of collateral. In addition,

governments and central banks provided liquidity assistance in foreign currencies, injected capital into banks, offered guarantees for the liabilities of financial institutions and directly supported asset prices. Some economies also benefited from bilateral swap facilities with the Federal Reserve, and additional bilateral swaps within the region were increasingly discussed.

Trade activity fell rapidly, driving increased concern about the real economy. By December, aggregate exports from Asia were down 18% year on year, with imports declining at a similar rate, prompting many governments in the region to introduce special programmes to support trade finance. In addition to the monetary policy stimulus already in play, governments announced aggressive fiscal stimulus, amounting to approximately 1% of GDP in Australia, Malaysia and Thailand, and a massive 13% in China.

Table I.1

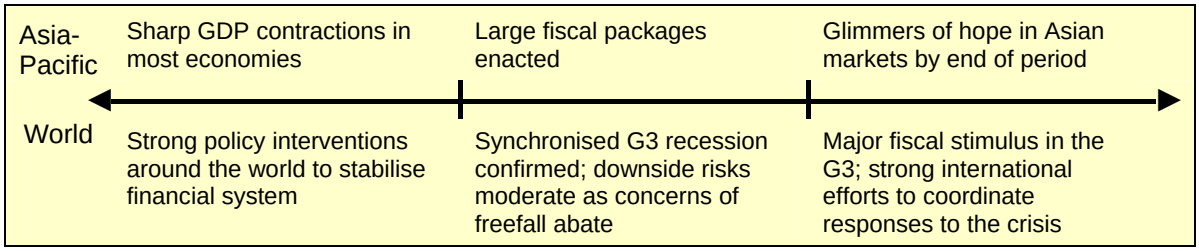
Summary of policy actions taken in North America, Europe, Asia and the Pacific[1]

	CA	US	EU	CH	UK	AU	CN	HK	IN	ID	JP	KR	MY	NZ	PH	SG	TH
Ease monetary policy	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Introduce fiscal stimulus		√	√		√	√	√	√	√	√	√	√	√	√	√	√	√
Liquidity assistance in local currency	√	√	√	√	√	√		√	√	√	√	√		√	√		
Lend foreign exchange	√		√	√	√	√			√	√	√	√		√	√	√	
Expand deposit insurance		√	√		√	√		√		√		√	√	√	√	√	√
Guarantee non-deposit liabilities	√	√	√		√	√						√		√			
Prepare bank capital injection		√	√	√	√		√	√	√		√	√					√
Create demand for assets	√	√	√	√		√	√		√	√	√	√	√				
Impose short sale restrictions	√	√	√	√	√	√		√		√	√	√				√	
Relax mark to market rules		√	√[2]	√	√					√	√	√	√		√		

CA = Canada; US = United States; EU = Euro area; CH = Switzerland; UK = United Kingdom; AU = Australia; CN = China; HK = Hong Kong SAR; IN = India; ID = Indonesia; JP = Japan; KR = Korea; MY = Malaysia; NZ = New Zealand; PH = Philippines; SG = Singapore; TH = Thailand.

[1] As of July 2009. This table summarises policy actions proposed but not necessarily implemented. Details in Annex A. [2] Applies to economies whose companies report under IFRS.

Phase 3: Macroeconomic deterioration (late 2008–Q1 2009)



As 2008 drew to a close, many of the policy measures aimed at stabilising financial markets and shoring up the banking system were gaining traction, and attention naturally gravitated to the apparent freefall in the macroeconomy.

In retrospect, the strong explicit and implicit government guarantees played a significant role in calming markets. The fear that additional major financial institutions would be allowed to fail diminished, decreasing counterparty risk. Use of official reserves, and the establishment of bilateral swap arrangements with the Fed, mitigated liquidity shortages in local US dollar markets. Confidence was further boosted by other cooperative initiatives to increase available foreign currency funding, such as bilateral swaps among Asian economies and progress towards the eventual creation of a multilateral reserve pool under the Chiang Mai Initiative.

Banks in Australia, Japan and Korea were able to source new capital in the marketplace, and credit growth stabilised in many economies. Nonetheless, this newfound stability was punctuated by episodes of investor pessimism, and risk indicators remained elevated. Indeed, US, European and Japanese equity markets hit new lows in early March 2009.

In contrast to the gradual stabilisation of financial markets, exports and industrial production in Asia and the Pacific decelerated sharply. In the final months of 2008, exports fell sharply across the region (Graph I.8). Imports also declined, in many cases by more than exports (for example, in China, Hong Kong, Indonesia, New Zealand and Thailand). For highly open economies, including Hong Kong and Singapore, the effects of the fall in trade on the wider economy were particularly severe.

GDP growth slowed across the region. The change in annual growth rates between Q3 and Q4 2008 averaged –3.4%. The fall in growth was especially sharp in Thailand and Korea, which contracted by –3.4% and –4.2%, respectively, in Q4 2008 after posting positive growth in Q3. Growth in Hong Kong, Japan, New Zealand and Singapore started to slow in Phase 1, and by Q1 2009 each had endured three or more consecutive quarters of contracting GDP. At the other extreme, Indonesia saw only a modest slowdown, from 6.4% in Q3 2008 to 4.4% in Q1 2009. In India and China too, high growth rates were maintained, although they slowed relative to earlier performance.

Graph I.8

Trade[1] developments in Asia-Pacific

AU = Australia; NZ = New Zealand.

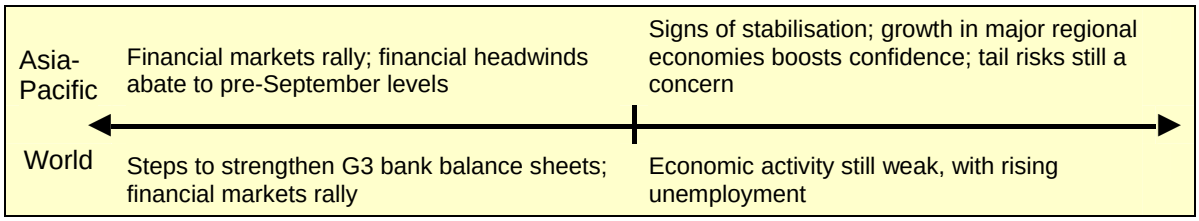
[1] Of goods. [2] Annual changes in per cent. [3] Weighted averages based on 2005 GDP and PPP exchange rates. [4] Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [5] In billions of US dollars.

Sources: Datastream; national data.

Substantial new monetary and fiscal policy measures were taken. New fiscal stimulus plans were announced across the region, amounting to 5% of GDP in Japan and 8% in both Malaysia and Singapore. Monetary policy easing also continued. By the end of March, policy rates were at record lows in Australia, Indonesia, Korea, New Zealand and the Philippines.

Towards the end of the first quarter of 2009, some tentative signs emerged that the region's economies were no longer in freefall.

Phase 4: Stabilisation and tentative signs of recovery (Q2 2009–present)



Even though the macroeconomy was still in decline, forward-looking indicators offered glimmers of hope in an otherwise grim situation. To be sure, indicators on the whole remained weak, with depressed investment and rising unemployment in most economies. Yet, in the first quarter of 2009, household consumption in Indonesia accelerated to 5.8%, and GDP growth in India of 5.8% significantly exceeded market expectations. In April, Japan's industrial output surged the most in 56 years, and monthly out-turns for exports improved for China, Hong Kong, Japan, Korea, Malaysia, New Zealand, the Philippines and Singapore.

Financial indicators also began to recover, as investors came back to the markets. Sovereign CDS spreads, though well above pre-crisis levels, continued to fall, and regional exchange rates were stable or appreciating. Stock markets rallied across the board from March, and sentiment surveys indicated expected improvement in Australia, China, Indonesia, Korea, New Zealand, the Philippines and Singapore.

Key policy challenges are currently being addressed with respect to monetary policy, the normalisation of financial markets and the strengthening of financial stability in the region. On the monetary policy side, central banks face a very challenging policy environment in which to navigate in the near term. Downside risks to economies in the region, and even a bout of entrenched deflation, continue to concern central bank policymakers at the end of the period under review. These concerns were being weighed against the fact that monetary stimulus already in the pipeline may be more than adequate to address these risks, and the chance that a surge in inflation might be in the offing if commodity prices rebound strongly.

On the financial markets side, the process of normalisation appears to be under way, but far from complete. Most of the policy initiatives adopted, both in and outside the region, are generally seen as being exceptional and are expected to be removed as the private sector goes back to playing the central role in financial markets. Questions about how best to facilitate that transition remain.

On the financial stability side, considerable efforts are being made to ensure that another financial crisis like the current one will never occur again. International and regional efforts continue to make progress towards filling in the prudential and regulatory gaps that emerged, and strengthening the overall international financial architecture.

Part II discusses all these issues, along with the attention increasingly focused on the need to ensure sound medium-term frameworks with respect to monetary, fiscal and prudential policies.

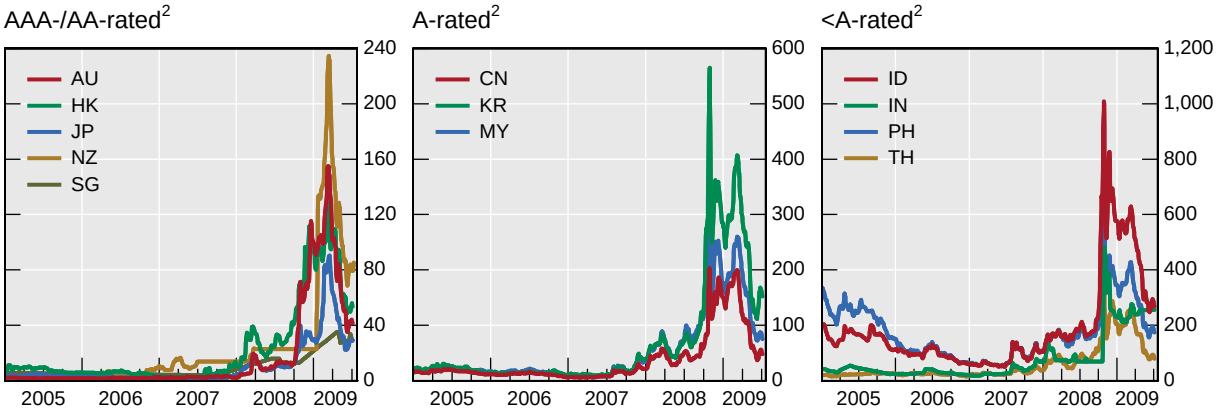
Cross-sectional variation within Asia-Pacific

While all Asia-Pacific economies have been affected by the international financial crisis, the nature and severity of the spillovers to regional financial markets and economies have varied considerably. While there are many details that characterise the differential impact of the crisis across the region, four key cross-country differences stand out as indicators of the nature and severity of the spillovers: sovereign CDS spreads, cross-border financial flows, exports and economic activity. We address each in turn.

Sovereign CDS spreads provide an indicator of risk aversion, together with a measure of the perceived riskiness of an economy. At one extreme, Hong Kong, Japan and Singapore, all highly rated, net creditor economies, each saw increases in spreads of less than 100 basis points in the aftermath of the bankruptcy of Lehman Brothers (Graph I.9). At the other extreme, spreads increased by approximately 500 basis points in India, Korea and the Philippines, and 885 basis points in Indonesia. In particular, Korea's CDS spread increased more than those of China, Malaysia and Thailand. Kim (2009) explains this by showing that CDS spreads of economies which have experienced a crisis or default, or have high capital mobility and a large equity market compared to GDP, tend to increase more than those of economies which do not.

Graph I.9

Five-year CDS sovereign spreads[1]



For an explanation of the economy abbreviations, see Graph I.3.

[1] In basis points; five-day moving average. [2] For each economy, the mode of the ratings from the three major rating agencies is used.

Source: Markit.

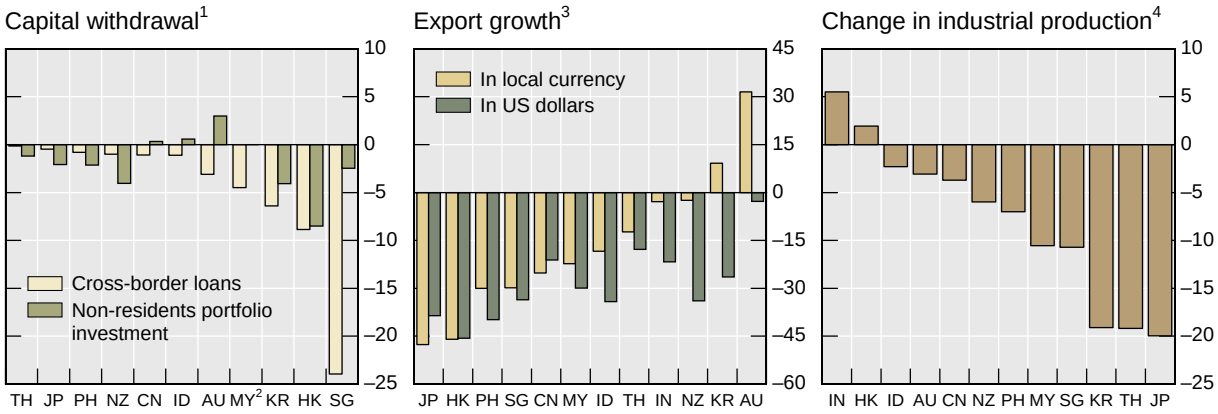
A different type of financial stress is indicated by the extent of disintermediation associated with the retreat of international banks, and difficulty in accessing credit. Credit withdrawals were experienced in all Asia-Pacific economies. The credit crunch manifested itself initially in outflows of relatively liquid portfolio investment, and subsequently in the difficulty of rolling over maturing US dollar debt as liquidity pressures mounted (Graph I.10, left-hand panel). The drop in cross-border loans, as a percentage of GDP, was largest in the financial centres of Singapore and Hong Kong. Portfolio outflows were largest in Korea and New Zealand, which have liquid and open equity markets, and Malaysia, which has a large domestic bond market with significant foreign participation.

The impact of the adverse macroeconomic shock hitting the region was most clearly reflected in the adjustment of exports (Graph I.10, centre panel). The decline in trade was particularly evident where exports were concentrated in high-end manufactures (for example, autos and electronics) and investment goods, and destined for US markets. In US dollar terms, the fall in exports was pronounced, partly reflecting the sharp appreciation of the US

dollar. In domestic currency terms, the negative impact was generally more modest. In contrast to exports, the impact of net trade on GDP tended to be small, as imports also declined dramatically, in some cases by more than exports.

Graph I.10

Impacts of the international financial crisis on capital flows, exports and industrial production



For an explanation of the economy abbreviations, see Graph I.3.

[1] Q4 2008 data for cross-border loans and 2008 annual data for non-resident portfolio investment (gross flow), both as a percentage of 2008 GDP. [2] Data on non-resident portfolio investment not available. [3] January–February 2009 over January–February 2008. [4] December 2008 over June 2008; percentage change.

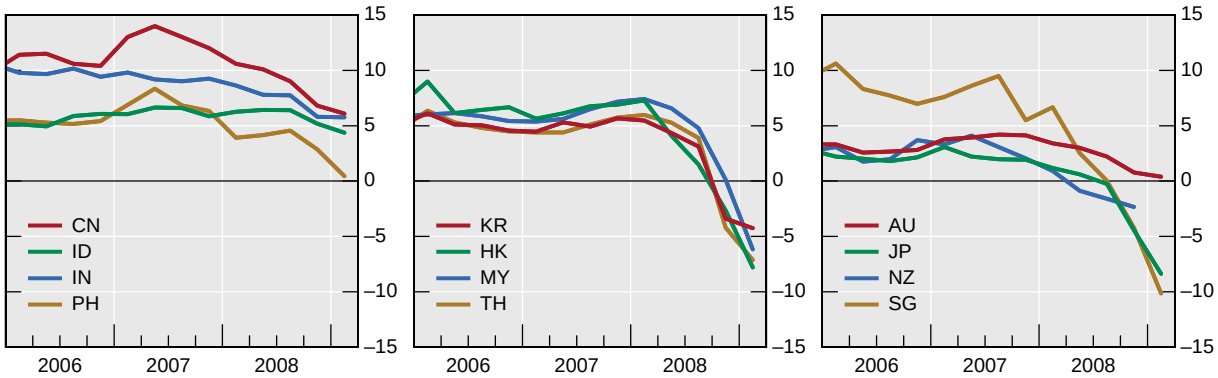
Sources: IMF; CEIC; Datastream; IMF; national data; BIS.

The output consequences of the international financial crisis were quite stark in some cases. Declining consumption, collapsing exports and inventory destocking resulted in falling industrial production in most economies (Graph I.10, right-hand panel). Japan, Thailand and Korea were hit hardest. Aside from the predominantly service-based Hong Kong economy, the only economy to experience expanding industrial production through the crisis was India where it increased by only 0.5% from October 2008 to March 2009. In terms of real GDP growth, the most affected economies were Hong Kong, Japan, Singapore and Thailand. In these economies, the rate of real growth fell by more than 9% (Graph I.11).

Graph I.11

Real GDP growth[1]

In per cent



For an explanation of the economy abbreviations, see Graph I.3.

[1] Annual changes.

Source: national data.

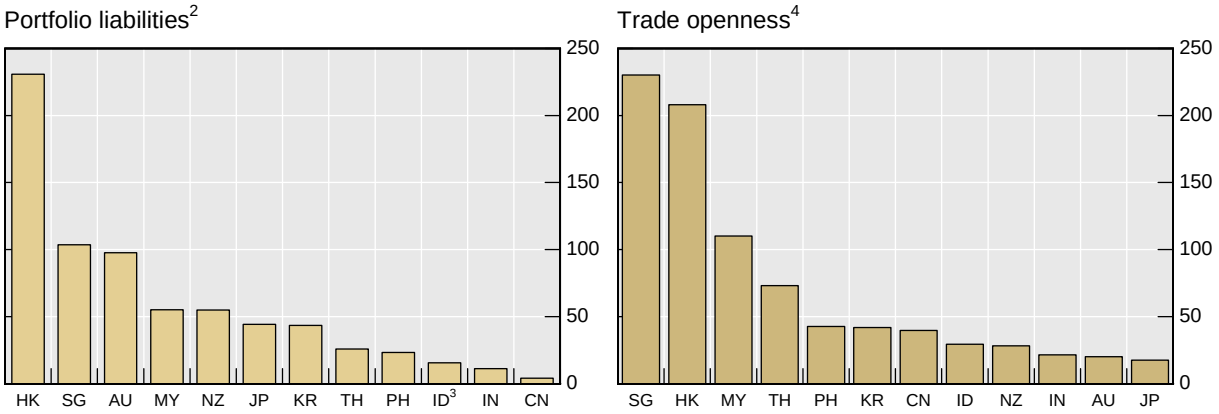
Digging a bit deeper into the forces at work in the region, we find it useful to look at the cross-country experience during the crisis through the lens of differences in vulnerabilities, and the effectiveness of buffers against those vulnerabilities. As outlined above, some economies were affected much more than others by the crisis. We account for this, focusing first on the effects of the crisis on the real economy, followed by financial markets.

The cross-country macroeconomic story is fairly straightforward. The economies most open to trade were also most vulnerable to the cutback in external demand. The economies with the highest share of exports to GDP (Graph I.12, right-hand panel) were China, Hong Kong, Korea, Malaysia, the Philippines, Singapore and Thailand. A key buffer that mitigated the effects of falling external demand was exchange rate flexibility. In Japan, exchange rate movements exacerbated the impact of weaker external demand because capital inflows caused the yen to appreciate (Graph I.13).

Another contributing factor to the macroeconomic story is the sectoral composition of output. The most exposed economies were those where high-end manufactures (autos in Japan and Korea, electronics in the Philippines and Singapore), transport (ships in Korea, shipping services in Singapore) and investment goods (Japan, Korea and China) were a large share of exports (Graph I.14).

Graph I.12

External vulnerabilities[1]



For an explanation of the economy abbreviations, see Graph I.3.

[1] As a percentage of GDP. [2] Defined as gross external portfolio liabilities in 2007. [3] 2006. [4] In terms of exports of goods and services in 2007; includes re-exports.

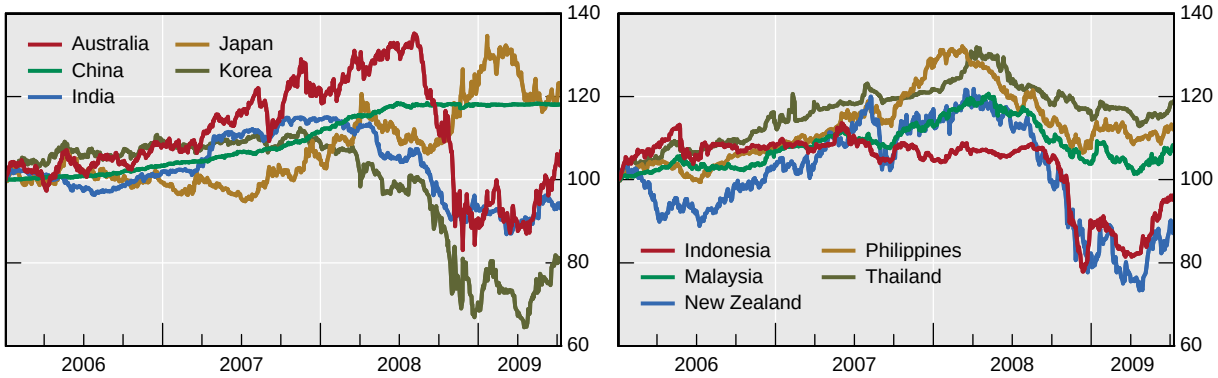
Sources: IMF; national data.

On the financial side, the explanation for the cross-country pattern is more complex. The vulnerabilities depended on the importance of particular funding markets, and various special factors.

Vulnerabilities associated with portfolio flows were related to the size and openness of equity and bond markets. Going into the crisis, portfolio liabilities were more than 50% of GDP in Australia, Hong Kong, Malaysia, New Zealand and Singapore, and only a little less in Japan and Korea (Graph I.12, left-hand panel). As risk appetite receded, the lower-rated economies suffered larger withdrawals relative to initial liabilities. While foreign capital was withdrawn from liquid markets in Hong Kong, Japan and Singapore, those economies had large external surpluses, and repatriation of capital more than offset capital withdrawal.

Graph I.13

Foreign exchange rates[1]



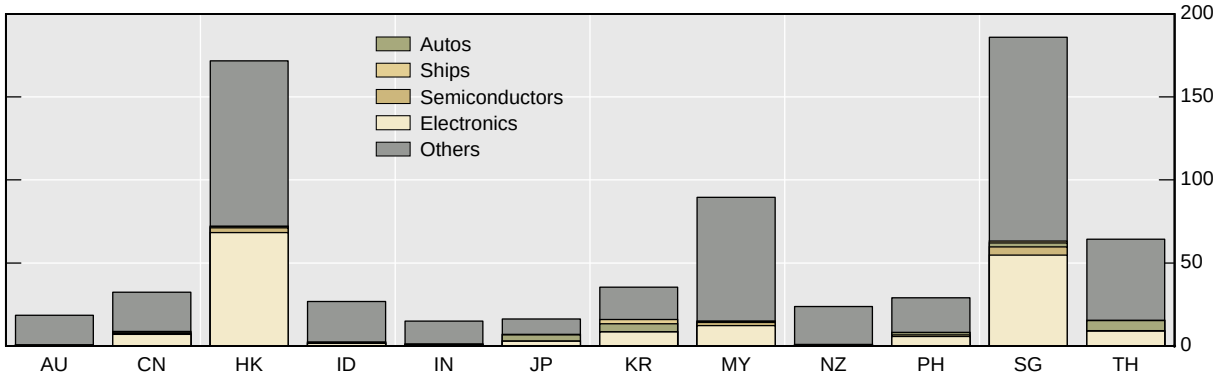
[1] US dollars per unit of local currency; 2 January 2006 = 100.

Source: Bloomberg.

Graph I.14

Exports as a percentage of GDP, by products[1]

In per cent



For an explanation of the economy abbreviations, see Graph I.3.

[1] Products are classified according to the HS standard of the United Nations Commodity Trade Statistics. Autos = 87; Electronics = 85 excluding 8541; Semiconductors = 8541; Ships = 89; Others = total minus the listed four categories. 2008 numbers (2007 for Japan and Korea).

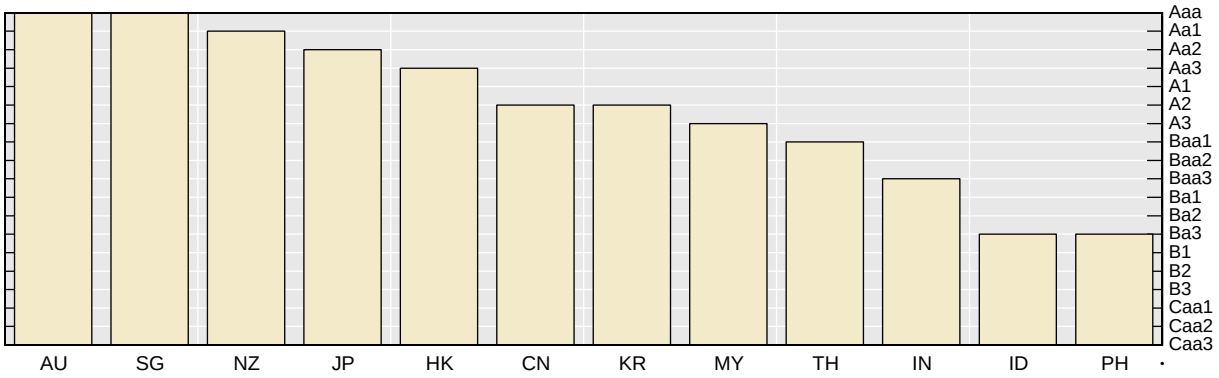
Sources: IMF, *World Economic Outlook*; United Nations Commodity Trade Statistics; BIS calculations.

Cross-border loans from BIS-reporting banks fell across the region, but to different extents. Cross-border loans to the financial centres of Hong Kong and Singapore were very high. However, a number of factors helped to buffer the financial markets of Hong Kong and Singapore against these vulnerabilities. For example, persistent current account surpluses, high sovereign ratings (AA– and AAA respectively; see Graph I.15) and expanded deposit insurance supported repatriation of capital, thus providing a substitute for external lending. Further, relatively stable exchange rates, which inhibited macroeconomic adjustment to the trade shock for these economies, increased the perception of the safety of their currencies, and so served as a buffer for financial markets as risk aversion rose. Nevertheless, the large role of financial services meant a fall in domestic demand as business activity slowed sharply in both economies.

Graph I.15

Credit ratings on long-term foreign currency sovereign debts for Asia-Pacific economies

Rating scale of Moody's Investors Services



For an explanation of the economy's abbreviations, see Graph I.3. As of June 2007. For each economy the mode of the ratings from the three major rating agencies is used. The equivalent rating scales from Standard & Poor's and Fitch Ratings are: AAA (Aaa), AA+ (Aa1), AA (Aa2), AA– (Aa3), A+ (A1), A (A2), A– (A3), BBB+ (Baa1), BBB (Baa2), BBB– (Baa3), BB+ (Ba1), BB (Ba2), BB– (Ba3), B+ (B1), B (B2), B– (B3), CCC+ (Caa1), CCC (Caa2) and CCC– (Caa3).

Sources: Fitch Ratings; Moody's Investors Services; Standard and Poor's.

In other economies with highly developed financial markets, the story varied. In Australia and New Zealand, the hedging of foreign currency liabilities meant that domestic currency liquidity was an effective substitute for foreign currency lending. In Japan, repatriation of capital mitigated foreign currency liquidity pressures. However, this also caused the exchange rate to appreciate, reinforcing pressures on the trade side.

Korea provides an illustration of the importance of additional factors in determining the impact of financial spillovers. In contrast to Australia, Hong Kong, Japan, New Zealand and Singapore, Korea was much more affected by capital outflows. Outflows began earlier, in Q3 2007, and continued throughout the crisis. By December 2008, over $70 billion (7.7% of GDP) had been withdrawn from Korea's equity market by non-residents. When foreign currency liquidity pressures became severe, the central bank rapidly scaled up liquidity provision. But credit guarantees, so effective in some other economies, were less so here due to Korea's foreign currency exposure. Substantial holdings of foreign currency reserves, however, proved useful in Korea's case: they were used both to smooth foreign exchange market volatility and, perhaps more importantly, to provide foreign currency liquidity to domestic banks and exporters. The foreign currency swaps from the Fed, China and Japan subsequently bolstered both confidence and the provision of foreign currency liquidity.

Other lower-rated economies in the region were also adversely affected during this time of heightened risk aversion and flight to quality. Borrowers in these economies either faced very high credit premia or were shunned by lenders altogether. However, being less financially open, these economies tended to have smaller initial exposures, and were therefore ultimately less vulnerable.

Another vulnerability related to trade credit. Trade credit is normally considered safe, with the traded goods serving as collateral; however, it is largely denominated in US dollars and short term in nature, so rollover of trade credit appears to have become difficult, especially for exporters in lower-rated economies, as US dollar funding markets and FX swap markets became dysfunctional at the height of the crisis. Expanded lending by domestic banks and regional "international" banks, together with guarantees by governments and (AAA-rated) multilateral agencies, all supported continued trade credit supply shortages during the crisis. Nonetheless, anecdotal evidence suggests that some firms, especially those exposed to

sectors and export destinations where demand contracted sharply, found it difficult to secure trade credit.

Box I

The Asian and international financial crises compared

A comparison of the current international financial crisis and the Asian financial crisis highlights some similarities, but many differences. One similarity between Asia a decade ago and the United States and western Europe now is that, on the eve of both crises, signs appeared of credit and asset price booms across a range of markets in the region, fuelled in part by strong capital inflows. Another similarity is that the economies at the centre of each crisis witnessed devastating meltdowns in their banking systems. In addition, in both crises Asia saw its equity markets plummet sharply and experienced large capital outflows.

The differences are equally stark. While the initial shock of the Asian crisis had its epicentre in Southeast Asia, the origins of the current international crisis lay outside the region. In contrast to the large current account deficits of 3–8% of GDP in the four most affected economies of the Asian crisis (Indonesia, Korea, the Philippines and Thailand), many Asia-Pacific economies now run sizeable current account surpluses. While the Asian crisis was a classical twin currency and banking crisis, the region's banking sector has today held up well to the spillovers from the United States and Europe, and economies have been flush with foreign reserves. This time the export powerhouses of Japan, Korea and Singapore have been harder hit, under the weight of collapsing trade flows.

The challenges facing regional policymakers are quite different today than they were a decade ago. While IMF-administered austerity measures featured prominently in the Asian crisis, most economies in the region now have chosen expansionary fiscal and monetary policies, and have eschewed overtures from the IMF for financial assistance. Last time, massive regional exchange rate devaluations and a strong US economy largely supported an export-led recovery; this time, a more home-grown recovery may be needed, owing to the retrenchment of US consumers, stubborn global imbalances and the limited depreciation of most Asian currencies. Finally, Asian policymakers are now actively participating in regional and international forums to devise strategies to combat the international financial crisis, to draw useful lessons from the crisis and to search for more robust global financial stability frameworks.

Table I.2

Impact of the Asian and international crises

	Exchange rate changes[1] (in per cent)		Stock market changes[2] (in per cent)		Change in GDP growth[3] (in percentage points)	
	Asian crisis[4]	**Intl crisis[5]**	**Asian crisis**	**Intl crisis**	**Asian crisis**	**Intl crisis**
Australia	–23	–32	–11	–51	–2.0	–3.8
China	0	12	–12	–71	–3.5	–6.5
Hong Kong SAR	–1	1	–56	–59	–15.3	–15.1
India	–20	–23	–35	–56	–1.3	–3.5
Indonesia	–83	–24	–62	–55	–23.5	–2.2
Japan	–21	36	–35	–58	–4.6	–11.0
Korea	–47	–37	–60	–49	–14.1	–9.9
Malaysia	–43	–14	–72	–40	–19.6	–13.6
New Zealand	–32	–36	–34	–41	–4.4	–6.2
Philippines	–40	–17	–58	–51	–8.4	–7.9
Singapore	–19	–11	–56	–58	–13.6	–19.6
Thailand	–53	–12	–68	–56	–13.3	–13.1

[1] Maximum depreciation (–) or appreciation (+) against the US dollar. [2] Peak-to-trough change in the benchmark stock market index. [3] Largest difference in year-on-year real GDP growth rates. [4] From June 1997 to June 2000. [5] From June 2007 to March 2009.

Sources: Bloomberg; BIS calculations.

Part II: Policy challenges in Asia and the Pacific

With the timeline as a background, we now consider the crisis through three lenses: monetary policy and exchange rates, financial market development and financial stability. In each case, we focus on the effects of the crisis, the policy responses and the challenges ahead.

II.1 Monetary policy and exchange rates

The international financial crisis was remarkable in its scope, size and synchronicity. Equally remarkable was the policy reaction to the intensification of spillovers to Asia and the Pacific in the post-Lehman bankruptcy period. This section briefly summarises some of the key monetary policy actions, putting them in the perspective of ongoing thinking about appropriate conduct of monetary policy during crises. We then turn to contemporary policy issues associated with exit strategies out of the crisis, and some lessons for thinking about monetary policy frameworks over the medium term. We conclude the section with some thoughts on optimal reserve levels in the light of the enhanced swap lines, and consequences for the effectiveness of monetary policy control if the region were to move away from export-led growth strategies in the future.

II.1.1 Regional monetary stability prior to the crisis

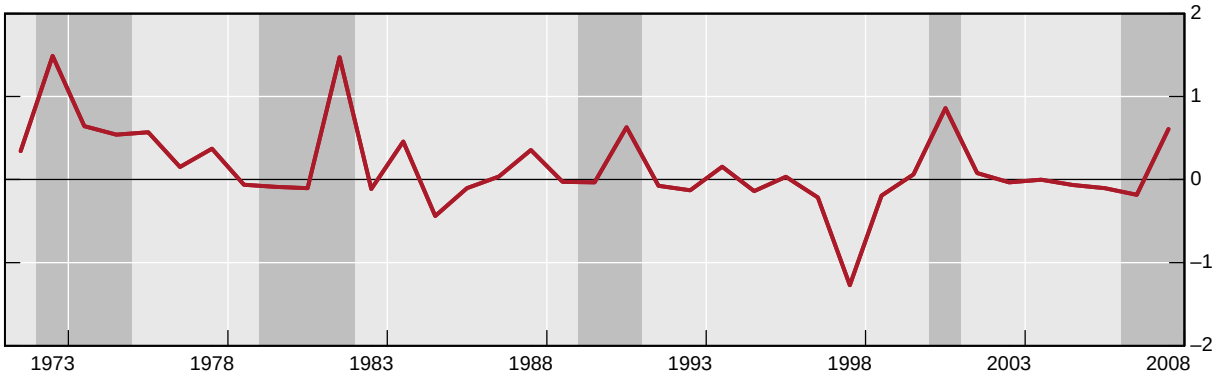
In the decade prior to the crisis, the region had achieved considerable success in promoting monetary stability. Inflation had generally stabilised, although price pressures were building in many economies in the run up to the crisis. Central banks focused clearly on maintaining price stability, whether achieved through interest rate or exchange rate management. Indeed, over the past decade, several central banks adopted formal inflation targeting regimes, and even those that did not assigned priority to inflation control in their policy frameworks. Evidence of regional central banks' success in this regard can be seen in a reduction in the inflation rate and inflation volatility. In addition, the region saw a general narrowing of the dispersion of private sector inflation forecasts, and the relative stability of inflation expectations, even during the crisis (Filardo and Genberg (2009)). Prudent progress towards price stability helped to promote real side performance, and uneventful exchange rate adjustments.

These positive developments even led in the first phase of the international crisis to consideration of the possibility that Asia could decouple economically and financially from the fates of the United States and Europe.[4] In the end, the spillovers from the recession and financial turmoil in the United States and Europe were too strong to avoid, despite the increased resilience of the region relative to the Asian crisis. Yetman (2009) shows that the sensitivity across economies around the globe to US recessions during the crisis was consistent with past cyclical correlations, and hence should not have been such a surprise (Graph II.1.1). Further, the rising degree of financial openness, when combined with deleveraging by international investors, provided an additional channel for the transmission of the crisis to Asia-Pacific (Devereux and Yetman (2009)).

[4] Decoupling hypotheses have generally emphasised that economies around the world appeared not to co-move as closely in recent decades as in the past. However, this evidence was partly misleading. Yetman (2009) shows that the decline in co-movement primarily reflects the greater duration of expansions in the West associated with the Great Moderation. Global linkages have always tended to strengthen significantly during recessions.

Graph II.1.1

Business cycle phase co-movement[1]



[1] Average co-movement of annual real GDP growth in Asia-Pacific economies with the United States. Shaded areas represent NBER-dated recessions. See Yetman (2009) for details on construction.

Sources: IMF; NBER; BIS calculations.

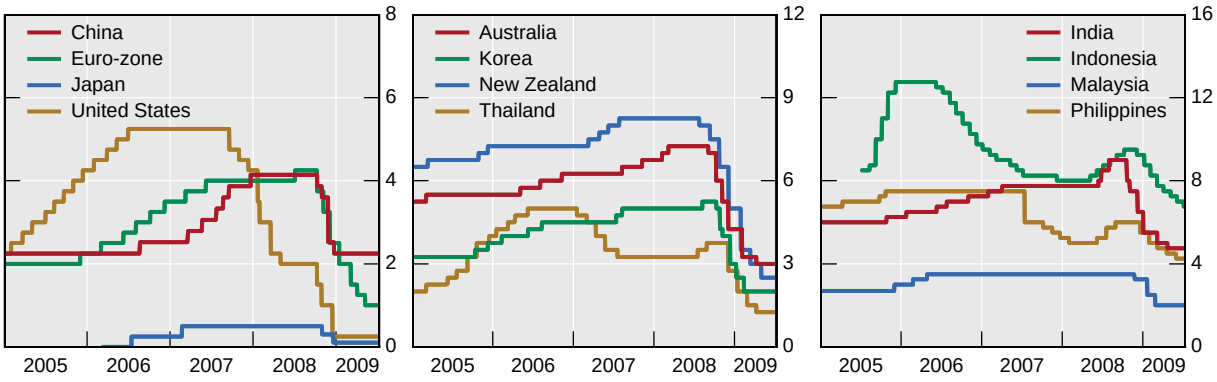
II.1.2 Policy responses during the crisis and their effectiveness

Monetary policymakers addressed the extreme financial and macroeconomic conditions with a diverse set of policy tools. Complementing fiscal and prudential policies adopted at the time, monetary policy actions included interest rate cuts, reduced reserve requirements, use of official reserves to stabilise foreign exchange markets and policies to expand domestic credit. Together these various actions greatly mitigated the impact of the crisis on Asia-Pacific economies and financial systems.

Graph II.1.2

Policy rates[1]

In per cent



[1] Policy target rates or their proxies. For China, household saving deposits one-year rate; for the euro area, ECB minimum bid refinancing one-week rate; for Japan, BoJ target rate; for the United States, fed funds rate; for Australia, RBA cash target rate; for Korea, overnight call rate target before 7 March 2008, one-week BOK Base Rate thereafter; for New Zealand official cash daily rate; for Thailand, 14-day repo rate before 17 January 2007, one-day repo thereafter; for India, RBI repo cutoff yield; for Indonesia, BI reference interest rate; for Malaysia, overnight policy rate; for the Philippines, overnight reserve repurchase agreement RRP daily rate.

Source: Bloomberg.

Asia-Pacific central banks cut policy rates aggressively following the Lehman bankruptcy (Graph II.1.2). The biggest rate reductions were seen in New Zealand (–500 basis points), India (–425 basis points), Australia (–400 basis points) and Korea (–325 basis points).

Singapore recentred the target band for the nominal effective exchange rate downwards, and adopted a zero appreciation path. In Indonesia and the Philippines, the first cuts in policy rates occurred later than in other parts of the region owing to inflationary and exchange rate pressures, and continued through mid-2009 after other central banks had paused.

Central banks complemented policy rate cuts with reductions in reserve requirements. China lowered its reserve requirement ratio for large banks by 2%, India decreased its cash reserve ratio by 4%, Indonesia cut its rupiah reserve requirement by 4.1%, Malaysia reduced its statutory reserve requirement by 3%, and the Philippines decreased its reserve requirement ratio by 2%. The reductions in reserve requirements were used to help boost liquidity in banking systems and, as a result, cushion pressures that might otherwise increase borrowing costs.

The sale of assets in the region by international banks, and subsequent pressure on domestic asset prices, exchange rates and local currency liquidity in late 2008, prompted an additional range of policy responses. As liquidity pressures spread to domestic financial markets and confidence fell, impairing the effectiveness of the interest rate transmission channel, Asia-Pacific central banks and governments supported the provision of credit through domestic currency liquidity support, expansion of deposit insurance, debt guarantees, asset purchases, bank capital injections, short sale restrictions and relaxation of mark to market rules (see Section II.3.2). Foreign exchange reserves and central bank access to swap lines were also used to smooth volatility in foreign exchange markets and, in some cases, provide foreign currency liquidity. Further, exchange rates were allowed to adjust to shifting capital flows, except in the case of Hong Kong, which operates a currency board.

Finally, as interest rates approached the zero lower bound in Japan, the Bank of Japan resorted to unconventional monetary policy measures. These included outright purchases of commercial paper and expanding the range of eligible collateral in order to ease liquidity conditions, as well as outright purchases of corporate debt securities to ease credit conditions. The BoJ balance sheet increased by 11.4 trillion yen in the half-year to 31 March 2009, with receivables under resale agreements, commercial paper and corporate bonds, loans and bills discounted, and foreign currency loans accounting for the lion's share of the increase. These measures resulted in some flattening of the yield curve, even though financial conditions in Japan as a whole remained relatively tight.

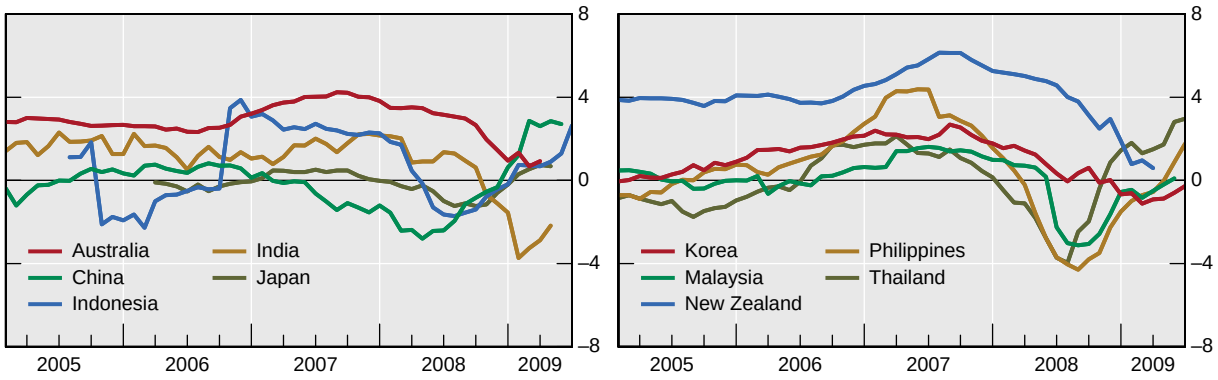
Questions about the effectiveness of unconventional easing measures remain uncertain. In the case of Japan earlier in the decade, quantitative easing appeared to have a greater impact via increasing the expected duration of the zero interest rate environment rather than by jump-starting bank lending, or pumping up domestic demand. In contrast, purchases of risky assets aimed at improving market functioning appear to have been relatively effective in depressing interest rates and improving borrowing conditions. However, uncertainty about the effectiveness of unconventional easing policies suggests that, as central banks approach the zero lower bound, it may be desirable to put more (asymmetric) weight on the downside risks than otherwise. The Japanese example also throws water on the concern that aggressively pumping liquidity into the financial system necessarily results in inflation overshooting. Nonetheless, such concerns cannot be ruled out in the current situation. With banks in the Asian region being relatively sound and in a strong position to lend, making a commitment to a timely exit of unconventional measures may be important.

One complication in reading the effective stance of monetary policy in the region has been the impact of inflation on real policy rates. While nominal monetary policy settings have been much lower since September 2008, the effective stimulus has been heavily influenced by the wide swings in inflation associated with commodity prices. Graph II.1.3 illustrates just how variable real conditions have been in the region. Real policy rates had already begun to fall across the region in mid-2007 as headline inflation picked up. Indeed, real policy rates were either close to zero or in negative territory for extended periods for all regional economies

except Australia and New Zealand (which may explain the large nominal interest rate cuts in those economies). At the time of writing, real rates were negative in India and Korea (based on an average of forward and backward looking measures of inflation). In recent months, real rates have been rising in many economies, despite the cuts in nominal rates, and particularly in China, the Philippines and Thailand as inflation rates have fallen.

Graph II.1.3

Real policy rates, based on forward- and backward-looking inflation[1]



[1] Policy target rates or their proxies corrected by forward- and backward-looking inflation component (equally weighted 12-month backward-looking CPI inflation and 12-month forward-looking consensus expectations). For Australia, RBA cash target rate; for China, household saving deposits one-year rate; for Indonesia, BI reference interest rate; for India, RBI repo cutoff yield; for Japan, BoJ target rate; for Korea, overnight call rate target before 7 March 2008, one-week BOK Base Rate thereafter; for Malaysia, overnight policy rate; for New Zealand official cash daily rate; for the Philippines, overnight reserve repurchase agreement RRP daily rate; for Thailand, 14-day repo rate before 17 January 2007, one-day repo thereafter. In per cent.

Source: Bloomberg; © Consensus Economics; national sources.

The immediate impact of easing monetary conditions has also been attenuated by persistent financial headwinds, resulting in rising risk premia, liquidity pressures and structural lags in pass-through to borrowing rates (Graph II.1.4). For example, by some measures pass-through from policy rate cuts to borrowing costs has been very limited in India, New Zealand, the Philippines and Thailand, and corporate borrowing costs have actually risen in Indonesia. By contrast, in China, where the central bank influences deposit and lending rates more directly, and in the Philippines, policy rate cuts have been largely matched by falls in corporate borrowing costs. In Australia, where bank lending is predominantly at floating interest rates, cash rate reductions have been passed on to end-borrowers, especially households, relatively quickly. In economies with more fixed-term funding (Indonesia) or lending (New Zealand), delayed pass-through is expected to continue to put downward pressure on borrowing costs in coming months.

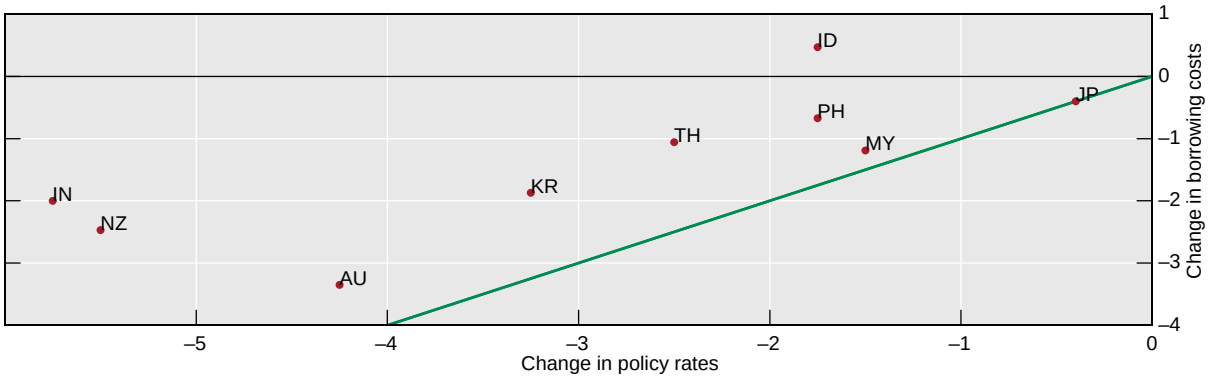
Broad money growth has remained robust across the region, even in the immediate aftermath of the Lehman bankruptcy. Rapid growth in deposits, supported by deposit guarantees, has supported growth in domestic credit, which has in turn substituted for declining external credit in the face of severe pressures in some foreign credit markets. The rapid growth of credit in China and Indonesia, however, has raised questions about whether monetary policy conditions may be becoming too accommodative.

Central banks are assessing the desirability of further rate cuts. In lieu of further policy rate reductions, some central banks have been trying to influence the shape of the yield curve at the longer end through their communication policies. Japan, Korea and New Zealand, for example, have been communicating their respective views that policy rates are likely to remain low for an extended period.

Three tentative lessons might be drawn from the experience in Asia and the Pacific. First, it was not clear that explicit inflation targeting central banks had it any easier than non-inflation targeting central banks in controlling inflation, boosting confidence or stimulating economic activity. Private sector inflation expectations appeared to remain fairly well anchored across the region (Filardo and Genberg (2009)).

Graph II.1.4

Incomplete pass-through from policy rates to borrowing costs[1]



AU = Australia; ID = Indonesia; IN = India; JP = Japan; KR = Korea; MY = Malaysia; NZ = New Zealand; PH = Philippines; TH = Thailand.

[1] The horizontal axis represents change in the official policy rate or its proxy, and the vertical axis the change in borrowing costs. For borrowing costs, the following have been used: Australia, average actual lending rate; Indonesia, base lending rate; India, average prime lending rate; Japan, prime lending short-term – middle rate; Korea, loans to corporations rate; Malaysia, base lending rate of commercial banks; New Zealand, business base lending rate; the Philippines, average quoted lending rates of commercial banks; Thailand, average MLR of commercial banks registered in Thailand. Changes are measured between the end of August 2008 and April 2009 for Korea and Malaysia; May 2009 for Australia, India, Indonesia and New Zealand; and 17 June 2009 for Japan, the Philippines and Korea. The green line represents 1:1 pass-through.

Source: Datastream; national sources.

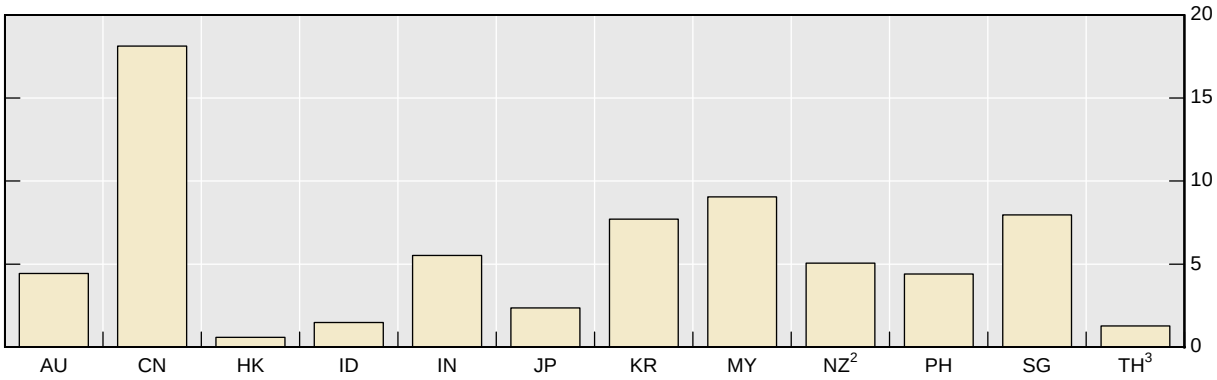
Second, monetary policy during a crisis – even if the epicentre is far away – may require a fundamentally different tactical approach than during periods when the monetary policy environment would be considered more normal. An emerging consensus prior to the crisis was that central banks should react to changing economic conditions gradually, in small steps and in a forward-looking fashion. The pattern of policy rate hikes in the region as inflation pressures were building in 2006–07 reflected behaviour largely consistent with such a view. However, in late 2008, central banks in the region and elsewhere took actions that were large and aggressive. Some of the motivation for the cuts reflected a deteriorating outlook of the most likely path for inflation and economic activity. But the size and swiftness of the rate cuts also reflected a consideration of the tail risks: the need at times to take "insurance" against low-probability, high-impact outcomes using monetary policy. The aggressive response reflects the fact that tail risks can develop very quickly.

Third, the monetary policy response in the region also highlighted the desirability of coordinating monetary and fiscal policy responses. The countercyclical fiscal response has indeed been impressive (Graph II.1.5), and effective, in helping to stabilise the freefall in economic activity and to boost confidence in financial markets. While much of the fiscal stimulus is still in the pipeline, central banks in the region have had to condition their policy responses and, going forward, their exit strategies on the size of the fiscal stimulus and nature of the lagged impact on the economies. The potential for future leveraged booms or other large external shocks to the region (for example, from the sudden unwinding of persistent global imbalances) and the effective conduct of fiscal policy in the current crisis highlight the importance of attention to monetary-fiscal coordination.

Graph II.1.5

Announced size of fiscal stimulus relative to 2008 GDP[1]

In per cent



For an explanation of the economy abbreviations, see Graph I.3.

[1] Data up to April 2009; some announced stimulus plans may be spread over multiple years. [2] 2007 GDP number used as a denominator. [3] Not including infrastructure spending plans of THB 1.43 trillion over the 2010–12 period.

Source: IMF; Reuters News; UNESCAP.

II.1.3 Challenges for central banks

Looking forward, central banks in the region face several challenges. As financial markets normalise and economies recover, the timing and pace of stimulus will require a familiar balancing act, but with greater complexity. The effectiveness of monetary policy frameworks may need revisiting, particularly in terms of countercyclical prudential policy, as economies become more financially open. Finally, the adequacy of reserves will need to be reconsidered based on experience during the crisis, and the mechanisms put in place for providing foreign currency liquidity, as bilateral swaps and multilateral reserve pooling arrangements being developed become available.

Exit strategies

As tentative signs of stabilisation and recovery emerged in 2009, Asia-Pacific central banks naturally turned to questions about when best to exit from their very accommodative policy stances, and balance the risks of withdrawing too much liquidity too soon against inadvertently leaving policy rates too low for too long.

The nature of the exit strategies reflects the dual motivations for expansionary policy in late 2008. The sharp cuts in policy rates, along with the adoption of other exceptional monetary policy measures since last September, were largely motivated by spillovers from the international financial crisis to both financial markets and economic activity in the region. This therefore suggests a two-pronged exit strategy, with one based on normalisation of regional financial systems and the other on the cyclical position of the macroeconomy.

As market conditions improve and financial headwinds abate, the first prong of the strategy would emphasise the need for central banks to withdraw the portion of the accommodative measures put in place to counter the unusual stresses in financial markets. Some of these measures were designed to be temporary, for example guarantees that have ceased to be used after risk premia have declined. Others may remain in place as part of the reform of the overall monetary policy framework. Still others will need to be withdrawn once markets return to normal and the orderly functioning of the monetary transmission mechanism is restored.

The second prong of the exit strategy would address the countercyclical aims of monetary policy. Conventionally, the narrowing of the output gap and upward pressure on inflation would lead to a normalisation of policy rates. The presence of monetary policy lags suggests the need to be pre-emptive. This part of the strategy might also emphasise a speedier unwinding of policy rate cuts, as macroeconomic tail risks associated with the crisis dissipate.

In assessing the need for the reversal of policy measures, several special factors associated with the international financial crisis complicate matters.

First, the long and variable lags of monetary policy are likely to be particularly difficult to assess, owing to the nature of financial and macroeconomic developments since September 2008 in Asia and the Pacific. Financial headwinds in the region have been sufficiently strong and variable to compromise the reliance on historical relationships to calibrate the likely impact of monetary policy. As a result, the effectiveness of policy rates in stimulating domestic demand and ensuring an adequate flow of credit to all segments of the economy may continue to vary with changes in risk appetite and market liquidity.

Second, the monetary, fiscal and financial policy environment has been unusually complex as a result of the plethora of government policy initiatives adopted over the past year, the range of additional proposals in the pipeline, and uncertainty regarding announcement effects and implementation lags.[5] These initiatives include those being made domestically, regionally and internationally. Without a more orchestrated sequencing of policy actions, a central bank may find it more difficult than usual to time its withdrawal of stimulus.

Third, the possibility of an asynchronous international recovery puts Asia-Pacific economies at risk of volatile capital flows. If an Asia-Pacific unwinding of monetary policy were to lead the rest of the world, the resulting higher regional interest rates could attract strong capital inflows, including those associated with carry trades. Given the surfeit of global liquidity, these flows could be quite strong and disruptive.[6]

Finally, there are important questions about the specific criteria that central banks in the region might apply when calibrating the timing and speed of the exit strategy. On the financial side, measures of financial system health would be natural candidates. They would include the soundness of the banks (for example, non-performing loans, leverage, capital adequacy and CDS spreads) and the level of turmoil in financial markets (bid-ask spreads, deviations of covered interest parity, turnover and volatility). There are significant difficulties, however, in defining benchmarks for normalisation of risk appetite, such as CDS spreads, from historical data; if there had been a significant underpricing of risk in the pre-crisis period, then equilibrium spreads today would be higher than the historical experience in the 2000s. How high is an open question.

On the macroeconomic side, key indicators for exit strategies include the evolution of inflation relative to (implicit and explicit) inflation targets and output gaps. In measuring output gaps in the current environment key uncertainties arise in assessing whether the fallout from the international financial crisis has led to a one-off shift in potential output and a slowdown in the trend growth rate of (multi-factor) productivity which would reduce potential growth rates of economic activity in the future. The one-off shift may have come about from obsolescence of existing capital in response to changing secular demand patterns. The

---

[5] See Hannoun (2009) on the trade-off between fiscal stimulus and sustainability.

[6] In a model-based evaluation of Chile and New Zealand, Medina et al (2008) estimate that the bulk of variation in external capital flows is explained by foreign shocks. McCauley (2008) discusses measures used in Asian countries to moderate capital flows into Asia in the period preceding the crisis and implications for domestic financial systems. Chai-Anant and Ho (2008) examine the effects of foreign investors' transactions on market returns and exchange rates in six emerging Asian economies.

flattening of trend productivity could result from structural adjustments that might be needed as economies, especially in the region, search for new sustainable growth frameworks for the future.

In either case, if potential output turns out to be much lower than expected in the near term, and hence output gaps less negative, monetary policy will need to be less accommodative, and some central banks may even find themselves somewhat behind the curve with respect to inflation. Additional complications would arise if the slower trend productivity growth raised questions about the appropriate steady state (ie natural) real policy rate. These considerations suggest that central banks face considerable challenges in interpreting forward-looking indicators that reflect such potential structural shifts and calibrating the appropriate policy stance going forward.

Balance sheet considerations arising from the central bank responses in the region to the international financial crisis also feature in the exit strategies. Central banks have various alternatives to drain reserves out of the market. One tactic could be to sell back some of the lower-quality assets that were originally purchased in order to remove them from private sector balance sheets. However, feeding these assets back into markets could be problematic, especially if the associated market segments remain skittish. Alternative means to drain reserves include issuing central bank bills, paying interest on reserves (or equivalently raising the return on deposit facilities), reverse repos and raising reserve requirements. By setting an appropriate return on some of these alternatives, headline policy rates can respond to changing economic and financial conditions more gradually and smoothly while still draining excess liquidity from the financial system.

One final set of issues arises from considerations of how to communicate the exit strategies to the public. In particular, how important is it for central banks to announce the criteria for their exit strategy? Early announcement may be seen as tying the hands of policymakers, and hence effectively constraining the room for manoeuvre during this period of elevated uncertainty. Central banks may be wary of such constraints, especially when there appears to be a premium placed on keeping all options open. In addition, central bank statements on exiting run the risk of being misinterpreted by the markets; if judged as being premature, these statements could undermine fragile business and market confidence. Such statements might also be perceived as running afoul of government efforts to talk up the economy and financial markets, and could inadvertently result in press reports of internal disagreements when unity of purpose appears so critical.

However, telegraphing the intentions of the central bank well in advance might yield benefits by influencing public expectations.[7] Clear criteria for exiting can help to anchor expectations in a way supportive of central bank efforts in the current policy environment. Prior to the criteria being met, for example, longer-term interest rates are more likely to remain low if the central bank is perceived to have pre-committed to low policy rates. Then, as conditions improve and the preannounced criteria are expected to be met, credit conditions will naturally firm as the private sector bids up longer-term interest rates in anticipation of a rise in short-term policy rates. With the markets reinforcing the intentions of the central bank, then, central banks would be able to adjust policy rates in a more gradual and smooth fashion, with less concern about the possible need to reverse decisions.[8]

---

[7] See Filardo and Guinigundo (2008), García-Herrero and Remolona (2008) and Sahminan (2008) on the effect of central bank communication on expectations in Asia Pacific countries.

[8] Such by-products of a preannouncement strategy were evident in the Japanese experience as the Bank of Japan was exiting from its quantitative easing (QE) policy earlier in the decade. In the Japanese case, the initial announcement of a zero inflation criterion for exiting QE led markets to a significant lengthening of the expected duration of a zero interest rate environment while deflation persisted. As deflationary pressures faded, markets began bidding up the longer end of the yield curve, thereby reducing the likelihood of an

Monetary policy frameworks

Recent years have witnessed greater interest and determination by central banks in controlling inflation in the region.[9] However, exchange rate misalignments associated with periods of sustained capital inflows remain a source of concern because of their impact on inflation and economic growth, and fears that the inflows may suddenly stop or reverse, leading to stress in local banking systems.[10]

A key question going forward is how to maintain a primary focus on inflation in a context where concerns about financial stability, potential volatility of international capital flows and variability of economic growth are also seen as important policy objectives. What should monetary policy frameworks look like if they are to reflect the wide range of trade-offs that central banks face? The answer depends on how central banks perceive their responsibilities beyond strict control of inflation. A few stylised approaches may illuminate the key issues.

At one extreme is a view that central banks may need to compartmentalise their policy priorities. A lexicographical approach provides a succinct way to summarise this perspective (Fischer (2008)). According to this view, central banks would target inflation, and only when inflation was under control would they take countercyclical actions intended to smooth output. Likewise, only when inflation and output stability were achieved would central banks entertain issues associated with exchange rates, capital flows and financial stability.

An alternative approach is to smoothly trade off output and inflation stabilisation, while emphasising key risks associated with auxiliary goals for a range of relevant policy horizons. One could interpret the fact that most central banks in the Asia-Pacific region have adopted inflation targets over the medium term as consistent with this view that strict inflation control at all horizons is not paramount, but rather that there are a range of concerns that need to be addressed.

Finally, central banks find themselves in a somewhat awkward position when a failure on the part of other authorities to adequately address regulatory or external issues results in a crisis (Filardo (2009)). At that point, central banks may have a comparative advantage in addressing the ensuing crash, using both monetary policy tools and the lender of last resort function. However, doing so may lead to problems of moral hazard that the central bank would prefer to avoid.[11,12]

In considering appropriate monetary policy frameworks for the future, it is clear that one size does not fit all. On the contrary, a broader implication from the wide range of policy experiences in Asia-Pacific is that monetary policy strategies may have to be tailored to each central bank depending on the nature of the economic environment. Important factors to consider include: whether the economy is a commodity producer; the degree of exposure to food price shocks; exposure to volatile international capital flows; the ability of the domestic financial system to absorb such shocks; openness and the role of the exchange rate in the

---

eventual overshoot, while allowing short-term rates to remain low in order to address lingering short-term macroeconomic concerns.

[9] See, for example, Ho and Yetman (2008).

[10] See Committee on the Global Financial System (2009).

[11] In some respects, this motivation is one justification for central banks taking on the responsibility of lender of last resort. But recent central bank behaviour raises the practical question of whether the central bank should instead be lender of first resort, or somewhere in between.

[12] Notwithstanding this concern, the role of countercyclical regulatory policy, in both moderating bubbles and supporting the financial system during crises, is increasingly recognised (see Borio and Shim (2007)).

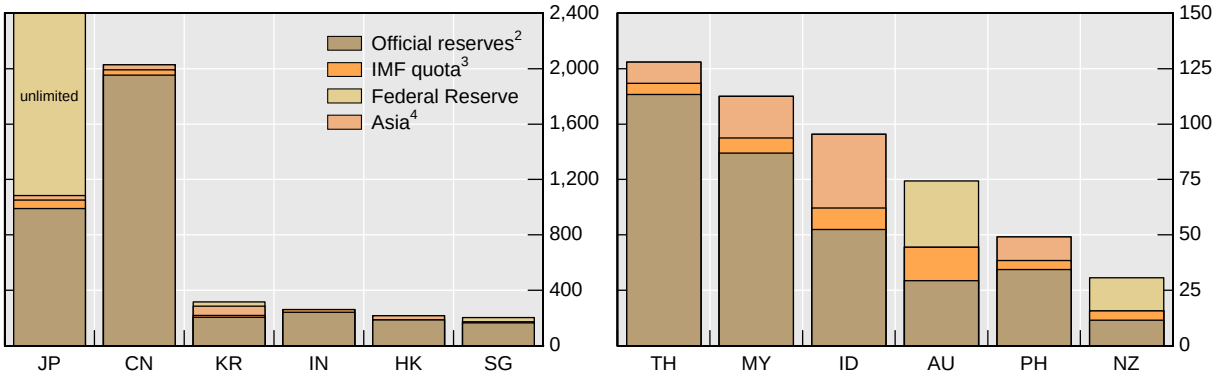
inflation process.[13] These factors are furthermore likely to change over time, implying that monetary policy strategies cannot be static, even if price stability remains the main objective of policy.

Foreign exchange reserves

Issues arising from the build-up of international *reserve stocks* (Graph II.1.6) in the Asia-Pacific region before the international financial crisis have been widely debated. Initially the build-up sought to achieve full coverage of short-term external debt, but then well exceeded that level.[14] The excess was argued by some to be justified by the vulnerability of external portfolio liabilities to withdrawal, potential under-measurement of external debt (as seen with foreign branches of Korean corporates during the Asian crisis) and as a confidence booster in the face of risk aversion, particularly for lower-rated economies. An alternative view was that the additional build-up was a side effect of attempts to resist exchange rate appreciation, as a means to improve trade competitiveness, implying that reserves may be inefficiently high.

Graph II.I.6

Reserves and foreign currency swaps[1]



For an explanation of the economy abbreviations, see Graph I.3.

[1] In billions of US dollars. ASEAN swaps net to zero. [2] As of March 2008; excludes SDRs, the reserve position in the IMF and gold. [3] Based on traditional 300% cumulative limit. More recent operations in eastern Europe have been as large as 12 times the quota (Latvia), so available liquidity may be underestimated here, especially for smaller economies. [4] Bilateral foreign currency swaps in place among Asian economies and the ASEAN Swap Arrangement (ASA). Does not include Japan's recently announced emergency fund of $60 billion equivalent in yen funding.

Sources: IMF; national data.

The international financial crisis illustrated just how valuable ample reserves can be during turbulent times. For example, the substantial withdrawal of portfolio investment from open and liquid markets such as Korea even before the Lehman bankruptcy reinforced the need for reserves beyond short-term external debt. Also, with strains in international financial markets having persisted for almost two years, even one year's short-term debt coverage began to look inadequate in some countries such as Korea, despite substantial exchange rate depreciation.[15]

---

[13] See Devereux and Yetman (2009) on the endogeneity of exchange rate pass-through and Khundrakpam (2007) on the evolution of exchange rate pass-through to domestic prices in India.

[14] Ho and McCauley (2008) examine the domestic financial consequences of reserve accumulation in Asia.

[15] One use of reserves during such times is to offset outflows; see Ma and McCauley (2008).

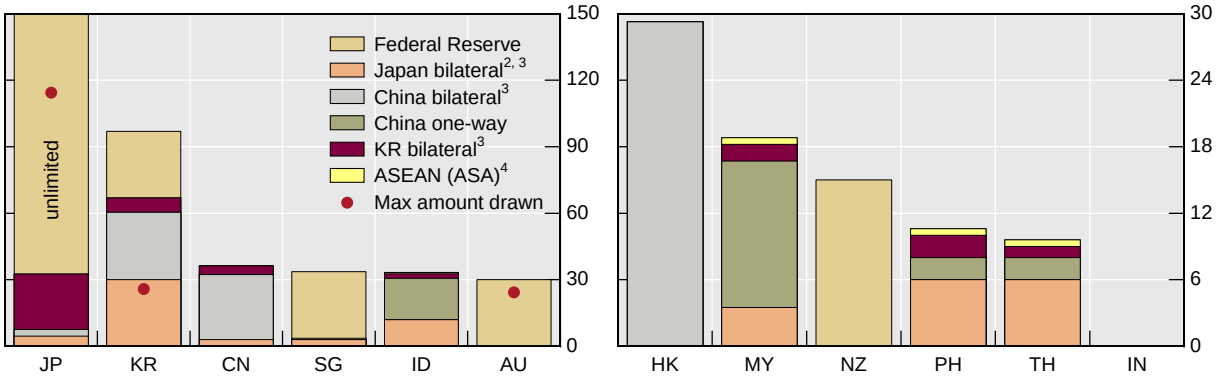
Reserve stocks also played an important role in maintaining orderly foreign exchange markets during the crisis, particularly as US dollar liquidity dried up. In some economies (Korea and the Philippines), foreign exchange reserves were used successfully to provide foreign currency liquidity to the banking system, partially mitigating the effects of the capital withdrawal and foreign currency liquidity pressures. One indicator of the underlying importance of reserve adequacy was the apparent success of bilateral swap lines in boosting confidence in financial markets, especially in economies with large external positions.

In some countries, however, the absence of large reserves did not seem to be an impediment. In particular, for countries with internationalised currencies and well developed financial markets, the use of financial derivatives to manage short-run foreign currency exposures proved helpful, as illustrated by Australia and New Zealand. High sovereign credit ratings probably contributed to the success of their strategy.

Questions nonetheless remain about the appropriate level of reserves in future. One key consideration is the impact of various institutional changes related to foreign exchange availability initiated during the crisis, not least the enhanced bilateral and multilateral swap lines and the new IMF funding facilities (Graph II.1.7).

Graph II.1.7

Bilateral and multilateral swaps[1]



For an explanation of the economy abbreviations, see Graph I.3.

[1] In billions of US dollars; maximum withdrawal. CMIM will encompass many but not all of these swaps. [2] Does not include the recently announced yen-denominated $60 billion equivalent fund. [3] Bilateral swaps in place, some in US dollars, some in local currencies. Excludes other bilateral swaps shown. [4] Refers to swaps among ASEAN members.

Sources: BoJ; IMF; Bloomberg; national data; BIS calculations.

Enhanced swap lines might reduce the incentive for the economies involved to increase their individual reserves. For example, the Chiang Mai Initiative Multilateralisation (CMIM), expected to be operational by end-2009, will allow member countries (Association of Southeast Asian Nations (ASEAN) plus China, Japan and Korea) to draw from 50% (for larger countries) to 500% (for smaller countries) of their contribution to a $120 billion multilateral reserves pooling arrangement. The CMIM is likely to be particularly valuable for lower-rated economies for which swap lines are substantial relative to reserves. These economies are also more likely to lose access to foreign currency when markets are stressed.

The impact of the new IMF facilities on reserve levels is less clear. In October 2008, the IMF Board approved a quick-disbursing Short-term Lending Facility (SLF)[16] and, in March 2009,

[16] By February 2009, the IMF had provided exceptionally large loans to eastern European countries based on SLF, amounting to 1,200% of quota in the case of Latvia, compared to the 100% annual and 300% cumulative limits on normal facilities.

introduced the Flexible Credit Line (FCL). This new facility makes funds available without conditionality and as a precautionary instrument for economies meeting pre-set qualification criteria. In principle, the existence of such a pool of funding from outside the region should reduce the incentive for any one economy to accumulate reserves. However, as of May 2009, no major Asia-Pacific economy had used the new facilities, perhaps reflecting the adequacy of domestic reserve supplies, the effectiveness of bilateral swap arrangements to meet the prospective needs and lingering concerns about the potential stigma associated with IMF borrowing.

The more comfortable level of foreign reserve capacity in the region, from both outright reserve holdings and access to swap lines and IMF loans, has implications for the desirability of continuing export-led growth strategies and, by extension, exchange rate flexibility. A by-product of export-led growth strategies in the region has been a build-up of reserves, especially for those authorities that manage the exchange rate and have resisted appreciation pressures associated with capital inflows. Going forward, the reduced incentives to build ever larger reserve positions and the vulnerability of increasing reliance on exports for growth illustrated by the crisis may shift sentiment towards greater exchange rate flexibility.

Increased exchange rate flexibility would result in both costs and benefits for economies.[17] Excessive exchange rate volatility could adversely affect growth, while also reducing global protectionist proclivities from outside the region vis-à-vis charges of exchange rate manipulation, for example. More importantly for central banks, increased exchange rate volatility may increase the effectiveness of domestic monetary policy by allowing greater control of inflation and increased focus by policymakers on domestic, rather than external, demand.

II.2 Development of financial markets

The state of development of financial markets in Asia and the Pacific helped to mitigate the initial impact of the international crisis on the region. The region was fortunate in that its financial markets were more developed than they had been at the time of the 1997–98 financial crisis, yet less developed than those in the United States and Europe. A key question for policymakers is how to realise the benefits offered by further development of their financial systems while managing vulnerabilities of their economies to external shocks transmitted or amplified by financial markets.

II.2.1 Impact of the crisis

The development of local financial markets, particularly bond markets, was viewed as a high priority by authorities in the Asia-Pacific region following the 1997–98 financial crisis. It was widely agreed that well functioning financial markets could help to reduce economies' vulnerability to currency and maturity mismatches (see eg Asia-Pacific Economic Cooperation (1999)). Various national and regional initiatives, including the Asian Bond Market Initiative (ABMI) and the Asian Bond Fund (ABF), were implemented to identify and remove impediments to the issuance and trading of local currency bonds.[18]

Supported by these initiatives, the depth and breadth of Asia-Pacific financial markets improved greatly during the decade following the 1997–98 crisis. This was especially true for government securities markets, where many issuers succeeded in extending the maturity of

[17] One trade-off is between bilateral and multilateral exchange rate stability; see Fung et al (2009).

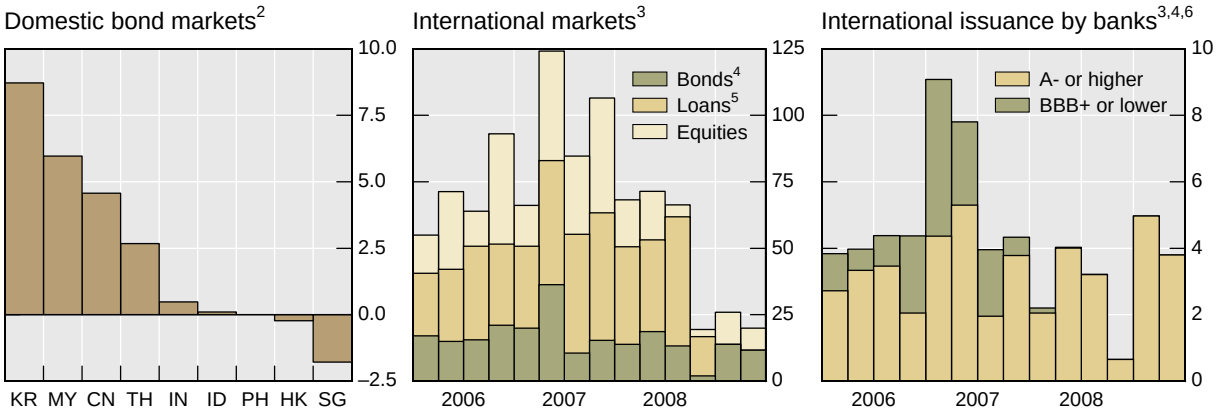
[18] For a discussion of ABF2, see Ma and Remolona (2005).

their offerings, diversifying their investor base and boosting secondary market trading. Corporate bond markets also expanded significantly, led by high-quality borrowers such as quasi-government entities. For example, in Singapore, the outstanding stock of corporate bonds rose from 15% of GDP in 1998 to 31% in the mid-2000s. In the Malaysian private debt securities market, the share of turnover accounted for by the five most actively traded entities fell from 97% in 1998 to 34% in 2006 (Chan et al (2009)). Across the region, the increase in issuance and trading volumes was accompanied by a broadening of the types of instruments available, including Islamic securities, asset-backed securities and various derivatives.

As a result of this progress, by 2007 Asia-Pacific borrowers enjoyed a greater diversity of funding sources than a decade earlier. This diversity enabled borrowers to reduce currency and liquidity risks, for example by tapping long-term local currency markets instead of participating in foreign currency markets. Furthermore, the diversity left borrowers less vulnerable to disruptions experienced in any one market. Local currency securities markets could better fulfil their role as a "spare tire", as they remained open to borrowers when other funding sources were not available. Indeed, in 2008 many Asia-Pacific banks and corporations that faced refinancing difficulties in foreign currency bond markets were able to turn to local currency bond markets. In particular, in Korea, Malaysia, China and Thailand financial and non-financial corporations alike raised sizeable amounts in local currency bond markets in 2008 (Graph II.2.1, left-hand panel).

Graph II.2.1

Corporate issuance in domestic and international markets[1]



For an explanation of the economy abbreviations, see Graph I.3.

[1] Issuance by financial and non-financial corporations, including state-owned enterprises, based in non-Japan Asia. [2] Net issuance in 2008 in onshore markets of bonds and money market instruments by residents of the specified territory, as a percentage of GDP. Calculated as the annual change in amounts outstanding. [3] Gross issuance in offshore markets by nationals of non-Japan Asia, in billions of US dollars; includes domestic bonds marketed to offshore investors. [4] Debt securities with an original maturity of more than one year. [5] International syndicated credit facilities. [6] Disaggregated by issuer ratings from Fitch.

Sources: Bloomberg; Dealogic; Fitch Ratings; Thomson Reuters; national data; BIS.

These benefits did not extend to lower-quality borrowers, however. Markets for lower-quality corporate bonds, ie those with credit ratings below single-A, remain underdeveloped across the region (Black and Munro (2009)). Even the yen-denominated market, which is by far the largest corporate bond market in the region, is not accessible to many lower-quality borrowers. The chief reason for this situation is that there does not appear to be any investor demand for lower-rated bonds denominated in Asia-Pacific currencies. Many institutional investors have internal guidelines that limit their investments to highly rated securities. Such guidelines could reflect perceived inadequacies in corporate reporting practices in the region,

which make it difficult for investors to assess the creditworthiness of potential issuers (Gyntelberg et al (2006)).

Consequently, low-quality borrowers in the region have remained dependent on banks and foreign currency bond markets. In late 2006 and the first half of 2007, when risk spreads were close to all-time lows in international capital markets, Asia-Pacific firms took advantage of the very favourable financing conditions to raise substantial amounts of new funds (Graph II.2.1, centre panel). After risk spreads in US dollar and euro credit markets soared in the second half of 2007, during Phase 1 of the crisis, some of these firms lost access to international markets. International bond issuance by low-rated borrowers essentially ceased in late 2007 (Graph II.2.1, right-hand panel). Asian banks were among those who saw their access to international markets deteriorate, and they were therefore not in a position to fill the funding gap lower-quality corporate borrowers suddenly faced. Many such borrowers struggled to refinance their foreign currency liabilities, and some were left with little choice but to reduce the size of their balance sheets.

Prior to the crisis, structured credit markets had begun to develop in Asia and the Pacific as a way to match local investors' preference for highly rated debt with local issuers' average credit quality (Remolona and Shim (2008)). Structures based on mortgages and consumer finance assets were the first to develop, but their main contribution was to enhance the liquidity of the underlying assets rather than the credit quality. Structured financial products backed by corporate debt hold more promise as a way to ease market access for lower-quality borrowers. Through diversification, such structures can in principle reduce the credit risk associated with holding low-rated debt. The Asia-Pacific region has lagged well behind the United States and Europe in the development of structured credit markets. In retrospect, this was fortunate. Most Asia-Pacific banks were not in the habit of originating assets for securitisation and, therefore, the collapse of virtually all structured credit markets in mid-2007 did not have a significant impact on their balance sheets (see Section II.3.1). The impact was greater in the few Asia-Pacific economies where structured credit markets were more developed, notably Australia and Japan. However, even in these two economies the impact was limited to banks' liquidity positions; their creditworthiness did not suffer because securitisations were backed predominantly by higher-quality assets, mainly prime mortgages. In consequence, these banks were not exposed to the "toxic" structured products held by many US and European institutions.

The underdevelopment of structured credit markets in Asia and the Pacific was indicative of the underdevelopment of financial derivatives markets more generally (Loretan and Wooldridge (2008)). Derivatives markets in the region are small and illiquid compared to their counterparts in Europe and the United States. Only a few segments function well. For example, Korea has a large bond futures market, and Hong Kong, New Zealand and Singapore have large foreign exchange (FX) swap markets. Australia and Japan currently are the only two Asia-Pacific economies where derivatives of all kinds are widely traded.

The small size of most Asia-Pacific derivatives markets limited the potential losses to counterparties in 2007-08. As a result, counterparty risks and the systemic consequences of the failure of a large derivatives dealer were less of a concern in Asia and the Pacific than in other regions. Of course, the small size of the derivatives markets also limited their ability to provide significant possibilities for hedging risk and reduced the options available to borrowers and investors for managing their risk exposures.

An important reason derivatives markets in the region are underdeveloped is the imposition of constraints on activities in which non-residents are permitted to engage or, more precisely, constraints on residents' ability to transact with non-residents. Many Asia-Pacific economies maintain controls on cross-border financial transactions as well as on foreign exchange transactions that make it difficult to trade the currency offshore, and consequently reduce the heterogeneity of market participants. It is no coincidence that the currencies not subject to

exchange controls – the yen and Australian, Hong Kong, New Zealand and Singapore dollars – have the most liquid derivatives markets (Tsuyuguchi and Wooldridge (2008)).

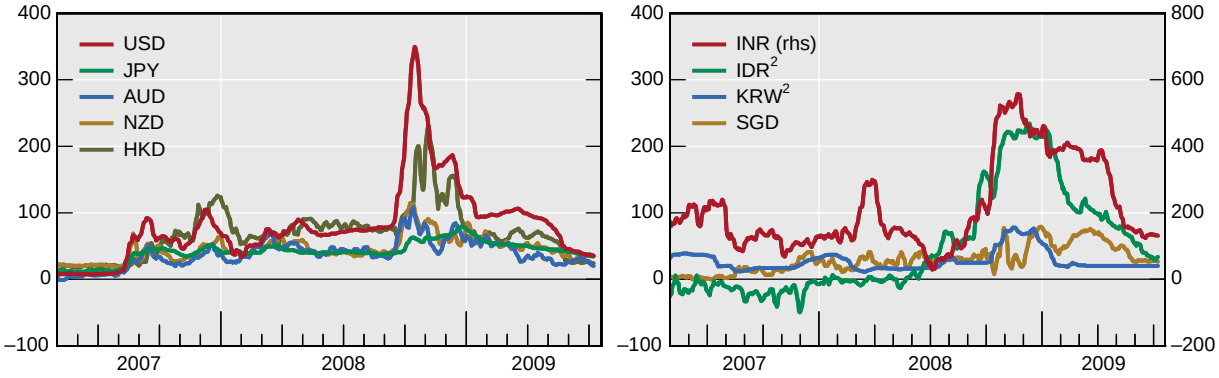
Restrictions on transactions with non-residents are usually intended to insulate domestic financial markets from disruptions occurring abroad. This goal was achieved to a large degree during Phase 1 of the crisis, but to a far lesser degree during Phase 2, ie after the Lehman Brothers bankruptcy in mid-September 2008. In late 2007 and the first half of 2008, the more open markets of the region were also those most affected by disruptions in the unsecured US dollar-denominated money markets. Banks' efforts to tap alternative sources of term funding caused the spread between interbank rates and expected policy rates to rise noticeably in the currencies of Australia, Hong Kong, Japan and New Zealand as early as August 2007 (Graph II.2.2, left-hand panel). In other Asia-Pacific markets, short-term interest rates were initially largely unaffected by the turmoil in US and European money markets.

However, after the dislocations in US dollar markets persisted and then intensified during Phase 2, even relatively closed financial markets in Asia and the Pacific experienced pressures. Money market spreads soared across the region (Graph II.2.2). Banks with maturing US dollar liabilities were compelled to either sell local currency assets or seek to borrow dollars from local sources. The closed, segmented nature of some money markets potentially exacerbated spillovers during this phase by impeding the flow of scarce funds. In many economies cross-border credit to foreign banks' affiliates fell by less than credit to unaffiliated borrowers in late 2008, and so pressures to sell local currency for US dollars and other foreign currencies tended to be greater in those economies where foreign banks are not important participants in the financial system.

Graph II.2.2

Asia-Pacific money markets[1]

Libor-OIS spreads unless otherwise noted, in basis points[1]



AUD = Australian dollar; HKD = Hong Kong dollar; INR = Indian rupee; JPY = Japanese yen; KRW = Korean won; MYR = Malaysian ringgit; NZD = New Zealand dollar; SGD = Singapore dollar; USD = US dollar. All currencies except INR are plotted against the left-hand scale.

[1] Three-month onshore interbank rate minus three-month overnight index swap rate; five-day moving average. [2] One-month onshore interbank rate minus policy rate; five-day moving average.

Sources: Bloomberg; Datastream.

II.2.2 Policy responses and their impact

The response of Asia-Pacific authorities to spillovers from US and European markets to local financial markets varied considerably across the region. Prior to mid-September 2008, authorities outside Australia, Japan and New Zealand saw little cause to take special action to stabilise local markets. This changed after the bankruptcy of Lehman Brothers, with many

authorities intervening in markets. Of course, the nature of the interventions varied according to the severity of market stresses and the structure of the financial system.

One common response was foreign exchange market intervention. Following a long period of reserve accumulation, reserves in most Asia-Pacific economies fell in the second half of 2008, in some cases by more than 25%. Hong Kong and Japan are notable exceptions because, in contrast to the rest of the region, they experienced large capital inflows during this period. Where reserves declined, there were two main explanations for the decline: intervention to stabilise foreign exchange markets, and the provision of US dollar funding to local firms facing difficulties tapping dollar markets directly.

The scale of intervention to stabilise foreign exchange markets depended very much on the exchange rate regime. While Asian exchange rates are generally more flexible today than prior to the 1997–98 crisis, some float more freely than others. In Australia, Japan and New Zealand, at one extreme, the authorities refrained from attempting to moderate the adjustment of their currencies during both Phases 1 and 2 of the crisis. Hong Kong is at the other extreme: the authorities intervened heavily to prevent the exchange rate from appreciating beyond the strong side of the target band. The response of authorities in other Asia-Pacific economies lay somewhere in between.

In those economies with more flexible exchange rates, heightened volatility and worries about possible feedback effects on occasion prompted the authorities to intervene. During Phase 2 in late 2008, unmet demand for foreign currency plus dealers' scaling-back of their market-making activities increased the frequency of price "gapping". In addition, sudden exchange rate depreciations led domestic borrowers unable to roll over foreign currency liabilities to buy US dollars to meet their maturing liabilities, thereby exacerbating downward pressures on the exchange rate. In these circumstances, intervention was sometimes deemed warranted to restore order in foreign exchange markets, including in the Australian and New Zealand dollar markets.

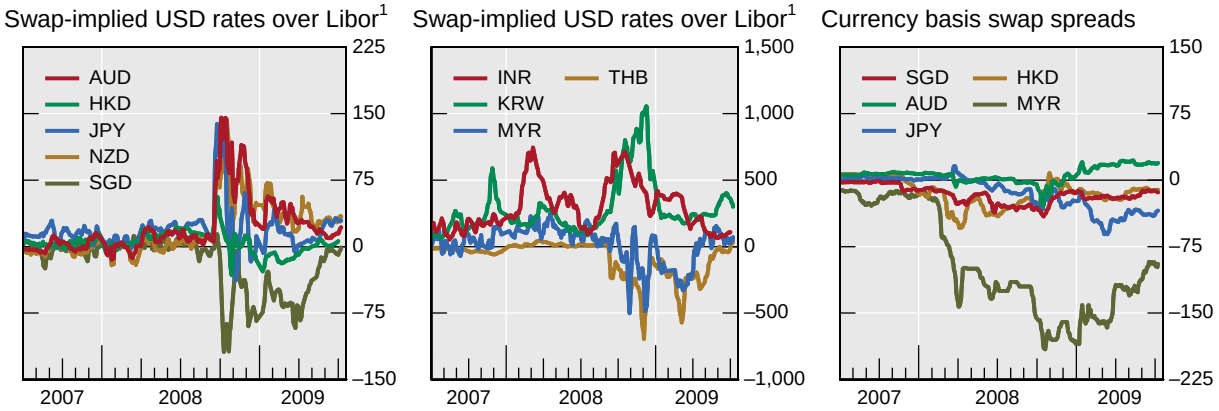
The disorder in some foreign exchange markets was closely linked to the disruptions in US dollar funding markets, as Asia-Pacific residents with maturing dollar liabilities were unable to roll them over and instead had to sell local currencies to reduce their dollar-denominated debt. Consequently, most authorities in the region established facilities to lend foreign currency (mainly dollars) to residents experiencing difficulties in accessing dollar-denominated funding markets. Many mobilised their own reserves, but a few borrowed foreign currency from other central banks, particularly the Federal Reserve, and onlent the funds to local residents. Such loans were typically collateralised, sometimes by foreign currency assets, as in the case of the Philippine central bank's dollar repo facility, but more often by local currency assets, through foreign exchange swaps. Indonesia, Korea and Hong Kong swapped, or announced their readiness to swap, part of their official reserves. Australia, Korea and Japan engaged in FX swaps with the Fed and established facilities to onlend the US dollar funds to local borrowers.

The willingness of central banks in the Asia-Pacific region to lend US dollars directly to domestic borrowers contributed significantly to alleviating resident borrowers' dollar funding difficulties. The spread between the FX swap-implied US dollar rate and dollar Libor, which should be close to zero if covered interest parity holds, spiked up in September and October 2008, but declined steadily in late 2008 and early 2009, during Phase 3 (Graph II.2.3, left-hand and centre panels). Conditions were slower to improve in those segments of foreign exchange markets in which central banks were not active, such as markets for longer-term cross-currency swaps (Graph II.2.3, right-hand panel).

Graph II.2.3

Deviations from covered interest parity

Spreads, in basis points



[1] Spreads between US dollar interbank rates implied by covered interest parity and three-month US dollar Libor. Implied rates are calculated from forward and spot exchange rates against the US dollar and interbank rates. Five-day moving averages.

Sources: Bloomberg; Datastream.

In addition to intervening in foreign exchange markets, some central banks modified their operations in local money markets. Funding pressures and concerns about counterparty credit risk caused the demand for safe, liquid local currency assets, including central bank assets and government securities, to increase substantially, especially after September 2008. Central banks responded by extending the maturities of central bank financing available to banks, widening the pool of collateral eligible for discretionary operations and standing facilities, and broadening the range of counterparties. The central banks of Australia and Japan modified their operating procedures along these lines in late 2007, while those of Korea, New Zealand and Chinese Taipei did so after Lehman's bankruptcy. In China, India, Indonesia and the Philippines, the central bank sought to accommodate increased demand for liquid assets by lowering reserve requirements (see Section II.1.2).

Owing in part to these actions, by the second quarter of 2009 money markets across the Asia-Pacific region had stabilised. Some appeared to function more or less normally, although in many markets there were questions about what should be considered normal. Market participants underpriced risks in the lead-up to the crisis. Therefore, a return to pre-2007 market conditions is not necessarily desirable. Uncertainty about what should be regarded as normal is adding to the difficulties central banks face when they consider appropriate exit strategies from their current policies (see Section II.1.3). Clear communication with market participants can ease the withdrawal of central bank support, as in Hong Kong, where in March 2009 the monetary authority announced the cancellation of some temporary measures and the institutionalisation of others. The design and pricing of liquidity facilities can also ease the eventual exit, as in Australia, where in the first part of 2009 demand for the Reserve Bank's term deposit facility gradually declined to zero.

Other local markets in which some authorities intervened included mortgage-backed securities (MBS), corporate bonds and equities. The usual justification for doing so was to improve liquidity conditions and thereby mitigate the risk of downward spirals in asset prices. The Australian government engaged in direct purchases of MBS, the issuance of which in Australia had all but ceased after August 2007. Even so, as of mid-2009 issuance was still a fraction of what it had been before the onset of the crisis. The Bank of Japan began direct purchases of commercial paper in early 2009, helping to contain increases in corporate borrowing rates. Authorities across the region restricted or banned short sales of equities in September and October 2008, usually of financial stocks but in some economies of all

stocks, and some maintained the restrictions even when equities rallied in March and April 2009. The overall impact on equity prices of these restrictions was unclear and, as of mid-2009, numerous initiatives were in progress to review the regulatory approach to short selling.

II.2.3 Implications for the future

Going forward, a key policy challenge will be to strengthen the resilience of financial markets in general and money and over-the-counter (OTC) derivatives markets in particular. The breadth and severity of the deterioration in market liquidity during the crisis surprised many, and while financial markets were not necessarily a source of shocks, they were an important propagator. Reforms to trading and settlement systems could help to strengthen markets' capacity to absorb shocks.

One concern is the functioning of money markets, especially markets for short-term collateralised lending. Collateralised markets such as the repo and FX swap markets are usually the most resilient in the face of disruptions to other markets. However, the crisis demonstrated that even collateralised markets can be vulnerable to disruptions when trading conditions in related markets deteriorate. Options for strengthening money markets include broadening the range of assets that might serve as repo-worthy collateral and encouraging the development of triparty repos.[19] Furthermore, modifications in monetary policy operating procedures could help central banks to cope with episodes of impaired money market functioning. The Committee on the Global Financial System (2008) recommends having systems in place that allow central banks to conduct operations with an extensive set of counterparties and against a broad range of collateral, redesigning standing facilities in ways that reduce any stigma associated with borrowing directly from a central bank, establishing swap lines among central banks and other mechanisms to facilitate the international distribution of funds, and enhancing communications with market participants and the media.

Another concern is the functioning of OTC markets, especially credit derivatives markets. OTC markets, as opposed to organised exchanges, offer benefits in terms of flexibility and innovation. As OTC markets can offer products tailored to the individual needs of customers, they have grown rapidly over the past two decades. However, counterparty risk is managed bilaterally and therefore can be greater than in markets where trades are cleared centrally. Also, OTC markets are opaque because their decentralised nature makes it difficult to collect market-wide information about trading activity, prices and exposures. To mitigate potential systemic risks, the Financial Stability Forum (2008) urged market participants to put in place a central counterparty (CCP) for clearing OTC credit derivatives and to achieve more robust operational processes in OTC derivatives markets. A CCP is expected to reduce counterparty and operational risks and increase transparency. However, measuring the impact of its introduction is difficult because market participants presently have many different forms of bilateral netting arrangements, some of which allow cross-product netting, which would not be possible with an instrument-based CCP. A CCP for credit default swaps became operational in the United States in early 2009. There are initiatives to set up others in the United States, Europe and Asia in the near future.

A third concern is the participation of foreigners in local financial markets. Closer integration with foreign markets can bring many economic benefits. At the same time, it can also introduce additional sources of shocks. Even so, insulating local markets from foreign

[19] In a triparty repo, an agent stands between the security lender and cash provider and physically controls the securities offered as collateral. The original counterparties remain as principals to the transaction, but the agent – typically a custodial bank – manages the collateral, making substitutions when necessary, monitoring risk and collecting payments. For a discussion of repo markets during the crisis, see Hördahl and King (2008).

influences does not necessarily enhance their stability. The presence of foreign financial institutions might serve as a catalyst for reductions in transactions costs and the development of new products; the most open markets also tend to be the most developed. Moreover, foreign market participants can add diversity, which can be an effective means of promoting stability. A heterogeneous investor base, with a range of different views and risk preferences, increases trading activity and hence market liquidity. It also enhances the informational efficiency of financial markets. For example, on the basis of their extensive empirical research centred on financial markets in Thailand, Gyntelberg et al (2009a, 2009b) find that foreign investors' equity market flows convey private information to market participants and that these flows are not explained simply by reactions to exchange rate movements. Chai-Anant and Ho (2008) observe that, while foreign investors often move in or out of markets in unison, at other times they have a stabilising effect. September 2001 was one period when foreign investors showed more optimism in the prospects for Asian equities than did domestic investors. Financial integration can pose risks to financial stability, but these risks – and the trade-off between the risks and the benefits of greater integration – differ depending on the stage of market development. Therefore, the appropriate policy approach to cross-border financial integration is likely to differ across economies.

II.3 Financial stability

II.3.1 Impact of the international crisis on the financial system in Asia and the Pacific

Banks in Asia and the Pacific weathered the crisis far better than their counterparts in the United States and western Europe. They were relatively immune to the financial turmoil in Phase 1 of the crisis. Even after the sharp deterioration in global financial conditions and economic prospects since September 2008, banks in the region appear to have a comfortable level of earnings and capital buffers to absorb possible near-term losses.

Resilience of the banking system in Asia-Pacific

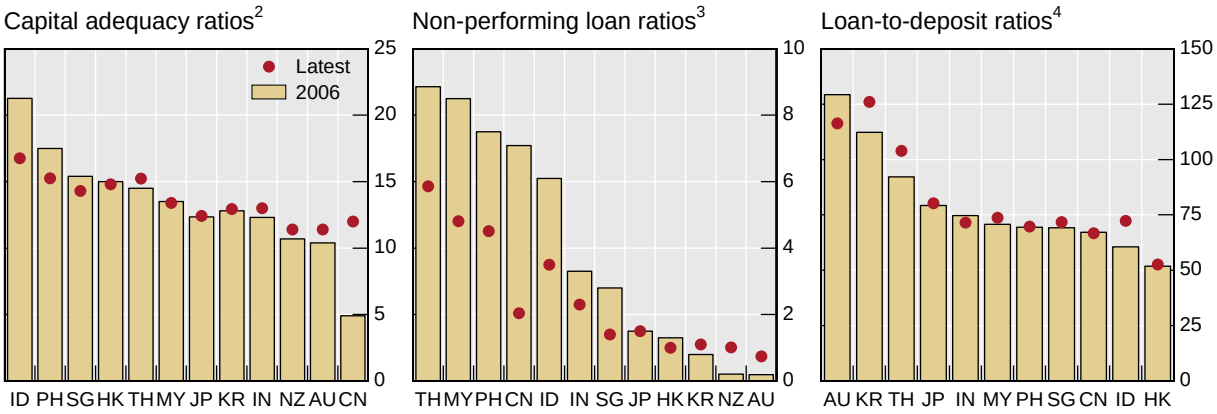
Financial intermediation in most Asia-Pacific economies has been traditionally dominated by the banking sector.[20] Therefore, the continuing soundness of the banking system is crucial for financial sector stability and economic growth in Asia-Pacific economies.

The resilience of banks in the region has been a bright spot during the international financial crisis. Since the inception of the crisis, banking systems in the United States and western Europe have posted losses exceeding $1 trillion, and loan quality has deteriorated significantly. In contrast, banks in Asia and the Pacific have remained strongly capitalised without incurring substantial losses (Graph II.3.1, left-hand panel). The ratio of non-performing loans to total loans has declined in most Asian-Pacific economies, or otherwise has remained at very low levels (Graph II.3.1, centre panel).

[20] The equity and bond markets in the region have witnessed rapid developments in the past decade (see Section II.2.1).

Graph II.3.1

Soundness of Asian banking systems[1]



For an explanation of the economy abbreviations, see Graph I.3.

[1] In per cent. [2] Total capital as a percentage of total risk-weighted assets. In Australia, Hong Kong SAR, Japan, Korea, Malaysia, New Zealand, Singapore and Thailand, the definition of risk-weighted assets changed during the period under review due to transition towards Basel II. [3] Non-performing loans as a percentage of total loans. For Australia, non-performing assets over total assets; for Japan, non-performing loans over total credit. [4] Total loans as a percentage of total deposits.

Sources: IMF; Bloomberg; CEIC; national data.

An important factor accounting for the resilience of banks in the region is their conventional business model. On the liability side of the balance sheet, deposits are the main funding source, while wholesale funding plays a limited role except in Australia, Korea and New Zealand. On the asset side, bank lending is typically originate-to-hold, and investments in complex innovative financial instruments have been kept at a low level. As a consequence, banks in Asia and the Pacific went through Phase 1 of the crisis almost unscathed, whereas US and western European banks posted substantial losses from these financial products. More importantly, the adoption of the conventional business model implies that in the Asia-Pacific region, risk management and supervisory frameworks are able to keep pace with business practices. Conversely, in the United States and western Europe, the transition to the "originate-to-distribute" business model was associated with distortions in incentives[21] and played an instrumental role in the increased vulnerabilities of their financial systems.

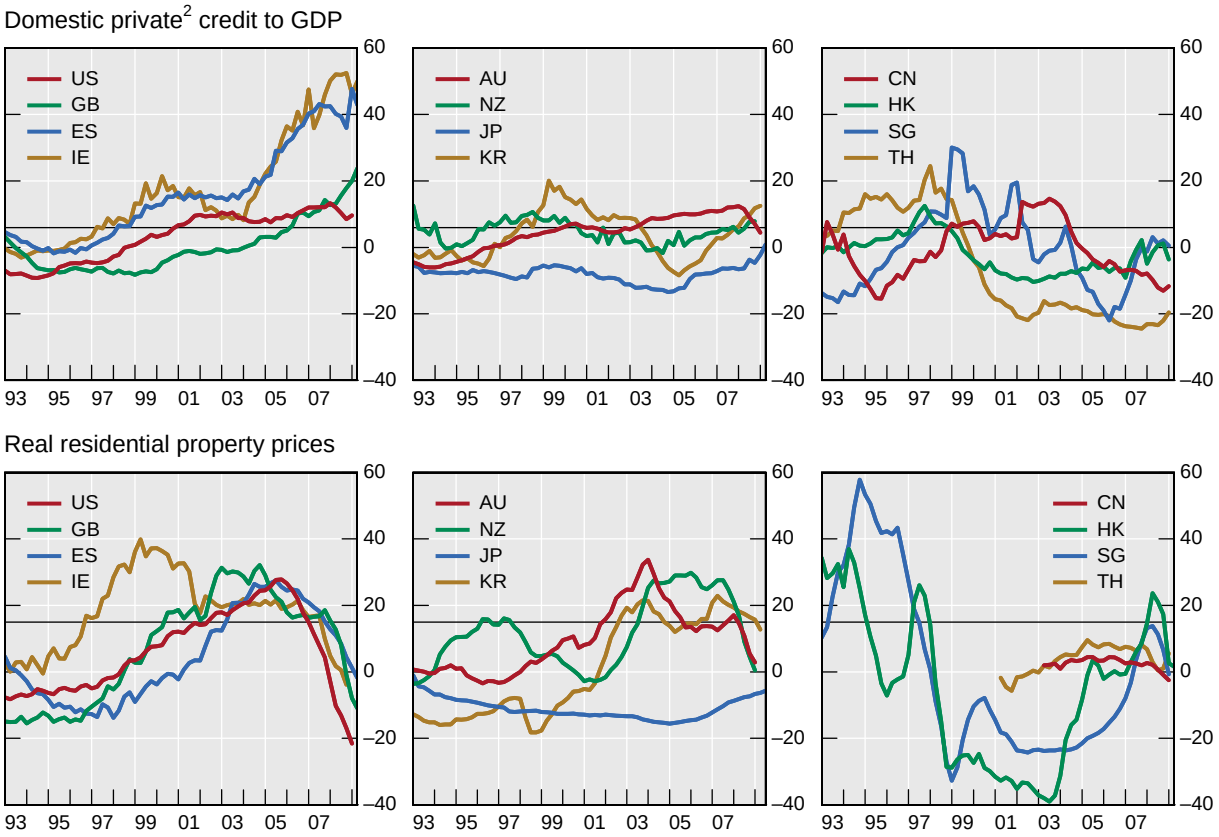
The relatively benign developments in credit and asset markets in most Asia-Pacific economies also contributed to the resilience of their banking systems. House price growth was quite diverse in the region, but was modest overall compared to the rapid growth observed in the United States and western Europe in the past decade. In Japan, Indonesia, Malaysia, the Philippines and Thailand, housing markets declined sharply in the previous boom-bust cycle and have not recovered since then. On the other hand, China, Hong Kong, Korea and Singapore all experienced an acceleration of housing price growth in the mid-2000s. Partly explaining the strong growth in these markets, housing prices were significantly undervalued at the beginning of the crisis either as a consequence of the Asian financial crisis (eg in Hong Kong, Korea and Singapore) or due to delayed market developments

[21] The distortion is exemplified in excessive risk-taking and lax risk monitoring, among others. See Knight (2008) for further discussion.

(eg in China).[22] Australia and New Zealand experienced substantial increases in bank credit and house prices in the early 2000s, but the pace had begun to moderate well before the current crisis.

Graph II.3.2

Gap measures[1] in credit and housing markets



AU = Australia; CN = China; ES = Spain; GB = United Kingdom; HK = Hong Kong SAR; IE = Ireland; JP = Japan; KR = Korea; NZ = New Zealand; SG = Singapore; TH = Thailand; US = United States.

[1] The gap measure is defined as the deviation (in relative terms) of a variable, either the ratio of private sector credit to GDP or the inflation-adjusted house price index, from its trend. The trend is calculated using the Hodrick-Prescott filter based on historical data. The thin horizontal lines plot the threshold values to predict banking crises as described in Footnote 21 in this section. [2] Refers to total credit for China, Hong Kong SAR, Singapore and Thailand.

Sources: CEIC; Datastream; national sources; BIS calculations.

Following an approach developed within the BIS, Graph II.3.2 plots the gap measures that reflect credit and asset market imbalances in eight Asia-Pacific economies and four non-Asia industrialised economies.[23] Taken at face value, signs of vulnerabilities began to emerge in

[22] Glindro et al (2008) show that there was little evidence of housing bubbles at national levels in these economies. However, in major cities or the luxury end of the market in these economies, house prices were significantly above their fundamental values and the irrational component was noticeable.

[23] Borio and Lowe (2002a, 2002b) define imbalances in the credit and real estate markets using "gap" measures, ie the deviations of the variables of interest from their long-term trends. Using combined criteria that (i) the credit gap (based on the ratio of private sector credit to GDP) exceeds 6%; and (ii) either the real estate gap exceeds 15% or the equity gap exceeds 60%, can successfully predict a high proportion (around 70%) of

the United States, the United Kingdom, Spain and Ireland several years before the international financial crisis. By contrast, evidence of financial imbalances was rather limited in the region, except for Australia and New Zealand in the years before the current crisis, and Hong Kong and Korea more recently. Nevertheless, housing market corrections in Australia and New Zealand have remained orderly and have not generated stresses for their banking systems. Two factors helped to explain this benign outcome. First, mortgage lending in these economies followed conventional practices, ie subprime lending and mortgage product innovations were rather limited. Second, mortgage borrowers benefited from large reductions in debt service due to the almost complete pass-through of policy rate cuts to mortgage rates. Hence, mortgage defaults have remained at low levels.

Spillovers since the failure of Lehman Brothers

For most Asia-Pacific economies, the failure of Lehman Brothers in September 2008 marked a turning point. It became highly costly, if not impossible, for Asian borrowers to access international capital markets (see Section II.2.1). Foreign banks, which continued to face heavy balance sheet pressure during this period, chose to scale back lending to the region. Domestic banks were also facing intensifying pressure, due not only to the deteriorating performance of the real economy in the region but also to a general loss of confidence and heightened risk aversion in financial markets.

As part of their strategy to adjust their balance sheets, international banks reduced lending activity in the region substantially in Phase 2 of the crisis. As shown by the BIS consolidated banking statistics, foreign claims by banks from major industrialised economies to non-Japan Asia fell dramatically in the second half of 2008 (Graph II.3.3, left-hand panel). In the fourth quarter alone, foreign claims on emerging Asia dropped by 12% to $870 billion, with US- and UK-headquartered banks accounting for roughly half of the decline. By type of claim, the decline in cross-border loans was most remarkable.[24] In general, the percentage drop in cross-border loans tended to be smaller in those host countries with greater foreign bank participation, probably reflecting strategic long-term orientation and business commitment (Graph II.3.3, right-hand panel).

The retreat of foreign banks from the Asia-Pacific region provides domestic banks with an opportunity to expand their operations and fill the gap in products and services. However, risks in the region have intensified as the crisis has deepened and spillover effects have become apparent. One example is the increase in credit default swap (CDS) spreads for major banks in the region in September–October 2008, implying that market confidence as it relates to the strength of Asian banks weakened. This was largely driven, however, by the demand for higher compensation for bearing the payoff uncertainty (ie default risk premium) and for facing liquidity constraints (ie liquidity risk premium).[25] During the same period, the likelihood of a systemic failure, as measured by the co-movement of banks' equity returns, also increased substantially (Graph II.3.4). After the strong interventions taken by government authorities, the stresses in the financial sector have eased significantly and returned to pre-Lehman levels.

---

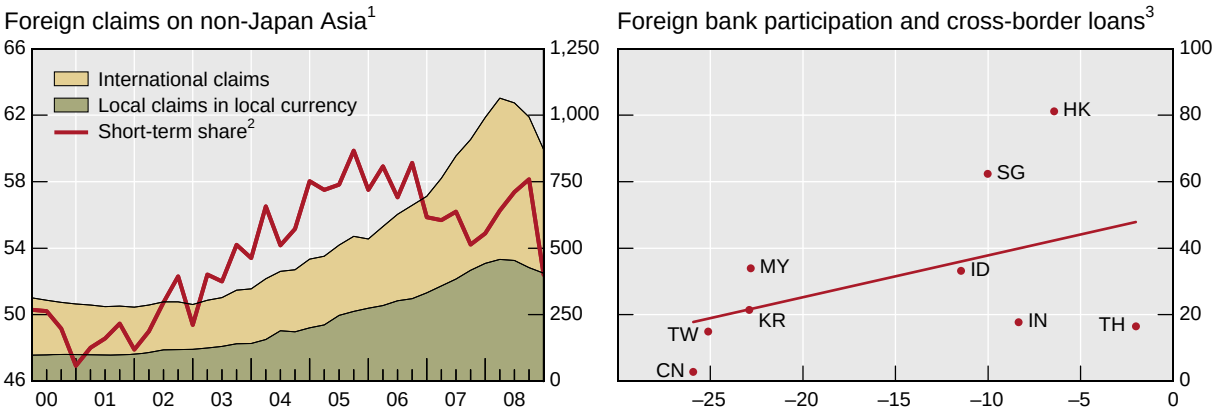
banking crises that will occur in the next two years (see Borio and Drehmann (2009)). Graph II. 3.2 does not show the gap measures in the equity markets because they were below the 60% threshold value in these economies in recent years (except in China and Korea in 2007).

[24] The drop in local claims in local currency extended by foreign offices was largely due to the dollar appreciation effect.

[25] See Huang et al (2009a, 2009b) and Kim et al (2009).

Graph II.3.3

Retreat of foreign banks from non-Japan Asia



[1] By banks headquartered in Austria, France, Germany, Italy, Japan, Netherlands, Spain, the United Kingdom and the United States. Foreign claims are defined as the sum of international claims (cross-border claims in all currencies and foreign currency claims extended locally by foreign offices) and locally claims in local currency extended by foreign offices. Shaded areas are billions of US dollars (rhs); solid lines are shares, in per cent (lhs). [2] Share of short-term claims in total international claims. [3] The horizontal axis refers to the percentage change in cross-border loans of BIS reporting banks vis-à-vis resident banks in the economies shown; Q4 2008 over Q3 2008. The vertical axis refers to the share of foreign-owned banks in total assets of the banking system; Q4 2008, in per cent.

Sources: IMF; BIS.

II.3.2 Policy responses and their impact

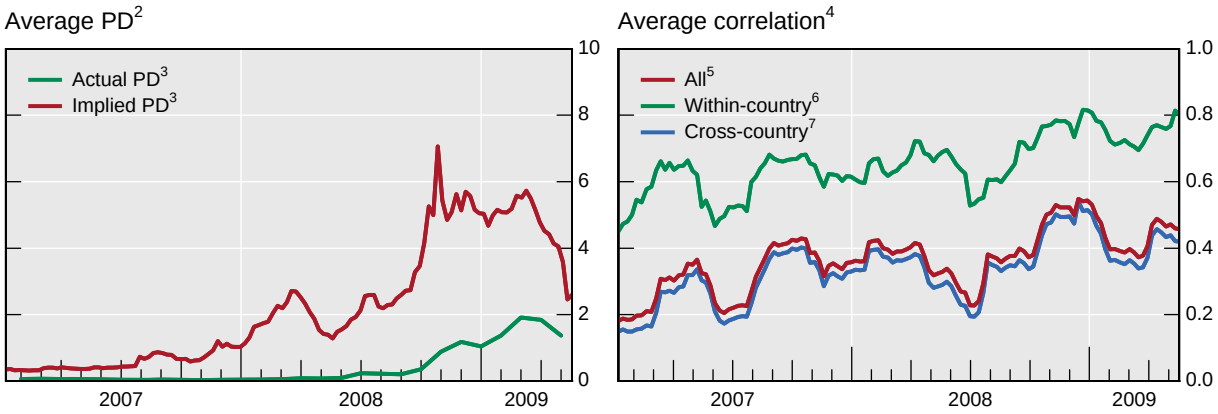
In response to the crisis, authorities in Asia and the Pacific have taken various policy measures mainly designed to achieve the following goals: (1) mitigating spillovers to the financial sector; and (2) avoiding a credit crunch that could induce or exacerbate a recession. Taken together, we can classify these policy measures into three categories: (1) liquidity and solvency assistance; (2) the purchase of distressed assets and the suspension of mark-to-market accounting rules; and (3) credit policies designed to mitigate a credit crunch.[26]

The first set of measures is intended to address shocks to financial institutions and avoid financial distress. Beginning in September 2008 when several western European countries implemented blanket guarantees covering bank deposits and other debts, many Asia-Pacific economies followed suit, by introducing a blanket guarantee on deposits, increasing the deposit insurance coverage amount or expanding the set of eligible deposits protected by deposit insurance. Australia, Korea and New Zealand, in order to facilitate access by banks to international financial markets, also provided state guarantees on non-deposit wholesale liabilities.

[26] Shim and von Peter (2007) provide an overview of available policy measures to mitigate distress selling and asset market feedback, which includes most of the measures discussed here.

Graph II.3.4

Measures of systemic risk[1]



[1] The sample comprises 23 major banks in China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Singapore and Thailand. [2] Weighted averages of individual banks' probabilities of default (PD), in per cent. [3] "Actual" PDs are based on Moody's KMV EDF data, which provide an estimate of *actual* one-year default rates for individual banks. "Implied" PDs, also known as the *risk-neutral* default rates, are derived from USD-denominated CDS spreads (see Tarashev and Zhu (2008)). Both PDs are forward-looking measures, but implied PDs are typically higher than actual PDs in that they also incorporate a default risk premium component, which compensates for bearing the risk in payoff uncertainty, and a liquidity premium component. [4] Three-month backward-looking equity return correlations. [5] Average of all pairwise correlation coefficients. [6] Average of pairwise correlations between two banks that are from the same economy. [7] Average of pairwise correlations between two banks that are from different economies.

Sources: Bloomberg; Markit; Moody's KMV.

Many central banks in the region expanded local currency liquidity support to help banks cope with funding problems. Measures have focused on extending the maturity of borrowing from the central bank (Australia, Chinese Taipei, Hong Kong, India, Indonesia and New Zealand), broadening the eligibility of collateral for lending by central banks (Australia, Hong Kong, Japan, Korea and New Zealand) and broadening participation (India, Korea). Central banks also provided banks with liquidity assistance in foreign currency, especially US dollars, as described in Section II.2.2.

In still other cases, governments injected capital directly into financial institutions. The scale and scope of capital injections by governments in Asia and the Pacific have been much smaller than those by the US and western European governments (Graph II.3.5). Also, capital injections by governments in the region were largely made to state-owned banks, with the objective of expanding lending to SMEs and the trade sector, whereas capital from governments in the United States and western Europe was most often provided to large private financial institutions.[27]

The second set of measures, purchasing assets and suspending mark to market accounting rules, helped to mitigate the impact of the crisis on the financial statements of banks. The Bank of Japan purchased company shares and bonds held by financial institutions. Korea Asset Management Corporation purchased bad loans worth KRW 1.8 trillion in 2008, and will set up a restructuring fund of up to KRW 40 trillion to buy substandard assets in 2009.

The financial crisis has forced authorities to reconsider the use of fair value accounting in illiquid markets. In September and October 2008, the International Accounting Standards

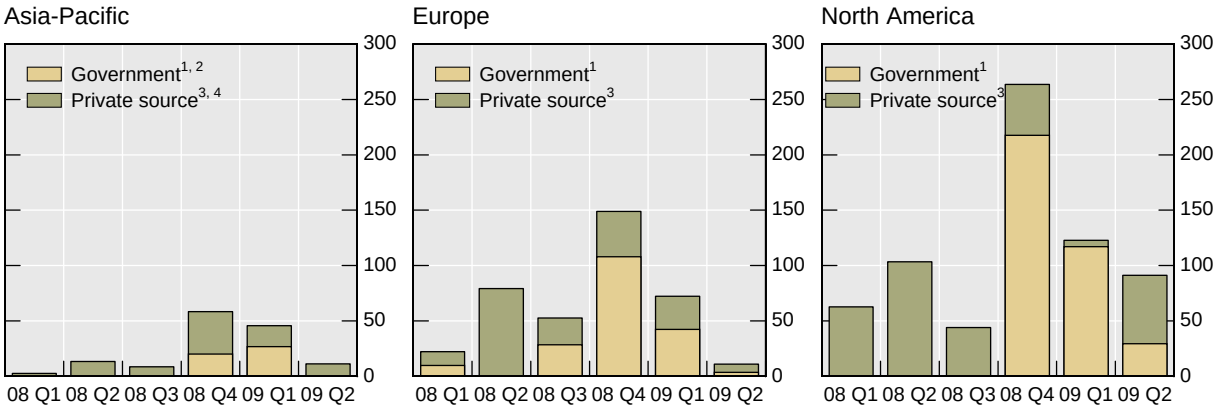
[27] For a discussion on the recapitalisation of state-owned banks by the Chinese government before 2006, see Ma (2007).

Board (IASB) and the accounting standard setter in the United States relaxed mark to market rules for transactions in distressed markets. In the Asia-Pacific region, Japan subsequently adopted similar measures, while Indonesia and the Philippines, facing a bond market collapse in October 2008, modified their accounting standards to permit the reclassification of assets held at fair value into amortised cost categories and the rebooking of previously incurred losses. Malaysia also allowed financial institutions to reclassify non-derivative securities on a cost value basis. Suspension of mark to market rules during a market collapse can temporarily strengthen reported balance sheets of financial institutions holding distressed assets and prevent distress selling and the realisation of losses.[28]

Graph II.3.5

Sources of capital raised by financial institutions

In billions of US dollars



[1] Includes capital injections by the government into state-owned financial institutions. For Europe and North America, also includes capital injections by parent companies. [2] Actual capital injection completed for China and Korea; plans to inject capital announced in Q1 2009 for India and Japan. [3] Public offerings, strategic buyers, sovereign wealth funds and private placements. [4] Raised by selected banks, brokers and insurance companies in Australia, China, Chinese Taipei, Hong Kong SAR, Japan, Korea and Singapore.

Sources: Bloomberg, Fitch ratings, national sources, BIS calculations.

The last set of measures was introduced to facilitate the supply of credit, particularly to lower-rated SMEs as they tend to suffer disproportionately during a credit crunch. To wit, Hong Kong and Malaysia introduced credit guarantee schemes for SME loans, while Korea expanded the provision of credit guarantees to SMEs through the two existing government agencies. Despite these and other efforts, real domestic credit growth slowed substantially in Australia, Hong Kong, India, Indonesia, Korea, New Zealand and Singapore in 2008 compared to 2007. On the other hand, Malaysia, the Philippines and Thailand exhibited stronger credit growth in 2008 and early 2009 than in 2007.

It should be noted here that the current crisis has highlighted the importance of the government's capacity to provide assistance to financial institutions in the form of liquidity provision, liability guarantees or capital injections. This has strengthened the notion that banks' risk depends on sovereign risk. Given that the financial sector in Asia and the Pacific is relatively sound and resilient, too much emphasis on the government's bailout capacity

[28] The IASB issued for public comment an exposure draft on fair value measurement in late May 2009. The proposals incorporate recent guidance on fair value measurement published by the US accounting standard setter and address valuation issues arising in markets that have become inactive.

might have the unintended consequence of increasing the incentives for greater risk-taking by financial institutions.

Box II

Measuring the impact of deposit and debt guarantee measures

Guarantees provided by governments to financial institutions have been a key element of the policy response by Asia-Pacific economies. One way to look at the impact of the expansion of deposit and debt issuance guarantees is to examine the reaction of banks' CDS spreads to the announcement and implementation of these measures.

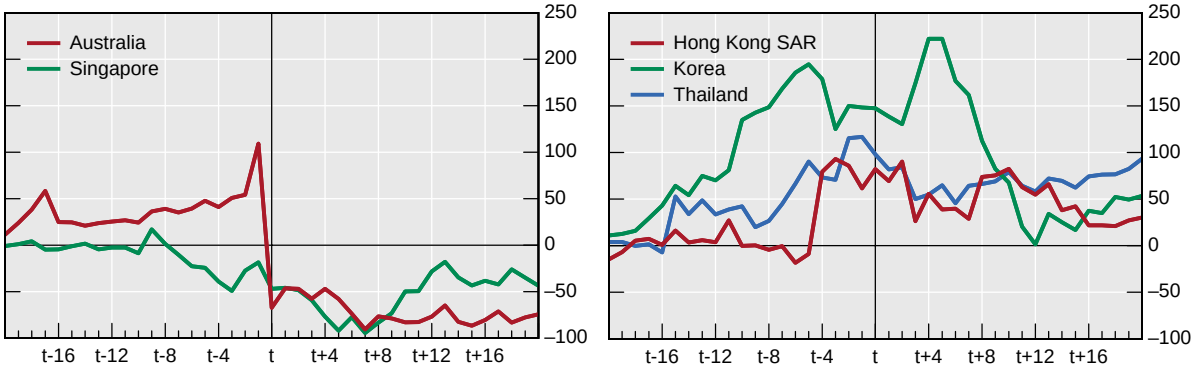
We use an event study methodology following King (2009). In order to determine the net effect of the guarantee measures, we first use the historical relationship between an individual bank's CDS spread and a corresponding CDS index for one year up to the bankruptcy of Lehman Brothers, and then extract the abnormal changes in the CDS spreads of individual banks. Graph II.3.6 shows the cumulative average abnormal changes in CDS spreads of banks in each economy for the 20 trading days preceding and following the date when the measures were taken. In Australia and Singapore, CDS spreads for major banks dropped substantially, even after adjusting for their co-movement with the market, and stayed low after the announcement of deposit and debt issuance guarantees. In contrast, in Hong Kong, Korea and Thailand, the announcement appeared to be less effective after adjusting for the movement of their banks' CDS spreads explained by the market.

Note that Australia and New Zealand did not have any formal deposit insurance system until they introduced a blanket deposit protection system in October 2008, while Chinese Taipei, Hong Kong, Malaysia and Singapore already had a partial deposit guarantee scheme before they introduced a temporary blanket guarantee. Indonesia and the Philippines, on the other hand, increased the protection limit substantially, but not to the point of issuing a blanket guarantee. In the case of Australia, the strong impact of the guarantee measures is partly explained by the introduction of both the blanket guarantee on deposits and debt issuance guarantee on the same day and partly by relatively large wholesale liabilities.

Graph II.3.6

Impact of deposit and debt guarantee announcements on CDS spreads

Cumulative abnormal changes in bank CDS spreads, in basis points



"t" is the date of announcement of policy measures. For Australia, blanket deposit guarantee and debt issuance guarantee. For Hong Kong SAR, Singapore and Thailand, blanket deposit guarantee. For Korea, debt issuance guarantee. Six banks for Australia, three for Hong Kong SAR, eight for Korea, three for Singapore and three for Thailand. The linear relationship between a bank's CDS spread and a market benchmark is calculated over the period between 21 September 2007 and 12 September 2008. For banks in Australia, the iTraxx Australia index is used for the market benchmark. For banks in Hong Kong SAR, Korea, Singapore and Thailand, the iTraxx Asia ex-Japan IG index is used.

Sources: Markit; BIS calculations.

II.3.3 Implications for regulation and prudential supervision

Steps taken by authorities in Asia and the Pacific thus far have helped to stabilise markets and boost confidence. However, these actions have been generally short-term in nature and domestic in orientation. In the medium term, exit strategies for the various stabilisation programmes will need to be implemented, and in the longer term institutional frameworks for the oversight and stability of financial systems should be considered. Work being conducted by various domestic and international authorities on proposed structures and frameworks that could enhance financial stability may serve as an appropriate starting point. This section considers the implications of key initiatives for Asia and the Pacific.

Implementation of exit strategies for government guarantees

Since last October, authorities in Asia and the Pacific have taken a number of measures in an attempt to maintain the stability of the financial system. These steps have generally taken the form of enhanced deposit protection schemes and debt guarantees. While the length of the crisis remains uncertain, the exit timing of these measures was in some cases announced at the time of their implementation, as summarised in Table II.3.1.

Table II.3.1

Exit timing of measures taken in Asia and the Pacific

	AU	HK	ID	KR	MY	NZ	PH	SG	TW	TH
Deposit protection	Oct 2011	Dec 2010	No sunset	–	Dec 2010	Oct 2010	No sunset	Dec 2010	Dec 2009	Aug 2011
Debt guarantee	Uncertain[1]	–	–	June 2010	–	Uncertain[2]	–	–	–	–

For an explanation of the economy abbreviations, see Graph I.3. TW = Chinese Taipei.

[1] Once market conditions have normalised. [2] When market conditions in the key funding markets have returned to relative normality for a sustained period.

The introduction and withdrawal of blanket guarantees of deposits is not new to the region. In response to the Asian financial crisis in the late 1990s, Indonesia, Japan, Korea, Malaysia and Thailand put in place blanket guarantees of deposits. However, each economy took a rather different approach to exiting from this policy measure. Korea removed its blanket guarantee at the end of 2000 as scheduled, but with a significant increase in the coverage limit to maintain depositor confidence. Japan introduced a blanket guarantee in 1996 with the intention of withdrawing it in 1999, but later decided to extend the guarantee until 2002. Indonesia and Thailand gradually lowered the coverage amounts over almost 10 years. These episodes demonstrate that the circumstances in each economy will significantly influence the timing and structure of the exit strategy. In the context of the current crisis, given that specific exit dates for the blanket guarantees have already been announced, it will be important to make sure that the implementation schedule is credible by restoring the health of the banking system and, if necessary, strengthening the regulatory and supervisory framework. The more interconnected financial markets in the region may warrant effective

coordination across jurisdictions in terms of exit timing and the new levels of limited coverage, so that the potential disruptions in capital flows can be kept to a minimum. [29]

The issues regarding the phase-out of debt guarantees are more subtle. The removal of debt guarantees needs to be gradual and predictable. Also, pricing of debt guarantees should be close to market rates and risk-based, so that their removal will not adversely affect the market once the situation returns to normal. In addition, given that debt guarantees were adopted by a number of economies inside (Australia, Korea and New Zealand) and outside the region in October and November 2008, the removal of guarantees in one economy earlier than others may lead to differential funding conditions across banks. This aspect of the exit strategies may warrant greater dialogue among economies.

Implications for the international reform measures in Asia and the Pacific

The Financial Stability Forum (re-established in April 2009 as the Financial Stability Board (FSB)) assumed a leading role in coordinating the actions of national and international bodies aimed at strengthening financial systems to address the weaknesses that contributed to the crisis. Detailed recommendations were issued by the Financial Stability Forum in April 2008 in the following areas which lie at the centre of the international response to the crisis: (1) strengthening of prudential oversight of capital, liquidity and risk management; (2) enhancing transparency and valuation; (3) changing the role and uses of credit ratings; (4) strengthening the authorities' responsiveness to risks; and (5) developing robust arrangements for dealing with stresses in the financial system. Since then, many of these actions have been implemented by international financial institutions, global standard setters, national authorities and the financial industry. In April 2009 the FSB issued further recommendations, guidelines and principles in the areas of reducing procyclicality, modifying compensation systems at financial institutions to prevent excessive risk-taking and enhancing cross-border crisis management. The reform measures and recommendations should be largely completed by end-2009, with a few actions extending into 2010. While all of the international reform measures are important, some are more relevant to Asia and the Pacific than others, such as strengthening macroprudential policy tools, implementing Pillar 2 of the Basel II Framework, developing an effective liquidity risk management framework and identifying potential home-host issues in the region.

An overarching theme of the international recommendations is the importance of the macroprudential approach to regulation and supervision to supplement the more traditional, firm-level microprudential approach. As illustrated in Table II.3.2, authorities in Asia and the Pacific have, over the years, implemented some measures to marry macro- and microprudential supervision. Nevertheless, authorities will need to devote further resources and expertise to fully develop suitable tools to address systemic vulnerabilities arising from excess liquidity, leverage, risk-taking and systemic concentrations across the financial system. They will also need to devise tools to mitigate procyclicality stemming from risk measurement, capital regulation, provisioning rules, accounting rules and other sources. There is growing support for a countercyclical capital charge that would require financial institutions to build up defensive buffers in good times that could be drawn down in bad times, and work is underway to design a framework for determining the level and cyclical sensitivities of capital requirements (BIS (2009)).

[29] On 22 July 2009, the Hong Kong Monetary Authority, Bank Negara Malaysia and the Monetary Authority of Singapore announced the establishment of a tripartite working group to map out a coordinated strategy for the scheduled exit from the full deposit guarantee by the end of 2010 in their respective jurisdictions.

Table II.3.2

Pre-emptive prudential and monetary measures taken against credit booms in Asia

	Prudential instruments					Monetary instruments	
	LTV	**Capital**	**Provision**	**Exposure limit**	**Lending criteria**	**Credit limit**	**Average reserve requirement**
China	2001, 2005, 2006				2004		2003, 2004, 2006, 2007–08
Hong Kong SAR	1991, 1997			1994–98		1994	
India		2005, 2008, 2009	2005, 2006, 2007	2006	2007	2003	2004, 2006, 2007–08
Korea	2003, 2006–08				2006		2006
Malaysia	1995–98	2005		1997–98	1995		1994–98
Thailand	2003				2004–05		

LTV = loan-to-value ratio; Capital = capital requirements; Provision = loan provisioning rules; Credit limit = limit on credit growth; Lending criteria = limits on debt repayment-to-income, debt repayment-to-debt or credit line-to-income ratio; Exposure limit = credit exposure to a sector. The years indicated refer to the timing of the introduction of the measure. A year after a dash refers to the timing of the lifting or relaxing of the measure.

To maintain confidence in the banking system, implementation of Basel II and maintenance of adequate capital buffers for banks should remain a priority. At present, all of the major economies in Asia and the Pacific have either implemented Basel II in its entirety, are in the midst of a phased implementation process or are planning to implement it in the near future (Table II.3.3). That said, the financial crisis has clearly illustrated that Basel II is more than a set of rules or quantitative measures; rather, it is a process that ensures capital adequacy with respect to an institution's overall risk profile.[30] This process, which is largely captured in the Supervisory Review Process, or Pillar 2, of the Framework, requires an assessment of all material risks facing an institution and that capital be held above regulatory minimums. The qualitative aspects of Pillar 2 will present challenges to many central banks and supervisory authorities in the region.

In contrast to previous financial crises, the lack of funding liquidity at major global financial institutions has played a central role in the current crisis. In response, central bank operational frameworks should be sufficiently flexible to allow the use of a variety of tools and instruments in the face of illiquidity, either among institutions or markets. Similarly, supervisors must have the capacity to assess liquidity risk management in financial institutions. In the region, the supervision of liquidity risk is still emerging, with many jurisdictions in the process of developing appropriate prudential metrics and processes. For example, in June 2009 the Reserve Bank of New Zealand released a new prudential liquidity policy for banks, which establishes various balance sheet requirements and disclosure obligations intended to make banks more resilient to short- and long-term funding shocks.

[30] See Borio and Zhu (2008) for further discussion.

Table II.3.3

Timetable for the implementation of Pillar 1 of Basel II[1]

1 January unless otherwise noted

	Credit risk			Operational risk		
	Standard-ised approach	**Foundation IRB**	**Advanced IRB**	**Basic indicators approach**	**Standard-ised approach**	**Advanced measurement approaches**
Australia	2008	2008	2008	2008	2008	2008
China	Not permitted	2010–13[2]	2010–13[2]	Undecided	Undecided	Undecided
Hong Kong SAR	2007	2007	2008	2007	2007	Not permitted
India	2008–09[3]	2012–14	2012–14	2008–09[3]	2012–14	2012–14
Indonesia	2009	2010[4]	2010[4]	2009	2010[4]	2011[5]
Japan	2007[6]	2007[6]	2008[6]	2007[6]	2007[6]	2008[6]
Korea	2008	2008	2009	2008	2008	2009
Malaysia	2008	2010	2010	2008–10[7]	2008–10[7]	Undecided
New Zealand	2008	2008	2008	2008	2008	2008
Philippines	2007[8]	2010	2010	2007[8]	2007[8]	2010
Singapore	2008	2008	2008	2008	2008	2008
Chinese Taipei	2007	2007	2008	2007	2007	2008
Thailand	2008[4]	2008[4]	2009[4]	2008[4]	2008[4]	Not permitted

[1] Pillar 1 refers to minimum capital requirements. [2] Permitted only for internationally active banks; banks can implement an IRB approach as early as 31 December 2010 but must implement one by 31 December 2013. [3] 31 March 2008 for Indian banks with a foreign presence and foreign banks operating in India; 31 March 2009 for all other banks. [4] 31 December. [5] 30 June. [6] 31 March. [7] 2008 for banks that are adopting the standardised approach for credit risk; 2010 for banks that are adopting an IRB approach for credit risk. [8] 1 July.

The international financial crisis has also had an important impact on the landscape and direction of the financial sector in Asia and the Pacific. The retreat of foreign banks from the region implies that, at least in the near term, the role of foreign banks will decline and domestic banks may fill the gap. As regional banks are expected to expand their presence in the region, partly replacing the large international banks, it is important to recognise potential home-host issues related to regulation and safety net provisions. Also, a potential growth of regional financial institutions into large and complex financial institutions requires close monitoring of systemic risk.

Finally, the causes and spillovers of the international crisis may spark a discussion about the trade-offs associated with financial liberalisation. While there is a consensus about the benefits of deregulating financial markets, liberalisation can also be costly in terms of increased susceptibility to external financial crises. To balance this trade-off, it is crucial that financial liberalisation, particularly in the context of financial innovation, should be accompanied by the appropriate framework of sound financial regulation, targeted towards ensuring adequate levels of risk management, prudential buffers and transparency.

Annex:
Overview of measures announced by Asia-Pacific authorities since September 2008

A1: Changes in macroeconomic policies

	Monetary policy		Fiscal stimulus package
	Change in policy rate (in basis points)	Other measures	
Australia	–425 cumulative: –25 (2/09/08), –100 (7/10/08), –75 (4/11/08), –100 (2/12/08), –100 (03/02/09), –25 (07/04/09)		AUD 10.4 bn = 1% of GDP (10/08); AUD 42 bn (13/02/09)
China	–216 cumulative: –27 (15/09/08), –27 (8/10/08), –27 (29/10/08), –108 (26/11/08); –27 (22/12/08)	Cumulative change in reserve requirements: –200 for large banks: –50 (8/10/08), –100 (26/11/08), –50 (22/12/08) –400 for other banks: –100 (15/09/08), –50 (8/10/08), –200 (26/11/08), –50 (22/12/08)	RMB 4 trn = 13% of GDP, over two years (9/11/08)
Chinese Taipei	–237.5 cumulative: –12.5 (26/09/08), –25 (09/10/08), –25 (30/10/08), –25 (10/11/08), –75 (12/12/08), –50 (08/01/09), –25 (19/02/09)	–75 change in reserve requirements (18/09/08)	TWD 180 bn, comprised of 123 bn in subsidies and tax cuts and the remainder in infrastructure spending (11/09/08); TWD 83 bn in shopping vouchers (18/11/09); TWD 859 bn investment spending and TWD 1.1 trn corporate financing over four years (20/04/09)
Hong Kong SAR	na	–300 bp cumulative change in Base Rate: –150 (09/10/08), –50 (30/10/08), –100 (17/12/08) Calculation method for the HKMA's base rate changed on 08/10/08: first "leg" is changed from fed funds target rate (FFTR) + 150 bp to FFTR + 50 bps; second leg – average of five-day MAs of o/n and one-month HIBORs – suspended until the end of March 2009. After the FOMC's decision in December 2008 to adopt a 25 bp range for the federal funds rate instead of a single number, HKMA announces it will set the base rate at 50 bp above the lower end of the FOMC's target range. Second leg re-instated as of 01/04/2009, ie the base rate is now the higher of (i) the (lower end of the FOMC's range for the) FFTR + 50 bp and (ii) the average of five-day MAs of o/n and one-month HIBORs.	5.2% of GDP (cumulative through 26 May 2009)

A1: Changes in macroeconomic policies (cont)

	Monetary policy		Fiscal stimulus package
	Change in policy rate (in basis points)	Other measures	
India	Repo: –425 cumulative: –100 (20/10/08), –50 (3/11/08), –100 (08/12/08), –100 (05/01/09), –50 (05/03/09), –25 (21/04/09) Reverse repo: –275 cumulative: –200 (02/01/09), –50 (05/03/09), –25 (21/04/09)	–400 cumulative change in reserve requirements: –250 (24/10/08), –50 (25/10/08), –50 (03/11/08), –50 (17/01/09)	INR 1860 bn = 3.5% of GDP (October 2008, December 2008, February 2009)
Indonesia	–225 cumulative: +25 (04/09/08), +25 (07/10/08), –25 (04/12/08), –50 (07/01/09), –50 (4/02/09), –50 (04/03/09), –25 (03/04/09), –25 (05/05/09), –25 (03/06/09), –25 (03/07/09)	–158 change in reserve requirements (09/10/08)	IDR 73.3 trn = 1.4% of GDP (13/01/09)
Japan	–40 cumulative: –20 (31/10/08), –20 (19/12/08)		JPY 5 trn = 1% of GDP (30/10/08); JPY 15.4 trn = 3% of GDP (10/04/09)
Korea	–325 cumulative: –25 (10/09/08), –75 (27/10/08), –25 (07/11/08); –100 (11/12/08); –50 (09/01/09); –50 (12/02/09)		Government spending increase: KRW 16 tr = 1.6% of GDP (in 2008), KRW 17.7 tr = 1.7% of GDP (in 2009) Tax cut: KRW 35.3 tr = 3.4% of GDP (during 2008–2012)
Malaysia	–150 cumulative from Nov 08 to Feb 09: –25 (24/11/08); –75 (21/01/09); –50 (24/02/09) to 2% (and maintained as of May 2009)	–300 cumulative: –50 (24/11/08), –150 (21/01/09), –100 (24/02/09); Statutory Reserve Requirement (SRR) adjusted downwards from 2% to 1% effective 1 March 2009 to further reduce the cost of intermediation.	MYR 7 bn = roughly 1% of GDP (10/08); aimed at offsetting the shortfall in private sector demand and reinvigorate private spending; focused on small-scale construction, maintenance of social infrastructure and public amenities and development projects, including building of low- and medium-income housing, plus measures to boost consumption. MYR 60 bn in spending, tax incentives and other measures over the next two years (10/03/09); includes wide-ranging measures to support domestic demand and strengthen growth capacity: 15 bn of fiscal spending, 25 bn for guarantee funds, 10 bn for equity investment, 7 bn for private finance initiatives and 3 bn for tax incentives.

A1: Changes in macroeconomic policies (cont)

	Monetary policy		Fiscal stimulus package
	Change in policy rate (in basis points)	Other measures	
New Zealand	–575 cumulative: –25 (25/07/08), –50 (11/09/08), –100 (23/10/08), –150 (04/12/08), –150 (29/01/09), –50 (12/03/09), –50 (30/04/09)		NZD 7 bn = 4% of GDP, over two years (27/11/08)
Philippines	–200 cumulative: –50 (18/12/08); –50 (29/1/09); –25 (05/03/09), –25 bp (16/04/09), –25bp (28/05/09), –25 bp (09/07/09)	2% reduction in reserve requirements (14/11/08)	PHP 330 bn for quick-disbursing infrastructure, agriculture and social expenditure
Singapore	na	Slope of target band for SGD changed to neutral from modest and gradual appreciation (10/10/08). April 2009 policy statement further shifted to modestly weaker currency stance.	2009/10 fiscal year includes a SGD 4.9 bn (USD 3.2 bn) drawdown of the fiscal reserve to partly fund the SGD 20.5 bn (USD 13.6 bn) fiscal stimulus package and the deficit of 3.5% of GDP.
Thailand	–250 bp cumulative (since October 2008): –100 (03/12/08); –75 (14/01/09); –50 (25/02/09); –25 (08/04/09)		THB 116.7 bn (USD 3.33 bn) package to provide a THB 2,000 monthly living allowance to low-income earners, school subsidies, promotion of rural small enterprises, free electricity and water for small households and property tax cuts (13/01/09). THB 1.43 trn “Strong Thailand” package for 2010–12, most of which will be spent on infrastructure projects (17/03/09).

A2: Liquidity assistance in local currency

	Extend the maturity of operations	Expand eligible collateral	Other changes in operating procedures
Australia	Frequency of six- and 12-month repos was increased to daily (08/10/08).	Accept RMBS and ABCP of related parties (08/10/08).	Term Deposit Facility with one- and two-week maturities introduced to absorb liquidity (24/09/08); restrictions on substituting collateral within an existing repo removed (08/10/08).
China			Financial institutions facing short-term liquidity problem receive help to borrow from the interbank market.; bilateral currency swap arrangements with six economies total RMB 650 bn (see Annex A3); government plans pilot cross-border trade settlement programme in CNY between Hong Kong SAR and five cities in mainland China (08/04/09), later signed (29/06/09); for the first time, foreign banks permitted to sell renminbi-denominated bonds outside (in Hong Kong, 19/05/09) and inside mainland China (03/06/09).
Chinese Taipei	Maximum maturity of the repo facility extended to 180 days, from 30 days (26/10/08).		Access to repo facility expanded to include all securities firms and insurance companies, transacting via eligible dealers (26/10/08).
Hong Kong SAR	Maximum maturity of borrowing from the HKMA's standing facility increased on 30/09/08 from o/n to three months. This measure was allowed to lapse as of 30/03/09.	USD assets accepted under the same conditions as HKD collateral (30/09/08). This measure was allowed to lapse as of 30/03/09.	Costs of borrowing from the HKMA's standing facility reduced (30/09/08); plan announced to make term funding available, against repo collateral or through FX swaps, upon request and if deemed necessary by the HKMA (30/09/08); strengthened HKMA's lender of last resort framework by including FX swaps as one of the basic instruments to provide LOLR support and expanding the definition of eligible securities for repos to include foreign currency securities of acceptable ratings (26/03/09).
India			A special two-week repo facility was introduced, through which banks can borrow to lend to mutual funds to meet redemptions (14/10/08); special refinance facilities for financial institutions; reduction in the statutory liquidity ratio from 25% to 24%;. Corridor for overnight interest rates narrowed from 200bp to 150bp (03/11/08)
Indonesia	Two-week repo operations introduced (09/10/08).		Corridor for overnight interest rates narrowed from 200 bp to 100 bp (04/12/08).

A2: Liquidity assistance in local currency (cont)

	Extend the maturity of operations	Expand eligible collateral	Other changes in operating procedures
Japan	Providing up to JPY 1.225 trn at 0.1% through 03/04/09 – previously only overnight funds had been offered at such low rates.	Accept corporate debt rated BBB– or higher (until 30/04/09), previously A– (2/12/08); debt instruments issued by real estate investment corporations (22/01/09); government-guaranteed dematerialised commercial paper (19/02/09); bonds issued by the US, UK, German and French governments (22/05/09)	Expansion of the securities lending facility (14/10/08, 19/02/09); increase in the frequency and size of CP repo operations (14/10/08); expansion of JGB purchases through repos (14/10/08); introduction of the complementary deposit facility (31/10/08); introduction and expansion of special funds-supplying operations to facilitate corporate financing (02/12/08, 19/12/08, 19/02/09)); increased JGB purchases from JPY 14.4 trn per year to 16.8 trn (19/12/08) and later 21.6 trn (18/03/09); introduction of outright purchases of CP (19/12/08, 22/01/09) and corporate bonds (22/01/09, 19/02/09).
Korea	91-day repos introduced (9/1/09)	Bonds issued by banks and special entities accepted (27/10/08); public corporation bonds accepted (09/12/08).	Interest began to be paid on bank deposits in the central bank (03/12/08). Liquidity support for construction companies (10/08) and importers and exporters (12/08). Additional liquidity support for shipbuilders (31/04/08). Twelve additional securities firms eligible counterparties for repo operations (11/12/08). Reverse mortgage scheme expanded: minimum age lowed and maximum loan amount increased (18/02/09).
New Zealand	Term Auction Facility introduced to provide three-, six- and 12-month funding up to NZD 2 bn (07/11/08).	Bank bills accepted (23/08/07), All AAA-rated locally registered bonds (07/05/08) and (temporarily) unrated RMBS (9/10/08) accepted. Further extension of the range of collateral (17/12/08).	Reintroduction of central bank bills, not issued since 1999 (07/11/08). Application of the graduated haircut regime to all securities eligible for domestic liquidity operations (17/12/08).
Philippines			Reclassification of financial assets (vis mark to market) in line with IAS amendments (31/10/08); liberalisation of rediscounting guidelines and increasing rediscounting budget (2/03/2009)

A3: Liquidity assistance in foreign currency

	Swap facility with Federal Reserve to provide US dollars against local currency		Other measures
	Maximum amount	**Drawn**	
Australia	$10 bn (24/09/08), increased to $30 bn (29/09/08)	Yes	
China			Bilateral swap arrangements: RMB 180 bn / KRW 38 trn with Korea (12/12/08); RMB 200 bn / HKD 227 bn with HKMA (20/01/09); RMB 80 bn / MYR 40 bn with Malaysia (08/02/09); RMB 20 bn / BYR 8 trn with Belarus (11/03/09); RMB 100 bn / IDR 175 trn with Indonesia (23/03/09); RMB 70 bn with Argentina (29/03/09). Multilateral swap facility: ASEAN+3, total $120 bn. China commits 32%. China made plans to lend foreign exchange to financial institutions running short of foreign currency liquidity.
Hong Kong SAR			Bilateral swap line with mainland China of RMB 200 bn / HKD 227 bn (20/01/09).
India			RBI made available to banks a FX swap facility, raised the interest rate ceiling on non-resident Indian deposits, relaxed the all-in cost ceiling for external commercial borrowings, and permitted systemically important non-bank financial institutions to raise short-term foreign currency borrowings; regulations on borrowing by banks from their overseas branches eased (15/10/08); RBI more than tripled (to INR 347 bn) the funds it makes available for banks to refinance export credit and increased the export credit refinance limit for commercial banks from 15% to 50% of outstanding export credit (16/11/08).
Indonesia			Maximum maturity of IDR-USD FX swaps with BI was extended to one month from seven days (14/10/08); reserve requirements on foreign currency deposits lowered to 1% from 3% (14/10/08); limit on foreign borrowing by banks of 30% of capital abolished (9/10/08); arrangement of $5.5 bn standby loans from the World Bank, the ADB, Australia and Japan (02/02/09); Expansion of bilateral currency swap arrangement with Japan from $6 bn to $12 bn (21/02/09); USD 3.5 bn contribution to the expanded Chiang Mai Initiative (22/02/09); bilateral swap line with China of RMB 100 bn / IDR 175 trn (23/03/09).
Japan	$60 bn (18/09/08); increased to $120 bn (29/09/08); increased to an unlimited amount (13/10/08); reciprocated (up to JPY 10 trn; 06/04/09).	Yes	Expansion of bilateral KRW-JPY swap line with BoK from $3 bn to $20 bn equivalent, effective until end-April 2009 (12/12/08); expansion of bilateral currency swap arrangement with Indonesia from $6 bn to $12 bn (21/02/09).

A3: Liquidity assistance in foreign currency (cont)

	Swap facility with Federal Reserve to provide US dollars against local currency		Other measures
	Maximum amount	**Drawn**	
Korea	$30 bn (29/10/08); extended to end-October 2009 (4/02/09).	Yes	Competitive auctions for KRW-USD FX swaps between the BOK and banks introduced (17/10/08); BOK makes up to $30 billion of its reserves available to lend to local banks (19/10/08). Expansion of bilateral KRW-JPY swap line with BoJ from $3 bn to $20 bn equivalent, effective until end-April 2009. Established KRW-CNY swap line of RMB 180 bn equivalent, effective for three years (12/12/08).
Malaysia			PBC and BNM establish a bilateral currency swap arrangement, designed to promote bilateral trade and investment for economic development of the two countries. Arrangement will provide RMB 80 bn/MYR 40 bn; the effective period of the arrangement will be three years, and could be extended by agreement between the two sides.
New Zealand	$15 bn (29/10/08)	No	
Philippines			Repo facility introduced by the BSP for USD-denominated Philippine government bonds (23/10/08); exclusion of mark-to-market losses from computation of 100% foreign currency deposit cover (31/10/08).
Singapore	$30 bn (29/10/08); extended to end-October 2009 (04/02/09).	No	

A4: Guarantees and recapitalisations

	Government guarantees for liabilities of authorised institutions		Credit guarantee polices	Government injections of bank capital
	Customer deposits	**Other liabilities**		
Australia	Guarantee introduced for an unlimited amount until October 2011 (12/10/08), for a fee for deposits above AUD 1 mn (28/11/08).	Debt securities with maturities up to five years, for a fee of 70–150 bp (12/10/08).	Government will temporarily guarantee state-issued debts (25/03/09).	
China				Huijin, the investment arm of Chinese government, injects USD 19 bn into the Agricultural Bank of China (06/11/08). Capital injection later increased to USD30 bn (02/09).
Chinese Taipei	Guarantee increased from TWD 1 mn to 3 mn (06/10/08), then increased to an unlimited amount until December 2009 (07/10/08).			
Hong Kong SAR	Guarantee increased from HKD 100,000 to an unlimited amount and coverage expanded to deposits with restricted licensed banks and deposit-taking companies, effective until December 2010 (14/10/08).		LegCo approved enhance-ments to the SME Loan Guarantee Scheme (28/10/08) and a time-limited Special Loan Guarantee Scheme for more general business use (14/11/08).	Government introduced a new Contingent Bank Capital Facility to make capital available to banks (14/10/08).
India				Government announces intention to raise capital in state banks from 9% to 12% with no clear time frame (23/10/08). Government announces injection of INR 200 bn into state banks and INR 250 bn into non-bank finance companies (09/01/09).
Indonesia	Maximum guarantee increased from IDR 100 mn to 2 bn (12/10/08).			

A4: Guarantees and recapitalisations (cont)

	Government guarantees for liabilities of authorised institutions		Credit guarantee polices	Government injections of bank capital
	Customer deposits	**Other liabilities**		
Japan	Existing guarantee unchanged at JPY 10 mn for ordinary and time deposits and an unlimited amount for payment and settlement deposits.			Government proposes increasing the limit on official injections of capital in banks (30/10/08). Bank of Japan announces purchases of up to JPY 1 trn of stock rated BBB or higher held by financial institutions (03/02/09). Government announces plans to inject JPY 121 bn into three regional banks (13/03/09). BoJ announces the provision of subordinated loans to banks (17/03/09, 10/04/09).
Korea	Existing deposit insurance of KRW 50 mn expanded to include foreign currency deposits (03/11/08).	External debt issued between October 2008 and June 2009, with maturities up to three years; capped at $100 billion (19/10/08). Guarantee on FC debt extended by six months to end-2009 and to include maturities up to five years (29/4/2009).		KRW 1.65 trn into in three government banks: Korea Development Bank, Korea EXIM Bank, Industrial Bank of Korea (16/12/08). Korea EXIM bank's capital doubled from KRW 4 trn to KRW 8 trn to facilitate trade finance (30/1/09). Cash injection in five state-run financial institutions (2/1/09). An additional KRW 800 bn injected (30/1/09). The government plans to launch two funds: a KRW 40 trn Restructuring Fund to buy troubled loans and corporate assets; and a KRW 20 trn Bank Recapitalisation Fund to inject capital into banks by purchasing preferred stock. The corporations behind the two funds will issue government-guaranteed bonds (27/03/2009). BOK provided KRW 3.3 trn in loans to Korea Development Bank to support the Bank Recapitalisation Fund (30/03/09).

A4: Guarantees and recapitalisations (cont)

	Government guarantees for liabilities of authorised institutions		Credit guarantee polices	Government injections of bank capital
	Customer deposits	**Other liabilities**		
Malaysia	Guarantee increased from MYR 50 mn to an unlimited amount until December 2010 and expanded to include deposits in foreign currencies (16/10/08).		The central bank announces the establishment of a MYR 2 bn (USD 555 mn) SME Assistance Guarantee Scheme (SAGS) (23/01/09).	
New Zealand	Guarantee for retail deposits introduced until October 2010 (12/10/08), later capped at NZD 1 mn per depositor per institution (22/10/08).	All newly issued senior unsecured negotiable or transferrable debt securities, for a fee, issued by financial institutions with an investment grade credit rating and substantial NZ borrowing and lending operation (01/11/08).		
Philippines	Maximum deposit insurance increased from PHP 250,000 to PHP 500,000 (effective 1/06/2009) and permanent deposit insurance fund upgraded from PHP 3 bn to PHP 24 bn (09/12/08).			
Singapore	Guarantee increased from SGD 20,000 to an unlimited amount until December 2010 and expanded to include deposits in foreign currencies (16/10/08).		Special Risk-Sharing Initiative launched that includes New Bridging Loan Programme and Trade Finance Schemes (loan insurance scheme + trade credit insurance programme) (22/01/09).	
Thailand	Planned reduction of the existing unlimited guarantee postponed to August 2011 from 2009 (28/10/08).		THB 30 bn credit guarantee programme initiated by the government and the BOT to support SMEs	THB 12 bn capital injection for three state financial institutions (Small Business Credit Guarantee Corp., Export-Import Bank of Thailand, and Small and Medium Enterprise Development Bank of Thailand) to support lending

A5: Support for equity and other asset prices

	Restrictions on short sales of equities	Other measures
Australia	Ban on naked shorts (19/09/08), later made permanent; temporary ban on covered shorts (21/09/08), lifted for non-financial equities (19/11/08) and for financial stocks (25/05/09) after two extensions (21/01/09, 05/03/09).	Government will purchase at least AUD 4 bn worth of AAA-rated RMBS (26/09/08) and up to AUD 8 bn (13/10/08).
China		Number of foreign institutions approved to invest in Chinese securities increased (13/09/08); transactions tax of 0.1% removed for purchases of equities (18/09/08); government fund Central Huijin purchases shares in three major banks (23/09/08); foreign banks allowed to trade corporate bonds in the interbank market (09/01/09).
Chinese Taipei	Banned for selected equities (21/09/08).	Incentives introduced for financial holding companies to buy back their own shares (08/09/08); transactions tax for equities reduced to 0.15% from 0.3% until March 2009 (10/09/08); agreement with mainland China to facilitate cross-Straits financial services (26/04/09).
Hong Kong SAR	Decided to uphold the uptick rule and double the penalties for the failed settlement of short-selling transactions (26/09/08)	
India		Controls (imposed in October 2007) on foreign investment in structured equity products eased (06/10/08); limit on portfolio investment in local corporate debt doubled to USD 6 bn (15/10/08); later increased to USD 15 bn (02/01/09); relaxation in risk weights and provisioning requirements was permitted as a counter-cyclical measure.
Indonesia	Banned (29/09/08); extended to 30/04/09 (06/01/09).	Jakarta stock exchange closed for three days (08/10/08); mark to market accounting for banks' bond portfolios temporarily suspended (09/10/08); buybacks of government bonds announced (29/10/08).
Japan	Ban on naked shorts until 31/03/09 (28/10/08); extended to 31/07/09 (24/03/09).	BoJ announced plans to purchase JPY 3 trn of commercial paper (19/12/08, 22/01/09), as well as plans to purchase JPY 1 trn of corporate bonds (22/01/09, 19/02/09). BoJ suspended sales of its equity holdings (14/10/08) and resumed purchases of equities held by financial institutions (3/02/09).
Korea	The Financial Services Commission prohibited short-selling on borrowed stocks listed on the KRX (01/10/08). Lifted the ban on non-financial stocks (01/06/09)	Tax incentives introduced for investors to hold mutual funds for longer periods (19/10/08); government guarantees for 60–70% of the value of MBS backed by unsold new homes (10/08); government agency announces plans to buy unsold new homes up to KRW 2 trn via reverse auction (10/08); regulators establish a KRW 10 trn fund to purchase corporate bonds issued by local firms (13/11/08).
Malaysia		To boost the stock market, the government injected MYR 5 bn into special-purpose vehicle Value Cap Sdn Bhd for investment in undervalued companies (22/10/08).

A5: Support for equity and other asset prices (cont)

	Restrictions on short sales of equities	Other measures
Philippines		Regulations on banks' reclassification of assets held at fair value temporarily eased, in line with amendments by the IASB (23/10/08).
Singapore	To deter naked short selling, increased penalties for failed trade to 5% of the value of trade, with a minimum penalty of S$1,000 (25/09/08).	
Thailand		Thailand plans to ease taxation rules to support the development of an Islamic bond market that enables local companies and banks to tap new investors (25/02/09).

References

Asia-Pacific Economic Cooperation (1999): Compendium of Sound Practices: Guidelines to Facilitate the Development of Domestic Bond Markets in APEC Member Economies, APEC Collaborative Initiative on Development of Domestic Bond Markets.

Bank for International Settlements (2009): *79th Annual Report*, Basel, June.

Black, S and A Munro (2009): "Why issue bonds offshore?", *BIS Working Papers*, forthcoming.

Borio, C and M Drehmann (2009): "Assessing the risk of banking crises – revisited", *BIS Quarterly Review*, March, pp 29–46.

Borio, C and P Lowe (2002a): "Asset prices, financial and monetary stability: exploring the nexus", *BIS Working Papers*, no 114, July.

——— (2002b): "Assessing the risk of banking crises", *BIS Quarterly Review*, December, pp 43–54.

Borio, C and I Shim (2007): "What can (macro-)prudential policy do to support monetary policy?", *BIS Working Papers*, no 242, December.

Borio, C and H Zhu (2008): "Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism?", *BIS Working Papers*, no 268, December.

Chai-Anant, C and C Ho (2008): "Understanding Asian equity flows, market returns and exchange rates", *BIS Working Papers*, no 245, February.

Chan, E, M F Hj Ahmad and P Wooldridge (2009): "Liquidity in an emerging bond market: a case study of corporate bonds in Malaysia", *BIS Working Papers*, work in progress.

Committee on the Global Financial System (2008): "Central bank operations in response to the financial turmoil", *CGFS Papers*, no. 31, Bank for International Settlements, July.

——— (2009): "Capital flows and emerging market economies", *CGFS Papers*, no 33, Bank for International Settlements, January.

Devereux, M and J Yetman (2009): "Financial deleveraging and the international transmission of shocks ", *BIS Working Papers*, work in progress.

——— (2009): "Price adjustment and exchange rate pass-through", *Journal of International Money and Finance*, forthcoming.

Filardo, A and H Genberg (2009): "Targeting inflation in Asia and the Pacific: lessons from the recent past", *BIS Working Papers*, work in progress.

Filardo, A and D Guinigundo (2008): "Transparency and communication in monetary policy: a survey of Asian central banks", BSP-BIS High-Level Conference on Transparency and Communication in Monetary Policy, Manila, 1 February.

Filardo, A (2009): "Household debt, monetary policy and financial stability: still searching for a unifying model", *BIS Papers*, no 46, Bank for International Settlements, May.

Financial Stability Forum (2008): *Report on enhancing market and institutional resilience*, www.financialstabilityboard.org/publications/r_0804.pdf, April.

Fischer, S (2008): "The Phillips curve and Israeli monetary policy", presentation at "Understanding inflation and the implications for monetary policy: a Phillips curve retrospective", conference sponsored by the Federal Reserve Bank of Boston, Cape Cod, Massachusetts, 9–11 June.

Fung, S, M Klau, G Ma and R McCauley (2009): "Implications of refined renminbi effective exchange rates with Asian entrepot and intra-regional trade", in Y-W Cheung and K-Y Wong (eds), *China and Asia: economic and financial interactions*, Routledge, pp 178–93.

García-Herrero, A and E Remolona (2008): "Managing expectations by words and deeds: monetary policy in Asia and the Pacific", BSP-BIS High-Level Conference on Transparency and Communication in Monetary Policy, Manila, 1 February.

Glindro, E, T Subhanij, J Szeto and H Zhu (2008): "Determinants of house prices in nine Asia-Pacific economies", *BIS Working Papers*, no 263, October.

Gyntelberg, J, M Loretan, T Subhanij and E Chan (2009a): "Private information, stock markets, and exchange rates", *BIS Working Papers*, no 271, February.

——— (2009b): "The exchange rate, portfolio rebalancing, and equity market flows in Thailand", *BIS Working Papers*, forthcoming.

Gyntelberg, J, G Ma and E Remolona (2006): "Developing corporate bond markets in Asia", *BIS Papers*, no 26, pp 13–21.

Hannoun, H (2009): "Long-term sustainability versus short-term stimulus: is there a trade-off?", speech given at the 44th SEACEN Governors' Conference on Preserving Monetary and Financial Stability in the New Global Financial Environment, Kuala Lumpur, 7 February.

Ho, C and R McCauley (2008): "The domestic financial consequences of reserve accumulation: some evidence from Asia", in R Rajan, S Thangavelu and R Parinduri (eds), *Exchange rate, monetary and financial issues and policies in Asia*, World Scientific.

Ho, W-Y and J Yetman (2008): "The long-run output-inflation trade-off with menu costs", *North American Journal of Economics and Finance*, vol 19, no 3, pp 261–73.

Hördahl, P and M King (2008): "Developments in repo markets during the financial turmoil", *BIS Quarterly Review*, December, pp 37–53.

Huang, X, H Zhou and H Zhu (2009a): "A Framework for assessing the systemic risk of major financial institutions", *Journal of Banking and Finance*, forthcoming.

——— (2009b): "Assessing the systemic risk of a diversified portfolio of banks in Asia-Pacific during the recent credit and liquidity crisis", *BIS Working Papers*, work in progress.

Khundrakpam, J K (2007): "Economic reforms and exchange rate pass-through to domestic prices in India", *BIS Working Papers*, no 225, February.

Kim, D, M Loretan and E Remolona (2009): "Contagion and risk premia in the amplification of crisis: evidence from Asian names in the global CDS market", *BIS Working Papers*, work in progress.

Kim, Y (2009) "The impact of stigma effect and capital mobility on sovereign CDS premium", Bank of Korea Working Papers no 388 (in Korean).

King, M (2009): "Time to buy or just buying time? The market reaction to bank rescue packages", *BIS Working Papers*, forthcoming.

Knight, M (2008): "Some reflections on the future of the originate-to-distribute model in the context of the current financial turmoil", speech at the Euro 50 Group Roundtable on The Future of the Originate and Distribute Model, London, 21 April.

Loretan, M and P Wooldridge (2008): "The development of money markets in Asia", *BIS Quarterly Review*, September, pp 39–51.

Ma, G (2007): "Who pays for China's bank restructuring bill?" *Asian Economic Papers*, vol 6, no 1, pp 46–71.

Ma, G and R McCauley (2008): "The efficacy of China's capital controls – evidence from price and flow data", *Pacific Economic Review*, vol 13, no 1, pp 62–82.

Ma, G and E Remolona (2005): "Opening markets through a regional bond fund: lessons from ABF2", *BIS Quarterly Review*, June, pp 81–92.

McCauley, R (2008): “Managing hot money inflows”, *ADBI Discussion Papers*, no 99.

Medina, J, A Munro and C Soto (2008): “What drives the current account in commodity exporting countries? The cases of Chile and New Zealand”, *BIS Working Papers*, no 247, March.

Remolona, E and I Shim (2008): “Credit derivatives and structured credit: the nascent markets of Asia and the Pacific”, *BIS Quarterly Review*, June, pp 57–65.

Sahminan, S (2008): “Effectiveness of monetary policy communication in Indonesia and Thailand”, *BIS Working Papers*, no 262, September.

Shim, I and G von Peter (2007): “Distress selling and asset market feedback”, *Financial Markets, Institutions and Instruments*, vol 16, no 5, pp 243–91.

Tarashev, N and H Zhu (2008): “The pricing of portfolio credit risk: evidence from the credit derivatives market,” *Journal of Fixed Income*, vol 18, no 1, pp 1–20.

Tsuyuguchi, Y and P D Wooldridge (2008): “The evolution of trading activity in Asian foreign exchange markets”, *Emerging Markets Review*, vol 9, no 4, pp 231–46.

Yetman, J (2009): “Exporting recessions: international links and the business cycle”, *BIS Working Papers*, work in progress.