BANK FOR INTERNATIONAL SETTLEMENTS

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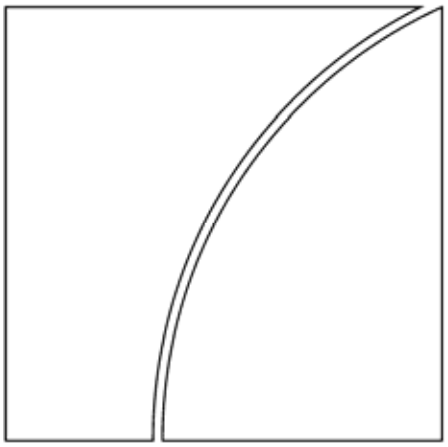
December 2006



International banking and financial market developments

BIS Quarterly Review
Monetary and Economic Department

General queries concerning this commentary should be addressed to Frank Packer (tel +41 61 280 8449, e-mail: frank.packer@bis.org), queries concerning specific parts to the authors, whose details appear at the head of each section, and queries concerning the statistics to Philippe Mesny (tel +41 61 280 8425, e-mail: philippe.mesny@bis.org).

Requests for copies of publications, or for additions/changes to the mailing list, should be sent to:

Bank for International Settlements
Press & Communications
CH-4002 Basel, Switzerland

E-mail: publications@bis.org

Fax: +41 61 280 9100 and +41 61 280 8100

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Notations used in this Review

e	estimated
lhs, rhs	left-hand scale, right-hand scale
billion	thousand million
…	not available
.	not applicable
–	nil
0	negligible
$	US dollar unless specified otherwise

Differences in totals are due to rounding.

Peter Hördahl
+41 61 280 8434
peter.hoerdahl@bis.org

Christian Upper
+41 61 280 8416
christian.upper@bis.org

Overview: markets anticipate an orderly slowdown

While at times sending mixed signals, markets appeared to be largely optimistic about global economic prospects and the likelihood of a soft landing for the US economy. Prices of risky assets increased in most markets from September to late November. In contrast, government bond yields struggled to find direction as investors reacted to conflicting news about growth prospects and the outlook for monetary policy, in particular in the United States.

This general confidence could also be discerned in the behaviour of a number of other market indicators. In mid-November, implied volatilities in bond and stock markets reached their lowest levels in years, while measures of risk appetite showed that the retrenchment by investors after the sell-off in May and June had been largely reversed. Not even events such as the reported $6 billion loss by a large hedge fund or several instances of political instability in emerging markets in September seemed to dent investors' confidence.

The overall positive sentiment among market participants was briefly tested in late November, when sharp movements in the foreign exchange market and a string of data surprises led to abrupt declines in many risky asset prices. While losses in many markets were subsequently largely recouped, implied equity market volatilities at end-November remained above earlier levels, albeit low by historical standards.

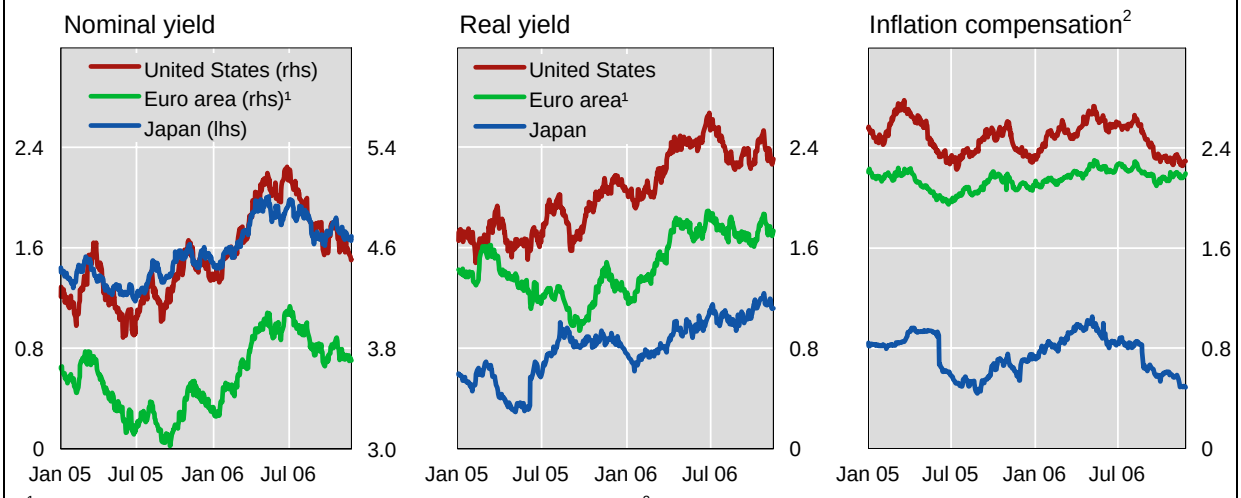
Bond yields struggle to find direction

Following a period of falling yields in the government bond markets of the United States, the euro area and Japan, long-term interest rates seemed to bottom out in September 2006, and have since remained within a range. At end-November, the US 10-year yield stood at 4.5%, around 20 basis points lower than at the end of August, while the corresponding euro area and Japanese yields were little changed during the same period, standing at 3.7% and 1.7%, respectively (Graph 1, left-hand panel). With short-term policy rates unchanged, the fall in US long-term bond yields translated into a steeper inversion of the US yield curve. Meanwhile, the euro area yield curve remained flat, while the Japanese curve continued to display an upward slope. The fall in US nominal yields was almost fully reflected in lower break-even inflation rates, with real yields little changed despite some volatility during the period (Graph 1, centre and right-hand panels). In Japan, the stability of nominal

A steeper inversion of the US yield curve

Government bond markets

Ten-year yields, in per cent



¹ Based on French government bonds linked to euro area inflation. ² Nominal minus real 10-year government bond yields.

Sources: Bloomberg; national data. Graph 1

yields masked a rise in real long-term interest rates and an offsetting fall in break-even inflation, while euro area real yields and break-even rates both remained generally stable.

Conflicting news on US growth prospects

As had been the case for much of the year, the outlook for global growth and monetary policy played a key role for short-term interest rates as well as long-term bond yields. This was particularly evident in the US market, where economic data releases alternately seemed to provide support for the view that policy rates would be eased relatively quickly and for the perception that the Federal Reserve would remain on hold for a prolonged period. The fed funds futures curve, which at the end of August had been sharply downward-sloping, shifted up considerably in the second half of October, with bond yields rising in parallel, on the heels of favourable employment news (Graph 2, left-hand panel). Renewed downward pressure on fed funds futures rates and bond yields ensued after the FOMC interest rate decision on 25 October, which left policy rates unchanged. While the decision was widely expected, the accompanying statement was less hawkish than anticipated by many investors.

Real US long-term yields on index-linked bonds experienced a similar roller-coaster ride in September–November, as investors continuously reassessed the likelihood of a severe economic slowdown in the United States. The sharp downswing in the housing market, in particular, fuelled concerns that the US economy might be heading for a recession. The inversion of the yield curve – traditionally a reliable indicator of a forthcoming recession – appeared to support this view. Data revealing slower than expected third quarter GDP growth and weakening consumer confidence added to this. However, other signs seemed to favour the view that the US economy would experience a soft landing, ie gradually slow down without entering a recession. Contributing to this perception was the apparently limited fallout of the housing slump on consumption and consumer confidence. Moreover, declining oil prices, a booming stock market and a strong corporate sector were expected to provide

vital support for the economy if the situation in the housing market were to deteriorate further. In line with this, though survey expectations for 2007 GDP growth continued to be revised downwards, they remained well above recession territory (Graph 3, left-hand panel).

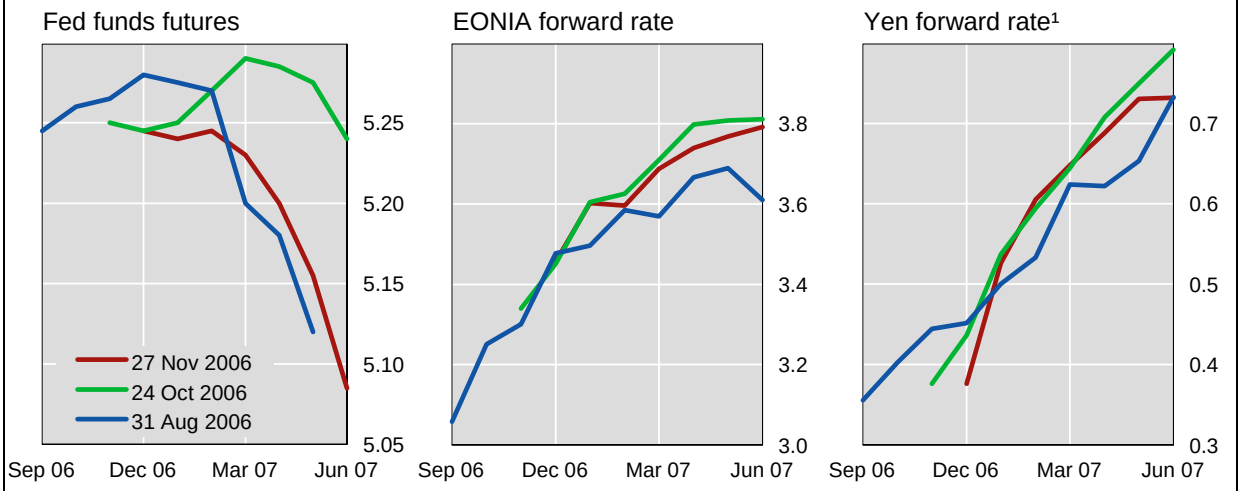
EONIA forward rates rise as euro area growth prospects brighten

In the euro area, long-term real yields were little changed between end-August and end-November while the implied EONIA forward rate curve shifted slightly upwards. The rise in euro area forward rates took place in an environment of positive data surprises that led market economists to upgrade their expectations for 2007 GDP growth (Graph 3, left-hand panel). Second quarter euro area GDP growth, at 2.7% year-on-year, exceeded investor expectations, and a string of data releases showed that the German economy, in particular, displayed surprising strength. The upbeat picture was to some extent balanced by concerns that growth in 2007 could be dampened by a number of factors, including the planned German VAT increase, expected fiscal consolidation in a number of euro area countries and lagging effects of past ECB rate hikes. Figures released in early November showing that the French economy had unexpectedly experienced zero growth in the third quarter, and that euro area GDP at the same time had grown at a slower pace than anticipated, were seen as a warning sign of possible negative growth surprises to come, although they, too, only had a minor impact on yields.

In Japan, the 10-year nominal bond yield remained broadly stable between end-August and end-November, as a result of a rising real yield and an offsetting drop in the break-even inflation rate. These developments took place in an environment where official data releases painted a mixed picture with respect to economic activity, and where survey forecasts for growth next year were slightly downgraded in September and October. The Japanese forward short-term interest rate curve changed little as investors seemed to maintain their wait-and-see position with respect to the Bank of Japan's next move (Graph 2, right-hand panel). Comments in early November by the

Forward curves

In per cent

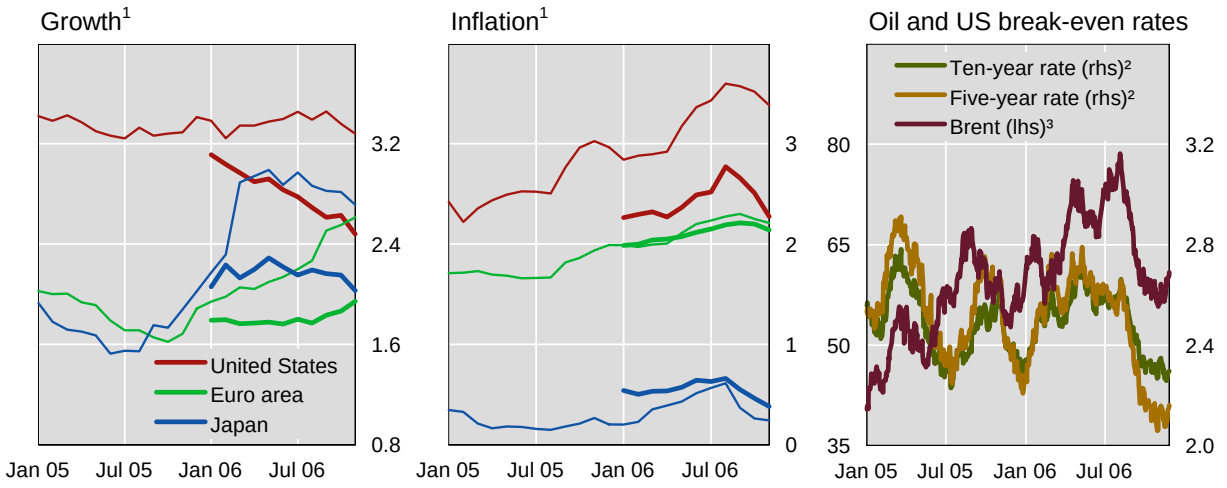


[1] Calculated from Libor fixing rates.

Sources: Bloomberg; BIS calculations.

Graph 2

Macroeconomic outlook, oil price and break-even inflation



[1] Forecasts for annual growth and inflation as published monthly by Consensus Economics, in per cent. The thin lines are forecasts for 2006 and the thick lines for 2007; observations are positioned in the month in which the forecast was made. [2] Nominal minus real government bond yields, in per cent. [3] In US dollars.

Sources: Bloomberg; © Consensus Economics; I/B/E/S; BIS calculations. Graph 3

Governor of the Bank of Japan, which were interpreted as suggesting the possibility of a second rate hike before the end of the year, had little impact on short-term interest rates. Unexpectedly strong third quarter GDP figures released in mid-November were seen as a favourable sign by investors, and resulted in rising Japanese interest rates on the day of the release.

Break-even rates decline as oil prices fall …

The sharp fall in oil prices in September and October seemed to play a key role for developments in break-even inflation rates in major markets. This was perhaps particularly evident in the case of the United States. As expected, the effect of declining oil prices was especially pronounced at short- to medium-term horizons: the five-year US break-even inflation rate fell by almost 50 basis points from mid-August, when oil prices peaked and began their rapid slide (Graph 3, right-hand panel). Some effect of the decline in oil prices was also seen in US and Japanese 10-year break-even rates, but less in euro area 10-year break-even rates. However, shorter-maturity euro area rates fell considerably: the five-year break-even rate declined by almost 20 basis points between mid-August and end-November.

… and price pressures ease

Apart from oil prices, the decline in US and Japanese break-even rates seemed to reflect perceptions among investors that price pressures would ease more generally. In the case of the United States, the Federal Reserve's series of past rate hikes and the gradual slowdown of the economy were increasingly seen as restraining consumer price increases. Incoming data largely supported this view, with headline inflation figures surprising on the downside. Core inflation measures displayed less downward momentum, however, indicating that underlying inflationary pressures persisted. Surveys released in September, October and November indicated that expectations for US CPI inflation in 2007 had been revised downwards, reversing the direction that such revisions had taken during most of 2006 (Graph 3, centre panel). In Japan, the fall in break-even inflation appeared to partly reflect continued adjustments of

inflation expectations among investors, following the downward revision of Japan's CPI statistics in late August.

Strong profits boost equity markets

The ups and downs in the bond market bore little relation to developments in equities, which rallied in most countries during the summer and autumn. By the end of November, the EURO STOXX had increased by almost 20% from its trough in June 2006, after the spring sell-off, while the S&P 500 had gained 13% (Graph 4, left-hand panel). The Japanese market put in a more mixed performance: equity prices fluctuated widely during the period under review, and remained well below their peak prior to the sell-off.

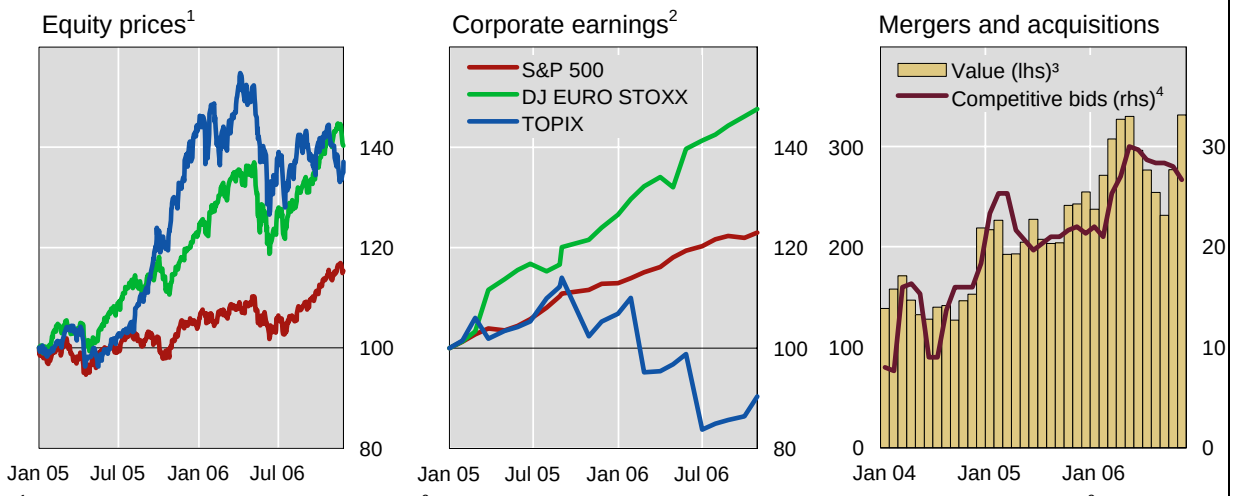
US equities rally despite reduced growth forecasts …

In contrast to the euro area and Japan, where equity prices largely mirrored changes in the outlook for economic growth, equities rallied in the United States in the face of declining growth forecasts. Admittedly, stock prices in the United States were not insensitive to macroeconomic data releases, but there were signs that traders were putting less weight on such information as time progressed. For example, the S&P 500 fell by almost 1% in the two hours following the announcement of a larger than expected decline in US industrial production on 17 October, whereas two weeks later it dropped by only one third of a percentage point after a release indicating that non-farm productivity increased at a much lower and unit labour costs at a far higher pace than expected by analysts.

… as corporate earnings remain strong

In general, US equities took consolation from the fact that the slowing of GDP growth had a much smaller effect on corporate profits than previously expected (Graph 4, centre panel). Although stock analysts cut their earnings forecasts for US corporates by a small amount in October, higher than usual

Equity prices, corporate earnings and M&As



[1] In local currency; 3 January 2005 = 100. [2] Twelve-month-ahead earnings, in local currency; January 2005 = 100. [3] Announced, in billions of US dollars; three-month moving average. [4] Number of competitive bids over a rolling 12-month period; includes euro area countries, plus Denmark, Iceland, Japan, Norway, Sweden, Switzerland, the United Kingdom and the United States; three-month moving average. The first ever bid for a target company is excluded from the calculation, as well as consecutive bids by the same company if no other bid by another company has been registered in the meantime. Only individual target companies are included in the calculation, while all potential acquirers (individuals or groups) are included.

Sources: Bloomberg; I/B/E/S; BIS calculations. Graph 4

surprises in third quarter profits led them to increase their predictions in the following month.

Support from M&A activity

Strong merger and acquisition (M&A) activity continued to support equity prices, too. The volume of announced takeovers reverted to its previous high (Graph 4, right-hand panel), after pausing during the summer. The M&A boom was in part due to a number of very large deals by private equity funds. A bid by Blackstone Group for the US-based commercial real estate firm Equity Office Property Trust in mid-November could become the largest leveraged buyout ever if the transaction is completed. The number of competitive bids, ie rival bids for the same target, declined in the United States but remained near its previous level in Europe and Japan. Competitive bids presumably have a larger impact on stock prices than uncontested bids.

Weak bank stocks contribute to underperformance of Japanese equities

In contrast to other advanced markets, Japanese equities did not fully recover their losses of the early summer, when analysts had sharply cut their earnings forecasts. While most sectors in Japan lagged their US and euro area peers, the underperformance was largest for financial stocks, which in late November traded at prices 30% below their peak in May. Bank stocks in particular are viewed by many market participants as investments which are very sensitive to cyclical economic conditions. They therefore profited disproportionally from high economic growth earlier this year, but also fell more than other sectors when questions about the sustainability of such growth figures emerged. This high sensitivity to macroeconomic conditions became apparent once again on 14 November, when the stocks of Japanese banks rose by more than 3%, almost twice as much as the market as a whole, after the announcement of higher than expected third quarter GDP figures. However, these gains evaporated within a week when a large bank revealed lower than expected profits for the second quarter of the financial year.

Structured product issuance drives down CDS spreads

Corporate bond spreads narrow ...

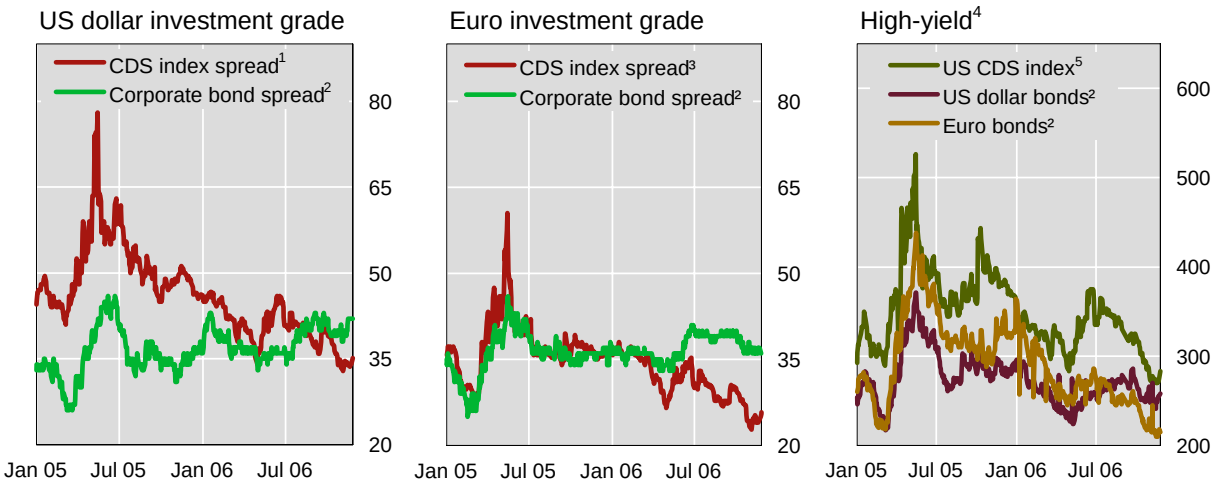
Corporate credit markets in the United States and Europe were less buoyant than equity markets during the summer and autumn. Bond spreads tightened but, with the exception of euro-denominated high-yield debt, generally remained above levels seen prior to the May–June sell-off (Graph 5). Spreads on credit default swaps (CDSs) declined more than bond spreads, mainly as a result of market pressure from issuers of structured instruments.

... on the back of strong corporate profits

The limited decline in corporate bond spreads was, at least in part, in line with strong fundamentals. As mentioned above, the outlook for corporate profits continued to improve in the euro area and remained stable in the United States, which could explain why spreads on European corporates tightened more than those on US firms. The strength of the corporate sector was also reflected in the number of defaults, which according to Standard & Poor's remained, in the third quarter, at their lowest level since 1997. And although both Moody's and S&P continued to expect the number of defaults to rise, they revised further downwards their default rate forecasts (Graph 6, left-hand panel).

Corporate credit markets

In basis points



[1] On-the-run five-year DJ CDX.NA.IG. [2] Merrill Lynch corporate bond indices; asset swap spreads over Libor. [3] On-the-run five-year iTraxx Europe. [4] Five-day moving average. [5] On-the-run five-year DJ CDX.NA.HY.

Sources: JPMorgan Chase; Markit; Merrill Lynch. Graph 5

High-yield bonds outperformed investment grade debt on both sides of the Atlantic. This may partly be explained by the higher sensitivity of lower-rated borrowers' spreads to rising equity prices and declining volatility. Another factor that may have contributed to the underperformance of investment grade bonds was concerns about leveraged buyout (LBO) and M&A risk, as highly capitalised firms are often more attractive targets for LBOs than corporations that already carry large amounts of debt. According to calculations by investment banks, the five largest LBOs of public companies in 2006 resulted in losses of around $2 billion for the owners of bonds in these companies. More generally, S&P reported that the average debt/cash flow ratio for companies acquired by private equity firms reached a record high of 5.4 in 2006. Meanwhile, the private equity industry continued to raise record amounts of funding to finance acquisitions and the releveraging of the US corporate sector through share repurchases increased further.

LBO risk remains a concern

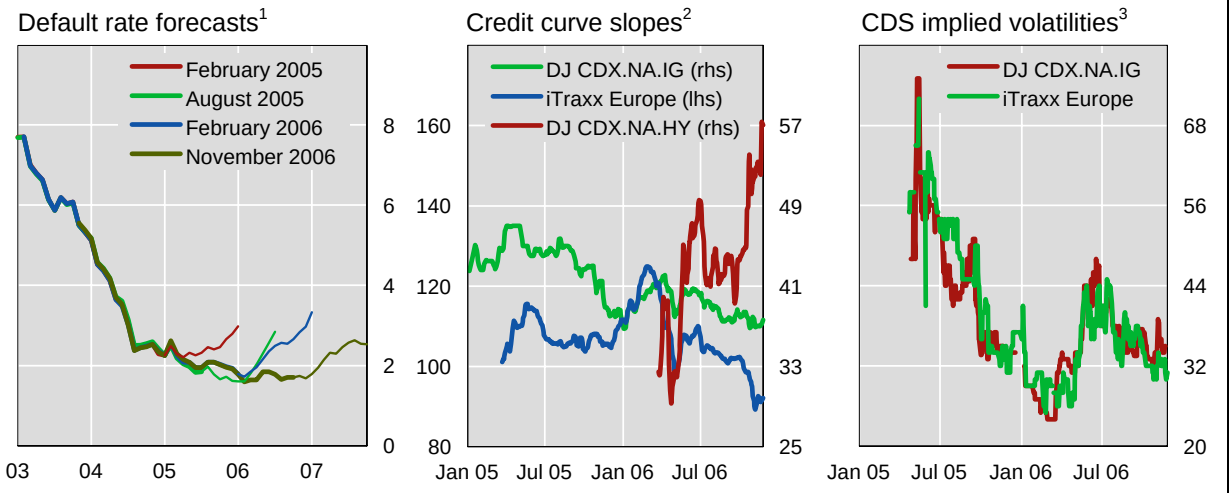
Some warning signs

Notwithstanding the apparently strong fundamentals, a closer look at the available data reveals some possible warning signs. First, although the slope of the credit curve over the past few months remained relatively stable for US investment grade debt and declined for corresponding euro debt, the slope of the US high-yield curve actually increased sharply (Graph 6, centre panel). This could be a sign of heightened concern for the credit outlook of low-rated debt in the longer run relative to the near term. Second, implied volatilities on CDS index options did not fully recover after the sell-off in May–June, possibly indicating increased uncertainty about short-run developments in credit spreads (Graph 6, right-hand panel).

CDS spreads fall …

In recent months CDS spreads have tended to fall more than corporate bond spreads (Graph 5). The benchmark US five-year investment grade CDS index (DJ CDX.NA.IG) fell to the lowest level for the year in early November 2006, at just below 35 basis points, while the corresponding iTraxx Europe

Default rates, credit curve slopes and implied volatilities



[1] Speculative grade default rate forecasts by Moody's at the time of the legend date, in per cent; the thin lines refer to forecasts one year ahead of the legend date; the thick lines refer to historical default rates. [2] Ten-year minus three-year slope for on-the-run CDS spreads, in basis points; five-day moving average. [3] On-the-run five-year at-the-money one- to four-month implied volatility, in per cent.

Sources: JPMorgan Chase; Moody's Investors Service. Graph 6

index fell below 25 basis points. High-yield CDS spreads also dropped faster than the corresponding cash spreads. As a consequence, the CDS-cash basis, ie the difference between CDS spreads and comparable corporate bond spreads, moved deeper into negative territory.

… driven by high issuance of synthetic CDOs …

This widening of the negative basis seemed largely to reflect a surge in issuance of synthetic collateralised debt obligations (CDOs) and other structured credit products (Graph 7, left-hand panel). Synthetic CDOs replicate cash flow CDOs using CDSs, and thereby provide credit protection without the need to acquire cash assets. Strong issuance of synthetic CDOs is associated with high volumes of credit protection selling, thereby exerting downward pressure on CDS spreads. In the third quarter of 2006, global CDO market issuance reached a new high for the fourth quarter in a row, with synthetic CDOs accounting for an increasing share (Graph 7, left-hand panel).

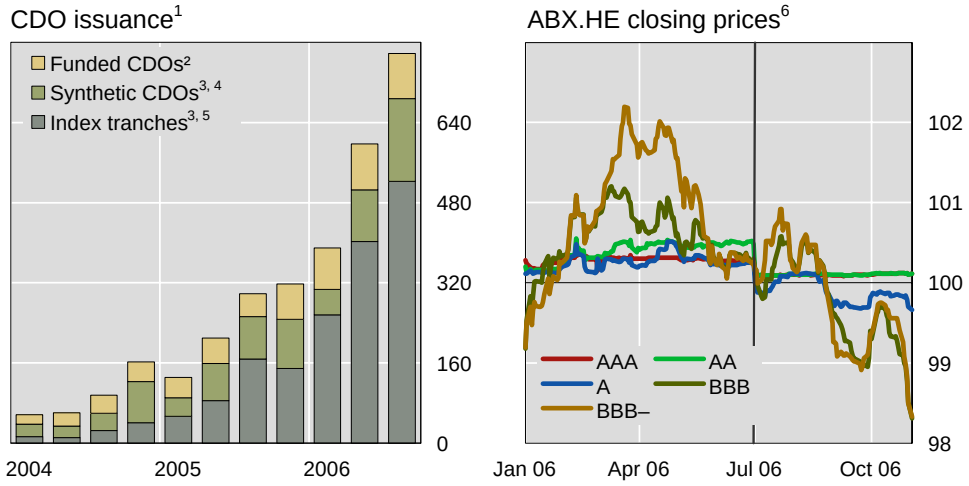
… and other structured products

New structured products, such as constant proportion debt obligations (CPDOs), may have added to the downward pressure on CDS spreads. A CPDO is a product with a AAA rating that earns a high spread above Libor through leveraged exposure to credit default indices. Because these products are highly leveraged, they involve considerable amounts of credit protection selling. Market estimates suggest that although only around $2 billion of CPDO issuance has taken place thus far in notional terms, this corresponds to around $30 billion of index credit protection. Moreover, banks seem to have been selling index credit protection ahead of planned CPDO issuance, thereby adding to the pressure on spreads.

MBSs weather US housing slowdown …

The rapid cooldown of the US housing market seemed to have little impact on most US mortgage-backed security (MBS) spreads. This was so despite a steady increase in the proportion of mortgage loans to non-prime borrowers in the underlying collateral of such securities. However, a somewhat different picture emerged from the pricing of ABX.HE, a recently introduced group of

CDO issuance and US home equity ABS indices



[1] In billions of US dollars. [2] Cash flow CDOs. [3] Notional amount, not adjusted for the riskiness of different tranches. [4] Portfolio CDSs referenced to corporations, sovereigns and ABSs. [5] Portfolio CDSs referenced to CDS indices. [6] On-the-run contract. The vertical line marks the roll from the ABX.HE.06-1 contract to the ABX.HE.06-2 contract.

Sources: Bond Market Association; CreditFlux; JPMorgan Chase. Graph 7

… but again some warning signs

synthetic indices of US home equity asset-backed securities (ABSs). The ABX.HE indices replicate cash flows of tranches of US subprime home equity securitisations. In the past three months, the prices of the lowest-rated ABX indices fell considerably, suggesting a heightened perception of risk associated with home loans to borrowers with blemished credit histories (Graph 7, right-hand panel).

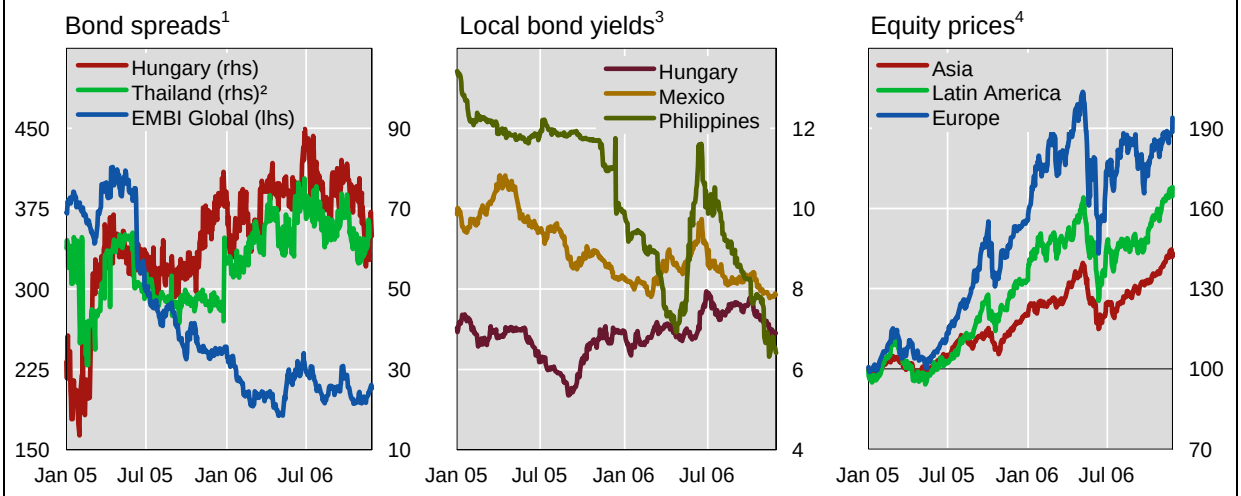
Renewed optimism in emerging markets

Spreads on emerging market debt tightened and equity prices increased during the autumn (Graph 8). Changes in the outlook for the US economy appeared to have a larger impact on asset prices in emerging markets than local events. Even in the case of the generalised widening of spreads in mid-September, it was not clear to what extent this was driven by local events, such as the coup in Thailand and riots in Hungary, or by news on US economic activity. Market commentary at the time gave a large weight to the latter. This view is also supported by the fact that domestic currency debt and equities were generally little affected by the sell-off in debt markets and that spreads quickly reverted to previous levels following favourable economic news from the United States later in the month.

Little impact from political instability

The dominance of global factors may seem surprising given that September saw an unusual clustering of events indicating political instability in emerging markets, and not only in Hungary and Thailand. The relatively minor and short-lived widening in the spreads of the countries concerned indicates that market participants' confidence in the ability and willingness of sovereigns to service their external debt was hardly tested. Among the few countries to experience a protracted widening in spreads was Ecuador, where presidential elections were held on 26 November. Spreads on Ecuador's external debt

Emerging markets



[1] JPMorgan Chase EMBI Global Diversified indices; sovereign stripped spread over government bond yields, in basis points; an index rebalancing in June 2005, following the restructuring of the Argentine debt, resulted in a structural break in the data for Latin America. [2] Spread calculated against the representative benchmark US bond. [3] Ten-year government bond yields, in per cent. [4] Morgan Stanley Capital International indices; in local currency; 31 December 2004 = 100.

Sources: Datastream; JPMorgan Chase; BIS calculations. Graph 8

widened as oil prices began to fall in late August and shot up in September after opinion polls showed the lead of a candidate who had not ruled out an Argentine-style default should negotiations with creditors not lead to a substantial reduction of the debt burden. After some temporary tightening in October, spreads rose to more than 600 basis points after the election, even though the winning candidate had qualified his previous remarks regarding the possibility of a default.

Perceived fundamentals remain strong

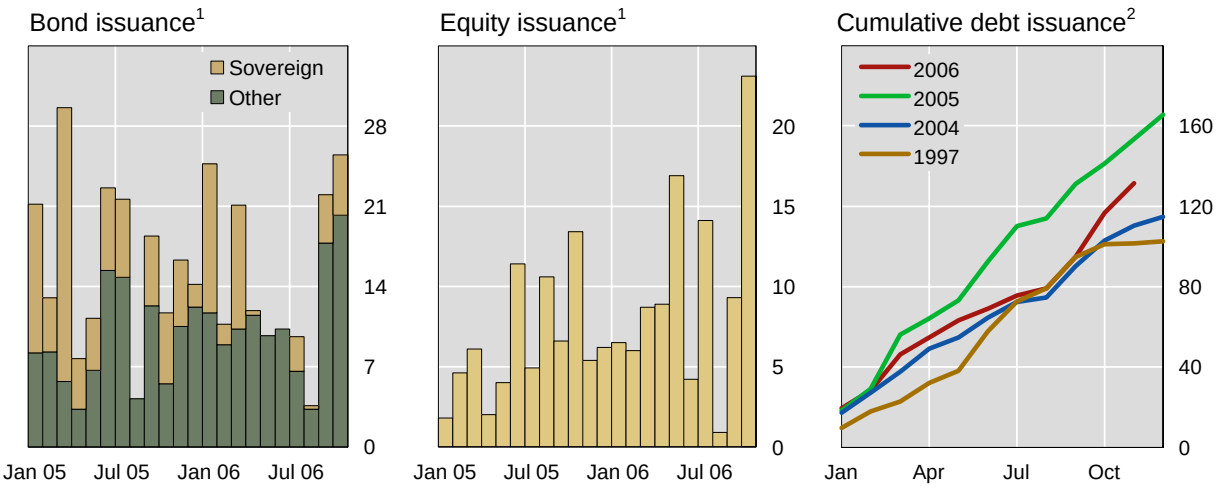
Confidence about a soft landing for the US economy went hand in hand with the perception of sound fundamentals in many emerging markets. Consensus growth forecasts for these economies remained strong. Solid fundamentals were also reflected in stable ratings. Another sign of increased confidence in the prospects of emerging markets was the return of investors to dedicated emerging market funds. To be sure, the amounts invested in such funds remained much lower than those recorded towards the beginning of the year. Even so, the very fact that they turned positive again represented a significant change from the outflows during the summer.

Reduced sovereign issuance …

Emerging market issuers took advantage of the benign market conditions to issue more external debt and equities (Graph 9, left-hand and centre panels). Sovereign issuers returned to the international market, from which they had been virtually absent since April. However, such borrowing remained low compared to 2005, when governments had front-loaded issuance in order to lock in favourable conditions (Graph 9, right-hand panel). One reason for the low level has been the improvement in the fiscal positions of most emerging economies in recent years, which has reduced the need for more debt. Another factor has been the replacement of foreign currency by domestic currency debt by some emerging market issuers. The move towards domestic currency bonds has been particularly noticeable in Latin America, above all in Brazil and

International emerging market issuance

In billions of US dollars



[1] Announced international issuance by nationality. [2] Announced issuance of international bonds and notes plus signings of syndicated loans.

Sources: Bloomberg; Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national authorities; BIS. Graph 9

Mexico. Mexico extended the yield curve in the local market from 20 to 30 years after issuing a peso bond of that maturity in late October.

... contrasts with high private issuance

Private issuance far exceeded sovereign debt sales during the period under review as firms took advantage of the favourable financing conditions. International equity issuance by emerging market corporations reached a new high in October, when China sold shares in the Industrial and Commercial Bank of China on the Shanghai and Hong Kong stock exchanges. The issue, which was heavily oversubscribed, raised $19 billion, making it the world's largest IPO to date.

Implied volatilities at unusually low levels

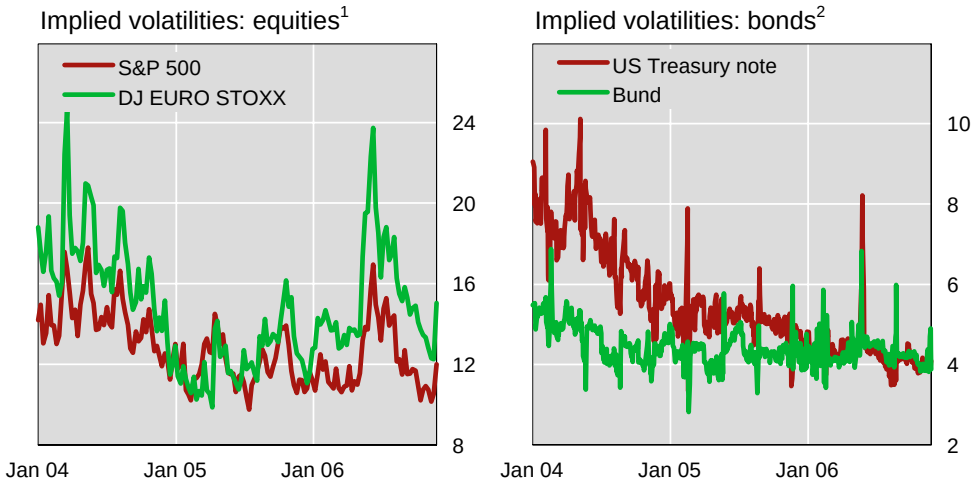
Low implied volatilities ...

In an environment where considerable uncertainty seemed to remain about the direction of economic growth, inflation and monetary policy – in particular in the United States – prices of options on government bond and stock index futures implied very low levels of near-term volatility (Graph 10). This largely mirrored developments in realised volatility (Graph 11, left-hand panel). At the same time, estimated US term premia indicated that investors required almost no compensation at all for bearing risk associated with uncertainty in future inflation and real interest rates (Graph 11, centre panel). Developments in euro area bond markets displayed a similar picture. Normally, low implied volatilities and risk premia close to zero could be interpreted as indicating a very high degree of confidence among investors about the likely evolution of monetary policy and economic fundamentals. The tight spreads seen in credit markets could be interpreted in a similar way. However, given that incoming data largely failed to provide a clear picture of the direction of the US economy, a strong appetite for risk among investors is likely to have played a role in the pricing of financial assets and associated derivatives. Indeed, by early November an options-based measure for risk aversion in the equity market had largely

... may reflect a high appetite for risk

Implied volatilities

In per cent



[1] Volatility implied by the price of at-the-money call option contracts on stock market indices; weekly averages. [2] Ten-year note future historical implied volatility.

Sources: Bloomberg; BIS calculations. Graph 10

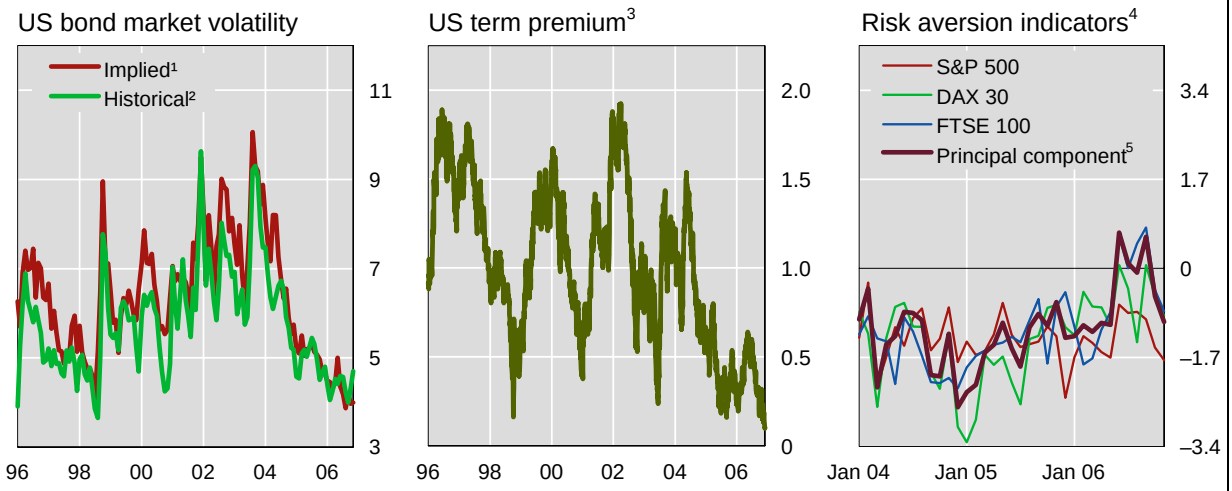
recovered to its level prior to the sell-off in May and June (Graph 11, right-hand panel).

Volatility jumps as the dollar slides

In this environment, markets experienced a bout of sudden volatility after the US currency fell sharply on 24 November and in the days that followed. It was not clear what event had triggered the dollar sell-off, although one factor may have been comments by an Asian central bank concerning the impact of dollar weakness on the value of foreign reserves. Adding to the wariness of

Investor confidence

In per cent



[1] Price volatility implied by the price of US 10-year government bond futures. [2] Conditional volatility of daily returns estimated over the period January 1996–November 2006; using an asymmetric GARCH(1,1) on US 10-year government bond futures. [3] US 10-year term premium, based on D Kim and J Wright, "An arbitrage-free three-factor term structure model and the recent behavior of long-term yields and distant-horizon forward rates," *International Finance Discussion Paper* 2005-33, Federal Reserve Board, August 2005. [4] Derived from the differences between two distributions of returns, one implied by option prices, the other based on actual returns estimated from historical data. [5] First principal component of risk appetite indicators estimated for the S&P 500, DAX 30 and FTSE 100.

Sources: Bloomberg; BIS calculations. Graph 11

investors at the end of November were a number of surprise data releases related to the US economy, including weaker than expected new home sales and an upward revision of third quarter GDP growth. All in all, US and European equities lost a couple of percentage points in the days following 24 November, but subsequently largely recouped these losses. At the end of November, however, implied equity market volatility had not fully settled back down to the levels seen in mid-November, although it remained low by historical standards.

Ryan Stever
+41 61 280 9615
ryan.stever@bis.org

Goetz von Peter
+41 61 280 8326
goetz.von.peter@bis.org

Christian Upper
+41 61 280 8416
christian.upper@bis.org

Highlights of international banking and financial market activity[1]

The BIS, in cooperation with central banks and monetary authorities worldwide, compiles and disseminates several datasets on activity in international banking and financial markets. The latest available data on the international banking market refer to the second quarter of 2006. The discussion of the international debt securities market and exchange-traded derivatives markets draws on data for the third quarter of 2006, while data on positions in OTC derivatives are available up to the end of June 2006. This section also includes a box on syndicated lending in Asia.

The international banking market

Locational banking statistics

The total cross-border claims of BIS reporting banks expanded by $602 billion in the second quarter of 2006. The 15% year-on-year increase brought the total stock of cross-border claims to $24 trillion. While the rate of growth represented a cooling from the previous quarter's 18%, it was closer to the 11% average growth rate over the previous five years.

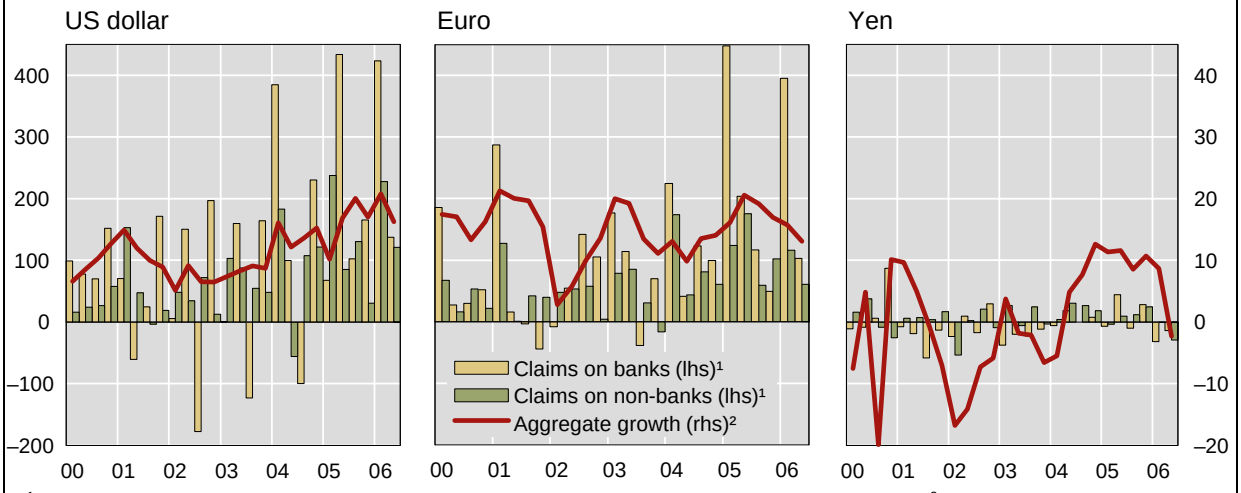
The growth of cross-border claims returns to more typical rates

The return to more modest growth in total cross-border claims reflected a deceleration in the expansion of claims of banks in the euro area and the United Kingdom. The first quarter of 2006 had seen a surge in bank loans initiated in these areas. The $92 billion in new loans from the euro area and the United Kingdom in the second quarter was more in line with previous experience. The year-on-year growth rate fell in each of the three major currencies as well (Graph 1).

Interbank and inter-office activity was responsible for a substantial part of the growth in cross-border claims in the second quarter. Of the $363 billion increase in claims on banks, 79% was due to inter-office transfers. Excluding inter-office claims, banks in France and Germany and the Cayman Islands

[1] Queries concerning the locational banking statistics and international debt securities statistics should be addressed to Ryan Stever, those concerning the consolidated banking statistics to Goetz von Peter, and those regarding the derivatives statistics to Christian Upper.

Cross-border claims by sector and currency



¹ Exchange rate adjusted quarterly changes in amounts outstanding, in billions of US dollars. ² Annual changes, in per cent, calculated as the sum of exchange rate adjusted changes in amounts outstanding between periods *t*–3 and *t*, divided by the amount outstanding in period *t*–4. Graph 1

expanded their cross-border claims the most, by $22 billion, $27 billion and $82 billion, respectively.

Yen-denominated claims fall for the second consecutive quarter

The stock of yen-denominated claims decreased for a second consecutive quarter. The outstanding stock of BIS reporting banks' yen-denominated claims had been trending upwards since early 2002, peaking at $1.1 trillion in the fourth quarter of 2005. By the second quarter of 2006, this stock had fallen to $1.0 trillion (Graph 2, left-hand panel), primarily the result of reduced claims of banks located in the United Kingdom, offshore centres and the euro area. Japanese banks' worldwide yen-denominated claims (excluding claims on residents of Japan) have remained relatively stable since 2000, at $30 billion (Graph 2, right-hand panel). In contrast, Swiss banks' worldwide yen-denominated claims have declined sharply, from a recent high of $170 billion in the third quarter of 2004 to $113 billion in the second quarter of 2006. Similarly, German and French banks have also reduced their yen-denominated claims since the fourth quarter of 2005, by $22 billion and $16 billion, respectively.

The growth in net claims on emerging market countries turned positive for the first time in five quarters. Reporting banks' total cross-border claims on developing countries increased by $66 billion. At the same time, growth in reporting banks' liabilities to the same economies slowed from $115 billion the previous quarter to $61 billion. The rise in net claims was most pronounced vis-à-vis Latin America and developing Asia, with increases of $22 billion and $11 billion, respectively.

Growth in lending to emerging Asia-Pacific was concentrated in China and Korea. Reporting banks' claims on China rose by $7.2 billion, following up on a similar increase the previous quarter. With little change in reporting banks' liabilities to China, net claims on China expanded by $5.4 billion. Reporting banks' net claims on Korea increased by a record $21.7 billion. The growth in claims on Korea stemmed from loans to both banks and non-banks.

Oil-exporting countries continued to place funds in BIS reporting banks in the second quarter, although at a somewhat slower pace than in previous

ones. Overall, residents of OPEC member states placed an estimated $8 billion in reporting banks, while Russian residents placed an additional $16 billion, pushing the total liabilities of BIS reporting banks to this group to $632 billion (Graph 3, left-hand panel). In fact, Russia experienced the largest net outflow of funds among all emerging market countries, thanks to the strong growth in Russian deposits at reporting banks, particularly in the United Kingdom (Graph 3, centre panel). The current stock of cross-border deposits by Russian residents stands at $220 billion.

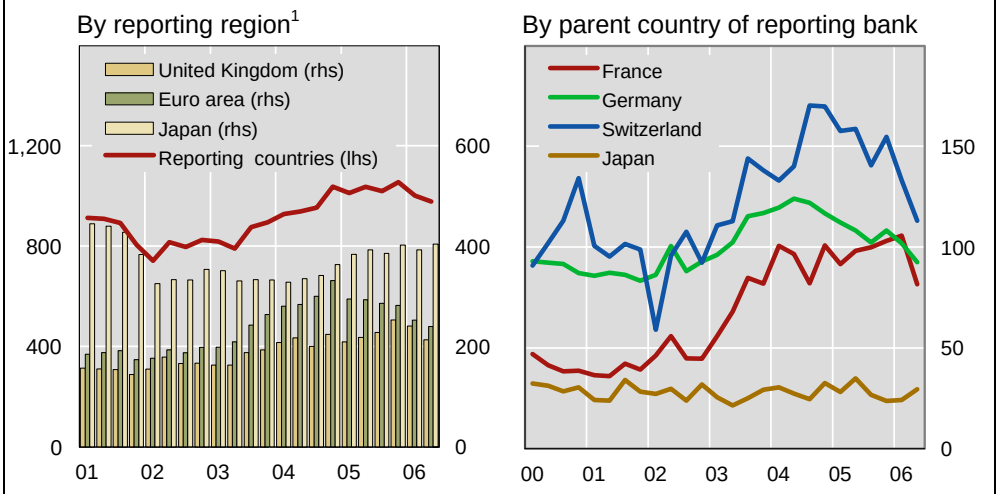
Russian deposits rise sharply …

While the data are not comprehensive, they do appear to indicate a modest shift over the quarter in the US dollar share of reporting banks' liabilities to oil-exporting countries.[2] Overall, deposits of US dollars by OPEC member states actually decreased, by $5.3 billion, while euro- and yen-denominated deposits rose by $2.8 billion and $3.8 billion, respectively. Placements of US dollars by Russian residents did increase, by $5 billion, but the bulk of the $16 billion in additions from them was denominated in euros. As a result, the share of US dollar liabilities to oil-exporting countries fell from 67% to 65% in a single quarter, while the euro share rose by 2 percentage points to 22% (Graph 3, right-hand panel).

… while the US dollar share of oil-exporting country deposits declines

The shift in the dollar share was evident in some but not all OPEC member states. For instance, US dollar deposits of residents of Iran in banks in developed European countries decreased by $4 billion. Similarly, residents of Saudi Arabia reduced their US dollar deposits in banks in the United Kingdom (by $3 billion) while increasing those in yen by a similar amount. Elsewhere, residents of Ecuador, Indonesia and Qatar reduced their US dollar deposits in BIS reporting banks by $2.3 billion, $1.9 billion and $2.4 billion, respectively. In contrast, residents of Libya placed greater US dollar funds ($5 billion), primarily

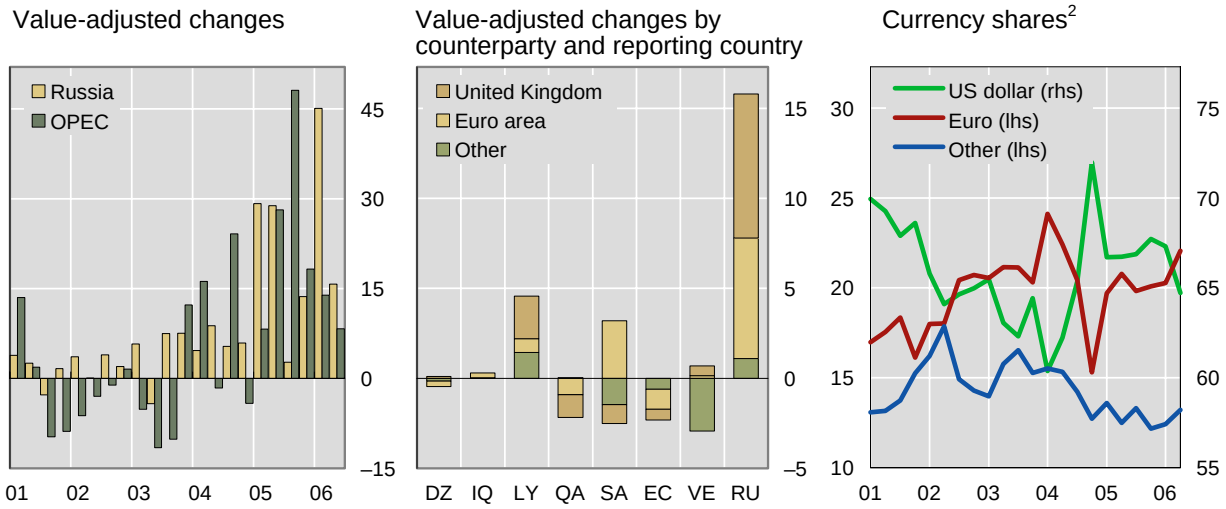
Bank lending in yen



[1] Total claims (for reporting countries' total, gross claims), in billions of US dollars. Graph 2

[2] The following figures should be interpreted with caution since the United States does not provide a complete breakdown of positions vis-à-vis individual oil-exporting countries in the Middle East but only for the Middle East region as a whole (which includes non-OPEC members). Thus, figures for many individual countries as well as OPEC do not include figures from banks in the United States.

Reporting banks' liabilities to oil-exporting countries[1]



DZ = Algeria; EC = Ecuador; IQ = Iraq; LY = Libya; QA = Qatar; RU = Russia; SA = Saudi Arabia; VE = Venezuela.

[1] Excluding liabilities of banks in the United States. OPEC member states and Russia. [2] Based on constant 2006 Q2 exchange rates.

Graph 3

in the United Kingdom, the euro area and Switzerland.

Consolidated banking statistics on an immediate borrower basis

Strong expansion due in part to a valuation effect

The consolidated banking statistics, which are compiled according to the nationality of reporting banks and net out inter-office positions, show an overall expansion of foreign claims to $24.7 trillion.[3] The reported change of $1.3 trillion (5.5%) in stocks during the second quarter of 2006 included a valuation effect, as the US dollar depreciated against several major currencies between end-March and end-June.[4] The outstanding stock of Dutch, French and German banks' claims rose the most, with greater credit to borrowers in the United Kingdom, the United States and emerging markets.

Share of lending to emerging markets remains stable …

Reporting banks' claims on emerging markets remained stable. Foreign claims on these borrowers, at $2.73 trillion, accounted for 11% of total foreign claims, up from 10% a year earlier. Austrian banks recorded the largest increase in foreign claims on emerging markets, almost exclusively vis-à-vis emerging Europe. These banks accounted for less than 2% of foreign claims worldwide, but for 20% of claims on emerging Europe. The growth of branches and new acquisitions have contributed to a tripling of this share since March 2005. For both Austrian and Greek banks, foreign claims on emerging markets amounted to some 50% of their total foreign claims, well above the shares of other banking systems.

[3] Foreign claims comprise international claims, which consist of cross-border claims in all currencies and local claims in foreign currencies, plus local claims in local currencies. Local claims are those booked by foreign offices on residents of the country where the foreign office is located.

[4] At constant exchange rates, an estimated $700 billion (+3.3%) can be attributed to increased lending and securities holdings. As the consolidated statistics do not report a currency breakdown, value-adjusted changes (at constant exchange rates) can only be approximated using information from the locational statistics.

The sectoral composition and maturity structure of international claims on emerging markets remained close to what they have been over the past seven years. The share of international claims maturing within a year declined by 1 percentage point, to 47%, as a result of the increasing share of longer-term claims on emerging Europe. The distribution across sectors shifted somewhat towards the private sector. Over the past year, the share of claims on emerging market public sector borrowers fell by 4 percentage points to 16%, with the shares of banks and non-bank private entities gaining 2 percentage points each. This was driven more by the overall expansion in emerging market claims than by the modest contraction in public sector claims.

Consolidated banking statistics on an ultimate risk basis

Banks' country risk exposures can be gauged with the consolidated banking statistics on an ultimate risk basis, which take into account risk transfers and include information on banks' contingent exposures. The broad sell-off in financial markets during May and June left reporting banks' aggregate foreign claims largely unaffected; exposures to most countries increased in the course of the second quarter of 2006. Total foreign claims (UR basis) stood at $20.3 trillion, up from $19.2 trillion the previous quarter. The market value of derivatives exposures increased particularly vis-à-vis many countries that had experienced financial market volatility, including Chile, Korea, Hungary, India, Indonesia and South Africa.

… and exposures are broad-based

BIS reporting banks raised their exposure to several emerging markets, notably to residents of China, Korea and Russia. The share of claims on China and Korea held by the three largest creditors remained broadly unchanged. In contrast, larger shifts took place in the case of Russia. Over the past year, the share of foreign claims on Russia held by the three largest creditors has declined from 57% to 44%.

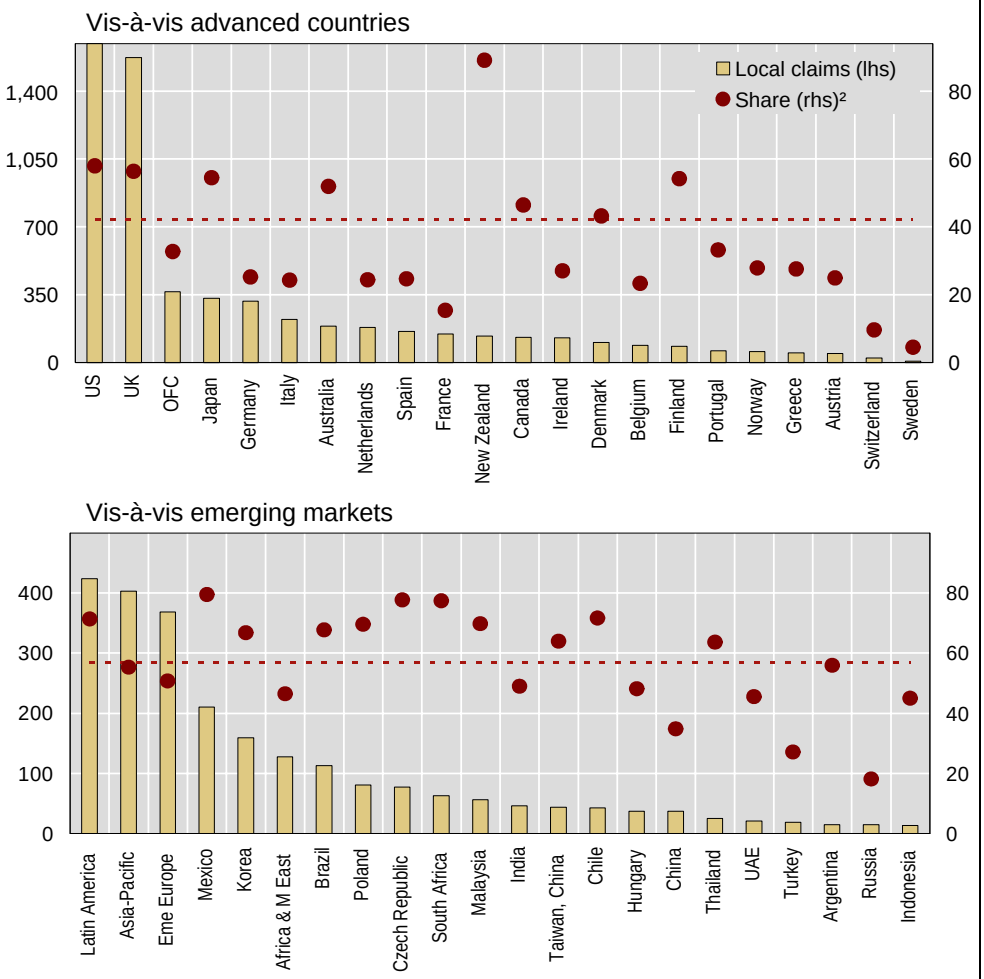
Lending through local offices: an important phenomenon …

A significant portion of foreign claims take the form of lending through local offices and subsidiaries (here referred to as "local claims"), as opposed to cross-border lending. For the 26 reporting countries combined, 44% of the stock of their foreign claims (UR basis) was conducted through local banking offices. Those banking systems responsible for the largest amounts of local claims (over $600 billion each) also extended a substantial share through local offices. More than 50% of Dutch, Spanish, Swiss and UK banks' foreign claims were local, and the share was 50% for US banks and 30% for French and German banks.

The main destinations for lending through local branches and subsidiaries are areas with significant financial activity. The principal recipients were residents of the United States and the United Kingdom, followed by offshore centres, euro area countries and Japan (Graph 4). Emerging markets accounted for $1.3 trillion, or 15%, of reporting banks' combined local claims. Of this total, 90% was almost equally divided between Latin America, Asia-Pacific and emerging Europe, while Africa and the Middle East accounted for 10%.

Worldwide consolidated local claims[1]

Amounts, in billions of US dollars; shares, in per cent



Eme Europe = emerging Europe; OFC = offshore centres. Some of the individual emerging markets are also contained in their regional group, eg Mexico in Latin America.

[1] Claims in all currencies on local residents by reporting banks' foreign offices; local claims on the United States stood at $3,059 billion as of 2006 Q2. The worldwide consolidated claims on an ultimate risk basis are reported by domestically owned banks in 26 reporting countries. [2] Local claims as a share of foreign claims. The dotted lines represent the overall shares as weighted averages. For the upper panel, the average includes all advanced countries and offshore centres, and in the lower panel it includes all emerging markets, not only those listed.

Source: BIS international consolidated banking statistics. Graph 4

… with much variation across destinations

The *share* of foreign claims extended through local offices shows considerable variation across recipient countries (Graph 4). At 57%, this share was higher on average for emerging markets (lower panel) than for advanced countries (42%, upper panel), although there is considerable variation across countries in either group. The 89% share of local claims on New Zealand, for instance, is the result of the exceptional degree of ownership by foreign, notably Australian, banks, while the UK share (56%) stems from London's role as an international banking centre. The high share associated with Mexico, and Latin America more generally, reflects the local presence of Spanish and US banks in the intermediation of funds.

Leveraged loans and Asian financial integration: the case of casino financing

Blaise Gadanecz and Robert N McCauley

To what extent are Asian banks financing investment spending in the Asian region? The recent boom in hotel and casino construction in Macao and now Singapore offers an interesting example in three respects. First, such investment projects serve domestic demand in the broad sense (through spending by mainland Chinese tourists). They thus represent an exception to the dearth of investment spending in East Asia relative to savings pointed out by many observers as a possible factor contributing to Asian current account surpluses. Second, resorts/gambling has been one of the few Asian sectors financed through highly leveraged loans during the past two years (Asian investors' appetite for high-yield US dollar and domestic currency paper has been low). And third, local currency loans are figuring prominently in the financing of these construction projects.

To assess the integration of Asian banking systems in the financing of these investments, this box analyses the syndicate composition of the loans set up to fund these projects at the senior and junior bank[①] levels. In keeping with McCauley et al (2002),[②] we find that US and European banks, rather than Asian ones, have served in the more remunerative role of arrangers. At the same time, the earlier finding of a high fraction, on average approaching one half, of the funding having been provided by Asian banks is observed in most but not all of the deals, with higher Asian participation for Asian currency loans.

In the past 12 months, loans totalling more than $4 billion have been syndicated for four hotel and casino construction projects in Macao. In addition, $2.9 billion of financing is currently being arranged for Macanese and Singaporean projects. One of the projects is entirely owned by a US casino group, while several of them are joint ventures with US groups and one with an Australian group. These projects are heavily financed with debt and thus the loans carry spreads of 250 basis points or more over Libor. At least 17% of the borrowing has been in Hong Kong and Singapore dollars (renminbi financing is unavailable for Macanese construction), the rest in US dollars.

An examination of syndicate composition at the senior level shows that the arrangers of these facilities have mainly come from the United States and Europe (in particular Portugal, through Macanese subsidiaries of Portuguese banks). US casino groups have tended to mandate their home banks to perform the high-end, fee-earning activity of arranging the loans. Consistent with the notion that arranger roles are allocated to relationship banks, relatively more Asian arrangers have tended to be present in loans syndicated to fund projects that are joint ventures with Asian partners.

The syndicate composition at the funds provider level shows a very uneven participation across the loans. Based on disclosed exact bank participations, loan shares provided by European banks tend to be highest, with Asian banks following with 30–50% shares. Asian banks achieved such a share notwithstanding very limited Japanese bank participation. Unsurprisingly, local banks figure prominently in the facilities or tranches denominated in Hong Kong or Singapore dollars, some of them explicitly targeted at Asian banks and carrying specific enhancements (collateral or guarantees). Asian shares are also often higher on joint hotel-casino (as opposed to just casino) operations, reflecting constraints on, inter alia, mainland Chinese banks' ability to finance casinos, and on facilities where the borrower is a joint venture with an Asian partner.[③] In the case of one large deal for a US-related resort project in Macao, a large part (called the term loan B) bypassed the bank syndication channels and through a Delaware obligor was marketed directly to US- and Caribbean-incorporated institutional investors. In common with other high-yielding term loan B paper, it trades actively and has to some extent been securitised into collateralised loan obligations.

In summary, while there is significant Asian bank participation in this small Asian loan sample, US investment banks can also tap US non-bank financial institutions, with Asian banks remaining out of the deals. This possibility reflects a greater direct entry of institutional investors into large leveraged loans.

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① The creditors in a syndicated loan can be divided into two groups. The first group consists of senior syndicate members, typically acting as mandated arrangers, arrangers, lead managers or agents, to bring together the syndicate of banks prepared to lend money at the specified terms. The syndicate is formed around the arrangers – often the borrower's relationship banks – who retain a portion of the loan and look for junior participants. The junior banks, typically bearing manager or participant titles, form the second group of creditors. For a more detailed discussion, see B Gadanecz, "The syndicated loan market: structure, development and implications", *BIS Quarterly Review,* December 2004. ② R N McCauley, S S Fung and B Gadanecz, "Integrating the finances of East Asia", *BIS Quarterly Review*, December 2002. ③ More generally, higher Asian bank shares have also been observed on most high-yield loans arranged in East Asia over the past two years that were denominated in Asian currencies (as opposed to US dollars) and granted to joint ventures with an Asian partner (relative to local subsidiaries of US firms).

Foreign offices of emerging market banks

The consolidated statistics also help to track the extent to which banks headquartered in emerging markets set up offices in other countries.[5] Indian, Taiwanese and Turkish banks reported a local share in foreign claims of 23%, 13% and 18%, respectively, lower than the shares for banks headquartered in the major advanced countries. The pattern of local lending visible in the data is suggestive of economic and cultural ties; for instance, Brazilian banks held their largest local claims[6] on residents of Portugal, the United States and Argentina, whereas Indian banks directed more towards the United Kingdom, Canada and Singapore.

The international debt securities market

Gross issuance of bonds and notes falls

The robust state of international financial markets was reflected in strong issuance of international debt securities in the third quarter of 2006. Gross issuance of bonds and notes totalled nearly $1.1 trillion, making 2006 the first year on record with three quarters of gross issuance over $1 trillion. Though gross issuance was nearly 5% lower than in the previous quarter, this decline was less than half the average third quarter fall resulting from seasonal considerations. Since prepayments also remained at historically high levels, net issuance of bonds and notes slowed more than normal seasonal patterns would have suggested to $506 billion, though it remained well above the previous year's pace.

UK net issuance exceptionally strong

Patterns of net issuance differed significantly by issuer region. The euro area saw the largest decline, of $76 billion to $200 billion, more than twice the average seasonal decline, while the US contraction from $179 billion to $154 billion was even larger on a seasonally adjusted basis. The United Kingdom was one of the few developed countries to see strong growth in bond and note issuance, consistent with the longer-term trend which has seen that country accounting for an increasing proportion of international debt borrowings (Graph 5, left-hand panel). Last quarter's issuance out of the United Kingdom was driven by private financial institutions, including a significant number of securitisations. For instance, the two largest issues were mortgage funds launched by the Royal Bank of Scotland.

A number of very large securitisations

For the sample as a whole, the slowdown in net bond and note issuance was less marked in the financial sector, in particular for non-bank financials. Net issuance by financial institutions of $492 billion in bonds and notes was virtually unchanged from the previous quarter on a seasonally adjusted basis. Securitisations continued to account for a large share of such issuance, including several of the largest single issues in the quarter. For example, a special purpose securitisation trust (Canada Housing Trust No 1) advised by Canada Mortgage and Housing Corporation had the largest single issue in the public financial sector of $5.7 billion.

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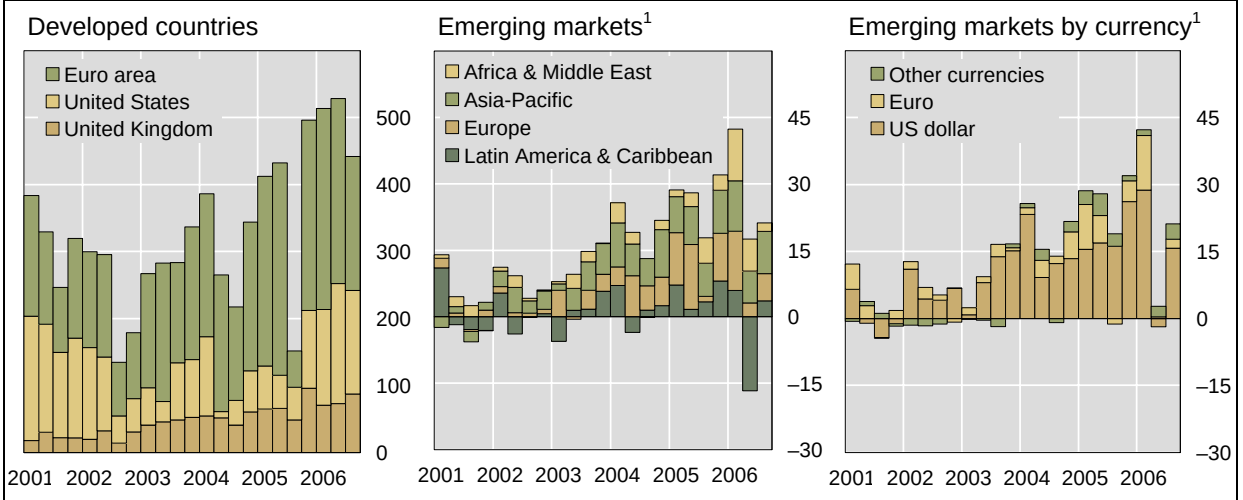
[5] Emerging markets reporting consolidated statistics on an ultimate risk basis are Chile, India, Taiwan (China) and Turkey. Two additional emerging markets, Brazil and Mexico, report consolidated statistics on an immediate borrower basis.

[6] This refers to local claims in local currency (IB); see previous footnote.

Net issuance of international bonds and notes

By nationality of issuer, in billions of US dollars



[1] Excluding issuance by the Argentine Republic in the first and second quarters of 2005.

Sources: Dealogic; Euroclear; ICMA; Thomson Financial Securities Data; BIS. Graph 5

While issuance in non-financial corporate debt slowed from the previous quarter, it remained at a historical high, at $449 billion. Utilities such as natural gas and electricity distribution corporations were responsible for a large share of total corporate issuance. In particular, the largest non-financial public corporate issue was $1.6 billion by Ras Laffan Liquefied Natural Gas Company, a Qatari natural gas company.

Emerging market issuance increases …

Issuance by emerging market borrowers was stronger than that of industrial country borrowers. Gross issuance increased from $31 billion to $39 billion, despite a seasonal tendency for it to decline in the third quarter. Net issuance also jumped from $0.8 billion to $21.2 billion, as emerging Asian, Latin American and European countries all saw an increase in activity (Graph 5, centre panel). Latin America in particular experienced a rebound in borrowing after a net repayment of $16.8 billion in the second quarter.

… thanks to prominent names in developing Asia …

In developing Asia, Korea and the Philippines were two of the most active countries in the international debt market. Korea saw total bond and note issuance surge to $6.8 billion in the third quarter, nearly all of which was accounted for by private financial institutions, both banks and non-banks. Close to 90% of Korea's new debt was US dollar-denominated. The new debt of $1.5 billion issued by the Philippines was entirely dollar-denominated. The dollar remains the largest single currency of issuance for emerging market countries on both a gross and a net basis (Graph 5, right-hand panel).

… and a return of sovereigns to the market

In contrast to the second quarter, when emerging market sovereigns were virtually absent from the international debt securities market, government issuance in the developing world was strong in the third quarter, at $8.2 billion on a gross basis. Net issuance returned to positive territory at $2.4 billion, after net repayments of more than $20 billion in the previous quarter. One large new issuer of note was Brazil, at $1.1 billion. A few countries, however, recorded net repayments. For example, Venezuela did so for the third quarter in a row.

Similarly, Mexico, after an $874 million net repayment in the second quarter, repaid $1.3 billion in the third quarter.

Derivatives markets

Exchange-traded derivatives

Seasonal decline in turnover of exchange-traded derivatives

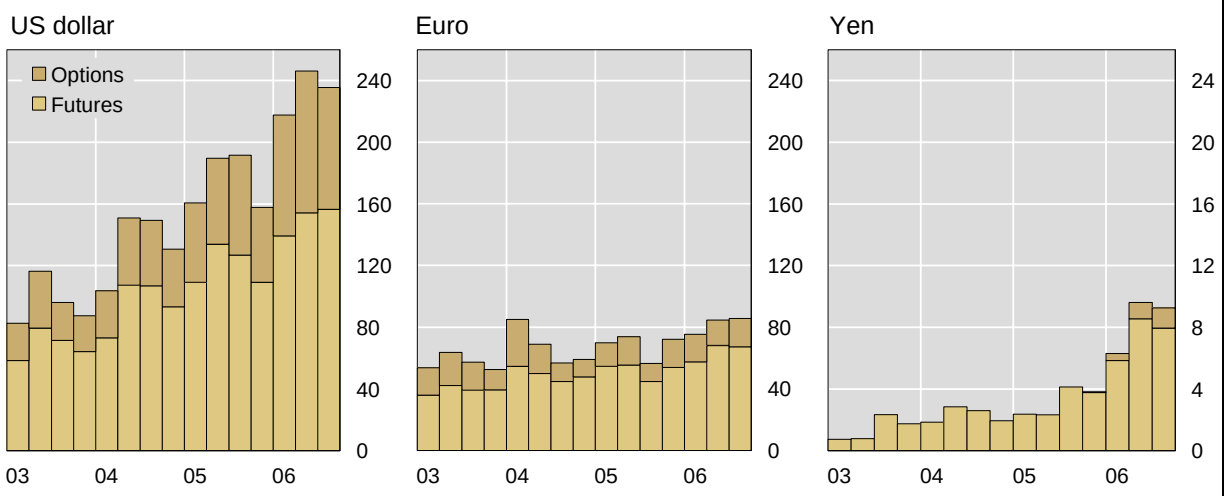
Activity on the international derivatives exchanges slowed in the *third quarter of 2006*. Combined turnover of interest rate, currency and stock index derivatives fell by 4% to $465 trillion between July and September.[7] In the previous quarter, activity had increased by 13%. Although volumes declined in all three risk categories, much of the slowdown appears to be related to seasonal factors, which depress trading in interest rate contracts in the second half of the year.

Little impact of monetary policy on volumes in money market contracts

In contrast to previous quarters, changes in the outlook for monetary policy provided little stimulus for trading in money market derivatives. July saw the first Japanese rate hike for years, but the move had been widely anticipated and therefore had little effect on trading. Turnover in futures and options on short-term yen contracts fell by 4% to $9 trillion in the third quarter (Graph 6). In the United States, a temporary reassessment of investors' outlook for policy rates in August and September had surprisingly little impact on turnover in contracts on short-term dollar interest rates, which fell by 4% to $235 trillion.[8] Turnover in derivatives on short-term euro interest rates remained stable at $86 trillion as monetary policy was largely in line with

Turnover in short-term interest rate contracts

Quarterly contract turnover, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 6

[7] All growth rates in the section on exchange-traded derivatives refer to quarter-on-quarter increases.

[8] Previous work has shown that changes in expected future interest rates tend to be an important driver of activity in exchange-traded derivatives on short-term interest rates, particularly in the case of contracts on three-month eurodollar rates. See C Upper, "Derivatives activity and monetary policy", *BIS Quarterly Review*, September 2006, pp 65–76.

expectations.

Declining activity in stock index contracts

Trading in futures and options on stock indices fell by 7% to $43 trillion in the third quarter.[9] Among the larger markets, turnover measured by notional amounts fell by 23% in Japan, 13% in the United Kingdom, 12% in the United States and 5% in Korea. The only increase in turnover was recorded in contracts on euro area stock indices, where valuation effects pushed up trading volumes measured in notional amounts by 5%. Turnover (measured by the number of contracts, since notional amounts are not available) also fell in the markets for options on individual stocks of firms domiciled in the United States and the euro area.

Higher turnover in energy derivatives offset by drop in other commodities

Turnover in commodity contracts was stable at a high level during the summer months, although there were substantial shifts between product categories. The number of energy contracts (notional amounts are not available) traded on the international derivatives exchanges increased by 22% to a new high, whereas trading volumes in other types of commodities declined despite stable or rising prices.

OTC derivatives markets[10]

Rapid growth in OTC derivatives ...

The volumes outstanding of over-the-counter (OTC) derivatives expanded at a brisk pace *in the first half of 2006*. Notional amounts of all types of OTC contracts stood at $370 trillion at the end of June, 24% higher than six months before. Growth in credit default swaps (CDSs) was particularly strong; positions in these instruments increased by 46%. Rapid growth was also recorded in other market segments. Open positions in interest rate derivatives rose by 24%, while those in FX contracts expanded by 22%. Equity and commodity contracts grew at 17% and 18%, respectively. Gross market values, which provide a better measure of market risk at a given point in time than notional amounts, increased by 3% to $10 trillion at the end of June 2006.

... despite an increase in multilateral terminations of CDS contracts

Growth in the market for CDSs would have been even higher had it not been for an increase in the number of early terminations of such contracts. Multilateral terminations[11] had a substantial effect on growth in the CDS market. Terminations of CDS contracts reached almost $4 trillion in the first six months of 2006, thus shaving almost 30 percentage points off the rate of growth in that market (Graph 7). The corresponding figures in previous half-years were below 20 percentage points.

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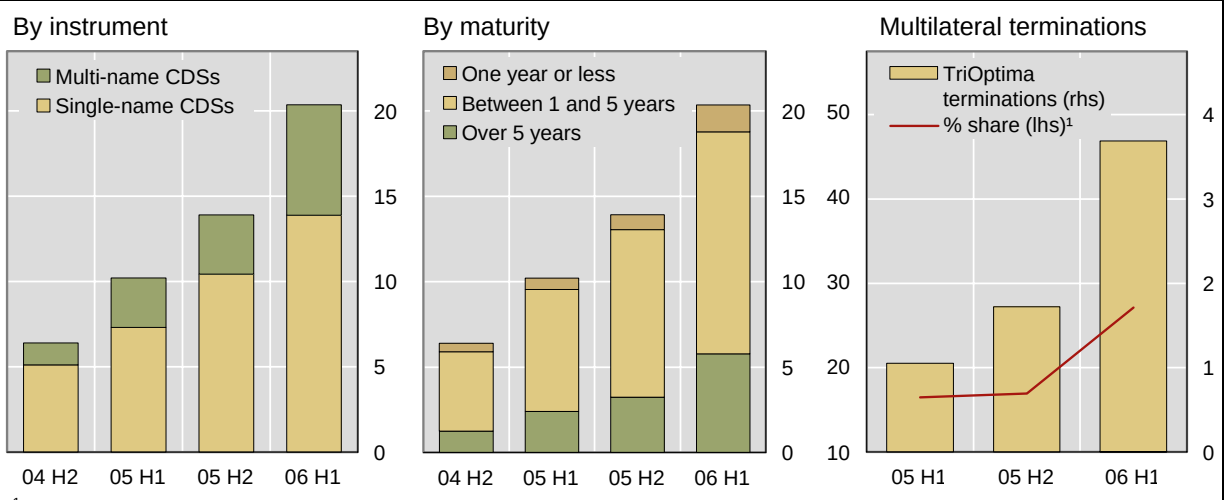
[9] It is not clear to what extent this slowdown is merely the result of seasonal factors, as it has not been possible to estimate a stable seasonal pattern for turnover in this market.

[10] A more detailed discussion of developments in the OTC derivatives markets is available at www.bis.org/publ/otc_hy0611.htm.

[11] The private firm TriOptima has been offering multilateral termination services to OTC derivatives dealers since the beginning of 2003, first for interest rate swaps and later for CDSs. A termination cycle consists of two steps. Dealers first provide TriOptima with contract by contract information on their derivatives positions. The firm then checks whether each individual contract is reported by both counterparties with identical terms. In a second step, it computes a set of bilateral contracts between participants that provides the same net exposures but lower gross exposures.

Credit default swaps

In trillions of US dollars



[1] Multilateral terminations during each half-year as a share of notional amounts outstanding of CDSs at the beginning of the period.

Sources: TriOptima; BIS. Graph 7

The rate of increase was particularly strong in multi-name CDSs, a category that includes index tranches. The notional amounts of such instruments expanded by 86% in the first six months of 2006 to $6.5 trillion, while those of single-name CDSs increased by just under one third to $13.9 trillion.

Activity in the CDS market has become more evenly spread across the maturity spectrum. Although most CDSs continue to fall into the maturity bracket ranging from one year up to five years, growth was much stronger in market segments of shorter and longer maturity. The notional amounts of CDSs with a maturity of less than one year increased by 83%, while those of instruments expiring in more than five years rose by 79%. The growth in the nearer-term segment may be explained in part by older contracts approaching expiry, whereas the sharp expansion in long-term CDSs points towards increasing liquidity at the far end of the maturity spectrum.

Patrick McGuire
+41 61 280 8921
patrick.mcguire@bis.org

Nikola Tarashev
+41 61 280 9213
nikola.tarashev@bis.org

Tracking international bank flows[1]

Activity in the international banking market has grown in recent years, both in absolute terms and relative to aggregate measures of economic activity and liquidity. By establishing a global outreach, several international banking centres have become key players in this market. This feature shows how the BIS international banking statistics can be used to track the net flow of capital through the global banking system, with a focus on the role of banks in the United Kingdom and Caribbean and Asian offshore centres.

JEL classification: F34, G15, G21.

The international banking market is a primary conduit through which funds are transferred between countries. Since 2002, cross-border lending and deposits have risen, both in absolute terms and relative to aggregate measures of real economic activity and liquidity. The structure of the international banking market has evolved over the past 30 years. While London has remained a primary financial centre, Asian and Caribbean offshore centres have expanded their global presence, and are important in the channelling of funds between countries.

This feature uses the BIS international banking statistics to quantify these developments. The first section places into perspective the growth in international banking activity in recent years, while the following section analyses the importance of international banking centres. The final section provides a convenient graphical representation of the structure of the international banking market, and analyses the net flow of bank credit between ultimate lenders and borrowers.

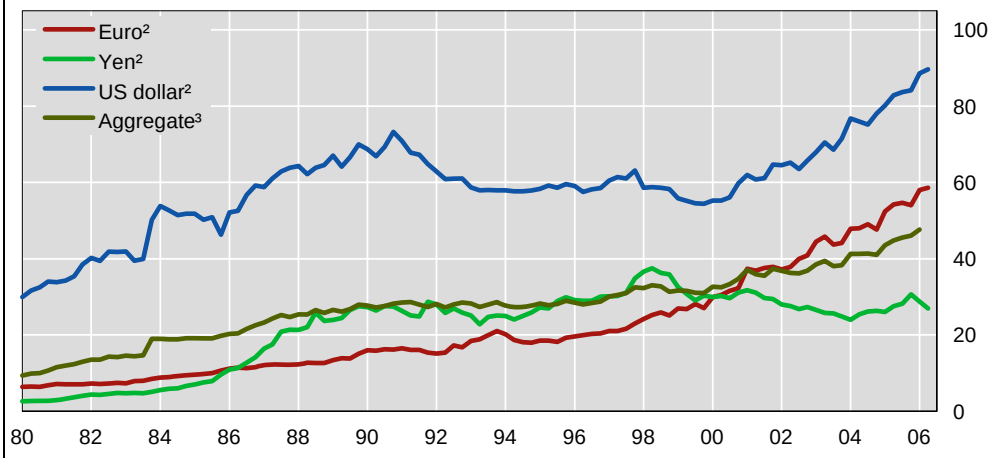
Growth in international banking

International banks play an increasingly important and complex role in the global financial system. In part, this growing complexity is the result of consolidation within the banking industry, globalisation and capital market integration. Cross-border claims today are over 30 times larger in absolute

[1] The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS. The authors would like to thank Goetz von Peter for assistance in constructing Graphs 4 and 5 and Jhuvesh Sobrun for help with the data and graphs.

BIS reporting banks' international claims relative to GDP[1]

In per cent



[1] International claims comprise cross-border claims in all currencies and claims on residents in foreign currencies. Euro-denominated claims among countries that form the euro area are excluded. [2] Stocks outstanding of claims, as a percentage of the annualised GDP of the issuing country or country group. [3] Total stocks outstanding of claims, in all currencies, as a percentage of annualised world GDP.

Sources: IMF; national data; BIS. Graph 1

terms than 30 years ago. Relative to monetary aggregates or measures of global macroeconomic activity, international activity grew robustly in the 1980s, slowed somewhat in the 1990s and has trended upwards again since 2000.

International banking activity has grown …

The international banking market took off in the 1960s, when banks in London were permitted to accept foreign currency (ie non-sterling) deposits. These banks were able to attract US dollar deposits, or eurodollars, because they faced lower regulatory costs than their counterparts in the United States, which were subject to reserve requirements. The political climate at the time also helped this process along, as the former Soviet Union and oil-exporting states, in search of a store of hard currency outside the United States, deposited a significant amount of US dollars in banks in London.[2]

… relative to global economic activity …

Since then, international banking activity has grown significantly, in all major currencies. The BIS international banking statistics – the most comprehensive source of information on banks' international assets and liabilities – indicate that the outstanding stock of international claims,[3] primarily loans, increased from $684 billion at end-1977 to $23 trillion in the second quarter of 2006.[4, 5] The growth in this market is evident even

[2] For a thorough treatment of the development of the international banking market, see Mayer (1979), McKinnon (1979), Johnston (1983), Niehans (1984) and Krugman and Obstfeld (1991).

[3] International claims (liabilities) are defined as cross-border claims (liabilities) in all currencies plus foreign currency claims (liabilities) vis-à-vis domestic residents. The BIS locational banking statistics follow balance of payments concepts, and are hence based on the residency of the reporting bank. For a complete description of these statistics, see BIS (2003a,b) and Wooldridge (2002).

[4] Part of this increase is due to a widening of the reporting area. In particular, data for the Cayman Islands, Hong Kong SAR, Singapore and other offshore financial centres became available only at end-1983. Australia, Bermuda, Greece, Guernsey, the Isle of Man and Portugal joined the reporting population in or after 1998. Banks located in these countries accounted for less than 5% of total claims of BIS reporting banks in 2006.

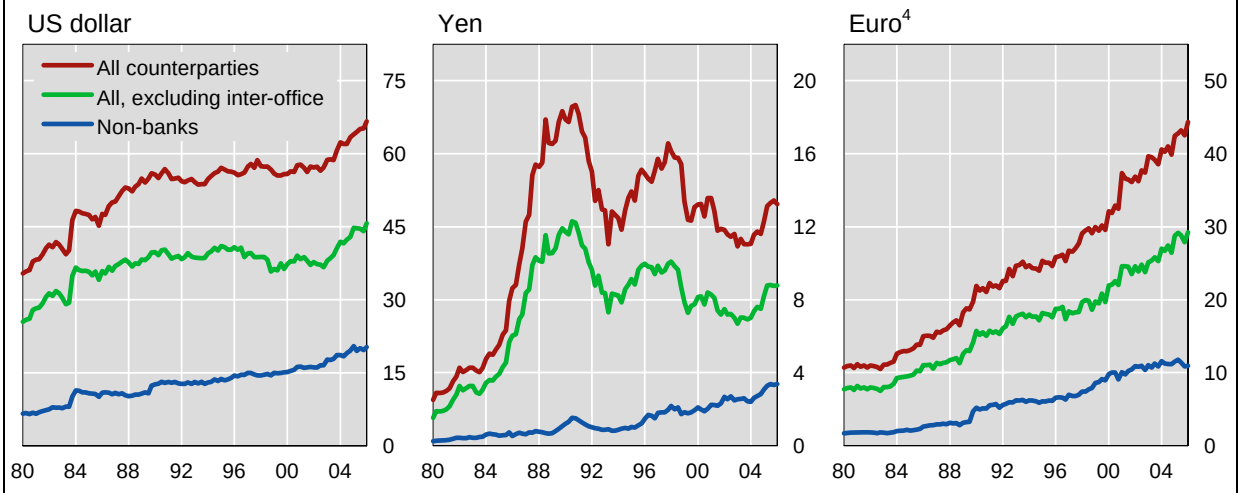
when scaled by measures of overall economic activity. Graph 1 portrays cross-border claims of banks in all reporting countries as a ratio of world GDP, as well as a decomposition of this ratio by currency. Total international claims of BIS reporting banks rose from roughly 10% of world GDP in 1980 to 28% at end-1990. This ratio stagnated over the 1990s, in part reflecting the retrenchment of Japanese banks, but has been on the rise since end-1999, reaching 48% by early 2006.[6]

... and measures of liquidity

Banks' liabilities, primarily deposits, have grown along with their claims. Cross-border liabilities can be combined with domestic liabilities (eg domestic currency deposits in resident banks) to yield a measure of "liquidity" in a particular currency.[7] Graph 2 plots banks' international liabilities – to (i) non-banks, (ii) non-banks and other banks or (iii) all counterparties (ie including

BIS reporting banks' international liabilities[1] relative to M2[2, 3]

By currency and counterparty, in per cent



[1] International liabilities comprise cross-border liabilities in all currencies and liabilities to residents in foreign currencies. [2] In general, M2 includes domestic currency in circulation plus bank liabilities to non-banks denominated in the domestic currency, eg demand deposits, savings deposits, small-denomination time deposits and balances in retail money market mutual funds. For the United States and Japan, M2 includes liabilities to both residents and non-residents. Liabilities to non-residents are subtracted from US and Japanese M2. Euro area M2 includes liabilities to euro area residents only. [3] International liabilities to all counterparties, to all counterparties excluding inter-office (ie to non-banks and other banks) or to non-banks only as a fraction of the sum of international liabilities to all counterparties and M2. [4] The pre-1999 portion of the euro area M2 series is estimated by the ECB. Cross-border liabilities vis-à-vis euro area residents denominated in euros or in the legacy currencies are excluded.

Sources: IMF; national data; BIS. Graph 2

[5] Throughout this feature, the term "euro area" refers to the group of 12 countries that adopted the euro in 1999. In addition, all calculations exclude euro-denominated cross-border positions within the euro area.

[6] The currency distribution of international claims has also evolved. The US dollar share of international bank claims dropped from 73% in mid-1984 to 52% in mid-2006 (evaluated at constant 2006 Q2 exchange rates). Over the same period, the share of euro-denominated claims (including the euro legacy currencies prior to 1999) rose from 11% to 27%.

[7] During the 1970s and 1980s, a relatively large literature on the growth of the eurocurrency market emerged. In part, this was driven by concerns that US dollars placed in banks outside the United States would contribute to inflationary pressures in the United States and dull the effect of domestic monetary policy. See McKinnon (1979), Niehans and Hewson (1976) and Mayer (1979).

inter-office deposits) – as a fraction of the sum of total international liabilities in that currency and the corresponding monetary aggregate M2.[8] In each of the major currencies, international liabilities have risen as a share of liquid funds in recent years, in line with the GDP-based ratios reported in Graph 1. US dollars held in banks outside the United States are 30–50 percentage points larger than the corresponding ratios for the euro or the Japanese yen, underscoring the importance of the US dollar as an international currency.

Graph 2 also indicates that there has been a sustained shift towards greater liabilities to non-banks since the mid-1990s.[9] In the US dollar market, for example, positions vis-à-vis these entities in the United Kingdom and Caribbean offshore centres, which host many non-bank financial entities, accounted for much of this. Across all currencies, liabilities to non-banks currently account for 29% of total international liabilities, up from 22% in 1996 and 18% in 1988.

On the whole, however, interbank activity dominates both the claims and liabilities side of banks' balance sheets. Short-term misalignments in the demand for and supply of funds to end-use borrowers can mean that deposits in banks may be temporarily passed on to other banks. If so, each leg of this chain is reflected in the aggregate claims figure, and can generate what appear to be swellings in interbank loan flows. In mid-2006, inter-office claims accounted for an estimated 32% of total cross-border deposits, while lending to other banks accounted for an additional 39%.

The importance of international banking centres

Banks located in a few countries constitute the core of the international banking market. The United Kingdom has been the largest international banking centre (IBC), a focal point for the lending and depositing of foreign currencies. Asian and Caribbean offshore centres later emerged as regional banking hubs, and currently rival the United Kingdom in terms of overall activity.

Banks in IBCs …

The size and scope of the operations of banks located in these IBCs are large relative to aggregate economic activity in the host countries. Table 1 illustrates this point by reporting international liabilities of banks located in a particular country or country group, as a proportion of GDP. The United Kingdom and Asian and Caribbean offshore centres (as well as Luxembourg and Switzerland) clearly stand out, with liabilities/GDP ratios of 285% or more in 2006. Elsewhere, these ratios were 62% or less.

[8] The definition of M2 varies slightly by country but generally includes domestic currency in circulation, demand deposits, savings deposits, small-denomination time deposits and balances in retail money market mutual funds. Importantly, M2 is in domestic currency and excludes domestic interbank deposits and all eurocurrency deposits.

[9] See McGuire (2004) for a discussion of the shift towards lending to non-bank borrowers in the United States by banks in the United Kingdom.

Identifying international banking centres

In per cent

	Liabilities to total[1]			Liabilities to GDP		
	1990	1998	2006	1990	1998	2006
Euro area[2]	16	23	26	21	36	62
United States[3]	10	10	11	11	11	20
Japan	20	9	4	45	22	23
Other developed countries[4]	4	4	5	22	27	44
United Kingdom	21	21	27	143	154	285
Luxembourg	3	4	2	1,834	2,127	1,324
Switzerland	5	5	5	165	207	317
Caribbean offshore centres[5]	9	9	7	–	4,787	5,608
Asian offshore centres[6]	10	12	5	628	491	386
Developing countries[7]	0	0	3	–	–	16

[1] International liabilities of banks located in each country or country group at the beginning of the year, as a share of all BIS reporting banks' total international liabilities. International liabilities comprise cross-border liabilities in all currencies and liabilities to residents in foreign currencies. [2] Excludes Greece and Luxembourg. Euro-denominated cross-border liabilities contracted within the euro area are excluded. [3] Excluding liabilities to residents in all currencies. [4] Australia, Canada, Denmark, Norway and Sweden. [5] The Bahamas, the Cayman Islands and the Netherlands Antilles. [6] Hong Kong SAR and Singapore. [7] Brazil, Chile, India, Korea, Mexico, Taiwan (China) and Turkey.

Sources: IMF; national data; BIS. Table 1

… are a key component of the international banking market

Activity in some IBCs is dominated by internationally active *foreign* banks. In the United Kingdom and Caribbean and Asian offshore centres, for example, banks headquartered in the United States, the euro area (primarily Germany) and Switzerland account for the bulk of international claims (Graph 3, top row). Japanese banks were once dominant in London and Hong Kong, although their cross-border claims declined in the 1990s with the downturn in the Japanese economy and the deterioration in the health of the domestic banking sector. In contrast to the experience in these IBCs, domestic banks (ie banks headquartered in the reporting country) tend to be dominant in other countries (Graph 3, bottom row).

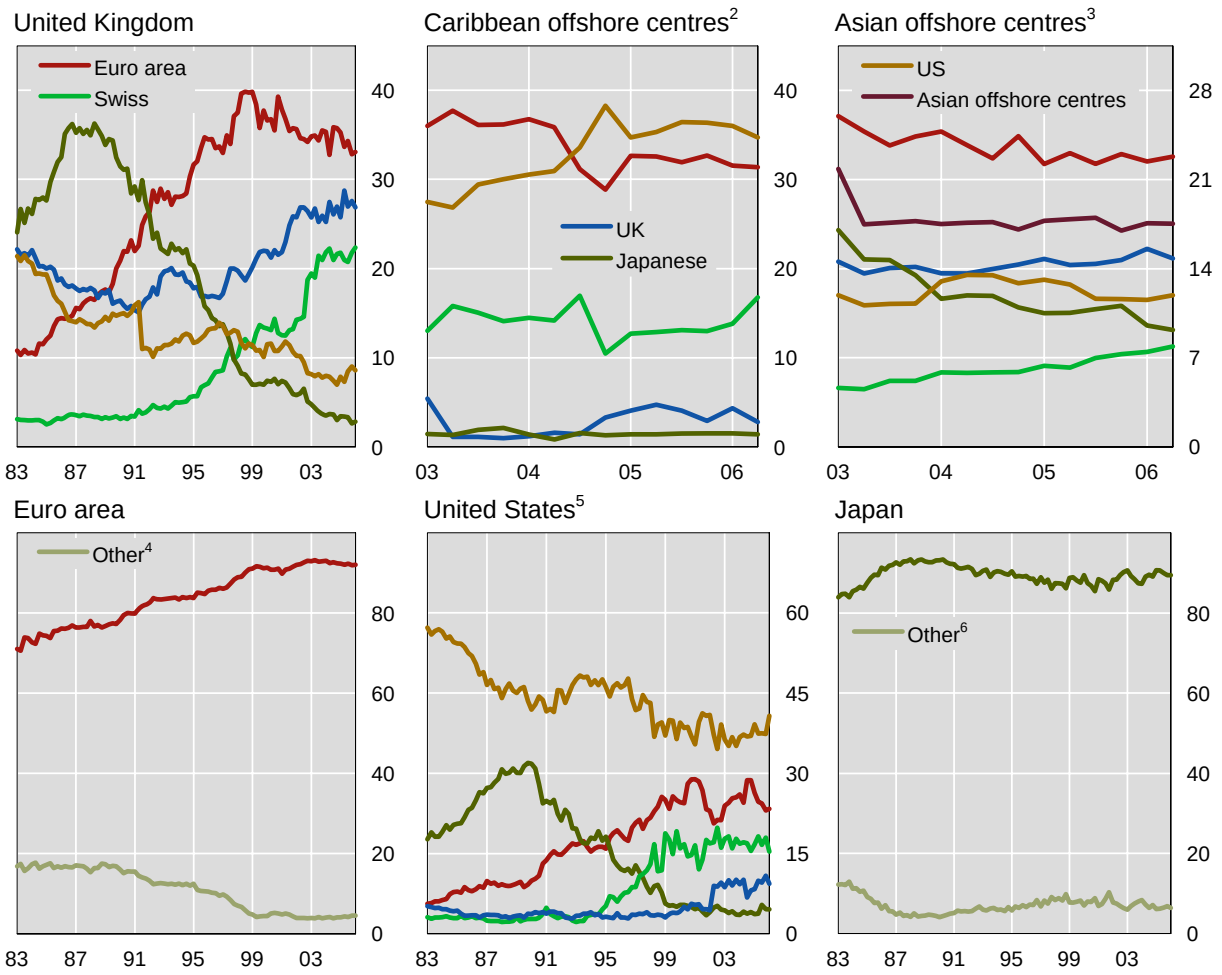
The structure of the global banking system can be viewed as a network of interconnected nodes, each representing a hub or particular geographical region.[10] Graph 4 provides one representation of the network of bilateral linkages between regions. The size of each node corresponds to the share of resident banks' cross-border claims in total cross-border claims of BIS reporting banks, and is thus an indicator of the relative importance of particular countries.[11] The thickness of the lines (or links) between regions corresponds

[10] The country groups OIL, LAT, EM EUROPE and ASIA PAC in Graphs 4 and 5 include both reporting and non-reporting countries. Bahrain (OIL), Brazil, Chile and Mexico (LAT), Turkey (EM EUROPE) and Taiwan (China) (ASIA PAC) all started to report data after 2000. Similarly, UK includes positions of banks in the United Kingdom as well as Guernsey, the Isle of Man and Jersey for 2006.

[11] Foreign currency claims on residents are not included in Graph 4.

International claims of foreign and domestically headquartered banks[1]

By reporting country, in per cent



[1] Lines indicate international claims of banks headquartered in various parent countries (identified by legend labels) as a share of total international claims of banks located in the reporting country or country group (identified by panel title). International claims comprise cross-border claims in all currencies and claims on residents in foreign currencies. [2] The Bahamas, Bermuda, the Cayman Islands and Panama. [3] Hong Kong SAR and Singapore. [4] Japan, Switzerland, the United Kingdom and the United States. [5] Excludes foreign currency claims on residents of the United States. [6] The euro area, Switzerland, the United Kingdom and the United States.

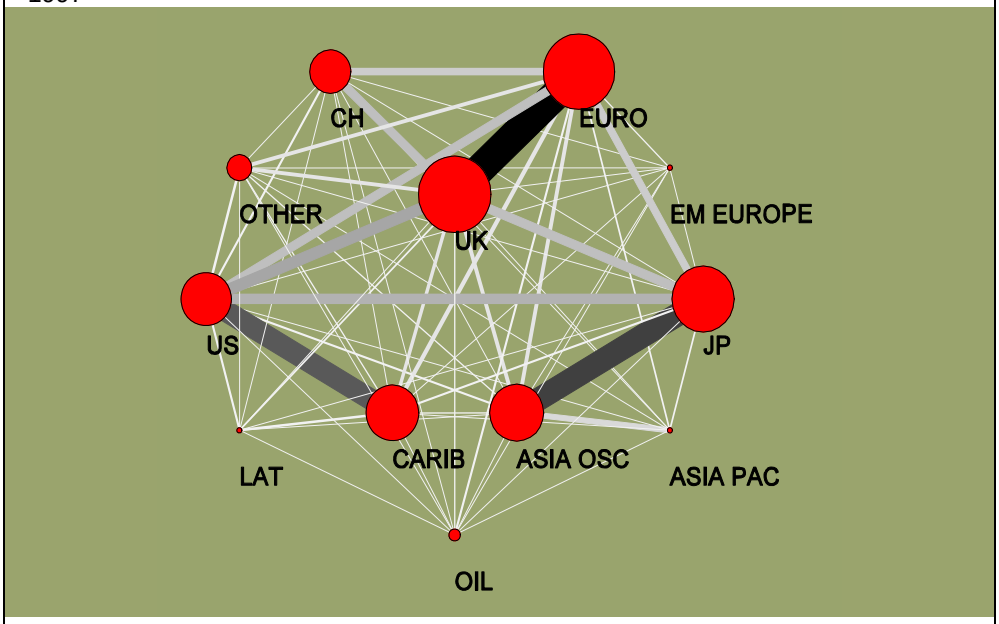
Source: BIS. Graph 3

to the *sum* of cross-border claims between the regions, and is a gauge of the size of aggregate cross-border positions.

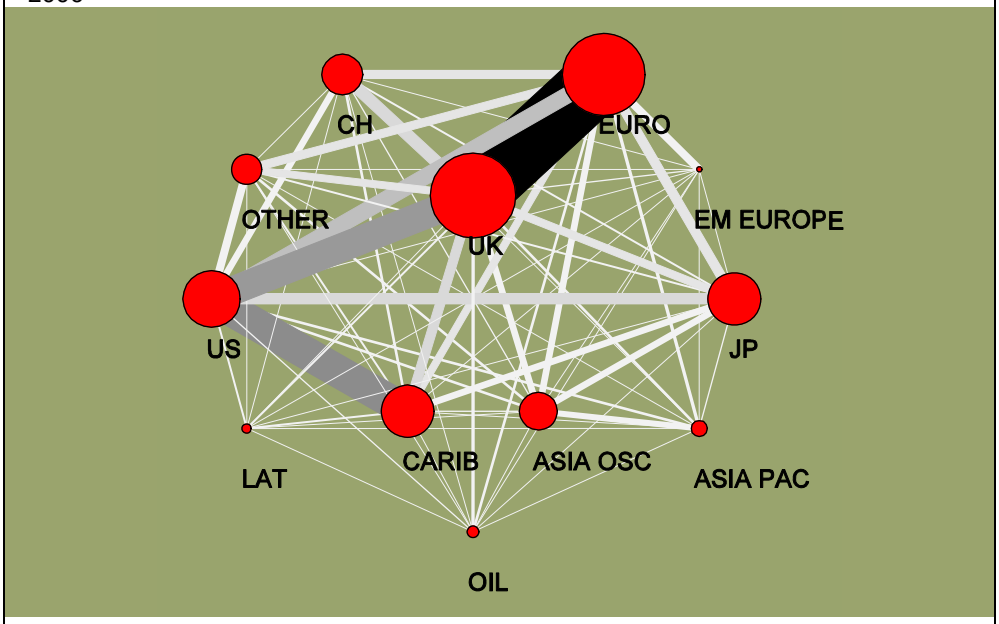
Bilateral linkages vary significantly between country pairs. For much of the last 20 years, the links between banks in the United Kingdom and the euro area (at roughly $4 trillion), and between banks in the United States and the Caribbean (roughly $2 trillion), were the largest. Aggregate positions between the United States and the United Kingdom, and between Switzerland and the euro area, were relatively significant as well. At the onset of the Asian financial crisis in 1997, Japanese banks still had significant positions vis-à-vis their offices in Hong Kong and the United Kingdom. By mid-2006, their cross-border positions vis-à-vis banks in Asian offshore centres had declined in relative terms.

Linkages in the international banking system[1]

1997



2006



ASIA OSC = Hong Kong SAR, Macao and Singapore; ASIA PAC = China, India, Indonesia, Korea, Malaysia, Pakistan, the Philippines, Taiwan (China) and Thailand; CARIB = Aruba, the Bahamas, Bermuda, the Cayman Islands, the Netherlands Antilles and Panama; CH = Switzerland; EM EUROPE = Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Turkey and Ukraine; EURO = euro area countries; JP = Japan; LAT = Argentina, Brazil, Chile, Colombia, Mexico and Peru; OIL = OPEC member states (excluding Indonesia) plus Russia; OTHER = Australia, Canada, Denmark, New Zealand, Norway and Sweden; UK = the United Kingdom plus the offshore centres Guernsey, the Isle of Man and Jersey; US = the United States.

[1] The size of each red circle is proportional to the outstanding stock of cross-border claims of reporting banks located in the particular geographical region. Some regions include countries which do not report data. The thickness of a line between regions A and B is proportional to the sum of claims of banks in A on residents in B and claims of banks in B on residents of A. The size of the circles and thickness of the lines are scaled by the overall stock outstanding, and thus are not directly comparable across panels.

Source: BIS. Graph 4

Tracking the flow of capital

Through lending, accepting deposits, or purchases of foreign securities, banks play a role in the transfer of capital between countries. The above analysis touches only indirectly on the United Kingdom's and Asian and Caribbean offshore centres' role as redistributors of financial capital. This section attempts to fill this gap by analysing *net* flows of funds among banks in different geographical regions, with a focus on the flows through banks in these IBCs.

The BIS banking statistics help track …

The BIS locational banking statistics track the net flow of financial capital between any two regions which is channelled through the banking system. For concreteness, consider measuring the cumulative net flow of funds over a given period between the residents of country A and the residents of country B. A portion of funds transferred between these residents will be external to the banking system – the purchase of a US Treasury by a non-bank outside the United States, for example – and thus are not covered by the BIS international banking statistics. The portion which *is* routed through the banking system equals the sum of three components. The first is the cumulative net claim flows (claims minus liabilities) to non-banks in country A reported by banks located in country B. The second is the counterpart to this, the cumulative net flows reported by banks in country A to non-banks in country B. Finally, there is the net interbank component.[12]

Graph 5 presents the net flow of capital channelled through banks, cumulated over two periods (1990–97 and 1998–2006). This allows for a comparison of the net flow of funds through banks before and after the Asian financial crisis. Each arrow in Graph 5 provides two pieces of information: the direction of net capital flows between two given regions and the relative size of these flows (indicated by its thickness).

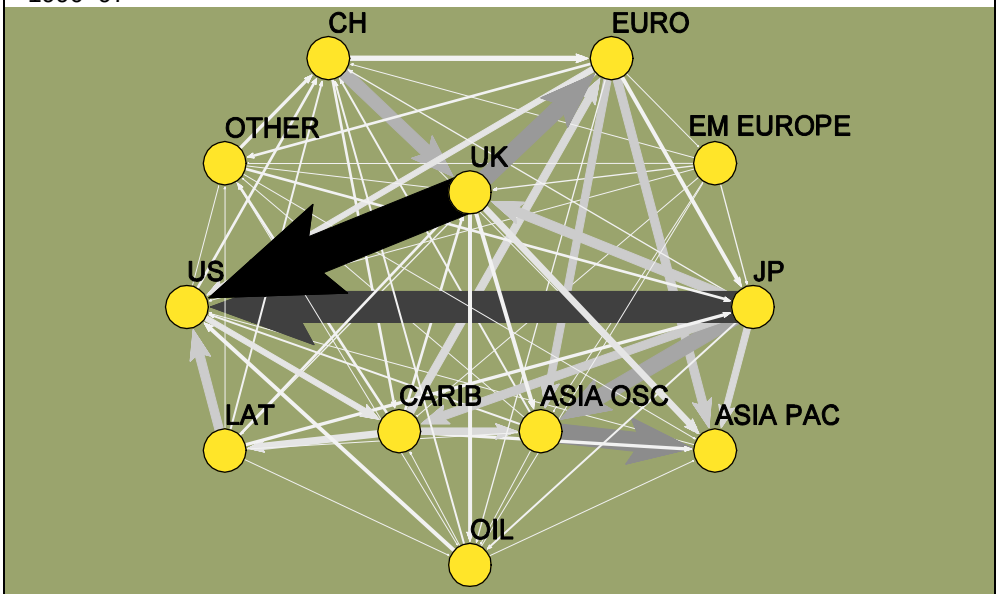
… the net flow of funds through banks

Between 1990 and 1997, the United States and emerging Asia-Pacific stood out as the main net borrowers on the international banking market, whereas Japan was the main provider of funds (Graph 5, top panel). In line with the renewed growth of its current account deficits over this period, the United States experienced a net inflow of $433 billion via the banking market. Roughly 85% of this was provided by Japanese and UK residents. At the same time, residents of Japan and the countries that now comprise the euro area jointly exported $195 billion to Asian offshore centres and emerging Asia-Pacific, accounting for 74% of the overall net banking flows into these economies.

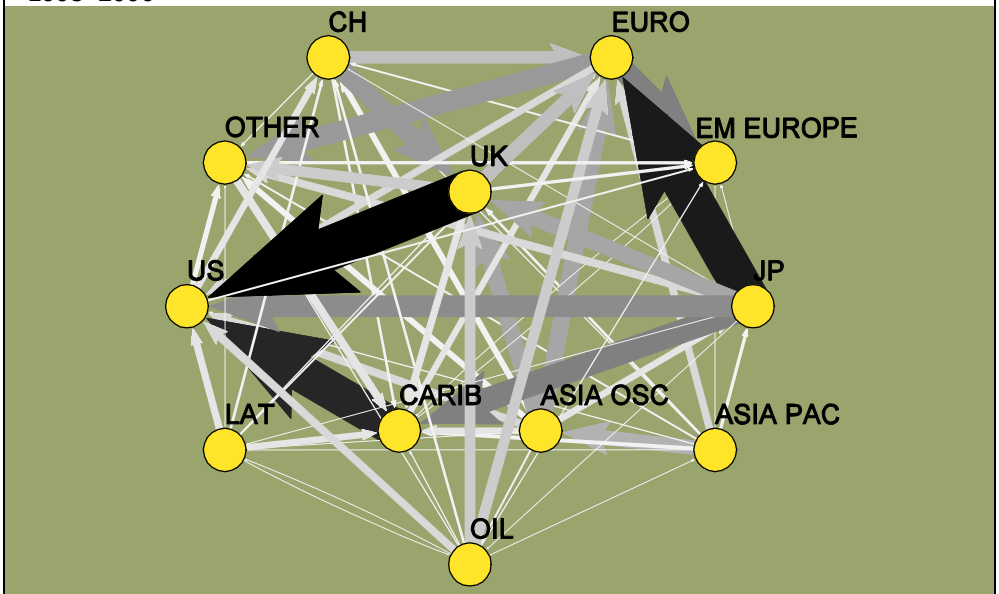
[12] Unlike net flows to non-banks, the net interbank flows reported by any country pair should be roughly equal. A net inflow reported by banks in country A vis-à-vis banks in country B should be reported as a corresponding outflow by banks in country B. In practice, different populations of banks on the reporting and vis-à-vis side of the data can create some, albeit small, discrepancies. In calculating net interbank flows, we chose the larger asset and liability positions reported across the two sets of reporting banks. Some regions include countries which do not report data. If, for example, country B is not a reporter, then flows from banks in country B to non-banks in country A will be missed. This is potentially a large component of total flows through the banking system for some regions. Finally, a small portion of banks' total liabilities is debt securities liabilities, which are often not allocated to a particular vis-à-vis country.

Net flow of funds through the international banking system[1]

1990–97



1998–2006



ASIA OSC = Hong Kong SAR, Macao and Singapore; ASIA PAC = China, India, Indonesia, Korea, Malaysia, Pakistan, the Philippines, Taiwan (China) and Thailand; CARIB = Aruba, the Bahamas, Bermuda, the Cayman Islands, the Netherlands Antilles and Panama; CH = Switzerland; EM EUROPE = Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Turkey and Ukraine; EURO = euro area countries; JP = Japan; LAT = Argentina, Brazil, Chile, Colombia, Mexico and Peru; OIL = OPEC member states (excluding Indonesia) plus Russia; OTHER = Australia, Canada, Denmark, New Zealand, Norway and Sweden; UK = the United Kingdom plus the offshore centres Guernsey, the Isle of Man and Jersey; US = the United States.

[1] The thickness of an arrow is proportional to the amount of cumulative net bank flows between regions. Net flows between regions A and B equal the sum of: (1) net claims (assets minus liabilities) of banks in A on non-banks in B; (2) net claims of banks in B on non-banks in A; and (3) net interbank flows between A and B. Some regions include countries which do not report data. The thickness of the arrows is scaled by the overall flows cumulated over the respective period, and thus is not directly comparable across panels. In contrast to Graph 4, the size of the circles has no significance.

Source: BIS. Graph 5

By mid-2006, the euro area had joined the United States as a main importer of funds on the international banking market, while the size and direction of net bank flows had changed between various country pairs (Graph 5, bottom panel). Between 1998 and 2006, funding from Japanese residents accounted for only 18% of the $764 billion in cumulative net bank flows into the United States (down from 38% between 1990 and 1997), with the remainder provided mostly by residents of the United Kingdom and Caribbean offshore centres. Japanese residents were again the largest exporters of capital through banks during this period ($642 billion), with 40% of this flowing to residents in the euro area. Over this same period, the flow of funds between Japan and Asian offshore centres dried up, reflecting both the retrenchment of Japanese banks from their overseas operations and the growing surpluses in emerging Asia in the wake of the Asian financial crisis. In contrast to the pre-crisis period, Asian offshore centres became important exporters of capital. Together with oil-exporting countries, they provided an estimated $450 billion in net funds via the banking system, mainly to residents of the United Kingdom and the euro area.

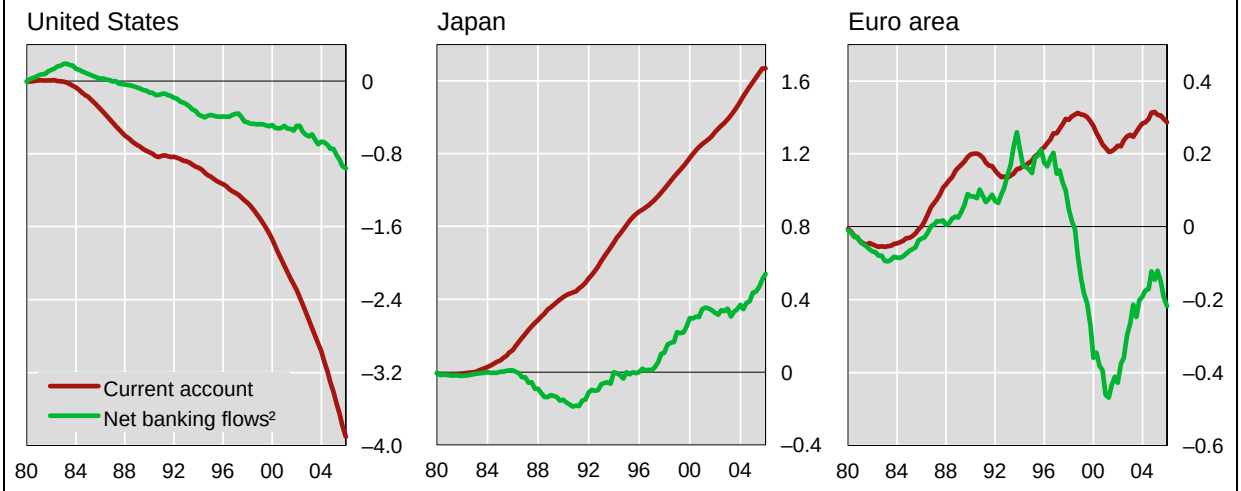
Net bank flows reflect current account balances

Net bank flows reflect in part the overall external position of individual countries or regions. A country's total net financing requirement in a given period can be expressed as the sum of net financial outflows from the public and private sectors which, by the balance of payments identity, is equal to the current account balance. Thus, a comparison between the current account balance and net international banking flows sheds light on the portion of a country's net financing requirement which is routed via the banking system, as opposed to via financial markets.

Graph 6 presents this comparison for the United States, the euro area and Japan. By mid-2006, roughly one quarter of the cumulative current account flows into the United States were routed through the banking system. Similarly,

External positions and the international banking market

In trillions of US dollars[1]



[1] Flows are scaled by the US GDP deflator (set to 100 in 1985 Q1) and are cumulated from 1980 Q1 onwards. [2] A positive flow signifies an outflow from the country or region to the rest of the world. See Graph 5 for a definition of net bank flows.

Sources: ECB; IMF; BIS. Graph 6

only a small portion of Japan's current account surplus has been channelled through the banking system, although this share has increased substantially over the last decade, from 5% in 1997 to 32% at mid-2006. In the euro area, net bank flows closely tracked the movement of cumulative current account balances up to 1995 and between 1999 and mid-2006. By contrast, from end-1995 to mid-1998, net inflows to the euro area, mainly from the United Kingdom, Japan and Asian offshore centres, coincided with current account surpluses and the accumulation of reserves in this region.

As highlighted in Graph 5, a sizeable portion of net credit flows between regions is not transacted directly, but is intermediated by banks in IBCs, in particular in the United Kingdom and Asian and Caribbean offshore centres. The indirect flows between ultimate borrowers and lenders which are routed through IBCs can be analysed using time series regressions. In each regression, the dependent variable is quarterly net bank flows from an IBC to a large economy (the United States or Japan or the euro area). The explanatory variables are net bank flows from other geographical regions to the IBC, or the net flow (in foreign currency) from bank and non-bank residents of the IBC to local banks.[13] A statistically significant *positive* regression coefficient indicates that an increase in the net flows from a geographical region *to* an IBC tends to be associated with an increase in the net flows from this centre *to* a particular country. By contrast, a *negative* coefficient suggests that a large economy and another geographical region tend to provide funds *in tandem* to the IBC in focus.

Banks in IBCs intermediate …

The results of this exercise are presented in Table 2. The prevalence of positive regression coefficients suggests that IBCs are indeed intermediaries in the global flow of capital. In addition, the regressors explain up to 50% of the variability of net bank flows between IBCs and major economies. This result is particularly interesting given that the dependent and explanatory variables are related only contemporaneously while some of the net banking flows may be intermediated with a lag. Since all the variables are expressed in standard-deviation units, the coefficient estimates reveal *directly* the impact of a *typical* change in an explanatory variable. Taken at face value, a one-standard-deviation increase in the quarterly net flow of funds from oil-exporting countries to the United Kingdom – or $4.5 billion – corresponds to a 0.18 standard-deviation – or $3.4 billion – increase in flows from the United Kingdom to the United States.

… between ultimate lenders and borrowers

Table 2 also reveals some distinct patterns in the global flow of funds through IBCs. For example, residents of Caribbean and Asian offshore centres appear to be significant sources of foreign currency funds for banks located in these centres. This helps explain the large net banking outflows from these areas, as portrayed by Graph 5, in the absence of commensurate cross-border inflows. In addition, there is evidence that some of the net banking flows between Asian countries and major economies have been routed through IBCs.

[13] For example, domestic residents, which are not included in Graph 5, channelled a cumulative $136 billion in foreign currency to banks in Asian offshore centres, and $19 billion to banks in Caribbean offshore centres, between 1998 and 2006.

International banking centres as redistributors of net international bank flows

Caribbean offshore centres

	CH	C OSC residents	EE	Euro area	JP	OIL	Other	UK	US	Adj R^2
US	0.12 [2.61]	0.35 [2.39]				0.16 [2.45]		0.59 [5.41]		0.51
JP	0.23 [2.88]		0.16 [1.94]	–0.32 [–2.43]			–0.32 [–2.40]	0.37 [2.15]	0.18 [1.58]	0.34
Euro area			0.31 [2.76]		–0.33 [–2.21]					0.22

United Kingdom

	A OSC	AP	CH	C OSC	EE	Euro area	JP	OIL	UK residents	US	Adj R^2
US		0.21 [2.08]	0.46 [4.22]	0.35 [3.45]		0.29 [2.64]	0.40 [3.46]	0.18 [1.94]			0.39
JP	–0.25 [–1.97]	0.21 [2.14]	0.23 [1.88]	0.32 [4.08]		0.49 [4.62]			0.20 [1.73]	0.38 [3.52]	0.38
Euro area		0.33 [2.84]	0.29 [2.52]	0.28 [2.07]	–0.18 [–1.55]		0.47 [4.71]		0.24 [1.97]	0.30 [2.05]	0.33

Asian offshore centres

	A OSC residents	AP	EE	Euro area	JP	LAT	UK	US	Adj R^2
US	0.23 [1.99]	0.45 [2.66]		0.45 [2.57]	0.33 [3.29]				0.23
JP	0.36 [3.57]	0.46 [2.55]	0.18 [1.94]	0.62 [3.56]		0.17 [1.81]	0.46 [5.14]	0.13 [1.61]	0.45
Euro area	0.30 [3.98]	0.56 [3.68]			0.56 [7.45]		0.28 [2.98]	0.25 [3.82]	0.50

A OSC = Hong Kong SAR, Macao and Singapore; AP = China, India, Indonesia, Korea, Malaysia, Pakistan, the Philippines, Taiwan (China) and Thailand; CH = Switzerland; C OSC = Aruba, the Bahamas, Bermuda, the Cayman Islands, the Netherlands Antilles and Panama; EE = Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, Turkey and Ukraine; JP = Japan; LAT = Argentina, Brazil, Chile, Colombia, Mexico and Peru; OIL = OPEC member states (excluding Indonesia) plus Russia; OTHER = Australia, Canada, Denmark, New Zealand, Norway and Sweden; UK = the United Kingdom plus the offshore centres Guernsey, the Isle of Man and Jersey; US = the United States.

Note: The sample covers the 90 quarters between 1984 Q1 and 2006 Q2. White heteroskedasticity-consistent *t*-statistics are in square brackets. A dependent variable is net bank flows from an IBC (identified by the table's subheadings) to another region (identified by the row headings). An explanatory variable is net bank flows from the region indicated in the column heading to the IBC. All variables are scaled by their standard deviation. See Graph 5 for a definition of net bank flows. In each regression, the selected explanatory variables are those that maximise the goodness-of-fit measure, adjusted R^2. Intercept estimates are not reported. Table 2

Specifically, net flows from emerging Asia-Pacific to the United Kingdom and Asian offshore centres help explain net flows from these IBCs to the euro area, Japan and the United States. Similarly, part of the net flows from Japan to the euro area and the United States appear to be routed via the United Kingdom and Asian offshore centres. This complements the information on *direct* banking flows (recall Graph 5) to provide a fuller picture of the flow of credit between Asia and the rest of the world.

The estimated regression coefficients should be interpreted with caution since several factors have not been controlled for. For example, the regressions do not include deposits by residents in *domestic* currencies, as these are not reported in the BIS banking statistics. Such deposits, however, may account for a significant portion of the funding of banks in IBCs and, thus, be a key determinant of net flows between these centres and major economies. In addition, the regressions do not incorporate information on asset prices, which would also be an important factor behind net banking flows.

Conclusion

This feature employed the BIS statistics in order to explore the growth in the international banking market, and shed light on the evolving role of IBCs. Underpinned mainly by interbank activity, the size of this market has increased recently not only in absolute terms but also relative to aggregate measures of economic activity and liquidity.

A contribution of this feature has been to provide a convenient graphical representation of the net flow of funds through the international banking system. At a broad level, cumulative bank flows co-move to some extent with regional external positions, as captured by current account balances. A large fraction of these flows have been channelled through banks in IBCs, which act as intermediaries in the international banking market.

References

Bank for International Settlements (2003a): "Guide to the international financial statistics", *BIS Papers*, no 14, February.

——— (2003b): "Guide to the international banking statistics", *BIS Papers*, no 16, April.

Grabbe, O (1986): *International financial markets*, Elsevier Science Publishing Co Inc, New York.

Johnston, R B (1983): *The economics of the euromarket: history, theory and practice*, Macmillan, New York.

Krugman, P and M Obstfeld (1991): *International economics, theory and policy*, second edition, HarperCollins Publishers Inc.

Mayer, H (1979): "Credit and liquidity creation in the international banking sector", *BIS Economic Papers*, no 1.

McCauley, R and Y K Mo (2000): "An update on developments in Hong Kong's international banking business", *BIS Quarterly Review*, p 19, February.

McGuire, P (2004): "A shift in London's eurodollar market", *BIS Quarterly Review*, September, pp 67–78.

McKinnon, R (1979): *Money in international exchange, the convertible currency system*, Oxford University Press, New York, Oxford.

Niehans, J (1984): *International monetary economics*, Johns Hopkins University Press, Baltimore, Maryland.

Niehans, J and J Hewson (1976): "The eurodollar market and monetary theory", *Journal of Money, Credit and Banking*.

Wooldridge, P (2002): "Uses of the BIS statistics: an introduction", *BIS Quarterly Review*, March, pp 75–92.

Robert McCauley

+852 9152 3611
Robert.McCauley@bis.org

Internationalising a currency: the case of the Australian dollar[1]

Asian policymakers are giving consideration to allowing their currencies to be used by non-residents. If policy allows this and a robust fixed income market provides support, the Australian experience indicates that a currency can internationalise fairly quickly, particularly if it offers a yield pickup.

JEL classification: F3, G1.

In Asia the transition of currencies from enforced insularity to international status is attracting attention. In May this year, the Korean authorities (Korean Ministry of Finance and the Economy (2006)) accelerated their schedule to liberalise the won and capital flows, thereby "facilitating the internationalisation of the won". In July, the Tarapore Committee of the Reserve Bank of India (RBI (2006)) devoted several paragraphs to the internationalisation of the Indian rupee.

This feature first defines an internationalised currency in terms of the domain of its use as a means of exchange and as a store of wealth. Then the path of the Australian dollar is traced from insular to internationalised currency. Policy permitted rather than encouraged this process. In addition, both domestic financial development and relatively high interest rates were important. The article concludes by briefly considering the effects of internationalisation on the exchange rate and bond yields. If the Australian experience is any guide, Asian bond yields can be expected to move more in line with those in major bond markets once currencies are internationalised.

[1] My thanks go to Paola Gallardo, Philippe Hainaut, Denis Pêtre, Swapan-Kumar Pradhan and Michela Scatigna for research assistance, and Claudio Borio, Michael Davies, Guy Debelle, Frank Packer, Yung Chul Park and participants in seminars at the Reserve Bank of Australia, the International Finance Bureau, the Bank of Korea, the Korean Ministry of Finance and the Economy, Bank Negara Malaysia and the Bank of Thailand for discussion. All errors remain the responsibility of the author. The views expressed are those of the author and not necessarily those of the BIS.

Defining and measuring an internationalised currency

An internationalised currency …

An internationalised currency can be defined as one that is freely traded against other currencies and used to denominate contracts, including bank accounts and bonds, outside its country of issue. In the bond market, internationalisation requires more than non-residents becoming important holders of domestically issued bonds: ie, the domestic bond market is taken to be fully internationalised only when non-residents figure as important *issuers* of bonds denominated in the domestic currency. In addition, an internationalised currency is used to denominate bonds sold outside its domestic financial markets, in offshore markets, by both domestic and foreign issuers who choose to tap non-resident investors. A telling sign of internationalisation is a non-resident issuer of a bond denominated in the domestic currency that is sold offshore to non-resident investors.

Australian dollar trading in the global foreign exchange market

… trades heavily offshore against other currencies …

Australian dollars are actively traded by non-residents. Like most major currencies, the Australian dollar trades more outside the home economy than

The geography of global foreign exchange trading

In billions of US dollars per day in April 2004

	Global trading	Domestic trading[1]	Offshore trading	*Memo: Offshore percentage*
US dollar	1,572.9	422.8	1,150.1	*73*
Euro	659.4	196.6	462.8	*70*
Yen	359.2	139.6	219.6	*61*
Sterling	299.4	209.5	89.9	*30*
Swiss franc	107.7	26.3	81.4	*76*
Canadian dollar	74.6	30.0	44.6	*60*
Australian dollar	97.1	39.4	57.7	*59*
New Zealand dollar	17.6	4.2	13.4	*76*
Chinese renminbi[2]	3.6	2.7	0.9	*25*
Hong Kong dollar	33.2	27.2	6.0	*18*
Indian rupee	6.1	5.4	0.7	*11*
Indonesian rupiah	2.1	1.8	0.3	*14*
Korean won	21.2	17.1	4.1	*19*
Malaysian ringgit	…	1.0	…	…
Philippine peso	0.8	0.6	0.2	*25*
Singapore dollar	17.0	10.8	6.2	*36*
New Taiwan dollar	7.3	4.1	3.2	*44*
Thai baht	3.5	2.3	1.2	*34*

[1] Domestic trading includes both onshore-onshore and onshore-offshore trading. [2] The 2004 survey captured only Shanghai interbank trading of the Chinese renminbi, leaving onshore trading not comparable to that of the other currencies. Ho et al (2005, p 53) estimate the domestic trading as at least $2.7 billion.

Source: BIS (2005), Tables E1 and E7. Table 1

within (Table 1).[2] That is, if one defines offshore trading in a currency as that between two non-residents, then such trades represent the major part of global transactions for major currencies. On this measure, the Australian dollar is as much an internationalised currency as the yen, although somewhat less so than the US dollar, euro or New Zealand dollar. Most Asian currencies other than the yen, including the rupee and the won, trade relatively little offshore.

The Australian dollar in the global bond market

... and attracts foreign investors and issuers

An internationalised currency also serves non-residents as a store of value whenever they buy or sell deposits or bonds denominated in the currency.[3] For the Australian dollar, this goes well beyond non-resident investment in the domestic bond market, where about half of the Australian Commonwealth bonds issued domestically in Australian dollars are held by non-residents. Non-resident investors have also enjoyed the convenience of Australian issuers selling Australian dollar bonds offshore (Table 2). A larger sum still has been raised by non-resident borrowers issuing Australian dollar bonds in the domestic market (foreign bonds known as "kangaroo bonds"). A yet larger sum has been raised by non-resident issuers of Australian bonds marketed to offshore investors. All told, Australian dollar bonds marketed offshore and kangaroo bonds amount to about 40% of Australian dollar bonds outstanding globally. (Taking account of non-resident holdings of domestic bonds issued by Australians would raise the international share above half.)

In an international comparison, the Australian bond market is more internationalised than most, but by no means the most internationalised (Graph 1, upper panel). After a generation of internationalisation, the yen bond

The Australian dollar in the global bond market

In billions of US dollars, at end-2005

Australian dollar bond issuers	Location of market		Total
	Australia	Offshore	
Australian	210	29	239
Others	39	78	117
Total	249	107	356

Note: According to BIS data, issuers of Australian nationality have $230 billion outstanding of bonds in other currencies, presumably mostly swapped. The Australian Bureau of Statistics reports foreign holdings of Australian bonds of $297 billion, including Commonwealth bonds of $22 billion.

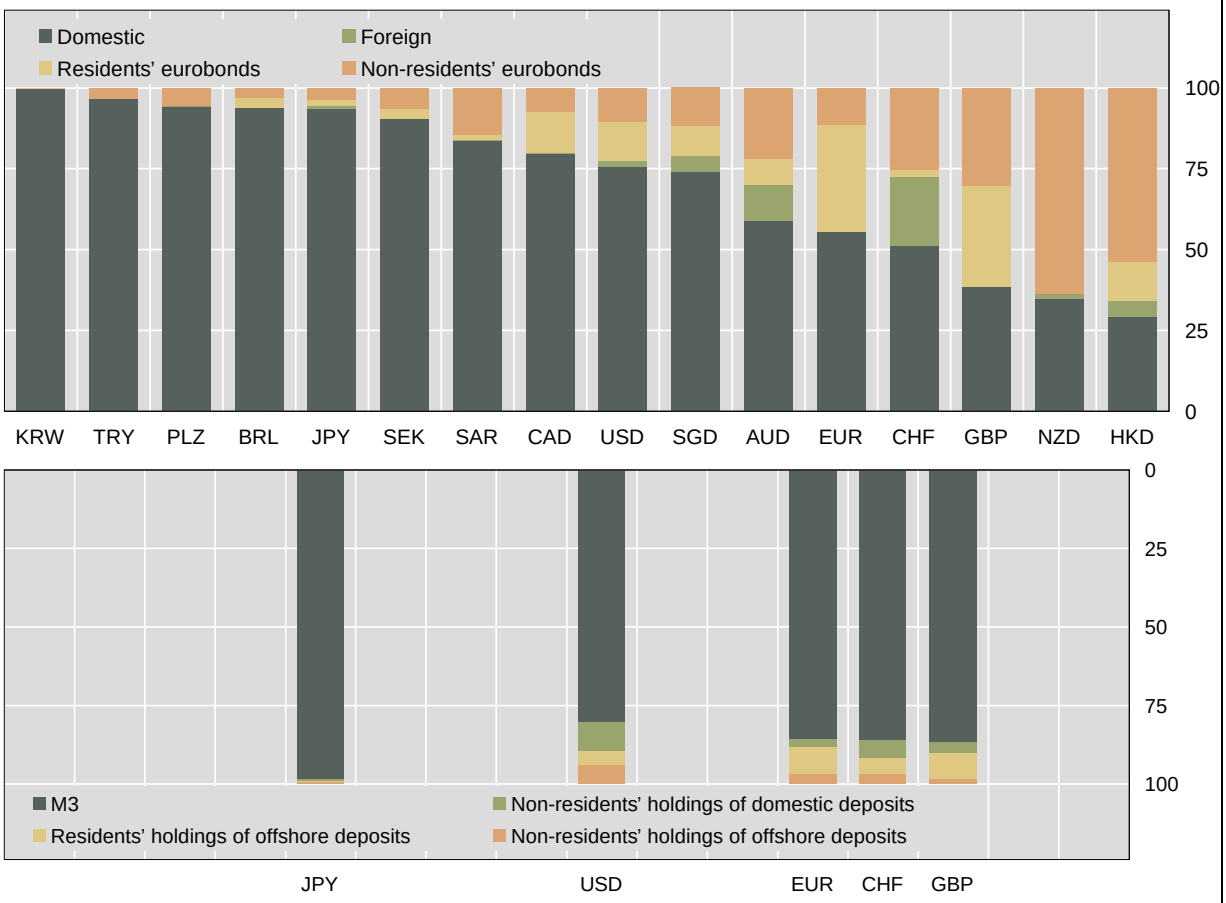
Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national authorities; BIS. Table 2

[2] Sterling, joined perhaps by the Hong Kong and Singapore dollars, offers an exception to this rule. This may be due to the pre-eminent role of London in the global foreign exchange market. The last four triennial surveys show that a high share of trading of major currencies consistently takes place between non-residents.

[3] Data on Australian dollar bank accounts held offshore are lacking, although some central bank holdings of Australian dollars are likely to be in this form. For example, the Riksbank (Sveriges Riksbank (2006)) targets a 5% share of foreign exchange reserves in the Australian dollar. For an indication that a portion of such holdings are invested in offshore bank deposits, see the rising liabilities of BIS reporting banks to official monetary authorities denominated in "other" foreign currencies in Table 5C of this *Quarterly Review*.

Selected currencies in the global bond and deposit market

At end-2005, in per cent



AUD = Australian dollar; BRL = Brazilian real; CAD = Canadian dollar; CHF = Swiss franc; EUR = euro; GBP = pound sterling; HKD = Hong Kong dollar; JPY = Japanese yen; KRW = Korean won; NZD = New Zealand dollar; PLZ = Polish zloty; SAR = Saudi riyal; SEK = Swedish krona; SGD = Singapore dollar; TRY = Turkish lira; USD = US dollar.

Note: The currency breakdown in the international banking statistics is limited to the currencies shown in the lower panel.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national authorities; BIS. Graph 1

market remains overwhelmingly domestic (Nishi and Vergus (2006)). The US dollar bond market likewise remains heavily domestic, albeit with non-residents holding a substantial fraction of domestic bonds. Only the euro and sterling bond markets, among major currencies, and the Swiss franc, New Zealand dollar and Hong Kong dollar bond markets, among smaller currencies, have a relatively larger offshore and foreign component than the Australian bond markets.

For other Asian bond markets, however, things look much different. The large Korean won bond market, for instance, remains very local. There have been at most scattered offshore issuance and a few foreign bond issues by international financial institutions and multinational corporations.

While no data are available on offshore deposits in Australian dollars, the evidence for the major currencies in the lower panel of Graph 1 suggests that only a small proportion of Australian dollar deposits are held offshore. Thus, measured internationalisation is highest for currency trading, moderate for bond markets, and low for deposits.

From insular to international currency

The Australian dollar's transition from an initial insularity to the current state of internationalisation took about a decade. The development of derivatives markets, and in particular the currency swap market, played an important role against the background of the Australian dollar's yield advantage over the US dollar. In addition, whereas a withholding tax was levied on coupon interest paid by domestic bonds, a broad exemption applicable to offshore issues gave the latter an extra source of support.

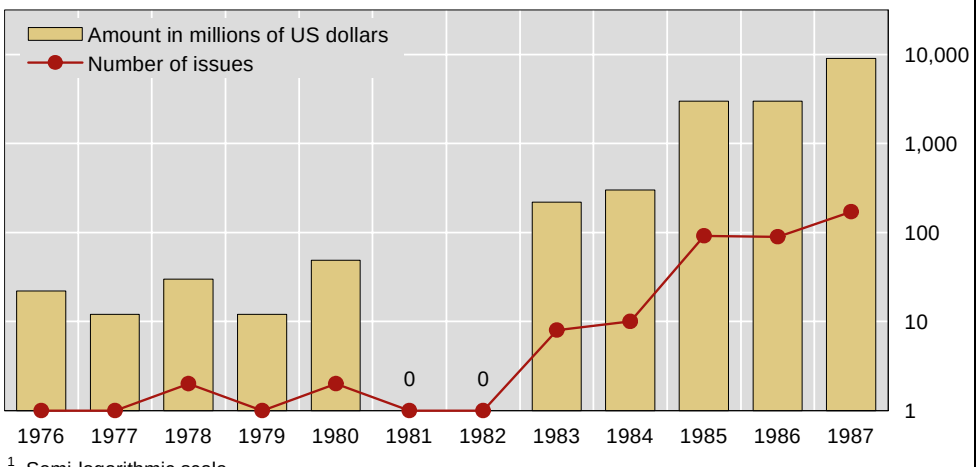
Insularity

Policy kept Australia's dollar at home and financial markets closed …

Australia's foreign exchange, money and bond markets in the 1970s and early 1980s remained quite insular. This was a policy choice in service of a succession of exchange rate regimes from bilateral peg through basket peg to basket crawl (Debelle and Plumb (2006)). In general, the Australian dollar was not used outside the country. Capital controls required exporters to surrender foreign exchange and generally restricted Australian portfolio investment abroad. The Reserve Bank of Australia limited forward cover to trade transactions. Banks were prohibited from paying interest on deposits of non-residents, and non-resident banks and governments were restricted to minimum working balances in order "to discourage the development of a reserve currency role for the Australian dollar" (Campbell Committee (1981, page 147)). Withholding taxes deterred investment in domestic bonds.

Even in this period, however, there were policies and practices that looked forward to a less insular future. First, in 1976–80, there were seven small Australian dollar issues offshore, in amounts between A$10 and 15 million (Graph 2). Sold to Benelux and Middle East investors, these resembled private placements. Dealers could not readily hold and fund inventory given the above restrictions and the consequently limited supply of offshore Australian dollar funding (Burnett and Kerr (1984)). Second, when the Australian dollar was under upward pressure the authorities did permit selected portfolio outflows.

Issuance of Australian dollar eurobonds[1]



[1] Semi-logarithmic scale.

Sources: Burnett and Kerr (1984, p 115); Gallant (1988, p 100). Graph 2

Third, the authorities permitted an onshore non-deliverable forward market to develop. Settled in Australian dollars, this market was in some ways the mirror image of the non-deliverable markets in Asia, where offshore players settle their side bets in dollars (Ma et al (2004), Debelle et al (2006)).

Opening

… until the currency float allowed issuance of eurobonds by top-rated Australians …

The Australian dollar was floated in 1983 and the capital controls that had buttressed the former regime were dismantled. Subsequently, an Australian dollar deposit market, integrated with the spot and forward foreign exchange markets, developed in London, Hong Kong and Singapore.[4] After a depreciation of the Australian dollar in early 1983, the Australian dollar eurobond market reopened with a A$20 million five-year offering from Primary Industry Bank of Australia. The issue yielded some 3 percentage points more than US dollar bonds but a full 1 percentage point less than did the Commonwealth of Australia's domestic five-year bond. Withholding taxes on sovereign bonds onshore left offshore investors willing to accept lower yields from inferior credits marketed offshore.

… followed by global issuers looking for swap opportunities

During the mid-1980s, the representative issuers in the Australian dollar sector of the eurobond market shifted. Early issuers in the 1970s and early 1980s were Australian names. As late as 1985, the top four issuers were two Australian banks, an Australian retailer and an Australian agency (Table 3). The following year, however, in response to demand shifting from Benelux retail buyers to Swiss and German buyers (Beard (1985)), German banks capitalising on their name recognition became two of the top five issuers. By 1987, most large Australian dollar eurobonds were issued by high-quality issuers with little or no intrinsic need for Australian dollar funding.

Top five issuers of Australian dollar eurobonds

In millions of US dollars

1985		1986		1987		2005	
Issuer	Amount	Issuer	Amount	Issuer	Amount	Issuer	Amount
ANZ Banking	142	IBM Australia	143	Deutsche Bank	491	New South Wales Treasury	2,792
Commonwealth Bank	100	Deutsche Bank	102	IBJ Australia	321	IBRD	2,652
GJ Coles	84	Commonwealth Bank	100	Westlb Finance	246	Bank Nederlandse Gemeenten	1,673
Austr Ind Dev Co	82	GMAC Australia	80	IBRD	242	Crusade Global Trust	1,425
Security Pacific	74	Hamburg Landesbank	72	SEK	218	Rabo Bank	1,112

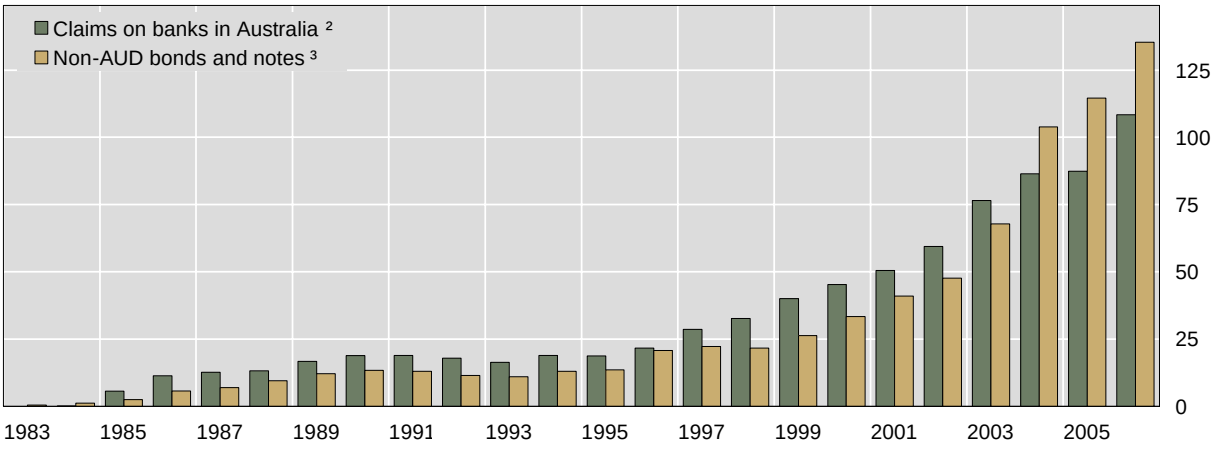
Sources: Gallant (1988, p 100) for 1985-87; BIS for 2005. Table 3

[4] As late as 1983, settlement in the Australian dollar eurobond secondary market still tended to be made in US dollars (Burnett and Kerr (1984, p 116)). Manuell (1986, p 45) alludes to the second-order exchange risk run by Australian borrowers offshore "because of the necessity for Australian dollar funds to be received or paid via the US dollar".

Box: An example of a swapped offshore Australian dollar bond

1. AAA-rated German agency KfW sells an Australian dollar bond that is heavily marketed to Japanese households (under so-called *uridashi* rules).
2. KfW swaps the proceeds, namely a fixed rate obligation in Australian dollars, with an underwriter for floating rate US dollars; KfW meets its funding target at an attractively low yield below dollar Libid.
3. An Australian bank borrows floating rate US dollars from a bank or by selling a US dollar bond and swapping the proceeds for floating rate US dollars (see graph below).
4. The Australian bank swaps its liability in floating rate US dollars with the underwriter for a fixed rate obligation in Australian dollars.
5. The Australian bank lends to an Australian firm in fixed rate Australian dollars.
6. In sum, AAA-rated KfW has sourced Australian dollar funding from Japan for a second-tier Australian firm.

Australian banks' interbank liabilities and outstanding foreign currency bonds[1]



[1] In billions of US dollars. [2] Consolidated international claims of BIS reporting banks (1983 to 2006 Q2). [3] International bonds and notes issued by banks in Australia (1983 to 2006 Q2).

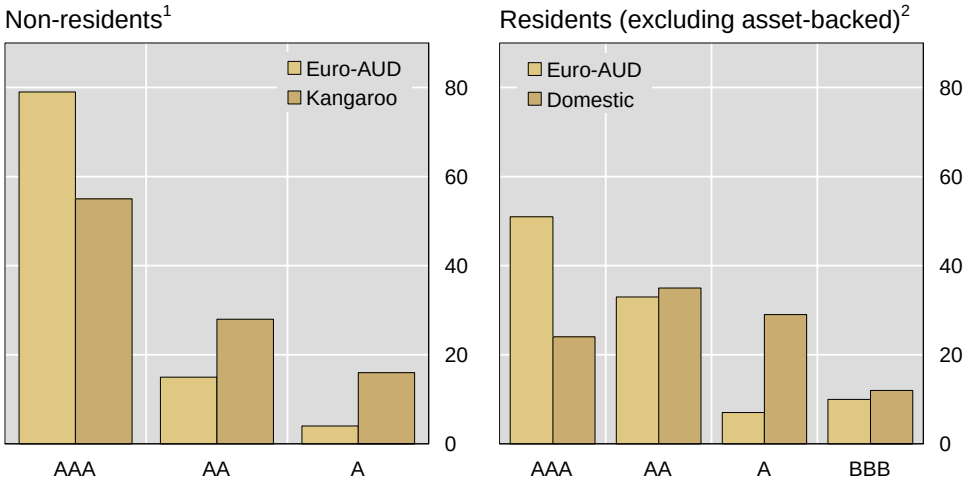
Sources: Dealogic; Euroclear; ICMA; Thomson Financial Securities Data; BIS consolidated banking statistics.

The pattern set in 1987 essentially holds to this day. While the largest state in Australia, a home-grown top credit, topped the list of issuers in 2005, the top five issuers included the World Bank and two Dutch banks. Issuance by a vehicle backed by Australian residential mortgages, namely Crusade Global Trust, points to more recent developments in asset securitisation. Instead of a bond issued by an Australian bank, offshore institutional investors bought a bond backed by the obligations of Australian households to an Australian bank.

The development of the cross-currency swap market played a key role in the internationalisation of the Australian dollar bond market. Without such swaps, the high demand for credit quality on the part of the buyers of Australian dollar bonds would have run up against the limited roster of top-quality Australian borrowers. Instead, top global issuers have been induced by favourable all-in costs of US dollar funding to issue and to swap. As the box illustrates, the cross-currency swap market caters to the preference of the end investor in offshore Australian dollar bond issues for top-quality names. In effect, a chain of banks and swaps links the saver and the ultimate borrower.

Against this background, the nascent offshore market for Korean won issues seems to be taking a different path. Prime Australian names opened the

Onshore and offshore issuance by Australian residents and non-residents, by rating



[1] As a percentage of outstanding issues in each market. [2] In per cent by value; covers only issues in 2005 and 2006.

Sources: Reserve Bank of Australia; BIS. Graph 3

offshore Australian dollar market before the days of currency swaps and to this day Australian names figure prominently. At the outset, the Korean won market instead features foreign financial issuers, seeking cheap US dollar funding. As the market for Korean won issues widens, the investor preference for top quality may become more important. Given Korea's single-A rating, foreign issuers may come to dominate the offshore won market, much as they do in smaller markets like New Zealand's (Drage et al (2005)), Ólafsson (2005)).

An international Australian dollar market

Internationalised market based on …

By the end of the 1980s, the Australian dollar had made the transition to an internationalised currency. Four characteristics mark what is now a thoroughly internationalised Australian dollar bond market: its grounding in the domestic fixed income market; the demand for quality among international investors in Australian dollar paper; the importance of the cross-currency swap market; and the importance of yield to international investors. Consider each in turn.

… strong domestic market …

The internationalised Australian dollar bond market depends on a well functioning set of domestic markets. In the early 1980s, government bond issuance through taps gave way to auctions, and the government ceased to have recourse to the central bank. Even as the offshore market developed, the domestic government bond market attracted international investment.[5] Though not large, the cash government bond market supports a 10-year government bond futures contract that performs a critical role in price discovery. In addition, well developed interest rate swap and currency swap markets link domestic

[5] As early as in Burnett and Kerr (1984), Japanese institutional investors are described as involved in Australia's domestic bond market, in contrast to continental European retail investors who were willing to accept lower yields on Australian dollar eurobonds than on domestic Commonwealth bonds. Gallant (1988, page 98), by contrast, describes Australian Commonwealth bonds as "actively traded in London".

and international markets (see below). While withholding tax remains on most foreign investment in most domestically issued bonds, whereas offshore issues of bonds are exempt, this impediment to foreign investment in the domestic market may actually have encouraged resident issuers to issue offshore.

... strong quality selection by offshore investors ...

As noted, foreign investors in Australian dollar bonds can avoid credit risk even as they accept currency risk. In fact, the issuers who have chosen to sell Australian dollar bonds offshore have been of the highest quality. This can be confirmed by a comparison of ratings (Graph 3) assigned to eurobonds sold by either non-Australians or Australians (targeted to foreign investors) and the foreign and domestic bonds sold in Australia (targeted to domestic investors). This comparison is apt because both sets of issuers are drawn from the same universe. The bias towards quality in the offshore issues is very clear. This quality bias to offshore issues in the case of the Australian dollar issues stands in sharp contrast to a general finding that lower-quality Australian names issue bonds outside Australia (Battellino (2002)). This reflects the greater openness of the global US dollar bond market to low-rated paper.

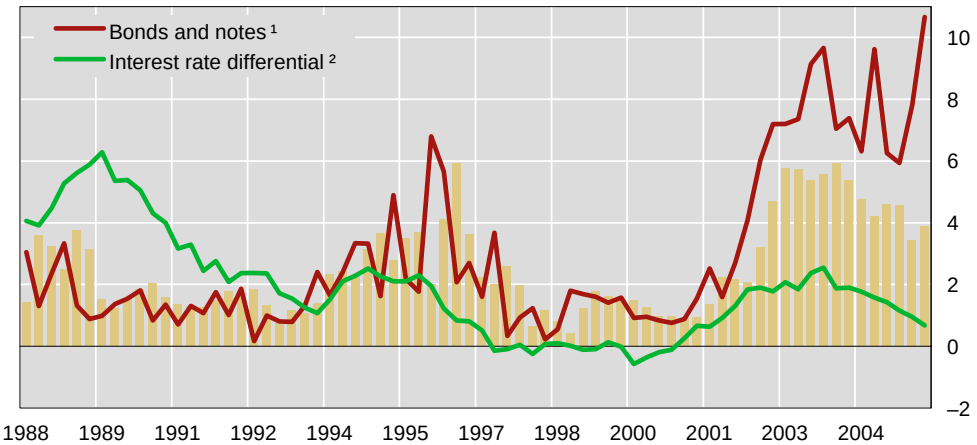
... an active currency swap market ...

As a result of the strong demand for credit quality by offshore investors, the currency swap market plays a crucial role. Most observers judge that the entirety of Australian dollar bond issues by non-residents, $117 billion (Table 2), is swapped and is thereby ultimately serviced by the Australian private sector (Australian Bureau of Statistics (2001)). On this supposition, at least a third of the Australian bond market depends on currency swaps.

... and a yield pickup

Finally, overseas demand for Australian dollar paper, as for bonds denominated in other currencies (Cohen (2005)), responds positively to the interest rate premium offered. Australian dollar issuance dried up in 1981–82, when US interest rates rose sharply against a backdrop of relatively stable Australian rates (Graph 2). Gallant (1988, page 99) suggests that "investors look for good quality credits issuing paper with coupons around 5% more than a comparable issue in US dollars". Of course, such spreads reflected inflation

Offshore issuance of Australian dollar bonds and notes



[1] Announced gross issuance in billions of US dollars; the bars represent the values as a percentage of GDP; two-quarter moving averages. [2] Australian dollar five-year interest rate swaps less US dollar five-year interest rate swaps; quarterly averages, in per cent.

Sources: Bloomberg; Datastream; Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national data; BIS. Graph 4

differentials that have since disappeared, leaving the Australian yield premium subject to cyclical developments. Thus, offshore issuance by both non-residents and residents weakened in 1997–2000 as yields converged. After US interest rates fell to extraordinarily low levels in 2001–03, the issuance of higher-yielding Australian dollar bonds rebounded once more (Graph 4).

Implications for the currency and interest rates

By making capital more mobile, the internationalisation of the Australian dollar (Blundell-Wignall et al (1993)) affected the currency and long-term yields. The discussion takes up first the level then the volatility of each.

Foreign investment demand makes for a stronger currency …

The internationalisation of the Australian dollar has, on balance, probably strengthened its exchange rate over the years. This conjecture is based on the idea that the Australian dollar's internationalisation is asymmetric, in that it has drawn international investment, but rarely international borrowing, to the currency. This is a case of "lopsided internationalization", which Sakakibara and Kondoh (1984) feared might characterise the yen. In contrast, the US dollar and euro attract not only outside investors, but also borrowers who do not hedge their liability positions. This leaves ambiguous the effect of these currencies being used internationally (McCauley (1997)). Most observers consider that the Australian dollar, with exceptions such as in early 1998 (FSF (2000)), has primarily attracted long positions (even if some of them, such as those held by Japanese life insurers, may be variably hedged).

… and lower yields …

On this same reasoning, the internationalisation of the Australian dollar may, on balance, have reduced Australian dollar long-term interest rates over the years. In fact, the internationalisation of the Australian dollar was associated with a shift in the composition of capital inflows from direct investment to bonds (Tease (1990)). Since most home mortgages in Australia are at floating interest rates, the stimulative effect of this development may have been largest in the corporate sector. Indeed, Gallant (1988, page 98) reported that Australian firms had then to look offshore for "most medium-term funding". Onshore funding opportunities have improved since then, but the offshore bid may still weigh on Australian bond yields to the benefit of the corporate sector.[6] Of course, to the extent that the Australian dollar has been stronger, policy rates have been lower, making mortgages more affordable. In New Zealand, by contrast, because of the recent shift to mortgages priced off two- or three-year interest rate swaps, the housing sector has benefited from the offshore demand for New Zealand paper (Drage et al (2005)).

… but also possible currency volatility at bond maturities …

Regarding volatility, observers worry that a waning of international demand can lead to periods of currency instability. A particular concern focuses on downward pressure during periods when Australian dollar yields have converged to US dollar yields. In such circumstances, offshore investors can be less inclined to roll the funds from maturing offshore Australian dollar

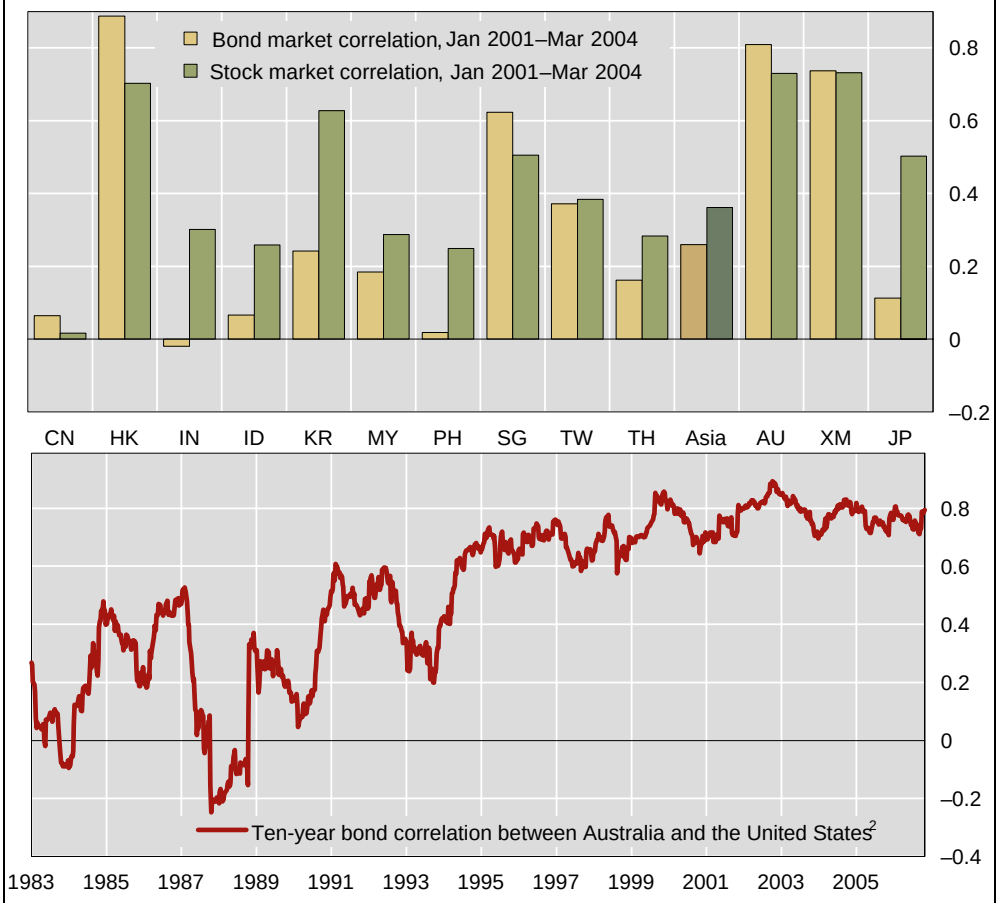
[6] In the case of Iceland, Ólafsson (2005, page 75) holds that demand for domestic currency eurobonds has "dampened the effectiveness of Central Bank monetary policy across the yield curve" and thus strengthened the exchange rate channel of monetary policy transmission.

issues into new ones. Of course, offshore issues can be bought by Australian investors before maturity, and by the same token non-residents can sell holdings of domestic bonds. Still, the Statement on Monetary Policy of the Reserve Bank of Australia ((RBA (2006)) gives attention not only to the pace of sales of Australian dollar bonds offshore, but also to the schedule of upcoming maturities of such bonds outstanding, as providing a clue to the near-term currency volatility.[7] That said, any effect of internationalisation on volatility is likely to be minimal compared to the effect of the policy stability conditioned by the structure of the economy (Simon (2001)).

… and more shared volatility in bond yields

As for the volatility of bond yields, internationalisation may heighten common movements at the expense of country-specific movements. Today, the Australian bond market moves closely with major bond markets (Graph 5, upper panel). Price discovery in the Australian bond market takes place to a

Bond and stock market correlations[1]



AU = Australia; CN = China; HK = Hong Kong SAR; ID = Indonesia; IN = India; JP = Japan; KR = Korea; MY = Malaysia; PH = Philippines; SG = Singapore; TW = Taiwan, China; TH = Thailand; XM = euro area.

[1] Based on weekly changes in benchmark yields (stock price indices) at Thursday closing for Asia and the Pacific and Wednesday closing for US Treasuries (S&P 500). [2] Based on weekly changes in yields at Thursday closing for Australia and Wednesday closing for the United States; rolling window of one year.

Sources: McCauley and Jiang (2004); Bloomberg. Graph 5

[7] Efforts to identify the effect of issuance and maturities in the case of the New Zealand dollar have not found statistically significant effects (Drage et al (2005)).

considerable extent outside Australian trading hours. As reviewed by Kearns (2006), US news, arriving in the overnight gap between Sydney close on one day and Sydney opening on the following day, has more effect on bond yields than Australian news. Not even the substantial cyclical differences between the Australian and the US economies that emerged five years ago seriously disturbed the coupling of long-term interest rates. Updating Kortian and O'Regan (1996), the lower panel of Graph 5 shows that the Australian bond market had at the time of its opening no more connection to the US bond market than a number of Asian bond markets have today. Asian policymakers already have some experience with openness to global factors in their equity markets. The internationalisation of their currencies could similarly increase the correlation of their bond markets with the US Treasury market.

Conclusion

Judging from the Australian experience, a currency can make the transition from extensive controls designed to restrict its use to domestic residents to the status of an internationalised currency in a relatively few years. The process is permitted by a removal of various restrictions but is also encouraged by a vibrant domestic fixed income market on which a range of derivatives markets can be based. Indeed, the potential for development of these latter markets (Hohensee and Lee (2006)) probably means that internationalisation of a currency can happen more quickly now than in the 1980s.

The relevance of Australia's experience may also depend on the prospective interest rates on any Asian currencies that are opened up to the world. Non-resident demand for Australian dollar bonds has waxed and waned with the interest rate differential. So, too, Asian currencies with higher coupons might internationalise more rapidly than currencies with relatively low coupons.

References

Australian Bureau of Statistics (2001): "Measuring Australia's foreign currency exposure", *Balance of payments and international investment position, Australia*, December.

Bank for International Settlements (2005): *Triennial central bank survey: foreign exchange and derivatives market activity in 2004*.

Battellino, R (2002): "Why do so many Australian borrowers issue bonds offshore?", *Reserve Bank of Australia Bulletin*, December, pp 19–24.

Beard, P (1985): "Why euro-A$ bonds are booming", *Euromoney*, August, pp 95–6.

Blundell-Wignall, A, J Fahrer and A Heath (1993), "Major influences on the Australian dollar exchange rate", in A Blundell-Wignall (ed), *The exchange rate, international trade and the balance of payments*, Reserve Bank of Australia.

Burnett, D and J Kerr (1984): "The Australian dollar sector", in I M Kerr (ed), *A history of the eurobond market: the first 21 years*, Euromoney Publications, London, pp 115–6.

Campbell Committee (1981): *Final report of the Committee of Inquiry into the Australian Financial System*, Canberra: Australian Government Publishing Service.

Cohen, B (2005): "Currency choice in international bond issuance", *BIS Quarterly Review*, June, pp 53–66.

Debelle, G and M Plumb (2006): "The evolution of exchange rate policy and capital controls in Australia", *Asian Economic Papers*,forthcoming.

Debelle, G, J Gyntelberg and M Plumb (2006): "Forward currency markets in Asia: lessons from the Australian experience", *BIS Quarterly Review*, September, pp 53–64.

Drage, D, A Munro and C Sleeman (2005): "An update on eurokiwi and uridashi bonds", *Reserve Bank of New Zealand Bulletin* 61(2), pp 100–11.

Financial Stability Forum, Working Group on Highly Leveraged Institutions (2000): Report, Annex E, Report of the Market Dynamics Study Group, April.

Gallant, P (1988): *The eurobond market*, Woodhead-Faulkner, New York.

Ho, C, G Ma and R N McCauley (2005): "Trading Asian currencies," *BIS Quarterly Review*, March, pp 49–58.

Hohensee, M and K Lee (2006): "A survey on hedging markets in Asia: a description of Asian derivative markets from a practical perspective", in *Asian bond markets: issues and prospects*, *BIS Papers,* no 30 (November), pp 261–81.

Kearns, J (2006): "Asset prices and monetary policy in Australia: the contrast of bonds and housing", paper submitted to the BIS Autumn Central Bank Economists' Meeting (October).

Kortian, T and J O'Regan (1996): "Australian financial market volatility: an exploration of cross-country and cross-market linkages", Reserve Bank of Australia *Research Discussion Paper* no 9609.

Korean Ministry of Finance and the Economy (2006): "The foreign exchange liberalization plan of the Korean Ministry of Finance and the Economy", 19 May.

Ma, G, C Ho and R N McCauley (2004): "The markets for non-deliverable forwards in Asia," *BIS Quarterly Review*, June, pp. 81–94.

Manuell, G (1986): *Floating down under: foreign exchange in Australia*, Sydney: The Law Book Company.

McCauley, R N (1997): *The euro and the dollar*, Princeton University *Essays in International Finance*, no 205, November.

McCauley, R N and G Jiang (2004): "Diversifying with Asian local currency bonds," *BIS Quarterly Review*, September, pp 51–66.

Ólafsson, T T (2005): "Króna-denominated eurobond issues", Central Bank of Iceland *Monetary Bulletin*, no 4, pp 55–83.

Nishi, F and A Vergus (2006): "Asian bond issues in Tokyo: history, structure and prospects", in *Asian bond markets: issues and prospects*, *BIS Papers,* no 30 (November), pp 143–67.

Reserve Bank of Australia (2006): "Statement on Monetary Policy", section on "International and Foreign Exchange Markets", May.

Reserve Bank of India (2006): *Report of the Committee on Fuller Capital Account Convertibility*, 31 July.

Sakakibara, E and A Kondoh (1984): "Study on the internationalisation of Tokyo's money markets"*, Japan Center for International Finance Policy Study Series,* no 1, June.

Simon, J (2001): "The decline in Australian output volatility", Reserve Bank of Australia, *Research Discussion Paper* 2001–01.

Sveriges Riksbank (2006): "Riksbank changes currency allocation", press release, 21 April.

Tease, W (1990): "The balance of payments", in S Grenville (ed), *The Australian macroeconomy in the 1980s*, Reserve Bank of Australia.

Haibin Zhu

+41 61 280 9164
haibin.zhu@bis.org

The structure of housing finance markets and house prices in Asia[1]

Emerging Asia has witnessed rapid growth of private housing and market-based housing finance in the past decade; nevertheless, market development has been uneven across countries. There is evidence that, in those economies with more flexible housing finance markets, house prices are more responsive to overall changes in market conditions, particularly equity price movements.

JEL classification: G12, G21, O53.

Over the past decade, Asia-Pacific economies have made significant progress in developing private housing markets and market-based systems for financing home purchases. However, development has been uneven across countries due to the heterogeneity in market infrastructure and economic development. This special feature documents structural characteristics of national housing markets in Asia, focusing on the private housing sector, and investigates their potential impact on house price dynamics. The study covers six economies in the region: China, Hong Kong SAR, Indonesia, South Korea (hereinafter Korea), Singapore and Thailand.

Since the 1997 Asian financial crisis, Asian governments have stepped up their efforts to improve the structure of the housing finance system. In the primary market, the share of private housing has increased substantially. In addition, commercial banks and other private financial institutions have gained importance in mortgage loan origination, and more diversified mortgage products have become available to households. In the secondary market, mechanisms for mortgage-backed securitisation have been established in most Asian economies, although the market is still not fully developed.

As pointed out in previous work, different arrangements in housing finance systems can have important implications for the linkages between house prices and macroeconomic factors (Tsatsaronis and Zhu (2004)). Whereas the previous study mainly focused on industrialised economies, this article provides complementary insights for emerging market economies.

[1] The views expressed in this article are my own and do not necessarily reflect those of the BIS. I thank Gert Schnabel for data support and Claudio Borio, Frank Packer, Ilhyock Shim, Kostas Tsatsaronis, Okja Yoon, Tao Zhang and Wenhong Zhang for helpful discussion.

The rest of this article is organised in three sections. The first section reviews the evolution of housing and housing finance markets in each economy. The second section examines structural characteristics of national housing finance systems from a cross-sectional perspective. In the last section, a common empirical framework is adopted to investigate the determinants of house price dynamics in each country. The principal finding is that, in those economies with more flexible housing finance arrangements, housing behaves more like an investment asset and is thus more responsive to changes in economic conditions, particularly equity market movements.

The evolution of housing and housing finance markets in Asia

High growth of housing markets in Asia

Housing has traditionally been one of the most important assets for households in Asia, and has played an important role in economic activity. In four out of the six economies (the exceptions being China and Korea), there was remarkable house price appreciation in the early 1990s, due to rapid urbanisation,[2] strong economic performance and the liberalisation of financial markets. Downward corrections in house prices subsequently played a significant role in inducing the Asian financial crisis and caused severe stress to the banking sector. Recently, housing market developments in some areas have again caught the attention of policymakers, notably the housing boom in Korea, Hong Kong and several of the largest cities in China (Graph 1).

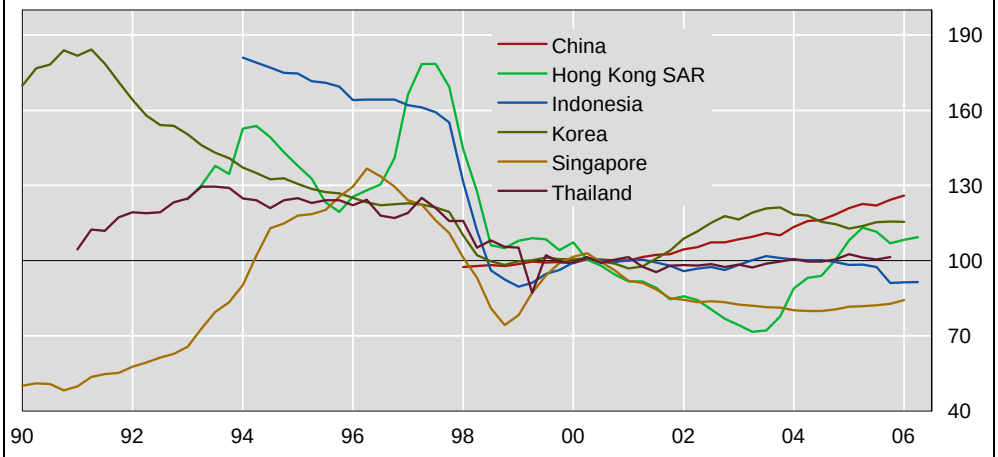
China

Country-specific experience

Traditionally, urban residents in China lived under a welfare housing system in which state sector employers owned properties and provided essentially free

Real house prices in Asia[1]

2000 = 100



[1] Nominal house prices deflated by consumer prices.

Sources: CEIC; national data.

Graph 1

[2] The urban population in the six economies increased from 335 million in 1985 to 705 million in 2005. The growth was most remarkable in China and Indonesia, with their urban population reaching 528 million and 105 million, respectively, in 2005.

housing for their workers. In the 1980s, privately owned residential units (also called commercial housing) emerged and formed the basis for the private housing market. Nevertheless, the market was very small until 1998, when the government put an end to the welfare housing system and began to encourage workers to buy their own homes.[3] In the same year, the People's Bank of China issued guidelines to banks on granting housing loans. The new policies speeded up the privatisation of residential housing and led to the full-scale development of the primary mortgage market. At the end of 2005, the majority of residential units were traded at market prices, and the subsidised segment (known as affordable housing) accounted for less than 10% of the private housing market.

Commercial banks are currently the dominant lender in the primary mortgage market, supplemented by the Housing Provident Fund (HPF) scheme established in 1990. The HPF scheme, which follows the Singapore model (see below), requires compulsory saving by employees (plus contributions from employers) for entitlement to a housing loan in the future. Currently, HPF loans represent approximately 12% of total mortgage balances outstanding.

Hong Kong SAR

The mortgage market in Hong Kong is one of the most developed in Asia. Housing is an important component of household assets and mortgage loans account for approximately 25–30% of bank loans. Traditionally, the government has played an important role in the housing market. On the supply side, it runs a large public housing programme (including low-cost housing and public rental units) that provides accommodation for about half of Hong Kong's population. In addition, land ownership and land restrictions by the government often restrict the adjustment of housing supply to changing demand.[4] On the demand side, the government affects the availability of housing finance via various measures, including limits on banks' exposure to mortgage loans and maximum loan-to-value (LTV) ratios. In 1999, the government established the Hong Kong Mortgage Corporation to promote mortgage loan securitisation and to provide the Mortgage Insurance Programme for high LTV loans. Nevertheless, commercial banks are the predominant source of housing finance and there is no government-run housing loan bank in Hong Kong.

Indonesia

In Indonesia, land ownership and tenure can be classified into four categories: ownership rights, the right to build, the right to exploit and the right to use. Ownership rights represent the majority of land ownership. Since the 1970s, the housing development policy of the government has focused on providing

[3] Land in China is nationalised. Home purchasers could hold legal rights to occupy the building for a specific period (typically 70 years) and could transfer the title to another party. Hong Kong has a similar system of ownership rights.

[4] The government imposed a limit on its annual land sales in 1985. Although this limit was lifted after the transfer of sovereignty on 1 July 1997, the uncertainty concerning land supply has remained.

low-cost housing for low-income households, by imposing a compulsory "1:3:6" rule for developers[5] and providing subsidised loans for low-cost housing through state-owned mortgage banks. Despite this, medium- and high-cost houses, which represent only 10% of housing units, have dominated the market in terms of sales value. Given that private sector lenders (including a number of domestic banks and one large foreign bank) have been actively involved in housing finance for high-end houses, they have played an important role in the primary mortgage market alongside two state-owned mortgage banks.

Korea

Korea's housing and housing finance system used to be heavily regulated. Since 1991, this sector has experienced major changes due to interest rate liberalisation and financial deregulation. Price controls on new apartments were abolished, and market-based housing finance emerged. In 1996, commercial banks were allowed to provide long-term mortgages. The following year, the Korea Housing Bank, which used to be the dominant mortgage provider and had been subsidised by the state, was privatised. After a decade of rapid growth, housing banks and commercial banks have become the major source of mortgage loans for medium- and high-cost houses. However, for low-income homebuyers, policy loans of the National Housing Fund (NHF) remain the primary funding source. In addition, there exists a huge market for informal housing finance that is unique to the Korean housing sector.[6]

Singapore

Home ownership in Singapore is segmented into private and public housing markets. It is worth noting that public housing in Singapore can be purchased by upper- or middle-income groups and therefore is not equivalent to low-cost housing as in other Asian countries. The public housing sector is dominant and accommodates 84% of total households. It is strictly under the authority of the Housing Development Board (HDB), which has responsibilities that affect both the demand and supply sides of the housing market, including housing planning and development, housing management and housing finance. Since the 1990s, the government has taken measures to encourage the development of private housing and the share of private housing has increased rapidly. In 2005, the value of contracts awarded for new private sector construction work was almost twice as great as the value of contracts for public housing. In terms of mortgage financing, two systems coexist in Singapore: the HDB public finance system that grants subsidised loans to first-time homebuyers, or second-time homebuyers who upgrade to another HDB flat, and the private

[5] That is, for every high-cost house, developers must build a minimum of three middle-class houses and six simple or very simple houses.

[6] The arrangement, known as chonsei, used to be dominant and remains an important channel of housing finance in Korea. It requires the tenant to give the landlord a lump sum deposit up front in lieu of monthly rent payments. The deposit is fully refunded at the end of the lease, or otherwise the tenant is granted full control over the property. This arrangement is essentially a housing loan provided by tenants to owners.

mortgage system. In addition, the majority of households have used the Central Provident Fund scheme, a mandatory social security savings plan, to finance their home purchases.

Thailand

The real estate industry in Thailand developed quickly in the 1980s, a period when the Thai economy performed remarkably well. In 1986, the government issued guidelines to encourage commercial banks to participate more actively in mortgage lending. Currently, commercial banks and the Government Housing Bank (GHB) are the two dominant mortgage lenders with a combined share of 80–90%. The GHB is the leading mortgage financial institution with a market share of 39% of all residential mortgages and 48% of new mortgage originations in 2005.

Characteristics of national housing finance markets

This section examines the structural characteristics of national housing finance markets. From a cross-sectional perspective, the analysis below compares the commonalities and differences across the six economies. On the basis of this analysis, the six economies are then divided into two groups with distinctive market characteristics.

The size of the mortgage market

Expansion of mortgage markets

Mortgage markets in Asia have witnessed rapid expansion in the past decade, though development has been uneven across countries. Growth has been particularly remarkable in China and Korea and has led to a fundamental change in the mortgage market landscape. In China, housing mortgages were launched as late as 1998, but the market quickly expanded to $227 billion at the end of 2005 (about 10% of GDP) to become the largest mortgage market in Asia. Korea came next, with total mortgage debt outstanding almost tripling in less than five years from $67 billion at the end of 2001 to over $200 billion in 2006. In terms of relative size, the two frontrunners are Singapore and Hong Kong, with mortgage loans accounting for 61% and 44% of GDP, respectively. At the other end of the spectrum is Indonesia, where the mortgage market accounts for only 2% of GDP (Table 1).

The uneven development of mortgage markets is in line with the overall state of financial markets in the various economies. Hong Kong and Singapore are the two regional financial centres and have well developed banking sectors and equity markets.[7] By contrast, financial markets in Indonesia, China and Thailand are still less developed, particularly in terms of direct financing via capital markets.

[7] Overall, the bond market in Asia remains rather limited. However, the situation started to change after the East Asian crisis, as Asian governments adopted various measures to promote bond market development (see Gyntelberg et al (2005)).

Mortgage markets in Asia

	Market size[1]	Mortgage rate	Length of contract[2]		Maximum LTV (%)	JLL trans-parency score[3]	First MBS issued	MBS frame-work[4]
			Max	Typical				
China	10.0	Variable	30	10–15	80	3.50	2005	1.07
Hong Kong SAR	44.0	Variable	30	20	70	1.30	2004	4.86
Indonesia	2.0	Variable	20	15	80	3.90	none	2.07
Korea	26.6	Variable	20	3	70	2.88	2001	4.50
Singapore	61.3	Variable	30–35	…	80	1.44	1998[5]	4.86
Thailand	8.8	Variable	30	10–20	80	3.40	2006[6]	3.29

[1] The ratio of mortgage debt outstanding to GDP in 2005, in per cent; definition of mortgage loans varies across countries. [2] In years. [3] The lower the score, the higher the transparency. See box for details. [4] A higher score indicates a more favourable framework for MBS issuance. See box for details. [5] First ABS issued. [6] Under plan.

Sources: Arner et al (2006); Ong (2005); Asian Development Bank; Jones Lang LaSalle (2006b); national data. Table 1

Primary mortgage market

Table 1 summarises the main characteristics of mortgage lending practices in the private housing finance markets in Asia. There are substantial differences across countries, as discussed below in four major aspects.

Commercial banks and mortgage banks dominate

In terms of the structure of mortgage lenders, domestic commercial banks and mortgage banks typically are dominant mortgage lenders in the private housing finance market, and foreign banks have only a limited role. The degree of competition among mortgage lenders varies across countries, and is sometimes affected by government policies such as interest rate controls that existed in most of the six economies at a certain period.[8]

Floating rate mortgages are popular

In terms of the payment of mortgage interest, all six economies have relied primarily on adjustable rate products.[9] This implies that households, rather than mortgage lenders, are bearing the interest rate risk. Fixed rate mortgages exist but lack popularity. For instance, fixed rate mortgages were introduced into the Hong Kong market in 1998, but enthusiasm quickly receded when interest rates began to fall and the cost advantage of floating rate mortgages increased. In China, fixed rate mortgage products have been introduced very recently but the market reaction remains to be seen.

In terms of the length of mortgage contracts, the maximum mortgage term ranges from 20 years in Indonesia and Korea to 30 years in other economies. In practice, however, the average mortgage term is typically shorter, ranging between 10 and 20 years in most countries. As a result, commercial banks bear the liquidity risk arising from the maturity mismatch between long-term mortgage assets and short-term deposit liabilities. A noticeable exception is

[8] For instance, interest rate controls existed in Korea before 1996 and in Hong Kong before 2001. In China, there is still a lower limit on mortgage rates to households.

[9] Adjustable rate mortgage loans are defined as loans with variable interest rates for the entire life of the loan or fixed for the first one to five years and then adjustable. By contrast, fixed rate mortgage loans refer to loans with interest rates fixed for at least five years.

Korea, where short-term mortgage loans represent the majority of mortgage originations and three-year bullet-type mortgages are most popular.

Lending practices are relatively conservative

In terms of collateral requirements, the typical maximum LTV ratio ranges from 70 to 80%, and is normally based on an appraisal evaluation.[10] This constitutes relatively conservative practice compared to market norms in industrialised economies (Tsatsaronis and Zhu (2004), CGFS (2006)). In Korea, mortgage lenders typically adopt even lower LTV ratios in practice (averaging 52.7% in January 2006); hence the financial constraint is often binding for home purchasers. Moreover, prudential regulators can adjust LTV requirements based on market conditions or impose different LTV requirements on different types of loans. For instance, the Hong Kong Monetary Authority lowered the maximum LTV ratio to 70% in November 1991, several years before the collapse of the real estate market. This measure proved to be successful in containing mortgage defaults and maintaining the resilience of the banking industry during the Asian crisis. In recent years, the People's Bank of China has imposed stricter LTV requirements, particularly for second-home mortgages, aiming to contain speculative investment in the housing market.

Secondary mortgage market

Development of MBS markets ...

The secondary mortgage market has grown rapidly in recent years, despite the fact that the first mortgage-backed security (MBS) was issued as late as 2001 in the six selected Asian economies.[11] So far, Hong Kong and Korea have already established relatively advanced MBS markets, while China issued its first MBS only in 2005.

Governments have played an important role in the development of MBS markets (Chan et al (2006)). The growth in MBS markets has helped mitigate the maturity mismatch risk in the banking system, improve liquidity in the primary mortgage market and deepen the local debt market. By contrast, another function of MBS instruments, credit risk transformation via risk enhancement techniques, has so far been limited.

... is still limited

Nevertheless, MBS markets in Asia are far from full-fledged. In some countries (such as China and Thailand), there are legal, tax and accounting impediments to the development of secondary mortgage markets. Even in more developed markets, trading of MBS instruments has not been very active. The market illiquidity may be attributable to various reasons, including insufficient information, lack of expertise in risk management and banks' unwillingness to remove mortgage loans from their balance sheets as the loan quality is usually high.

[10] Banks also impose a payment-to-income ratio in practice, which, according to Ong (2005), can range widely from 33% in Indonesia to 70% in China.

[11] The first MBS in Asia was issued in Malaysia in 1987. For an extensive discussion of the secondary mortgage market in Asia, see Gyntelberg and Remolona (2006).

Real estate taxes and transaction costs in Asia

As a percentage of property value

	Property tax[1]	Stamp duty and legal costs	Deeds and transfer tax	Sales tax or business tax	Other
China	0.96	0.13	3	5	0.05–0.35[2]
Hong Kong SAR	0.7	1.25–5.75			
Indonesia	0.1–0.2	1–2	1	10	
Korea	1	0.23–0.83	4		0.6[3]
Singapore	0.2	1–3			
Thailand	0.6	0.50[4]	2	3	1.05[5]

[1] In Hong Kong SAR, Singapore and Thailand, the property tax is calculated based on the annual value (rents), which is assumed to be 5% of the property value. [2] City maintenance and construction tax. [3] Including 0.2% rural development tax and 0.4% education tax. [4] The stamp duty is waived if the special business tax (3%) is paid. [5] Including 1% withholding tax and 0.05% income tax.

Sources: World Bank; Jones Lang LaSalle (2006a); author's calculations. Table 2

Real estate taxes and transaction costs

Transaction costs are region-specific

Housing is essentially a local product, and trading of houses is affected by transaction costs and real estate taxes that are region-specific. High real estate taxes and high transaction costs can reduce the volatility of house price movements, because they squeeze potential arbitrage profits and reduce the incentive to trade. Nevertheless, they can also be detrimental to the housing market because the lack of trading can cause house prices to deviate from their fundamental values for a long period. Conversely, low real estate taxes and low transaction costs stimulate trading and could cause house prices to react more quickly to changes in demand and supply factors, but might also amplify residential property cycles[12] and cause excess volatility in the market.

Table 2 compares real estate taxes and transaction costs across the six economies, including the annual real estate tax imposed on homeowners, stamp duty and legal costs, sales tax, and deeds and transfer tax that would be incurred by both buyers and sellers in a typical housing transaction.[13] The average total cost is as low as 2.2% in Singapore and as high as 12.5% in Indonesia.

Categorising housing finance systems

Two groups of housing finance systems

To summarise, there are substantial differences between national housing finance markets, ranging from contractual arrangements to the overall development of market infrastructure and market liquidity. In order to better examine the impact of these distinctions on the pattern of house price dynamics, it is useful to classify the six economies into two separate groups,

[12] Real estate cycles may exist due to distinctive features in the housing market, such as lags in the delivery of new housing, usage of current property prices in loan appraisal, and the absence of futures and options markets. See Davis and Zhu (2004) for a review of the literature.

[13] The table does not list other related costs, such as value added tax (VAT) imposed on new housing and capital gains tax, which also differ substantially across countries.

using the cluster analysis method that maximises the commonality of characteristics for countries within the same group and maximises the differences between those that belong to different groups (see box). The classification of housing finance systems is based on a list of variables that reflect various aspects of national mortgage markets. These include: primary mortgage markets (market size, mortgage contracts, taxes and transaction costs, and market transparency); secondary mortgage markets (market development and infrastructure); and financial market development (banking, equity and bond markets).

One group identified via this technique consists of China, Indonesia and Thailand, and the other consists of Hong Kong, Korea and Singapore. Comparison between the two groups shows that the second group has more flexible housing markets in the following senses. First, as regards primary mortgage markets, the economies in the second group have a lower cost of holding and transferring a house (averaging 4.2% of property value vs 9.5% in the first group) and higher transparency (the three economies have the three highest transparency scores among the six; see Table 1 and box). By contrast, the differences in mortgage contract arrangements (mortgage term and lending criteria) are less noteworthy. Second, as regards secondary mortgage markets, in the second group of economies, market development is more advanced and market infrastructures (legal, tax and accounting framework) are more favourable to the development of MBS markets. Finally, as regards broader

Classifying housing finance systems using the cluster analysis method

The cluster analysis is divided into two steps. In the first step, a list of variables are chosen to reflect the characteristics of national housing finance markets (as shown in Tables 1 and 2). They include:

- the ratio of mortgage loans to GDP;
- maximum loan-to-value ratios;
- maximum mortgage term;
- real estate taxes and transaction costs;
- the Real Estate Transparency Index compiled by Jones Lang LaSalle, which reflects various attributes of real estate transparency, including data availability, regulatory and legal factors and ethical standards among professionals. The score varies between 1 (high transparency and low corruption) and 5 (the opposite);
- the scale of MBS market development. Hong Kong and Korea score 2 for relatively high issuance of MBSs, China and Singapore score 1 for very limited existence of MBSs, and Indonesia and Thailand score 0;
- an average score reflecting the institutional framework for MBS issuance, including the effectiveness of the legal framework, the enforcement of ownership transfer, the enforcement of foreclosure, SPV arrangements, tax treatment and restrictions on multiple-tranche securitisation. The score is calculated based on the indices compiled by Arner et al (2006, Table 5) and ranges between 1 (poor) and 5 (very good);
- the size of the banking industry (domestic credit), equity market and bond market in each economy, all represented as a percentage of GDP in 2004 (see Gyntelberg et al (2005), Table 1).

Each variable has been standardised using its own maximum and minimum values across the countries. In the next step, standard cluster analysis techniques are applied to classify the six economies into two groups. One group consists of China, Indonesia and Thailand, and the other consists of Hong Kong, Korea and Singapore.

financial market developments, the economies in the second group also have relatively more developed equity and bond markets,[14] though all six economies rely heavily on finance via the banking sector.

Determinants of housing price dynamics

Methodology

Econometric method to examine house price dynamics

Tsatsaronis and Zhu (2004) suggest that the structure of housing finance markets has important implications for house price dynamics in major industrialised economies. In this section, the same question is examined for the selected Asian economies. The results provide complementary insights to the existing literature, particularly because mortgage market developments in Asia have distinct features that are relevant for other emerging market economies.

To investigate the impact of housing finance markets on house price dynamics, a common econometric method is first applied to each country to examine the determinants of house price dynamics. Then the differences in house price dynamics are linked to distinctive features of housing finance systems. In particular, the common econometric method used in the first stage is the two-step Engle-Granger (1987) error correction method, which provides insights regarding both the short-term and long-term determinants of house prices.[15] The following explanatory variables are included: GDP, bank credit, equity prices, short-term interest rates, the consumer price index (CPI) and the exchange rate.[16] Except for the CPI and the exchange rate, all variables are defined in real terms. The economic motivation for the inclusion of these variables is fairly clear, as already discussed in previous studies.

Empirical findings

The empirical results are shown in Table 3. In the upper panel of the table, the cointegration analysis results reveal the long-term relationships between house prices and other economic factors.[17] The lower panel of the table, instead, shows the determinants of house price dynamics. Two kinds of dynamic

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[14] Equity market capitalisation on average accounts for 35% of GDP (weighted by GDP) in China, Indonesia and Thailand, compared with 172% in the other three economies. Similarly, bond markets account for 28% and 64% of GDP, respectively, in the two groups of economies.

[15] The error correction method focuses exclusively on the determinants of house prices. Other important issues, such as the feedback effects from housing price movements to bank lending or equity prices, can be investigated using alternative econometric methods (such as vector autoregression or vector error correction models) but are left out here due to data limitations.

[16] Urban population was dropped from the study due to its insignificance in determining house prices, probably because the population data are only available on a low-frequency basis. In addition, long-term interest rates (or term spreads) are excluded because their influence on house prices is mainly through the impact on the cost of fixed rate mortgages, which have very limited use in the six economies.

[17] House prices implied from the long-term relationship can be considered as their long-term fundamental equilibrium. Alternatively, equilibrium house prices can also be derived using a financial approach (see, for example, Ayuso et al (2006)).

Determinants of house price dynamics

Two-step error correction method (ECM)

Step 1: Long-run relationship (cointegration analysis)

Variables	China	Indonesia	Thailand	Hong Kong SAR	Korea	Singapore
GDP	0.197	1.172	0.423		–2.100	–1.468
Bank credit	0.081		0.173	0.938	1.357	0.609
Equity prices				0.495	0.067	0.647
Short-term rate	0.471	–0.470		–0.865	1.834	2.777
Consumer price index	0.827	–0.789	–1.369			3.143
Exchange rate		–0.265			–0.489	–0.850

Step 2: Explaining changes in real house prices

Variables	China	Indonesia	Thailand	Hong Kong SAR	Korea	Singapore
Lagged ECM term	insig[1]	insig	insig	–0.357	insig	–0.143
Lagged dependent variable	0.708	1.042		0.834	0.698	0.712
Δ GDP					–1.010	
Δ Bank credit					0.395	
Δ Equity prices				0.176	0.048	0.199
Δ Short-term rate						
Inflation	0.288	0.542				
Currency depreciation		–0.195			–0.229	–0.356

Note: The country-specific regressions employ data in the following sample periods: China 1998 Q4–2005 Q4, Hong Kong SAR 1993 Q1–2006 Q1, Indonesia 1994 Q1–2006 Q1, Korea 1991 Q4–2005 Q3, Singapore 1985 Q1–2006 Q1 and Thailand 1994 Q4–2005 Q4. In the first step of the analysis, an OLS regression is run for the level of real house prices and explanatory variables, which are all defined in real terms (deflated by consumer price indices) except consumer price indices and exchange rates. In the second step, changes in real house prices are regressed on the lagged error correction term, the lagged own variable and contemporaneous changes in other economic factors. In order to prevent simultaneity bias, the contemporaneous variables are instrumented using four own lags. In addition, to keep the model parsimonious, insignificant explanatory variables (at the 5% level) are dropped from the estimation in both steps (except the ECM term). Coefficients for constant terms are omitted here.

[1] Statistically insignificant (at the 5% level). Table 3

linkages are reported here. The coefficient of the error correction term reflects the long-run influence from economic factors to house prices. Specifically, a negative coefficient implies that house prices tend to adjust to changes in market conditions, and its magnitude indicates the speed of price adjustments. In addition, the other coefficients reflect short-term influences from other economic factors to house prices.

Housing finance system matters for …

The results differ substantially across the six economies, suggesting that the driving factors behind house prices tend to be country-specific. Nevertheless, the differences can be linked to differences in housing finance markets and economic arrangements. The responses of house prices to changes in market conditions, particularly equity price movements, are similar in those economies with similar housing finance systems (based on the cluster analysis results). Bank credit has an important impact on house prices in all the economies except the one with the least developed banking sector. In addition, the impact of exchange rates on house prices largely depends on whether an economy adopts a fixed or a floating exchange rate regime.

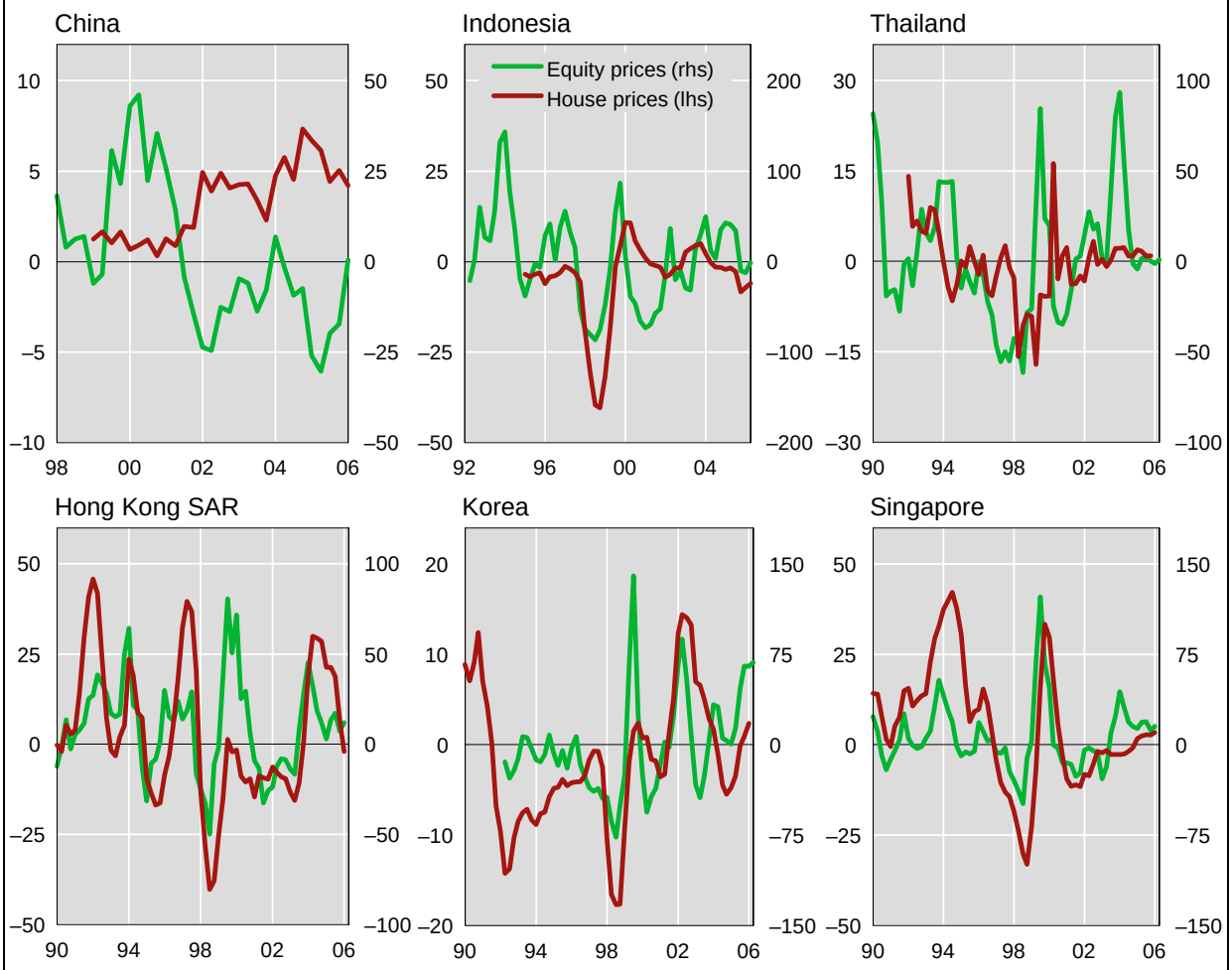
First, equity price movements have different impacts on house price dynamics in the two groups of housing finance markets. In the three economies with more flexible housing finance markets (Hong Kong, Korea and Singapore), there is a strong positive relationship between the two asset prices in the long run (Table 3, top panel). In addition, equity price movements have a strong short-term impact on house prices as well (Table 3, bottom panel). These results suggest that equity price movements tend to have a larger wealth effect than the substitution effect in these economies. This stands in sharp contrast to what has been generally observed in a number of industrialised economies since the 1990s. By contrast, the link between the two asset classes disappears in the three economies with less flexible housing finance markets.

... asset price co-movements ...

The difference in asset price co-movements is also illustrated in Graph 2. The average correlation between changes in the two asset prices is only 1% in China, Indonesia and Thailand, compared with 56% in the other three

Asset price co-movements[1]

1990 Q1–2006 Q2



[1] Nominal asset prices deflated by consumer prices; annual changes, in per cent.

Sources: CEIC; Datastream; national data.

Graph 2

economies.[18] The results may reflect the possibility that, in a more flexible housing finance system, housing behaves more like a tradable asset because of lower transaction costs, higher market liquidity and the more mature business environment. The more active trading and better flow of information might cause house prices to move more closely with other types of asset prices in response to changes in economic conditions.

Second, it appears that, in those economies with more flexible housing finance markets, house prices are more likely to adjust so as to eliminate their deviation from long-term relationships. As shown in Table 3, the coefficients of the error correction term, which represent the responsiveness of house prices to short-term supply and demand imbalances, are significantly negative only in Hong Kong and Singapore. This finding is consistent with the above conjecture that housing is more actively traded and house prices are more informative of economic conditions in these economies.

... and responsiveness of house prices to changes in market conditions

The high responsiveness of house prices can be a double-edged sword. More flexible market conditions and improved transparency can mitigate price distortions due to depressed market conditions, but cannot resolve other structural issues in the housing markets such as supply lags. In fact, house prices tend to be more volatile in these economies (see Graph 3), posing new challenges for the financial sector and more broadly for the real economy.

Bank credit is important

Third, consistent with findings in industrialised economies (Tsatsaronis and Zhu (2004)), bank credit is found to be positively related to house prices in all the economies. The exception is Indonesia (Table 3, top panel), where the banking sector is least developed and bank credit represents only 43% of GDP. The strong link between house prices and bank credit is economically intuitive for several reasons. One possibility is that increases in house prices imply a lower default probability for mortgage loans, so that banks are more willing to extend new credit for home purchases and new construction, and even to other sectors if housing or land is used as collateral. In addition, increases in bank credit, particularly to home purchasers, will boost demand and raise house prices. Finally, changes in economic conditions or in the monetary policy stance tend to cause house prices and bank credit to move in the same direction.

The role of exchange rates

Fourth, exchange rates have a significant impact on house prices in most countries that adopt flexible exchange rates.[19] In particular, currency appreciation (against the US dollar) is associated with housing booms and vice versa. This perhaps reflects the co-movements of the two variables driven by common economic fundamentals. In addition, it can be partly explained by the important role of foreign investors, who invested heavily in Asian property markets during the boom period (thereby boosting property prices and local currencies) but retreated after the Asian crisis, putting further downward pressure on the already weak currency and property markets.

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[18] The difference is smaller but still noteworthy if lagged correlations are calculated.

[19] China and Hong Kong had a fixed exchange rate regime during most of the period under review.

Deviation of real house prices from their long-term trends[1]

1990 Q1–2006 Q2

[1] As a percentage of the predicted value.

Graph 3

At the same time, some puzzling results emerge from the regressions. For instance, GDP and house prices are negatively related in Korea and Singapore and unrelated in Hong Kong, and short-term interest rates are positively related to house prices in China, Korea and Singapore.[20] These results contradict intuition as well as previous findings for industrialised economies and are perhaps driven by specific economic episodes that have occurred in the sample period. For instance, the relationship between house prices and GDP in Hong Kong and Singapore might be explained by the fact that corrections in house prices after the Asian financial crisis took much longer than the recovery in the macroeconomy in these two economies, which caused the two variables to move in opposite directions. As for the relationship between house prices and interest rates, changes in interest rates may reflect the removal of interest rate restrictions and can be positively related to the availability of bank credit. The positive link between the two variables may also reflect the shift from a public housing system towards a market-based housing market.[21] Therefore, the interactions between house prices and macroeconomic factors during crisis or transition periods may be worth further investigation in future research.

Conclusion

This article has documented recent developments in housing markets in Asia and investigated the impact of these distinctive features of national housing finance markets on the pattern of house price dynamics. The results suggest that the adoption of a more flexible housing market facilitates transactions and enhances the role of housing as a tradable investment asset. However, having

[20] As Tsatsaronis and Zhu (2004) have suggested, inflation can have either a positive or a negative impact on house prices.

[21] Under the public housing system mortgage rates were held down to subsidise low-income households. In addition, the positive relationship between interest rates and house prices may reflect the monetary policy response to asset price movements, such as the recent upward adjustment in policy rates in China to contain excessive house price growth.

a market-oriented housing finance system does not remove all risks. Indeed, new sources of volatility can arise. Given the growing role of mortgage loans in the financial sector, it is increasingly important to improve our understanding of the potential risks embedded in the new housing market structure in Asia and elsewhere.

References

Arner, D W, C D Booth, B F C Hsu, P Lejot, Q Liu and F Pretorius (2006): "Property rights, collateral, and creditor rights in East Asia", in I Dalla (ed), *East Asia finance: selected issues*, World Bank.

Ayuso, J, R Blanco and F Restoy (2006): "House prices and real interest rates in Spain", paper presented at the BIS Autumn Economists' Meeting, 30–31 October, Basel.

Chan, E, M Davies and J Gyntelberg (2006): "MBS markets in Asia: the role of government-supported housing agencies", *BIS Quarterly Review*, this issue, pp 71.

Committee on the Global Financial System (2006): "Housing finance in the global financial market", *CGFS Papers*, no 26, Bank for International Settlements.

Davis, E P and H Zhu (2004): "Bank lending and commercial property cycles: some cross-country evidence", *BIS Working Papers*, no 150.

Engle, R and C Granger (1987): "Cointegration and error-correction: representation, estimation, and testing", *Econometrica*, vol 55, pp 251–276.

Gyntelberg, J and E Remolona (2006): "Securitisation in Asia and the Pacific: implications for liquidity and credit risks", *BIS Quarterly Review*, June, pp 65–75.

Gyntelberg, J, G Ma and E Remolona (2005): "Corporate bond markets in Asia", *BIS Quarterly Review*, December, pp 83–93.

Jones Lang LaSalle (2006a): "Asia Pacific property investment guide 2005/2006", mimeo.

——— (2006b): "Real estate transparency index", mimeo.

Ong, S E (2005): "Mortgage markets in Asia", presented at the European Real Estate Society Conference 2005, Dublin.

Tsatsaronis, K and H Zhu (2004): "What drives housing price dynamics: cross-country evidence", *BIS Quarterly Review*, March, pp 65–78.

Eric Chan
+852 2878 7391
eric.chan@bis.org

Michael Davies
+612 9551 8303
daviesm@rba.gov.au

Jacob Gyntelberg
+852 2878 7145
jacob.gyntelberg@bis.org

The role of government-supported housing finance agencies in Asia[1]

In Asia, government-supported housing agencies have played a constructive role in the development of domestic residential mortgage and bond markets. Several agencies have increased their overall market presence in recent years by expanding their activities and have accepted a larger share of the associated credit risks.

JEL classification: G150, G180, G210, G280, H810, O160.

Several countries in Asia have established government housing finance agencies, in part to help develop their domestic housing finance markets and associated bond markets. And other countries in the region are currently considering setting up their own housing agencies. Meanwhile, Japan – which established its housing agency several decades before the other Asian countries – has decided to refocus and scale down its operations. Starting next year, the agency will mainly be responsible for issuance of mortgage-backed securities (MBSs) (Fuchita (2006)).

In this paper, we examine the roles of government-supported housing finance agencies in Asia. We consider five Asian economies: Hong Kong SAR, India, Japan, Korea and Malaysia.[2] We find that, in many of the cases considered, housing agencies appear to have played a constructive role in the development of residential mortgage bond markets. They have helped eliminate barriers to securitisation, initiated more systematic issuance of MBSs, improved access to housing finance for households and provided liquidity to banks.

[1] This article was written while Michael Davies was at the BIS, on leave from the Reserve Bank of Australia. The authors are grateful for useful discussions and comments from numerous individuals at the Bank of Japan, the Bank of Korea, Cagamas Berhad, the Government Housing Loan Corporation of Japan, the Hong Kong Mortgage Corporation, the Housing Development Finance Corporation of India, ICRA, KIS Pricing, the Korea Housing Finance Corporation, Merrill Lynch, Mitsubishi UFJ Securities, Moody's Investors Service, the National Housing Bank of India, the Reserve Bank of Australia, the Reserve Bank of India, State Bank of India and the BIS. The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS or the Reserve Bank of Australia.

[2] Singapore and Thailand also have government housing agencies, but these countries were not included in our sample because the housing agencies do not issue MBSs.

More recently, several of the housing agencies have broadened the scope of their involvement in mortgage and bond markets by providing mortgage insurance on loans and credit enhancements on domestically issued MBSs. This broadening of housing agencies' activities has seen them accept a larger share of the gross financial risks associated with residential mortgages. However, at present, the overall risks assumed still appear small relative to the economy as a whole.

In the next section, we describe the role and mandates of the housing agencies in the five selected economies. In the third section, we discuss housing agencies' risk management. The fourth section discusses the nature and perception of government support, as a prelude to a quantification of the value of these annualised government subsidies in the following section. The final section provides concluding thoughts.

The role and mandates of Asian housing agencies

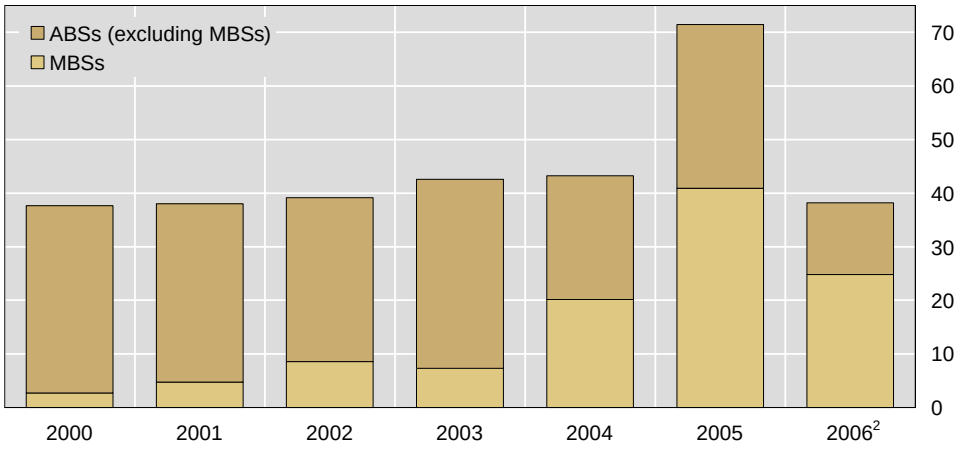
Housing agencies created to prevent shortages of housing finance

The housing agencies in the sample were initially established in response to concerns that there was a shortage of housing finance in the economy, or that there would be a shortage in the near future.

In Japan, the Government Housing Loan Corporation (GHLC) was established in 1950 to provide a stable supply of housing finance and improve the quality of the nation's housing stock (Konishi (2002)). In Malaysia, Cagamas Berhad was established in the mid-1980s to help rectify a shortage of housing finance (Kokularupan (2005)). The Hong Kong Mortgage Corporation (HKMC) was established in 1997 because of concerns in the mid-1990s that local banks would be unable to satisfy anticipated strong demand for housing credit (Yam (1996)). The Indian National Housing Bank (NHB) was established in 1988 to promote a sound and cost-effective housing finance system and to help alleviate housing shortages, particularly in rural areas (Reside et al (1999)). The Korea Housing Finance Corporation (KHFC) was set

Domestic issuance of ABSs in five Asian economies[1]

In billions of US dollars



[1] Hong Kong SAR, India, Japan, Korea and Malaysia. [2] Data up to the end of September.

Sources: Dealogic; HSBC; Moody's Investors Service; Standard & Poor's; Thomson Financial Securities Data; national rating agencies. Graph 1

up in 2004 to ensure that households had access to long-term housing finance (KHFC (2005)). Over time, all of the agencies have been given the additional task of promoting the development of domestic mortgage bond markets. The underlying notion was that bond markets would provide loan originators with a source of funding more stable than deposits.

MBS market role came later

Housing agencies have made visible contributions to the development and growth of the respective domestic bond and MBS markets. This has primarily been via increased MBS and bond issuance. The economies in the sample have had remarkable growth in the securitisation of mortgages over the past few years (Graph 1). Between 2000 and 2005, annual MBS issuance increased from $3 billion to $40 billion. This growth has been significantly faster than the growth in issuance of other asset-backed securities (ABSs) (Gyntelberg and Remolona (2006), Dalla (2006)). The housing agencies have led this growth; in all five cases, the outstandings of housing agency MBSs have risen more quickly than those of privately issued MBSs. Except in Japan, housing agency MBSs account for the bulk of outstanding MBSs. The housing agencies' issuance of MBSs has served to increase investor familiarity with the product. The longer-term objective is to gradually create a benchmark yield curve for the pricing of private MBSs. In several cases, housing agencies have also been among the largest non-government bond issuers, and their bond issuance has generally grown faster than the bond market as a whole (Table 1).

Agencies have helped develop MBS markets …

Many of these housing agencies have also contributed to the development of their domestic MBS markets by working with governments to develop legislation which has removed legal, tax and regulatory impediments to securitisation. They have also improved the availability of good historical data on rates of non-payment and prepayment on housing loans, and have encouraged financial institutions to standardise their loan documentation.

… by issuing MBSs and helping to remove legal and regulatory impediments

Size of bond and MBS markets[1]

Amounts outstanding, in billions of US dollars

	Date	MBSs		Bonds				MBSs + bonds
		Housing agency	Private	Housing agency	Financial and corporate[2]	Government	Non-resident	Share of housing agency debt securities[3]
Hong Kong SAR	Dec 01	0.0	0.1	2.6	8.2	6.8	3.6	14.7
	Mar 06	0.6	0.0	4.0	10.8	8.8	4.0	19.0
India	Jun 02	0.1	…	5.3	0.0	134.8	0.0	3.9
	Jun 05	0.2	…	28.4	15.8	243.8	0.1	9.9
Japan	Mar 02	1.5	6.1	16.6	1,314.1	3,166.3	57.0	0.4
	Mar 06	27.2	60.4	33.1	1,211.9	5,501.8	57.1	0.9
Korea	Dec 01	1.5	…	0.0	213.2	65.8	0.2	0.5
	Dec 05	8.3	…	1.5	356.7	226.0	0.0	1.7
Malaysia	Dec 01	0.0	0.0	5.6	36.0	30.9	0.0	7.7
	Dec 05	1.5	0.0	6.4	47.4	50.4	0.2	7.5

[1] Excluding money market instruments. [2] Excluding housing agency bonds and MBSs as well as private MBSs. [3] As a percentage of total bonds and MBSs.

Sources: Citigroup; government housing agencies; BIS. Table 1

Despite the housing agencies' efforts, domestic MBS markets are still not fully developed in any of the economies we consider. In Hong Kong, India and Korea only 1% of housing loans are securitised, while in Japan and Malaysia this proportion is 5–6%. As a result, in all cases there is limited liquidity in secondary MBS markets.

But MBS markets are still not fully developed

Housing finance markets

In their respective housing finance markets, the agencies have broadened the range of loan types that are available to borrowers of all income levels. Most agencies have focused on introducing longer-term fixed rate loans.[3] In several cases, this has stimulated private lenders to lengthen the maturity of their loan contracts and to introduce more sophisticated products that combine features from fixed and floating rate loans. In Korea, the KHFC's provision of 30-year fixed rate mortgages probably induced banks and other financial institutions to lengthen the maturity of their housing loans from three years to 20–30 years.[4] In Japan, the GHLC is the main provider of long-term fixed rate mortgages. Interestingly, the HKMC offered long-term fixed rate mortgages in 2001, but there was only limited demand for them as Hong Kong households have a preference for floating rate loans and the local banks did not market them aggressively.

Housing agencies introduced fixed rate loans

Similar objectives but different approaches

Despite their common objectives, the approaches used by the housing agencies to achieve these objectives have differed considerably (Table 2). Two of the agencies – the GHLC and the KHFC – distribute their own loans to households via banks and other loan originators. They thus compete fully with banks in the housing finance market by offering loans to any household that satisfies their lending criteria. In addition to direct lending, the GHLC offers mortgage insurance and purchases mortgages from other lenders for its MBS programme, while the KHFC provides guarantees on loans that are used to fund deposits for chonsei leases.[5] The remaining agencies – the HKMC, Cagamas and the NHB – do not lend directly to households. The HKMC and Cagamas purchase already originated mortgages from banks and other lenders. The NHB lends directly to banks and finance companies, with the loans secured against specific pools of mortgages. The HKMC also has a large mortgage insurance division, and the NHB is in the process of establishing the Mortgage Credit Guarantee Company, a joint venture between the NHB and

Considerable variation in approaches and in MBS market involvement

[3] This is similar to the United States, where the Construction Finance Corporation pioneered the 30-year fixed rate mortgage in the 1930s (Jones (1951)).

[4] When the KHFC was founded in March 2004, only 25% of housing loans had maturities of greater than 10 years. By December 2005, the proportion of loans with maturities of over 10 years had doubled to 50%. See KHFC (2006).

[5] Chonsei is a lease contract where, rather than paying a periodic rent for the right to use real property as in most western lease contracts, the tenant pays an up-front deposit for the use of the property with no requirement for periodic rent payments. Thus, the "rent" received by the landlord is the investment return on the chonsei deposit. At the end of the contract, the landlord returns the tenant's chonsei deposit (Zhu (2006)).

Housing agencies' business lines

	Agency	Issues MBSs	Private MBS enhancement	Own loan products	Purchases mortgages from banks	Mortgage insurance
Hong Kong SAR	HKMC	Yes	No	No	Yes	Yes
India	NHB	No[1]	Yes[2]	No	No[3]	No
Japan	GHLC	Yes	Yes[2]	Yes	Yes	Yes
Korea	KHFC	Yes	No	Yes	Yes[4]	No[5]
Malaysia	Cagamas	Yes	No	No	Yes	No

[1] Only issues MBSs on behalf of private financial institutions. [2] The GHLC provides credit wraps for private MBSs; the NHB provides credit wraps and purchases part of the subordinated tranche. [3] The NHB lends directly to banks, with the loans secured against specific pools of mortgages. [4] As of September 2006, the KHFC had not purchased loans from banks. [5] The KHFC provides a guarantee on deposits for chonsei leases.

Sources: National central banks; government housing agencies; BIS. Table 2

several private and supranational entities, to provide mortgage insurance services.

Housing agencies' involvement in MBS markets also differs. Cagamas, the HKMC and the KHFC issue their own MBSs, for which they guarantee interest and principal payments. Cagamas and the KHFC also hold the first-loss tranche of their own MBSs. These three agencies do not provide credit enhancements for privately issued MBSs. The GHLC also issues its own MBSs, for which it guarantees interest and principal payments, and in addition provides credit enhancements for MBSs issued by others. Finally, the NHB provides credit enhancements and trustee services for privately issued MBSs, but does not issue its own MBSs.

Increased supply of housing finance from banks with several agencies broadening their activities

In recent years, the supply of housing finance provided by banks has increased in most cases. Over the same period, several of the agencies have broadened their activities. The HKMC has broadened its loan purchases to include other household debt and some commercial loans. It has also expanded its mortgage insurance programme and increased the maximum loan-to-value ratio on insured loans to 95%. Cagamas has also broadened its loan purchases. The NHB has started providing credit guarantees on private MBSs, and is establishing a mortgage insurance company. In contrast, the GHLC has reduced its direct lending and has focused on buying mortgages from banks and issuing MBSs. In 2007, the GHLC will be replaced by the new Japan Housing Finance Agency (JHF), which will mainly guarantee MBS issues and purchase loans from private financial institutions.[6] This change partly reflects the government's desire to reduce its role in the Japanese economy.

Risk management by housing agencies

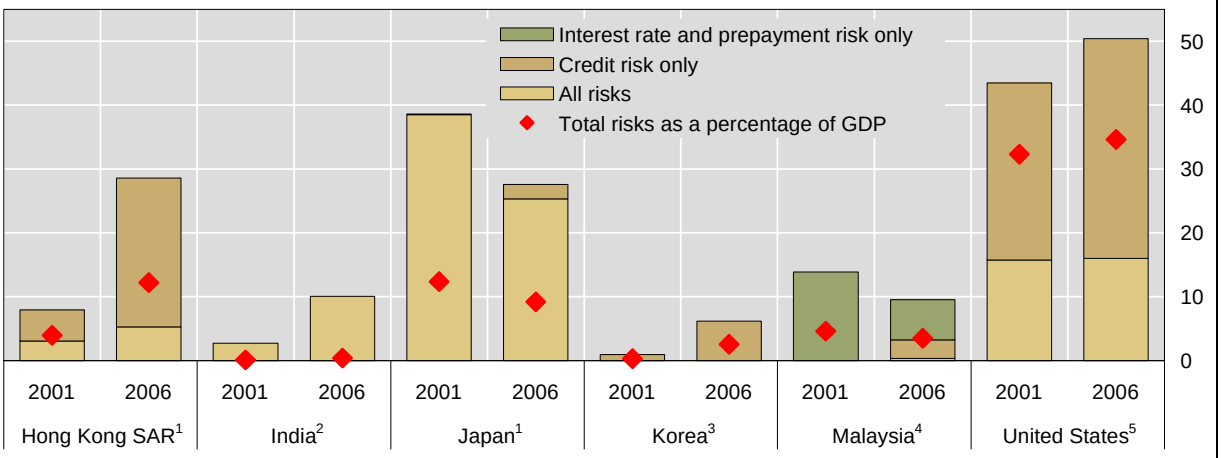
Some agencies have assumed more risks …

The broadening of mandates in Hong Kong and India, as well as the strong loan growth in Korea, have led to their housing agencies being more heavily

[6] The JHF will also provide direct loans for disaster mitigation and urban rehabilitation. See Ministry of Land, Infrastructure and Transport (2006).

Risks managed by housing agencies

Percentage of total housing loans



[1] The HKMC and the GHLC assume all risk on loans held on their balance sheets, and credit risk on their MBS issuance and mortgage insurance operations. [2] The NHB assumes all risk on its loans to banks and housing finance companies, and credit risk on the MBSs that it guarantees. [3] The KHFC assumes credit risk on its MBS issuance and mortgage insurance operations. For 2001, data are for the Korea Mortgage Corporation. [4] Cagamas assumes interest rate risk and prepayment risk on loans (with recourse to the originating bank) held on its balance sheet, and credit risk on its MBS issuance. [5] Freddie Mac and Fannie Mae assume all risks on loans and MBSs held on their balance sheets, and credit risk on their MBS issuance.

Sources: Congressional Budget Office; national central banks; government housing agencies; BIS. Graph 2

involved in the domestic housing finance markets. As a result, they face the challenge of managing a larger share of the overall financial risks associated with domestic housing loans. The housing agencies manage this financial risk by either hedging it with a third party, or transferring it to bond and MBS investors, or retaining it within their organisation.

… some others less

The proportion of total housing loans on which the agencies manage some or all of the financial risks is shown in Graph 2. Housing agencies are required to manage all risks, ie credit, interest rate and prepayment risks, on loans held on their balance sheets. Here an exception is Cagamas, which has relatively little credit risk on the majority of the loans on its balance sheet as it has recourse to the bank that sold the loan if the borrower defaults. Thus Cagamas only manages interest and prepayment risks on the loans it purchases. For securitised loans and loans for which the agency has provided mortgage insurance and credit enhancements on private MBSs, the agency is required to manage only credit risk.

More risk assumed in Hong Kong, India and Korea …

The agencies in Hong Kong, India and Korea have all increased the share of credit risk they manage. In Hong Kong, the HKMC's share of the credit risk on housing loans has quadrupled over the past five years, mainly due to the growth in the provision of mortgage insurance. In Korea, the KHFC's share of credit risk on housing loans has also risen strongly, reflecting the growth in its mortgage insurance and MBS programmes. In India, an increase in the NHB's direct lending to banks and other financial institutions has seen it managing additional risks. In contrast, the GHLC has scaled back its direct lending operations ahead of its restructuring, and consequently the share of risk on Japanese housing loans it manages has fallen. The HKMC is the only agency which actively hedges credit risk. Roughly half of the credit risk from its

mortgage insurance operations has been reinsured (HKMC (2006)). All the other housing agencies retain the credit risk within their organisations.

… less in Japan and Malaysia

In Hong Kong and India, the housing agencies have also increased the share of prepayment risk they manage. The available evidence suggests that these housing agencies retain this risk. The GHLC has started securitising its outstanding portfolio of housing loans, thereby reducing the share of prepayment risk it holds. The share of prepayment risk held by Cagamas has also fallen slightly, reflecting a decrease in the share of housing loans it holds. In Korea, the agency issues MBSs and thus transfers prepayment risk to bondholders.

Finally, the agencies in Hong Kong and India are the only ones which have increased the share of interest rate risk they manage. The shares of interest rate risk managed by the other housing agencies have all declined. As all of the housing agencies appear to hedge a significant share of the interest rate risk they manage, there has probably been limited change in the interest rate risk they retain.

Government support

Degree of government support varies …

Formal government support for the housing agencies varies across our sample, from outright guarantees and full government ownership to no guarantee and limited government ownership (Table 3). In India and Korea, the housing agencies have an explicit government guarantee and are wholly owned by their governments (via the central bank). In Korea, the law requires the government to cover losses in excess of the KHFC's capital reserves (see the Korea Housing Finance Corporation Act). In India, the NHB can request the government to guarantee its bonds (National Housing Bank Act of 1987).[7]

… ranging from strong government guarantees to minority government share of equity

In Hong Kong and Japan, the housing agencies do not have a government guarantee but they are wholly owned by the government. While it is clear that the HKMC enjoys a high level of government support,[8] the extent of government support for the GHLC is less obvious. The Malaysian government

Government support for housing agencies

	Government ownership		Explicit government guarantee
	Government	Central bank	
Hong Kong SAR	100	–	No
India	–	100	Yes
Japan	100	–	No
Korea	18	82	Yes
Malaysia	–	20	No

Sources: Merrill Lynch; national housing agencies; BIS. Table 3

[7] At present, only some NHB bonds have an explicit government guarantee, but both types of bonds trade at similar prices. This suggests that market participants perceive the NHB as being backed by the Indian government.

Yield spreads on agency bonds and MBSs

Spreads over five-year sovereign bonds, in basis points[1]

	Agency bonds	Agency MBSs	Bonds issued by financials	MBSs issued by financials
Hong Kong SAR	49	50–55	55–60	…
India	50	70	100	70
Japan	8	39	25	55
Korea	15[2]	25	50	…
Malaysia	57	78	95	…

[1] Rounded average spreads for 2006 to date. [2] Spread for MBS bond with bullet maturity.

Sources: Asian Development Bank; Barclays; Bloomberg; GHLC; HSBC; KIS Pricing; Mitsubishi UFJ Securities; R&I Japan; BIS. Table 4

owns only a fifth of Cagamas – the remainder being held by Malaysian and foreign banks – and the housing agency does not have a government guarantee.

Market perception of government support

Market perception in agreement with formal support

Generally, there is a high level of agreement between the formal level of government support and market perception thereof. The market perception of government support is reflected in credit ratings and bond market prices, and these two indicators are broadly consistent for all countries.

This perception is reflected in credit ratings and bond prices

For India and Korea, which have explicit guarantees, the market simply takes this as given. The housing agencies have the same credit ratings as their respective governments. The spreads on housing agency bonds and MBSs over government bonds are, according to market participants, a reflection of prepayment risk on MBSs and their smaller size (Table 4). Yields on housing agency debt and MBSs are well below yields on other financial institutions' bonds.[9] In the case of Malaysia, the market view is that Cagamas does not have a government guarantee. This is consistent with the formal level of government support. The domestic rating agencies state that Cagamas's AAA credit rating reflects the high quality of its loan assets and the quality of its shareholders, which include several large Malaysian and international banks as well as Bank Negara Malaysia (Kokularupan (2005)). Consistent with a lower level of government support, Cagamas bonds trade at yields that are roughly 60 basis points higher than yields on Malaysian government bonds – the largest spread differential of all the housing agencies. Reflecting their much higher liquidity, yields on Cagamas bonds are, however, lower than yields on bonds issued by other AAA-rated financial institutions.

[8] This is reflected in the HKMC having access to additional callable capital and a revolving credit facility and in the presence of various government officials and senior staff of the Hong Kong Monetary Authority on the board of the HKMC.

[9] In India, yields on the senior tranches of agency MBSs and private MBSs are similar. But private MBSs have a large subordinated tranche (10–20% of the value of the loan pool), whereas agency MBSs do not have a subordinated tranche.

In Hong Kong and Japan, where the agencies are wholly owned by the government, the market view is that they have strong implicit government guarantees. Both agencies have the same credit ratings as their respective governments, and upgrades and downgrades to the sovereign credit ratings have been reflected immediately in the housing agencies' ratings.[10] In Japan, GHLC bonds trade at yields that are less than 10 basis points over Japanese government bonds. The GHLC MBS spread of around 30 basis points is attributed to their risk profile, with the most important factor being prepayment risk. HKMC bonds and MBSs trade at yields that are 50 basis points higher than Hong Kong government bonds. This probably reflects the smaller size and lower liquidity of the HKMC bonds.

The size and distribution of government support

We have attempted to estimate the economic value and identify the main recipients of the government subsidy by using a net present value of cash flow methodology similar to CBO (2001, 2004) and Passmore (2005) (see box).[11]

Estimated level of government support below 0.1% of GDP

For all of the sample, we estimate that the level of government support given to housing agencies is below 0.03% of GDP (Table 5). The variation in the size of the estimated subsidies reflects the relative importance of business lines and the nature of government support. To ensure that the estimated subsidies are comparable, we have in the case of Japan not included a direct grant from the Japanese government to the GHLC, which the latter uses to cover a negative interest rate spread of 60–80 basis points between its existing mortgage portfolio and its Fiscal Investment and Loan Program (FILP) loans from the government. This negative interest rate spread reflects realised prepayment risks and stems from the lending and funding practices of the GHLC during the 1980s and early 1990s. During this period, the GHLC on the lending side allowed households to prepay their loans with little or no financial penalty. On the funding side, the GHLC relied on fixed maturity FILP loans that

Estimated value of government support in 2005

	Estimated range for subsidy[1]	Main beneficiaries
Hong Kong SAR	0.000–0.003	Households
India	0.006–0.009	Financial institutions
Japan	0.002–0.007	Households, financial institutions
Korea	0.015–0.025	Households
Malaysia	0.0000	.
Memo: United States[2]	*0.210*	*Households, housing agencies*

[1] As a percentage of GDP. [2] Data are for 2003.

Sources: Congressional Budget Office; BIS estimates. Table 5

[10] For rating agency views on the HKMC, see Chan et al (2005) and Wa et al (2005). For rating agency views on the GHLC, see Ogawa (2006) and Sonoda et al (2006).

[11] See Davies et al (2006) for a more detailed discussion.

Estimating the size of housing agency government support

To estimate the size of government subsidies received by housing agencies and their distribution, we consider the net present value of cash flows, following a methodology similar to those used in CBO (2001, 2004). We take as our starting point the fact that housing agencies' subsidies are derived from two main sources: an explicit or implicit government guarantee, which allows them to issue bonds at lower yields than other financial institutions; and direct government benefits such as grants, tax exemptions and favourable regulatory treatment. Following CBO, we assign the subsidy impact on cash flows to the year in which they were earned and not the year in which the subsidy was received. Cash flows received in future years are discounted using the appropriate government bond yield. Hence, the present value of gross subsidies (*S*) is calculated as:

$$S = \sum_{t=1}^{n} \frac{(r^{FI} - r^{HA})D^{HA} + (m^{FI} - m^{HA})MBS^{HA}}{(1 + d_t)^t} + Ex$$

where *r* is the average yield on bonds and *m* is the average yield on MBSs, with the superscript indicating whether the yield is for financial institutions (*FI*) or housing agencies (*HA*). The yields are based on the average maturity of bonds and MBSs issued in that year. D^{HA} and MBS^{HA} represent, respectively, the amount of bonds and MBSs issued by housing agencies, and *Ex* is the value of direct government subsidies such as grants, tax exemptions and other benefits received by housing agencies.

The housing agency bond spreads are spreads at issuance where available. However, data limitations mean that we have had to rely on secondary market spreads in a number of cases. To account for the resulting uncertainty regarding bond spreads at issuance, we have calculated the size of the support for a range of yield spreads. We have added and subtracted 10 basis points relative to our central estimates for all cases except India, for which we have added and subtracted 20 basis points. The amount of debt issued and its maturity are based on actual issuance data. The private financial institution bond spreads are based on entities of comparable credit quality to the housing agencies on a standalone basis, ie without government support.① These bond spreads are sourced from the secondary bond market. The housing agencies' discount rate *d* is taken from the corresponding sovereign yield curve, as full yield curves are not available for the housing agencies.

① The rating agencies do not provide standalone ratings for the housing agencies, so we have relied on market liaison and our own judgment to identify financial institutions that are of similar credit quality to the housing agencies.

could not be prepaid without incurring substantial costs.[12] When interest rates fell sharply in the mid-1990s, households refinanced their loans at lower rates while the agency had to continue paying the higher rate of interest on its FILP loans. Thus, the Japan case illustrates the importance of actively managing prepayment risks and the potential fiscal risks faced by governments from housing finance agencies.

The size of the KHFC subsidy reflects the fact that it issues large quantities of debt and has a funding advantage of around 75 basis points. The NHB has a similar funding advantage but issues less debt, and therefore receives a smaller estimated subsidy. The HKMC only benefits from an implicit government guarantee and raises moderate amounts of debt, resulting in a

[12] The Ministry of Finance, which is in charge of the FILP, agreed with the GHLC in 2005 that the GHLC could prepay a certain portion of outstanding FILP loans without penalty provided the GHLC exited from direct lending operations and abided by a corporate restructuring plan imposed by the Ministry.

relatively small estimated subsidy as well. Consistent with the market perception, we assume that Cagamas does not have a government guarantee, and therefore does not receive any government support.

Households seem to benefit via lower interest rates in Korea and Japan …

For Korea, we find that most of the government support is being passed on to households through lower interest rates on their mortgages. In Japan, both households and financial institutions benefit from the government support.

… while it is difficult to assess who benefits in Hong Kong and India

For Hong Kong and India, the structure of the housing finance markets makes it difficult to assess who benefits from the government support. Nonetheless, discussions with market participants in each of the countries have provided some indication of the distribution of the benefits from government support. In India, it appears that the housing agency transfers most of the government support to banks and other financial institutions by providing them with lower-cost loans. In Hong Kong, it appears that the HKMC's mortgage insurance operations have lowered the cost of loans for less creditworthy borrowers.

Conclusion

MBS markets have benefited from housing agencies' efforts

In several of the economies considered, the housing agencies appear to have helped develop domestic MBS and housing finance markets. In the MBS market, they have worked with governments to eliminate structural impediments to securitisation and have initiated more systematic issuance of MBSs. In several of the primary housing finance markets, they have broadened the range of loan types available to borrowers by introducing longer-term fixed rate loans. In some markets, they have also provided liquidity to the banking system – either by purchasing housing loans from financial institutions, or by making direct loans – though their capacity to provide stable funding for loan originators over the whole economic cycle has not yet been tested. Housing agencies also appear to have helped improve household access to loans in some cases.

Broadening of housing agencies' role should be monitored closely

Going forward, however, there are aspects of some of the Asian housing agencies' operations that may require close monitoring if the trends seen in recent years continue. One aspect is the recent broadening of Asian housing agencies' mandates as they try to remain relevant in an environment where banks have increased their supply of housing finance. This has arguably resulted in housing agencies holding more risks, particularly credit risk in Hong Kong, India and Korea. An additional aspect is that, as housing agencies increase their activities, their risk management requirements will also grow and thus become more challenging. However, at this stage these agencies do not have a dominant role in their respective housing finance markets. In addition, the overall risks assumed appear small relative to the economy as a whole.

Government-supported agencies not required for MBS markets

Finally, from a broader policy perspective it is not clear that government-supported housing agencies are necessary to develop well functioning housing finance markets or liquid mortgage bond markets. This has been successfully demonstrated by several countries, including Australia, Chile, Colombia and Denmark (Bailey et al (2004), Chiquier et al (2004), Frankel et al (2004)). In addition, in many countries it has proven less easy for governments to scale

back their involvement in markets than to introduce it (Higgs (1985)). None of the four government-owned Asian housing agencies have outlined exit strategies from their respective housing finance markets.

References

Bailey, K, M Davies and L Dixon Smith (2004): "Asset securitisation in Australia", *Reserve Bank of Australia Financial Stability Review*, September.

Campbell, J, A Coates, K Halkerston, R McCrossin, J Mallyon and F Argy (1981): *Australian Financial System, Final Report of the Committee of Inquiry*, Australian Government Publishing Service.

Chan, V, F Lu and P Eastham (2005): *Presale: Bauhinia MBS Ltd*, Standard & Poor's.

Chiquier, L, O Hassler and M Lea (2004): *Mortgage securities in emerging markets*, World Bank.

Congressional Budget Office (2001): *Federal housing subsidies and the housing GSEs*.

——— (2004): *Updated estimates of the subsidies to the housing GSEs*.

Dalla, I (2006): *East Asian finance: selected issues*, World Bank.

Davies, M, J Gyntelberg and E Chan (2006): *Who benefits from government guarantees in Asian MBS markets?*, unpublished working paper.

Frankel, A, J Gyntelberg, K Kjeldsen and M Persson (2004): "The Danish mortgage market", *BIS Quarterly Review*, March, pp 95–109.

Fuchita, Y (2006): *Securitization of residential mortgages – can Japan create a "good" GSE?*, Nomura Institute of Capital Markets Research.

Gyntelberg, J and E Remolona (2006): "Securitisation in Asia and the Pacific: implications for liquidity and credit risks", *BIS Quarterly Review*, June, pp 65–75.

Higgs, R (1985): *Crisis, bigger government and ideological change*, The Independent Institute.

Hong Kong Mortgage Corporation (2006): *Annual report 2005*, June.

Jones, J H (1951): *Fifty billion dollars: my thirteen years with the RFC (1932-1945)*, Macmillan.

Kokularupan, N (2005): *Mortgage-backed securities markets: experience of Malaysia*, Cagamas Berhad, presentation at Asia Pacific Finance.

Konishi, A (2002): *The GHLC reform and Japanese housing finance market*, presentation at the Third Workshop on Housing Finance in Transition Economies, OECD.

Korea Housing Finance Corporation (2005): *Annual Report 2004*, May.

——— (2006): *Annual Report 2005*, May.

Ministry of Land, Infrastructure and Transport (2006): *Addressing reform of the Government Housing Loan Corporation*.

Ogawa, T (2006): *Government Housing Loan Corp*, Standard & Poor's.

Passmore, W (2005): "The GSE implicit subsidy and the value of government ambiguity", *Real Estate Economics*, 33, pp 465–86.

Reside, R, S Ghon Rhee and Y Shimomoto (1999): *Mortgage-backed securities markets in Asia*, Asian Development Bank.

Sonoda, H, T Ogawa and H Saito (2006): *Presale: Government Housing Loan Corp*, Standard & Poor's.

Wa, L, M Yan, W Yen and A Cheuk (2005): *Hong Kong Mortgage Corporation Ltd (The)*, Moody's Investors Service.

Yam, J (1996): *Establishment of a Mortgage Corporation in Hong Kong*, Hong Kong Economic Association, 12 November.

Zhu, H (2006): "The structure of housing finance markets and house prices in Asia", *BIS Quarterly Review*, December, pp 55.

Ilhyock Shim

+41 61 280 8089
ilhyock.shim@bis.org

Corporate credit guarantees in Asia[1]

In many Asian countries, government institutions have played an important role in guaranteeing SME loans. Nevertheless, they have also exhibited lacklustre operating profits in recent years. Two episodes of failures involving companies offering credit guarantees highlight the importance of sufficient capitalisation and prudent risk management, as well as the difficulty borrowers have in making a transition from credit guarantees.

JEL classification: G200, G220, G280.

Credit guarantees are an important part of corporate financing in Asia, especially for small and medium-sized enterprises (SMEs). Adequate financing of SMEs is often constrained by their relatively high credit risk and the conservatism of domestic investors. To help solve this problem, public or private institutions in many Asian countries have provided credit guarantees. However, government provision of credit guarantees has the potential to distort incentives and diminish efficiency. If assured of guarantees, banks might be less thorough in screening and monitoring when they extend loans to firms, enabling firms to launch riskier projects and be less prudent in their business operations. Moreover, while the provision of public credit guarantees can stabilise the financial system during recessions, government institutions might be tempted to use such guarantees to boost economic activity during expansionary phases.

This article focuses on the role and performance of government and private institutions in the provision of corporate credit guarantees in Asia, and discusses the lessons from the failures of credit guarantee institutions. In many Asian countries, while government institutions have supplied a sizeable amount of credit guarantees for corporate debts, such as SME loans, collateralised bond obligations (CBOs) and collateralised loan obligations (CLOs), they have mostly exhibited poor underwriting performance in recent years. Two cases of credit guarantee company failure in Singapore and Korea highlight, respectively, the importance of sufficient capitalisation and adequate risk

[1] The views expressed in this article are those of the author and do not necessarily reflect those of the BIS. Any errors are the author's. I thank Claudio Borio, Frank Packer, Kostas Tsatsaronis and Haibin Zhu for helpful comments and Anna Cobau for research assistance. I especially thank Dong Soo Kang at KDI for his enlightening discussions and comments.

management, and the difficulty borrowers have in making a transition from credit guarantees. Based on this, it is argued that government policy should take into account the effects of guarantees on borrower and lender incentives with a view to increasing the efficiency of the guarantee system. Furthermore, the experience underscores the importance of complementing government policies with the promotion of financial market infrastructure, such as credit rating systems and accounting standards.

The next section reviews the roles and performance of public credit guarantee institutions in six Asian countries, and the securitisation of SME debt with government support in Japan and Korea. The following section discusses the lessons from the failed guarantee companies in Korea and Singapore. The final section concludes.

Corporate credit guarantee institutions in Asia

In many Asian countries ...

Credit guarantees[2] take the form of either guarantees provided by public institutions or commercial guarantees extended by private companies. Large government institutions have provided a sizeable amount of credit guarantees to SMEs – an important sector in all Asian economies – in Indonesia, Japan, Korea, Malaysia, Taiwan (China) and Thailand.[3] By contrast, many private companies supply the largest proportion of credit guarantees in China, (see Box 1). Recently in Japan, Korea and Singapore, governments have extended credit enhancements to SME debt securitisations.

Government agencies for corporate loan guarantees

... government institutions have guaranteed corporate debt ...

In the six countries considered below, business enterprises often lack the collateral for loans. As a result, credit guarantee institutions have been established to help enterprises obtain funds from banks by guaranteeing payment of loans, thereby seeking to contribute to a more balanced development of the national economy.

Japan has a unique two-tier credit supplementation system. Fifty-two independent Credit Guarantee Corporations (CGCs), established in each prefecture and five cities, assess the creditworthiness of local SMEs and guarantee bank loans to them. Japan Finance Corporation for Small and Medium Enterprise (JASME), established in 1953, supports the CGCs by reinsuring about 70–80% of their risks and by extending low interest loans to CGCs. JASME also supports SME debt securitisation. The central government supplies all of JASME's capital.

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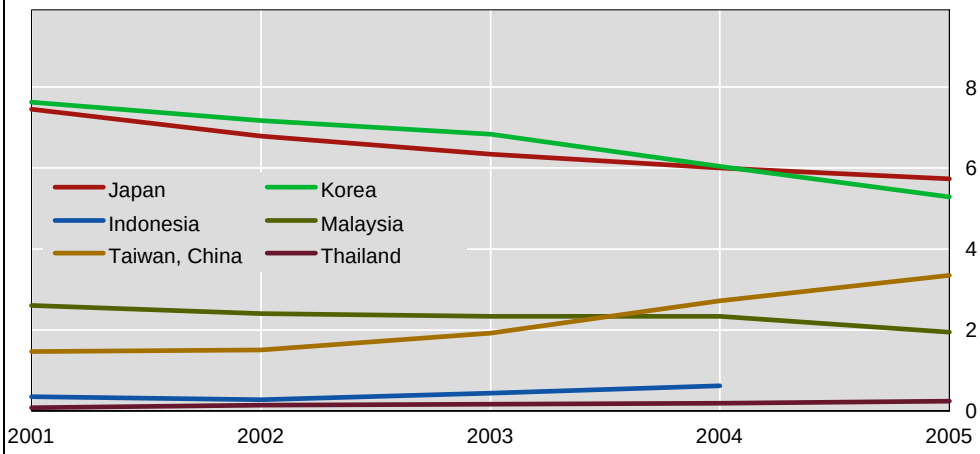
[2] Credit guarantee (sometimes known as financial guarantee) contracts require the issuer to make specified payments to reimburse the holder for a loss when a debtor fails to make payment when due (IASB (2004)). In this article, I use the term "credit guarantee" to refer to "financial guarantee".

[3] SMEs account for over 99% of all businesses in Japan, Korea and Thailand. They also account for 54% of total value added in Japan, and 51% of total production in Korea (Chin and Park (2005), Nuonome (2005), Tawee (2005)). Taiwan (China) is hereinafter referred to as Taiwan.

Credit guarantees outstanding in selected Asian countries

As a percentage of GDP



Note: For Japan, outstanding guarantee liabilities of CGCs; for Korea, sum of outstanding guarantee liabilities of KCGF and KOTEC; for Indonesia, sum of outstanding guarantee liabilities of Perum Sarana and acceptance of insurance by Askrindo.

Sources: IMF; ACSIC questionnaires; individual annual reports; BIS calculations. Graph 1

Korea has two corporate credit guarantee institutions: Korea Credit Guarantee Fund (KCGF) and Korea Technology Credit Guarantee Fund (KOTEC). Both are non-profit financial institutions whose paid-in capital comes from contributions by the government and banks. KCGF provides guarantees mostly for SME loans, while KOTEC covers mainly technology-oriented SMEs.

Indonesia also has two credit guarantee institutions for SMEs and credit cooperatives: Perum Sarana Pengembangan Usaha (Perum Sarana) and PT Asuransi Kredit Indonesia (Askrindo). Perum Sarana was established in 2000, and is 100% government-owned. Askrindo was established in 1971 and is owned by Bank Indonesia (55%) and the Ministry of Finance (45%).

In Malaysia, Credit Guarantee Corporation Malaysia Berhad (CGCMB) was incorporated in 1972, and the current shareholders are Bank Negara Malaysia (BNM) (79%) and commercial banks and finance companies (21%). The government makes loans to CGCMB through BNM at favourable rates for financial assistance.

Taiwan's Small and Medium Business Credit Guarantee Fund (SMEG) was established in 1974 as a non-profit legal entity. The central and local governments hold a 81% share in the entity.

Finally, the Small Industry Credit Guarantee Corporation (SICGC) in Thailand is a state-owned enterprise, established in 1991. The Ministry of Finance in Thailand holds a 93% share.

... on a large scale

The importance of these institutions in their respective economies and financial systems can be gauged by the ratio of credit guarantees outstanding to GDP (Graph 1). The total guarantee exposure is relatively high for Japan and Korea, at over 5% of GDP, but relatively low for Indonesia and Thailand, below 1%. While the ratio has been decreasing over the past five years for Japan, Korea and Malaysia, it has increased steadily over the same period in Indonesia, Taiwan and Thailand.

Institutional characteristics and operating results

Three measures – guarantee coverage, guarantee fees, and leverage – can be used to highlight the main characteristics of these institutions (Table 1). The guarantee coverage ratio measures the share of qualifying loans guaranteed by an institution. This ratio generally ranges between 50 and 90% for the entities under review, with the exception of Japan, where local CGCs guarantee 100% of the loan amount. Guarantees of loans are usually partial so as to ensure that banks retain some incentive both to screen and to monitor loans.

Government institutions differ in terms of guarantee coverage ...

Second, the annual guarantee fee represents the amount the institutions charge every year as a percentage of the guaranteed amount. The guarantee fee has the potential to partially reflect the riskiness of individual loans. Four of the agencies reviewed – KCGF, KOTEC, Perum Sarana and SMEG – have adopted a risk-based fee system in which the fees vary according to metrics of credit risk. In general, the guarantee fee appears quite comparable across countries, at 0.5–2.0% of the guaranteed amount. At the same time, the level of the fees seems insufficient to cover costs in most countries, as we will discuss further when considering the operating results of the institutions.

... guarantee fees ...

Finally, the leverage ratio − defined as the ratio of credit guarantees outstanding to the amount of the institution's capital (net worth) − is presented in the last column of Table 1. It provides a good indication of the amount of risk taken by the institutions, and ranges from around 4 for the Malaysian and Thai

... and leverage ...

Characteristics of corporate credit guarantee institutions

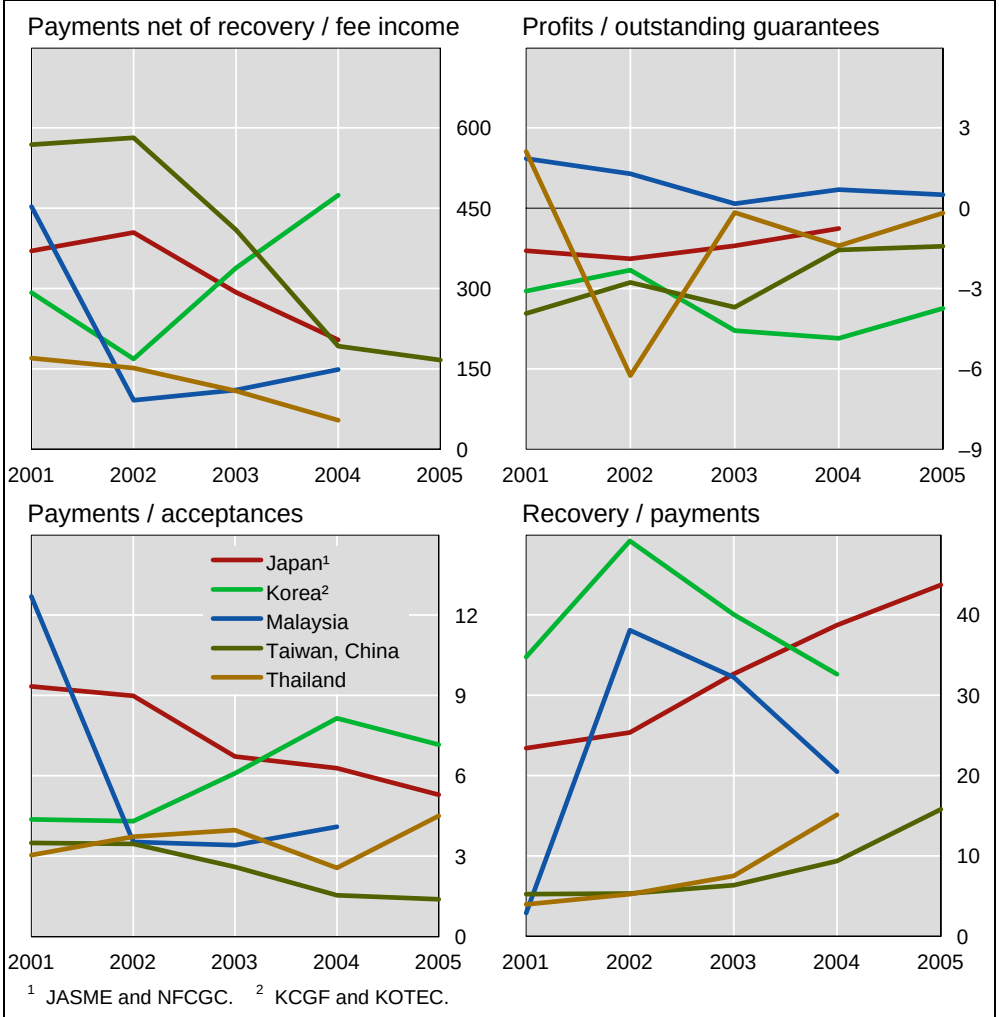
	Institution	Coverage ratio	Guarantee fee[1]	Maximum (actual) leverage ratio
Japan	JASME	70–80%	0.87%	No maximum (19.1, March 2005)
	CGCs	100%	1.25%,[2] 1.35%[3]	35–60 (18.6, March 2005)
Korea	KCGF	70–90% (usually 85%)	0.5–2% (risk-based)	20 (9.8, end-2005)
	KOTEC	70–90% (usually 85%)	0.5–2 % (risk-based)	20 (14.4, end-2005)
Indonesia	Perum Sarana	Max 75%	0.5–1.5% (risk-based)	20 (22.2, end-2004)
	Askrindo	50–70%	0.8–2%	. (6.9, end-2004)
Malaysia	CGC	30–100%	0.5–2%	No maximum (4.3, end-2005)
Taiwan, China	SMEG	70–100% (usually 80%)	0.75%, 1%, 1.25%, 1.5% (risk-based)	20 (20.6, end-2005)
Thailand	SICGC	Maximum 50%, or 50% of actual loss[4]	1.75%	5 (4.6, end-2005)

[1] Per annum. [2] With collateral. [3] Without collateral. [4] Depending on facilities.

Sources: ACSIC questionnaires; individual annual reports; BIS calculations. Table 1

Operating results of credit guarantee agencies

In per cent



¹ JASME and NFCGC. ² KCGF and KOTEC.

Sources: ACSIC questionnaires; individual annual reports; BIS calculations. Graph 2

institutions to around 20 for institutions from Japan, Indonesia (Perum Sarana) and Taiwan.

... but generally have shown ...

Most of the guarantee institutions have posted poor performance in recent years. Graph 2 summarises this performance on the basis of the following four ratios: payments (for defaulting credits) net of recovery divided by fee income; profits divided by outstanding guarantees; payments divided by newly accepted guarantees; and recovery divided by payments.

... lacklustre underwriting performance ...

Underwriting performance is measured by the ratio of payments net of recovery to guarantee fee income (Graph 2, upper left-hand panel). This is similar to the combined ratio used by industry analysts in the non-life insurance industry,[4] although it provides a more generous view because it does not include operating expenses in the numerator. In most countries, this ratio is

[4] The combined ratio indicates claims and operating expenses as a percentage of premiums. A ratio lower than 100% indicates an underwriting profit, ie premiums more than cover the cost of claims and operating expenses. A ratio higher than 100% indicates an underwriting loss.

considerably higher than 100%, implying that the institutions incur underwriting losses.

... and low profitability

The measure of profit per dollar of outstanding guarantee exposure, presented in the upper right-hand panel of Graph 2, captures the profitability of the guarantee institutions.[5] Note that, compared to the measure of underwriting performance, profits also incorporate investment income, other income and operating expenses. Except in Malaysia, where the ratio has been close to zero in recent years, the institutions have posted losses on their guarantee operations. Moreover, the level of profitability appears generally consistent with the underwriting performance of each country. The agencies in Korea have shown particularly weak and deteriorating profitability since 2002, partially due to the surge in the issuance of credit guarantees to weak venture firms in 2001.

The ratio of the payment of claims within a year to the amount of newly accepted guarantees within the same year can be used as a measure of the risk profile of credits accepted by the guaranteeing institution (Graph 2, lower left-hand panel). This ratio has been relatively high for Japan and Korea, at over 5% for the past few years, but has been low for Taiwan, at under 2%.[6]

Finally, the ratio of recovery to payments reflects not only the country-specific level of loss-given-default for loans but also how vigorously banks attempt to reclaim their assets in default. This ratio ranges between 3 and 50% for the institutions considered (Graph 2, lower right-hand panel). Since the loans carry at least a partial government guarantee, banks are likely to have a diminished incentive for diligence in this regard. As a result, many guarantee institutions have taken measures to induce banks to recover more from the defaulted loans. For example, CGCMB introduced recovery incentives such as rebates on recovery proceeds and sharing of legal fees for claims already paid by CGCMB. Under the Risk Participation Scheme in Thailand, SICGC is liable for 50% of the actual loss from the loan default, and banks for the rest. The recovery ratio has tended to increase since the beginning of the sample in 2001, suggesting that the institutions may have been making a greater effort to reduce losses.[7]

To compensate for the operational losses of these institutions, the shareholders have continued to contribute capital. In Japan, the CGCs' capital has been replenished by local governments, financial institutions and trade organisations. The central government has also contributed every year to JASME to compensate for its losses. In Korea, banks are currently required to contribute 0.25% per annum of their corporate loan balances in certain

[5] While public credit guarantee institutions do not necessarily aim at generating positive profits, the measure can nonetheless reflect in part the efficiency of operations.

[6] This ratio is subject to an "expansion bias". That is, since loans do not deteriorate immediately, when the new acceptance of guarantee exposures grows fast, the comparison of acceptances and payments within a year may underestimate the default risk.

[7] One caveat to this conclusion is that there is a lag between the payment of the guaranteed amount and recovery, so that the ratio may not provide a precise picture of the recovery effort in a particular year.

Box 1: Credit guarantee companies in China

In contrast to the other countries examined in this special feature, China does not have a centralised government institution providing credit guarantees to SMEs. As a result, only about 2.6% of all China's SMEs benefited from credit guarantees as of the end of 2005. Nevertheless, China does have about 3,000 local credit guarantee companies. China's first professional guarantee organisation was established in 1993. Since then, the SME credit guarantee industry has developed rapidly, especially following the measures introduced in August 2000 to encourage the further development of the credit guarantee system.

The number of guarantee organisations increased from 203 in 2000 to 2,914 at the end of 2005.[①] These companies operate at either the provincial level or the city level. About two thirds of them are privately owned, while the others are either fully or partly owned by local governments. The total amount of capital for these companies amounted to CNY 81.5 billion, with around a quarter being provided by local governments. The amount of SME loans guaranteed by the credit guarantee companies has increased rapidly since 2000. The amount of guarantees outstanding reached CNY 322.7 billion in 2004, and CNY 467,387 billion in 2005, or 2.0% and 2.6% of GDP in 2004 and 2005, respectively.

The guarantee companies in China provide different types of guarantees, including credit guarantees for SMEs, housing mortgage guarantees and export finance guarantees. However, credit guarantees for SMEs have been the most important line of business. Although the credit guarantee industry has expanded quickly, most of the guarantee companies are reportedly suffering from insufficient funds and accumulating losses.[②] As a way to overcome these problems, the National Development and Reform Commission in China has proposed establishing a National Fund for Development of Credit Guarantees for Private Enterprises (NCG). According to the plan, NCG is expected to attract funding from loans and grants from international donors and capital contributions by private enterprises, and its business will be to support credit guarantee companies through equity investment, loans, co-guarantees and re-guarantees.[③]

[①] Zhou (2006). [②] Invest in China (2005). [③] ADB (2005).

categories to KCGF and 0.15% to KOTEC. The Korean government also contributes to KCGF and KOTEC every year from the national budget.

How does the performance of the guarantee institutions relate to their distinguishing characteristics described above? For one, there appears to be an inverse relationship between profitability and the degree of guarantee coverage. This suggests that lower-quality loans tend to be accepted the greater the guarantee. For instance, in 2004 observations across institutions, there is a statistically and economically significant positive correlation (0.43) between the coverage ratio and the ratio of payments out of newly accepted claims. In addition, there is (weaker) evidence that greater risk-taking through higher leverage in guarantee extension is associated with greater realised losses; the coefficient of correlation between the leverage ratio and the ratio of profits to credit guarantees outstanding in 2004 is –0.16.

Securitisation of SME loans with public credit enhancements

Government also provides credit enhancements ...

In addition to directly guaranteeing individual loans, credit guarantee institutions can facilitate their securitisation and provide so-called credit enhancements to these securitised products. The credit quality of asset-backed securities (ABSs) depends on the performance of the underlying assets and the credit enhancements attached. To protect investors from the credit risk of the

underlying assets, ABS structures typically include several kinds of credit enhancements.[8] Through credit enhancements, ABS originators can attain a higher credit rating and a lower rate of interest on the related bond issues.

... to SME debt securitisation ...

CBOs and CLOs backed by SME debt have gained popularity as an asset class globally in recent years.[9] SME CLOs have been used in Europe since the 1990s, especially actively in countries such as Germany and Spain. In Asia, where the market is of more recent vintage, only a few countries have actively used SME CBOs and CLOs to date. In particular, government institutions in these countries have played an important role in providing credit enhancements to these early securitisations. In this subsection, we focus on SME CBO and CLO transactions in Japan and Korea.[10] Park et al (2005) project that, between 2008 and 2013, there will be increasing demand for securitisation of SME loans in Asian countries, most of which seems likely to occur in China, Japan and Korea.

... actively in Japan ...

In Japan, CLOs backed by loans to SMEs have been growing fast for the past several years, with a large part of them being initiated and guaranteed by the government institutions. Local governments such as the Tokyo Metropolitan Government (TMG) have been very keen to support CLO and CBO issuance by SMEs. Between 2001 and 2004, TMG issued CLOs and CBOs five times to provide in total over JPY 380 billion to approximately 9,000 companies. Since then, JASME has started Securitisation Support Programs. In particular, JASME provides partial guarantees of new unsecured loan claims that banks extend to SMEs and supports their securitisation effort. The Bank of Japan also purchased SME-related ABSs and asset-backed commercial paper in 2003 and 2004. This policy was intended to ensure the smooth flow of corporate finance to SMEs and improve SMEs' access to credit by accelerating the development of ABS markets (Hirata and Shimizu (2004)).

... and Korea

In Korea, following the financial crisis, securitisations were actively used for corporate financing, with guarantees provided by KCGF, KOTEC and the Small Business Corporation (SBC). The first issuance of CBOs by SBC in 2000 was driven primarily by the urgent need for the government to provide funds to SMEs and alleviate extremely tight credit conditions. Since then, issuance has become quite frequent with the range of underlying assets expanding sharply, and CBOs have been issued in both domestic and foreign currencies. From 2000 to 2005, SBC issued CBOs based on SME debts totalling KRW 2 trillion (approximately USD 2 billion) to almost 700 SMEs.

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[8] Internal credit enhancements include excess spread, subordination, overcollateralisation, put-back options and originator's guarantees. External credit enhancements refer to financial guarantees, called "wraps", provided by banks or financial guarantee institutions, and short-term loans provided by banks to special purpose vehicles with guarantees for these loans offered by credit guarantee institutions.

[9] For the structures and techniques of CBOs and CLOs in Asia, see Gyntelberg and Remolona (2006).

[10] Singapore also launched in 2006 an SME loan securitisation called SME CreditAssist (Singapore) Ltd, with the equity tranche (unrated subordinated notes, 17%) fully subscribed by its sponsors, the Standards, Productivity and Innovation Board of Singapore and the Development Bank of Singapore. For details, see Gyntelberg and Remolona (2006).

Such CBO issuance was strongly dependent on credit enhancements. The average credit ratings of the entities behind the SBC-issued CBOs were between B+ and BB–, well beyond the risk appetite of many investors. While around 15–20% of the CBOs issued by SBC consisted in equity tranches, this was not enough to ensure a AAA rating for senior tranches. Thus, banks and guarantee institutions provided additional credit enhancements. For example, the Korea Development Bank, SBC, the Industrial Bank of Korea and the Japan Bank for International Cooperation have provided guarantees to senior notes issued by securitised funds to help foreign capital finance Korean SMEs.

Policy lessons from troubled guarantee companies

As discussed above, inherent incentive and informational problems complicate the management of corporate credit guarantee systems. This section attempts to summarise the policy lessons drawn from two specific examples of guarantee schemes that ran into trouble in the late 1990s. These lessons can be broadly classified into those relating to the internal risk management and governance of the guarantee system, and those relating to the function of the system in the overall financial structure of an economy.

Internal risk management and governance[11]

Guarantee systems offer a facility to spread risks across a large number of borrowers, but are not fail-proof. To be sure, individual lenders may not be able to achieve a sufficient degree of diversification on their own because of limits to their size or their geographical scope, or their inability to withstand losses over the business cycle. At the same time, guarantee schemes can be vulnerable to concentration risk, as illustrated by the recent failure of Asia's first regional guarantee company, ASIA Ltd, established in Singapore (see Box 2).

The experience of ASIA Ltd emphasises ...

The failure of ASIA Ltd can be traced to a number of weaknesses in its structure. First, ASIA Ltd was structured to obtain an A credit rating, which proved to be too low to withstand the Asian financial crisis and conduct credit guarantee business outside the region. Second, in the aftermath of the crisis, a dispersed shareholder base made it difficult to coordinate its recapitalisation. Finally, the concentration of its business in selected Asian countries implied high correlation risk.

... the importance of strong capitalisation ...

Since 2003, the Asian Bond Market Initiative (ABMI) Working Group on Credit Guarantee and Investment Mechanisms under ASEAN+3 has been studying how best to set up a regional guarantee mechanism which is commercially viable and publicly owned (ABMI (2006)). The new plan by ABMI attempts to avoid some of the problems that contributed to the failure of ASIA Ltd. The new regional guarantee entity will aim at having a stronger capitalisation than ASIA Ltd, in order to obtain a AAA rating. In addition, plans are for the entity to be housed within the ADB, or set up as an independent multilateral organisation with clear procedures for recapitalisation, either of

[11] The information in this subsection is mainly drawn from Oh and Park (2004) and Standard & Poor's Rating Services (2001).

Box 2: Two cases of credit guarantee company failure in Asia

Asian Securitisation and Infrastructure Assurance Ltd (ASIA Ltd) was set up in 1995 in Singapore as Asia's first regional credit guarantee company. ASIA Ltd invested mostly in sovereign, asset-backed, infrastructure and financial institution debt obligations. Geographically, 78% of its portfolio was within China, Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines and Thailand.[①] Its major shareholders were both private and public entities.[②] The financial crisis in 1997 put the company under severe stress. Despite paying out only a limited amount of claims between 1997 and 2001, non-investment grade exposures reached about 40% of its risk portfolio. This resulted in a downgrade of its liabilities in January 1998, and its shareholders were unable to agree on the terms of a recapitalisation plan, owing to different views over the broadening of its geographical coverage. Subsequently, the company ran down its assets and was liquidated in 2005.

The Korea Guarantee Insurance Company and the Hankook Fidelity and Surety Company had guaranteed corporate bonds issued mainly by large corporations in Korea in the mid-1990s. The financial crisis and the surge in corporate defaults in 1997 and 1998 led to their failure. They were subsequently merged into the Seoul Guarantee Insurance Company in November 1998, after the injection of government funds.

[①] The remaining portfolio was in the United States, the United Kingdom, Japan and the Inter-American Development Bank. [②] CapMAC Asia Ltd, Apmac Investment Pte Ltd, Asian Development Bank, Employees Provident Fund of Malaysia, American International Assurance Co Ltd, Kookmin Bank, etc.

which will allow coordination problems in the event of recapitalisation to be more easily resolved.

... and adequate risk management

Given the high level of correlation risk within Asia, the insurance premiums charged for regional guarantees will need to correctly incorporate the correlation risk. Moreover, the capital buffer should be large enough to withstand a large negative regional shock. In this sense, it may be desirable for the new plan to take a conservative approach and strictly limit exposures to each country based on their ratings (Oh and Park (2004)).

Another potential problem is how to maintain equitable coinsurance payments among different countries. Persistent losses to the system generated by exposures to a specific country might test the political willingness of other participant governments to inject new capital on the basis of original shareholdings. In the medium term, the country that is experiencing stress might be forced also to lead the recapitalisation effort.

Role in financial structure

Another set of issues relates to the need for guarantee programmes to be structured in a way that mitigates problems of moral hazard and that provides incentives for borrowers to graduate to guarantee-free financing over time. Here it is important for policymakers to encourage the development of a private corporate credit guarantee industry, supported by the development of financial market infrastructure including credit rating systems and accounting standards.

Failures of credit guarantee companies in Korea ...

The experience in Korea after the closure of two guarantee companies in 1997 and 1998 highlights the risks of the excessive dependence of borrowers on credit guarantees (see Box 2). Immediately after the financial crisis began in 1997, Korean banks and two private guarantee companies were unable and unwilling to provide new guarantees on corporate bonds. This happened despite an emergency measure under which the deposit insurance system protected almost all liabilities of Korean financial institutions, including the credit guarantees provided by the two private companies. Later, in August 1998, the deposit insurance system discontinued support for bonds guaranteed by the two companies.

As a result of the unavailability of bond guarantees, corporate bond issuance had to shift to a mostly non-guaranteed basis. Whereas in the fourth quarter of 1997 guaranteed bond issuance accounted for over 90% of total issuance, by the fourth quarter of 2001 the share had sunk to less than 1% (Table 2). Initially, only companies with the highest ratings retained access to the bond market. Gradually, however, companies of intermediate credit quality were also able to issue bonds. In contrast to the period before 1997, spreads on these bonds reflected more accurately the creditworthiness of the issuers.

... highlight the difficulty of graduating from guarantees

Securitisation played a key role in the transition to this new stage in the development of the Korean bond market. During the same period, as the issuance of corporate straight bonds decreased, the issuance of ABSs increased significantly (Table 2). In large part, this was because public credit guarantees continued to be widely available in the ABS market, as discussed above. Therefore, even though the Korean corporate bond market was transformed to mostly non-guaranteed bonds, active provision of credit guarantees by the government – largely for structured securities – continued at least for a few years after the 1997 crisis.

Development of the Korean corporate bond and ABS[1] market, 1997–2001

In trillions of won

	1997	1998	1999	2000	2001
Issuance					
Corporate straight bonds	34.3	56.0	26.3	17.7	40.1
ABSs	0	0	4.4	41.0	39.6
Total	34.3	56.0	30.7	58.7	79.7
Amounts outstanding[2]					
Corporate straight bonds	90.1	122.7	115.2	89.9	83.0[3]
ABSs	0	0	4.4	43.7	65.1[3]
Total	90.1	122.7	119.6	133.6	148.1[3]
Share of issuance of corporate straight bonds with guarantees[4]	92.6	2.8	8.1	1.5	0.9

[1] ABSs include primary CBOs, secondary CBOs, CLOs, credit card ABSs, lease ABSs and NPL ABSs. [2] Year-end. [3] End-November 2001. [4] Share of total issuance of corporate straight bonds in the fourth quarter of each year, in per cent.

Source: Bank of Korea (2002). Table 2

In sum, the shift from bond guarantees by banks and credit guarantee companies to government guarantees on ABS transactions between 1997 and 2001 in Korea shows how difficult it can be for financial markets to reduce their dependence on credit guarantees.[12] The government had to provide temporary credit guarantees in many forms until the financial markets became more settled. This experience also underscores the importance of complementing government policies with the promotion of financial market infrastructure, such as credit rating systems and accounting standards.

Even with securitised structures, governments need to be cautious in providing credit enhancements. A tranching structure can mitigate moral hazard problems, since the interests of the sponsor can then be aligned with those of the CBO investors (IAIS (2003)). However, since the purchase of equity tranches by guarantee institutions can diminish the beneficial effects of the incentives of tranching structures, additional devices to restore the right incentives for banks and borrowing firms may be needed.[13] Furthermore, when banks originate new loans with eventual securitisation in mind, these loans may be screened and monitored less carefully. The problem might become more severe if banks know that a guarantee institution will hold the equity tranche.

Conclusion

In many Asian countries, government institutions have played an important role in providing credit guarantees for corporate debt. This has been accomplished either through direct guarantees of loans and bonds, or through credit enhancements to ABS transactions. In China, by contrast, private companies are the principal providers of corporate credit guarantees. The cross-country evidence suggests that credit guarantee institutions that are highly leveraged, provide close to complete guarantees for loans, or offer a large amount of credit guarantees relative to GDP, tend to exhibit poor underwriting performance and profitability. The historical performance of credit guarantee systems highlights the importance of guarantors having sufficient capitalisation and prudent risk management practices. At the same time, it underscores the difficulty for the financial market in moving away from credit guarantees.

[12] Moreover, the investors in Korean credit card ABSs were protected indirectly by the Korean government during the credit card crisis. This also confirms the difficulty of weaning the bond market away from credit guarantees (Moreno (2006)).

[13] Recent CBO issuance in Korea sheds some light on how this might be done (Small and Medium Business Administration (2005)). In one case, borrowing firms were required to purchase a mezzanine tranche to increase their stake in the securitised credit. In another fund, the mandatory purchase of a mezzanine tranche varied between 0 and 8% depending on the credit rating of the firm. This second device was intended to discourage very risky credits from joining the borrowing pool as free riders.

References

Askrindo, CGCMB, JASME, KCGF, KOTEC, NFCGC, Perum Sarana, SICGC and SMEG (2005): *Questionnaires on credit supplementation system*, Asia Credit Supplementation Institution Confederation.

Asian Bond Market Initiative (2006): *ABMI WG Progress Report [March 2006]: WG 2 [Credit guarantee and investment mechanisms]*.

Asian Development Bank (2005): "People's Republic of China: national fund for development of credit guarantees for private enterprises", *ADB Technical Assistance Report*, December.

Bank of Korea (2002): *Change in the structure and behaviour of Korean bond market after the financial crisis*, January.

Chin, Y and Y Park (2005): *The services of Korea Credit Guarantee Fund*, presentation at the Workshop on SME Credit Guarantee Systems, World Bank.

Gyntelberg, J and E Remolona (2006): "Securitisation in Asia and the Pacific: implications for liquidity and credit risks", *BIS Quarterly Review*, June, pp 65–75.

Hirata, H and T Shimizu (2004): "Purchase of SME-related ABS by the Bank of Japan (updated): monetary policy and SME financing in Japan", *Bank of Japan Working Paper no 04-E-1*, February.

International Accounting Standards Board (2004): *Financial instruments: financial guarantee contracts and credit insurance*, project updates, October.

International Association of Insurance Supervisors (2003): *IAIS paper on credit risk transfer between insurance, banking and other financial sectors*, presented to the Financial Stability Forum, March.

Invest in China (2005): *Warranties industry development of year 2004*, 15 July.

Moreno, R (2006): "The changing nature of risks facing banks", in *The banking system in emerging economies: how much progress has been made?*, *BIS Papers,* no 28 (August), pp 67–98.

Nuonome, A (2005): *The credit supplementation system in Japan*, presentation at the Workshop on SME Credit Guarantee Systems, World Bank.

Oh, G and J Park (2004): "Creation of a regional credit guarantee mechanism in Asia", in *Asian bond markets: issues and prospects*, *BIS Papers,* no 30 (November), pp 224–40.

Park, J, G T Oh and M H Lee (2005): *ASEAN+3 regional guarantee mechanism*, Korea Institute of Finance (in Korean).

Small and Medium Business Administration (2005): "Issuances of subcontractor ABS 1st and 2nd", press releases, 5 and 12 September (in Korean).

Standard & Poor's Rating Services (2001): Bond Insurance Book.

Tawee, N (2005): *Credit guarantee system in Thailand*, presentation at the Workshop on SME Credit Guarantee Systems, World Bank.

Zhou, P (2006): *SME credit guarantee industry development report*, presented at the 7th National Joint Conference of Leaders of SME Credit Guarantee Organisations, June (in Chinese).

Blaise Gadanecz

+41 61 280 8417
blaise.gadanecz@bis.org

Recent initiatives by the Basel-based committees and the Financial Stability Forum

During the period under review, the Basel Committee on Banking Supervision (BCBS) organised the 14th International Conference of Banking Supervisors in association with the Mexican Banking and Securities Commission. One important outcome of that meeting was the endorsement of a revised version of the Core Principles for Effective Banking Supervision and the associated Methodology. The Joint Forum published a paper on High-level Principles for Business Continuity, and the Financial Stability Forum (FSF) held its 16th meeting in Paris. Table 1 provides a summary of these and other initiatives.

Basel Committee on Banking Supervision

In September 2006, the BCBS provided clarification on the IRB use test. In October 2006, it acted as co-sponsor of the International Conference of Banking Supervisors in Mérida, Mexico, and released a paper on the observed range of practice in key elements of Advanced Measurement Approaches (AMA).

BCBS provides clarification on the IRB use test …

In a newsletter published in September 2006, the Committee provided background on the evolution of its thinking on the *IRB use test*[1] and clarified expectations for the use of IRB components and risk estimates for internal purposes. It presented a number of principles intended to support banks and supervisors in interpreting the key use test provisions of the Basel II framework. The principles state that banks are responsible for demonstrating their compliance with the use test, and highlight the role of the material use of IRB components as a catalyst for quality control. They discuss consistency and differences between IRB components and internal measures and recommend that banks follow a holistic approach when assessing the overall compliance of their institution with the use test requirements.

At the International Conference of Banking Supervisors (ICBS) held in Mérida, Mexico, on 4–5 October 2006, bank supervisors from central banks and supervisory agencies in 120 countries endorsed the updated version of the

[1] The IRB use test is a concept intended to test whether banks' IRB components (PD, EAD and LGD, which the Basel II framework requires banks to use for the calculation of regulatory capital) "play an essential role" in how banks measure and manage risk in their businesses.

Main initiatives by Basel-based committees and other bodies

Press releases and publications over the period under review

Body	Initiative	Thematic focus	Release date
BCBS	*The IRB use test: background and implementation*	• Background on the evolution of the Basel Committee's thinking on the use test for IRB; expectations for the use of IRB components and risk estimates for internal purposes	September 2006
	International Conference of Banking Supervisors	• *Core Principles for Effective Banking Supervision* • *Core Principles Methodology* • Presence of international banks in domestic markets and the implementation of Basel II	October 2006
	Observed range of practice in key elements of Advanced Measurement Approaches (AMA)	• Cross section of practices observed by supervisors in relation to some of the key challenges in the operational risk-related work of banks targeting the AMA • Particular focus on internal governance, data and modelling	
Joint Forum	*High-level principles for business continuity*	• Final version of consultation document issued in December 2005	August 2006
FSF	*Sixteenth FSF meeting in Paris*	• Global risks and vulnerabilities • Mitigation of risk in financial systems • Enhancing the effectiveness of regulation and standard-setting • Follow-up of ongoing concerns: avian flu pandemic and business continuity, offshore financial centres, and international accounting and auditing issues	September 2006
	Establishment of the International Forum of Independent Audit Regulators		

Source: Relevant bodies' websites (www.bis.org). Table 1

Core Principles for Effective Banking Supervision and of the associated *Core Principles Methodology*. They declared their continued support for the implementation of international minimum standards for bank supervision in all countries. Both documents had been issued for public comment in April 2006.[2]

… and updates Core Principles for Effective Banking Supervision

The revision of the Core Principles, originally published by the Committee in September 1997, was a response to changes which have occurred in banking regulation and to the experience gained by individual countries with implementing the Principles. Furthermore, new regulatory issues, insights and gaps have become apparent, often resulting in new Committee publications. The Principles fall into seven broad categories: objectives, independence,

[2] See "Recent initiatives by Basel-based committees and the Financial Stability Forum", *BIS Quarterly Review*, June 2006.

powers, transparency and cooperation (principle 1); licensing and structure (principles 2 to 5); prudential regulation and requirements (principles 6 to 18); methods of ongoing banking supervision (principles 19 to 21); accounting and disclosure (principle 22); corrective and remedial powers of supervisors (principle 23); and consolidated and cross-border banking supervision (principles 24 and 25). The revisions pay particular attention to sound risk management and corporate governance practices and cover common aspects across different risk types. The criteria for assessing interest rate, liquidity and operational risks have been enhanced; those dealing with the fight against money laundering and terrorist financing as well as fraud prevention have also been strengthened. In addition, cross-border and cross-sectoral trends and developments are reflected more comprehensively, as is the need for closer cooperation and information exchange between supervisors of different sectors and countries. The review also stresses the importance of the independence, accountability and transparency of bank supervisory authorities.

Participants at the ICBS also discussed issues arising from the growing presence of international banks in domestic markets. This second theme included, but was not limited to, issues arising from the implementation of the Basel II capital framework.

Release of paper on observed range of practice in key elements of AMA

On 13 October 2006, the BCBS released a paper entitled *Observed range of practice in key elements of Advanced Measurement Approaches (AMA)*. Despite the flexibility provided to banks in the development of an AMA, in recognition of the evolutionary nature of operational risk management, prudential supervisors have an interest in identifying and encouraging bank operational risk practices that are consistent with safety and soundness and level playing field objectives. Furthermore, the industry has, at various times, encouraged the Accord Implementation Group (AIG) and its subgroups to establish and maintain high standards for what constitutes acceptable practice and to publish "sound practice" papers to communicate those standards and promote consistency across jurisdictions. Against this background, the paper describes a cross section of the practices supervisors have observed in banks attempting to deal with operational risk issues under the AMA. It was prepared by the Operational Risk Subgroup (AIGOR) of the AIG.

No judgment is intended or implied regarding the acceptability of any of the practices reflected in this paper. For example, the fact that a particular practice is discussed should not be interpreted as an endorsement of that practice by the AIGOR or any of its members. Nor should the absence of a particular practice be interpreted to imply that it is, or is not, considered acceptable by supervisors. The principal purpose of the paper is to catalogue the key issues and corresponding practices observed among AMA banks operating in AIGOR member countries. As such, the paper provides the international community of bank supervisors with a means of framing the discussion of acceptable practice in both the management and the measurement of operational risk and monitoring the evolution of industry practice and supervisors' reactions. It is also expected to be a valuable resource for both banks and national supervisors to use in their respective implementation processes.

Joint Forum

Joint Forum publishes paper on high-level principles for business continuity …

On 29 August, the Joint Forum published a paper entitled *High-level principles for business continuity.* A consultative draft of the paper had been issued for comment in December 2005.[3] The document promotes a common base level internationally for the resilience of financial systems to major operational disruptions. It provides authorities with a broad framework for developing business continuity arrangements that are more closely tailored to their unique sectoral and local circumstances. The principles outlined in the paper apply to both financial industry participants and financial authorities and are applicable across the banking, securities and insurance sectors.

… setting out seven principles …

The paper sets out seven principles for business continuity covering the following specific areas: board and senior management responsibilities; incorporating the risk of major operational disruptions into business continuity plans; recovery objectives; communications; the special case of cross-border communications; testing; and business continuity management reviews by financial authorities.

… and taking account of comments received

In response to the comments received on the consultative draft, a number of changes were incorporated in the final paper. In particular, the definition of a "major operational disruption" was expanded beyond events causing widespread damage to the physical infrastructure to include other risks such as pandemics and technology viruses. The dependence of financial authorities and financial industry participants on third parties for important aspects of their business continuity was also acknowledged, along with the corresponding implications for an organisation's communication procedures. It was also recognised that employees' availability might be reduced if their families were directly affected by the same event. The involvement of business line management in establishing recovery objectives was noted and expectations for the recovery objectives of critical market participants were clarified. Finally, the paper now notes that it could be beneficial to designate a "coordinator" to facilitate communication among relevant financial authorities during a major operational disruption affecting a group where the oversight responsibilities for the group are shared.

Financial Stability Forum

In September 2006, the Financial Stability Forum held its 16th meeting. Representatives of the FSF also attended a roundtable in Paris where the International Forum of Independent Audit Regulators was inaugurated.

At the *16th FSF meeting* on 6 September in Paris, FSF members discussed risks and vulnerabilities in the international financial system and reviewed ongoing work to strengthen financial system stability and resilience. Particular attention was paid to firms' risk management practices, to improvements in the infrastructure for over-the-counter (OTC) derivatives, and

[3] See "Recent initiatives by Basel-based committees and the Financial Stability Forum", *BIS Quarterly Review*, March 2006.

to enhancing the effectiveness of regulation and standard-setting. The Forum also discussed other ongoing concerns such as business continuity, offshore financial centres (OFCs), and international accounting and auditing issues.

Favourable economic outlook noted at 16th FSF meeting, despite some concerns

The FSF noted that the economic outlook remained broadly supportive of financial stability, given financial firms' strong balance sheets and their ability to adjust to the ongoing removal of accommodation in monetary policy in many countries and to shifts in the balance of demand among the major economies. However, members pointed to several areas of concern. These included whether households in some countries had the capacity to manage rising debt levels, the rapid pace of leveraged buyouts and debt-financed acquisitions, the growing complexity of financial instruments, and persistent global current account imbalances. Financial market participants need to take account in their risk analysis and pricing of the full implications of a possible reversal of the current benign conditions, including more volatile and less liquid markets.

The FSF encouraged financial firms to further strengthen their risk management practices. The need to run stress test scenarios involving low-probability, high-impact events or in which several vulnerabilities crystallise in combination was seen as particularly important.

Members also reviewed issues concerning the infrastructure for OTC derivatives, as well as the growing role of hedge funds and implications for counterparty risk management. They welcomed progress by financial firms in improving the trading and settlement infrastructure for credit derivatives, particularly in reducing backlogs of outstanding confirmations, and in further strengthening counterparty risk management relating to complex products. The recent good cooperation between the private and public sectors in addressing these problems provides a model for future work in other areas. Nevertheless, there is need for further progress in improving the infrastructure of these rapidly growing market segments, particularly in such areas as the automation of trade processing and settlement. More generally, members stressed the importance of developing reliable valuation practices for illiquid products.

Progress on credit derivatives settlement, but scope for further improvements in this area …

… and in hedge fund counterparty risk management

Concerning hedge funds, the Forum stressed the importance of financial firms maintaining appropriate margining practices and guarding against any weakening of credit standards in prime brokerage and other counterparty relationships. Hedge funds themselves should make further progress in strengthening risk management practices.

As part of the ongoing dialogue with market participants, members exchanged views with representatives of the Institute of International Finance (IIF) on how regulation could be made more effective and efficient, and discussed ways to further enhance the dialogue between regulators and the financial industry. The Forum welcomed the IIF's efforts in this regard and recognised that financial services firms and regulators share a common view of the principles that underlie good regulatory practice. Noting the existing example of effective interaction discussed above, the FSF encouraged the IIF and other private market participants to raise issues of market weakness and other important regulatory issues that warrant the attention of regulators.

Stocktaking on standard-setting arrangements

With regard to international standard-setting practices, members took stock of the standard-setting arrangements employed by the key standard-

setting bodies (SSBs). Members felt that this stocktaking exercise would be useful to SSBs over time as they review their arrangements. The FSF welcomed the development of an Insolvency and Creditor Rights (ICR) Assessment Methodology by World Bank and UNCITRAL[4] staff. Members looked forward to the completion of a concise, unified ICR standard to help facilitate participation in the ROSC[5] process. Members agreed that the FSF should place on its website an overview by the FSF Secretariat of major international regulatory initiatives, and the timing of their implementation, in order to inform regulators and other stakeholders of what might be in the international regulatory pipeline so as to help avoid any potential bunching of initiatives.

The FSF also followed up on other ongoing concerns relating to business continuity, OFCs, and international accounting and auditing issues.

Further progress on business continuity …

Regarding international cooperation between financial authorities in safeguarding business continuity in the event of an avian flu pandemic, members encouraged financial industry participants and authorities to make use of the Joint Forum's high-level principles for business continuity (see page 102). A workshop on planning and communication for financial crises and business continuity incidents would be hosted by the FSF and the UK authorities in November.

… and in OFCs

The FSF's OFC Review Group is continuing to monitor progress by FSF member bodies which are working with OFCs to improve cross-border cooperation and exchange of information. The FSF noted the progress made in some OFCs and urged its member bodies to continue their efforts, including monitoring the progress achieved to improve international cooperation, notably with IOSCO and the IMF.

Review of recent international accounting and auditing developments

Members reviewed recent international accounting and auditing developments. These included the need to achieve more consistent interpretations of International Financial Reporting Standards (IFRS), and the IASB's "standard-setting pause" under which no major changes to IFRS will become effective until 2009. They welcomed work on convergence and harmonisation under way between the IASB, the US FASB and other authorities. Members reiterated the important role that high financial accounting and reporting standards play in safeguarding financial stability, and expressed concern about some recent incidents that raised questions about the quality controls in place within global accounting firms. The concentration of audit services for large companies at the four largest audit firms was in any event also thought worrisome. Against this background, the FSF welcomed the proposal to create an International Forum of Independent Audit Regulators.

Drawing on the discussions at the meeting, the FSF chair *reported* to the International Monetary and Financial Committee and the G7 Ministers and Governors in Singapore on 16–17 September.

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[4] United Nations Commission on International Trade Law.

[5] Reports on the Observance of Standards and Codes.

Establishment of an International Forum of Independent Audit Regulators

Since September 2004, the FSF has encouraged national audit regulators to meet to exchange experiences and improve communication and coordination in ways that could enhance and bring more global consistency to audit oversight and audit quality. At a meeting of national audit regulators in Paris on 15 September 2006, an *International Forum of Independent Audit Regulators* (IFIAR) was established. Its objectives are: to share knowledge of the audit market environment and exchange practical experiences of independent audit regulatory activity; to promote collaboration in regulatory activity; and to provide a focus for contacts with other international organisations which have an interest in audit quality.

The meeting was attended by national audit regulators as well as international organisations and groupings, including the FSF. At the request of the audit regulators, the FSF provided assistance with the establishment of IFIAR and gave presentations at the meeting in support of IFIAR's audit quality objectives.