

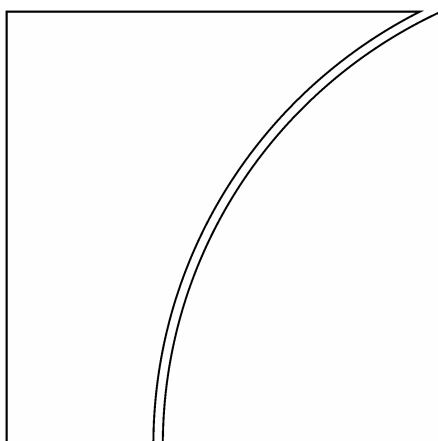


BANK FOR INTERNATIONAL SETTLEMENTS

# BIS Quarterly Review

December 2005

International banking  
and financial market  
developments



BIS Quarterly Review  
Monetary and Economic Department

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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 or negligible
\$	US dollar unless specified otherwise

Differences in totals are due to rounding.

## 1. Overview: inflation outlook unnerves investors

A deterioration in the outlook for inflation unnerved investors around the world in September and October. Upward pressure on consumer prices, resulting in part from high energy prices, prompted central bankers in the United States and the euro area to signal that monetary policy might need to be tightened to contain inflation expectations. Consequently, investors revised upwards their expectations regarding future policy rates. This led to higher bond yields in the major markets. Nevertheless, long-term yields remained low compared to their 2004 highs.

The prospect of a faster pace of monetary tightening contributed to a sharp drop in equity prices around the world in early October. But they rebounded strongly in November, boosted by signs of still robust growth in the United States as well as announcements of mergers, share buybacks and dividend increases. Japan outperformed most other equity markets throughout this period. There, an incipient recovery in domestic demand heightened the prospect of an end to years of deflation.

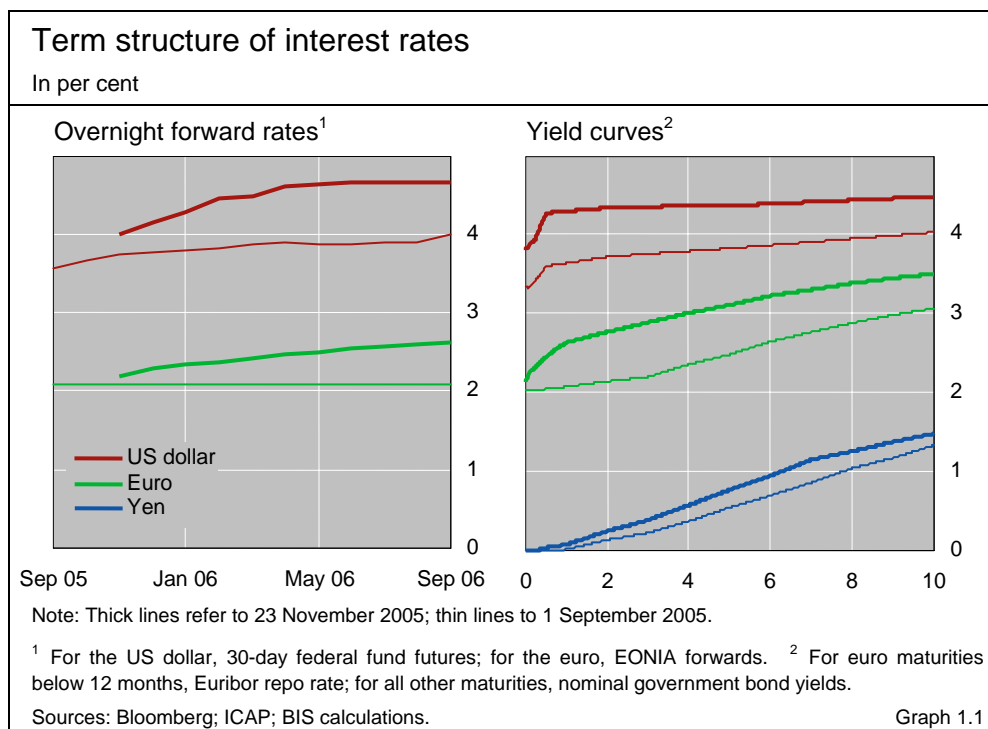
While emerging market spreads moved in tandem with equity markets, corporate spreads appeared to decouple. In contrast to equity and emerging markets, corporate bond markets never fully recovered from the sell-off earlier in 2005. And in November spreads widened even as equities rallied. This divergence largely reflected concerns about the impact that the growing number of shareholder-friendly actions might have on corporate credit quality.

### Investors revise upwards their policy rate expectations

Long-term yields  
rise steadily ...

Long-term interest rates rose steadily in many markets in September and October. Between 1 September and 23 November, yields on 10-year government bonds in the United States and Germany rose by about 45 basis points, and in Japan by 15 basis points (Graph 1.1). This followed a decline in yields in August, which in some markets had taken long-term rates close to their cyclical low (Graph 1.2).

Yields retreated slightly in November, and at the end of the month it was still unclear whether the recent rise in yields would prove as ephemeral as previous increases. Since June 2004, when the monetary tightening cycle in the United States began, increases in long-term yields have tended to be quickly followed by equally large, if not larger, declines. US dollar yields came



close to breaking out of the range in which they have been trading for the past year. They rose to almost 4.7% on 4 November, only 20 basis points below their June 2004 high, before falling back. Bund yields, by contrast, remained below even their levels in early 2005. JGB yields briefly climbed above 1.6% in early November, their highest mark since September 2004.

In September and October, two-year yields rose almost as much as longer-term yields (Graph 1.1). This suggests that the increase in longer-term yields mainly reflected upward revisions to interest rates over the near term. Whereas in early September investors had expected the US Federal Reserve to pause at 4%, by November investors were looking for the Fed to raise rates to at least 4.75% by mid-2006. In the euro area, the ECB had been expected to leave rates unchanged in 2006, but by November investors were expecting 50 basis points of tightening by mid-2006. In Japan, investors attached a high probability to an end to the zero interest rate policy by late 2006.

A series of positive macroeconomic surprises contributed to the changed expectations regarding policy rates. Especially in Japan, investors focused on accumulating evidence of a recovery in domestic demand. Alone among the major economies, analysts' forecasts for Japanese economic growth were revised up significantly in the third quarter (Graph 1.3). The improving outlook put upward pressure on government yields.

In the euro area too, the economic outlook brightened. For example, in September and October the German IFO and ZEW business confidence surveys were stronger than expected. As a result, US macroeconomic news was a less important driver of euro yields than it has been at times in the past. Supported by the improving outlook, euro yields were unchanged between 4 and 23 November, whereas long-term dollar yields declined by about 20 basis points over the same period.

... on the back of higher expected policy rates

Stronger domestic demand in Japan

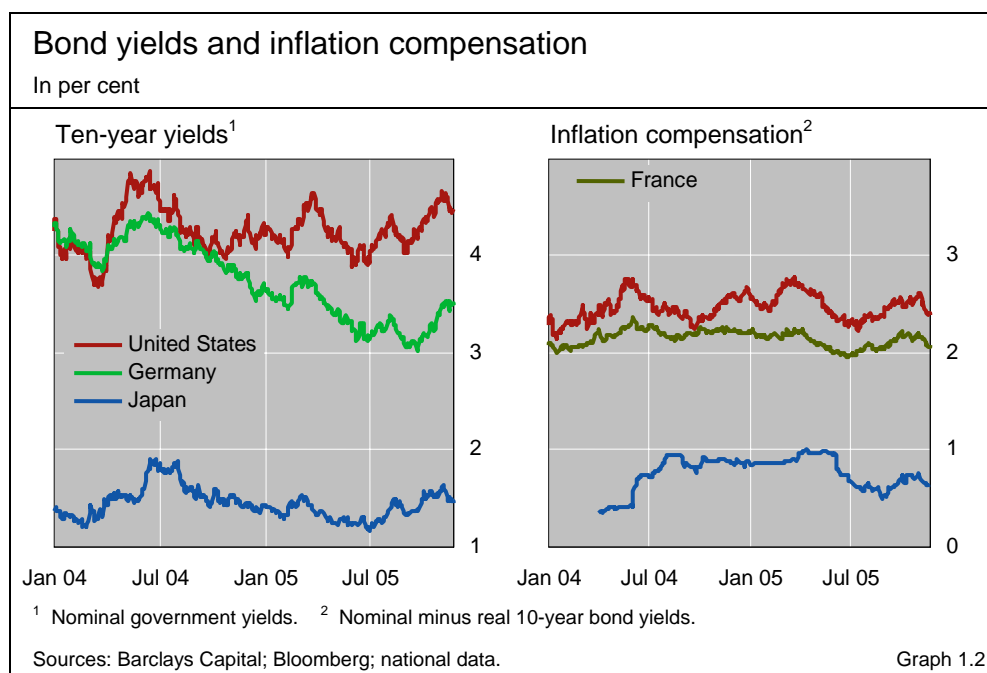
Impact of hurricanes is limited

In the United States, hurricanes had a smaller impact on economic growth than initially foreseen. The expected pause in rate hikes that had been priced in when Hurricane Katrina made landfall in late August was gradually reversed in September. In late September, Hurricane Rita wrought less damage than had first been feared. A much stronger than expected non-farm payrolls report on 7 October confirmed the resilience of the economy. Yet, the report elicited a weaker reaction than normal in bond markets. In fact, US dollar yields declined slightly on that day even though the surprise exceeded 100,000 jobs. This suggests that bond investors attached less importance to labour market conditions than they had earlier in the recovery.

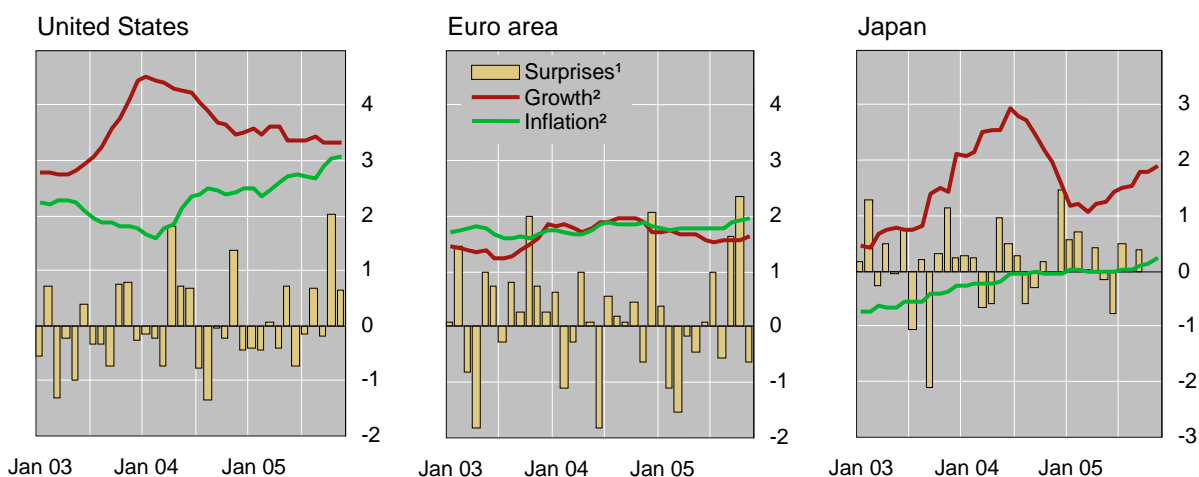
Concerns over inflationary pressures

Instead, the potential for rising energy costs to add to inflationary pressures was a key focus of investors' attention. While oil prices came down from the record highs reached in late August during Hurricane Katrina, in September they remained about 30% above their year-earlier levels. The increase in the prices of refined products was even larger. Such increases contributed to higher inflation expectations. In the United States especially, analysts' short-term forecasts of inflation moved noticeably higher in September and October (Graph 1.3). Households' longer-term inflation expectations also rose. So too did measures of inflation compensation derived from nominal and real bond yields (Graph 1.2).

Central bank officials, in particular those in the United States and the euro area, were quick to warn that monetary policy might need to be tightened further to contain inflation expectations. This put additional upward pressure on yields. For example, the ECB Governing Council's caution that "strong vigilance" was warranted with regard to inflationary pressures contributed to a marked rise in bund yields when released in the ECB monthly bulletin on 13 October.



## Macroeconomic news



<sup>1</sup> Difference between actual data and consensus forecasts, normalised by the mean and standard deviation of past surprises; observations are positioned in the month in which the actual data were released; for the United States, weighted average of the ISM survey, non-farm payrolls, retail sales and producer price and consumer price announcements; for the euro area, survey of the business climate in Germany compiled by the Institut für Wirtschaftsforschung (Ifo); for Japan, weighted average of the industrial production and machinery orders survey. <sup>2</sup> Rolling 12-month forecast, calculated as a weighted average of annual forecasts published by Consensus Economics; observations are positioned in the month in which the forecast was made; percentage change over the previous year.

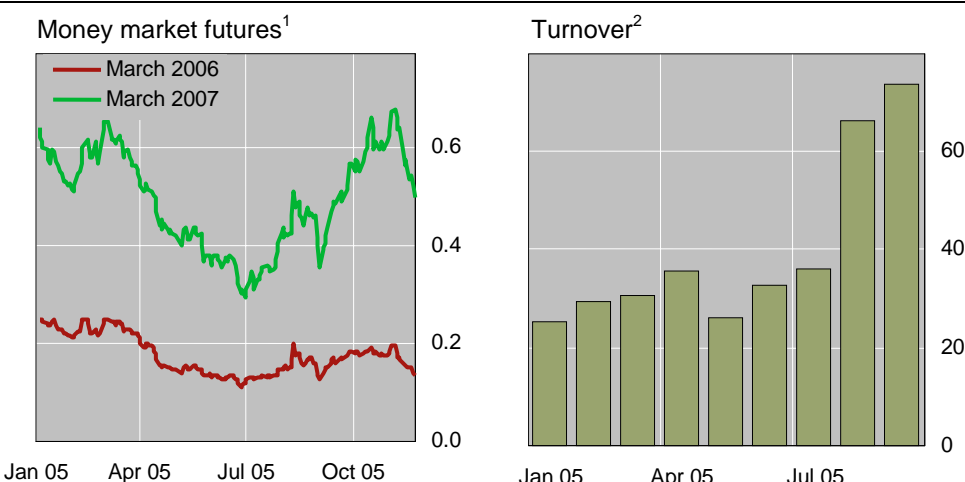
Sources: Bloomberg; © Consensus Economics; BIS calculations.

Graph 1.3

In Japan, firming expectations of an increase in prices next year heightened attention on when, and how, the Bank of Japan might exit from its current unconventional policy stance. Indeed, trading in yen money market futures increased markedly starting in August, as uncertainty about the course of policy rates grew (Graph 1.4). Statements by Bank of Japan officials in September and October helped to guide expectations, so that money market rates remained unchanged even as bond yields went up. The statements were interpreted as indicating that the zero interest rate policy would not be

Change in Bank of Japan policy not perceived to be imminent

## Japanese money markets



<sup>1</sup> Three-month euroyen futures rates, in per cent. <sup>2</sup> Average daily turnover of short-term yen interest rate futures on the Tokyo International Financial Futures Exchange; in millions of contracts.

Sources: Bloomberg; FOW TRADEdata; Futures Industry Association; BIS.

Graph 1.4



discontinued until at least the next fiscal year: the implied yield on the three-month yen futures expiring at the end of March 2007 moved up by around 25 basis points between early September and mid-October, whereas the same futures expiring at the end of the current fiscal year in March 2006 barely budged.

## Equity markets shrug off rate increases

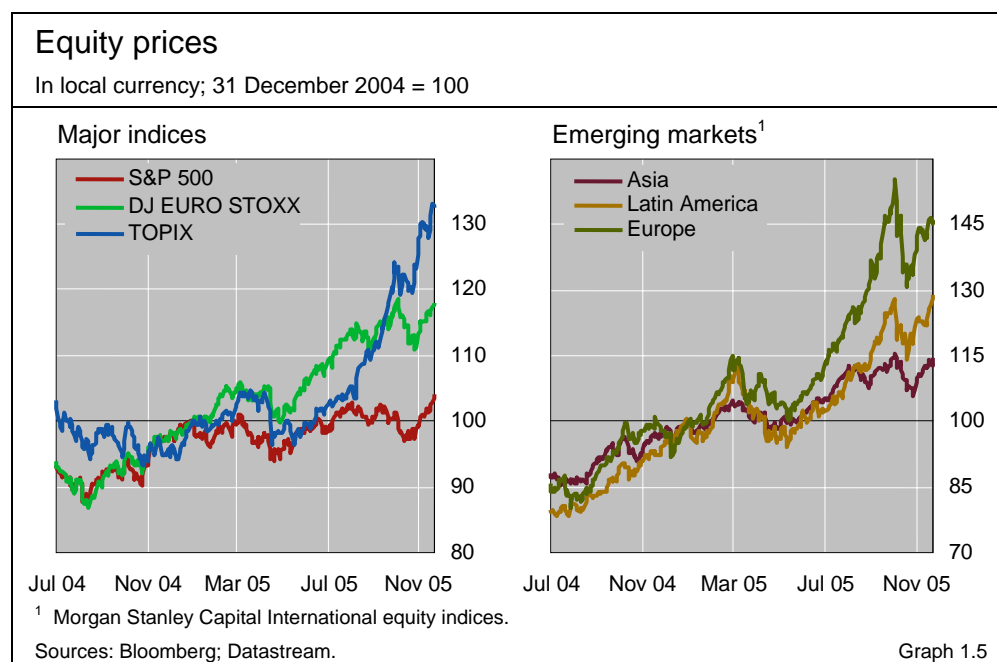
Initially, equity markets seemed little affected by the prospect of higher policy rates. With the notable exception of the United States, in September many markets rose to their highest level in several years (Graph 1.5). Markets stumbled in October, owing in part to concerns about higher policy rates. But they rebounded in November to levels close to, or in Japan well above, their September highs. On 18 November the TOPIX closed at its highest level since mid-2000, and the S&P 500 its highest since mid-2001.

During September, upward revisions to earnings forecasts, underpinned by signs of robust economic growth, appeared to propel markets higher (Graph 1.6). In the first half of October, however, ebullience turned into concern, and equity markets worldwide fell markedly. The trigger for the sell-off was a speech given by the President of the Federal Reserve Bank of Dallas on 4 October, which noted that inflation was “near the upper end of the Fed’s tolerance zone”. The observation had little impact on bond markets, which already in September had priced in the possibility of a much higher than previously expected increase in policy rates to contain inflation. But it contributed to a 1% drop in the S&P 500 Index on 4 October. When Asian and European markets opened the next day, they also dropped sharply.

In subsequent weeks, equity markets exhibited unusual volatility. Implied volatility rose in October, in some markets to its highest level in a year (Graph 1.7). This partly reflected a decline in investors’ appetite for risk. The

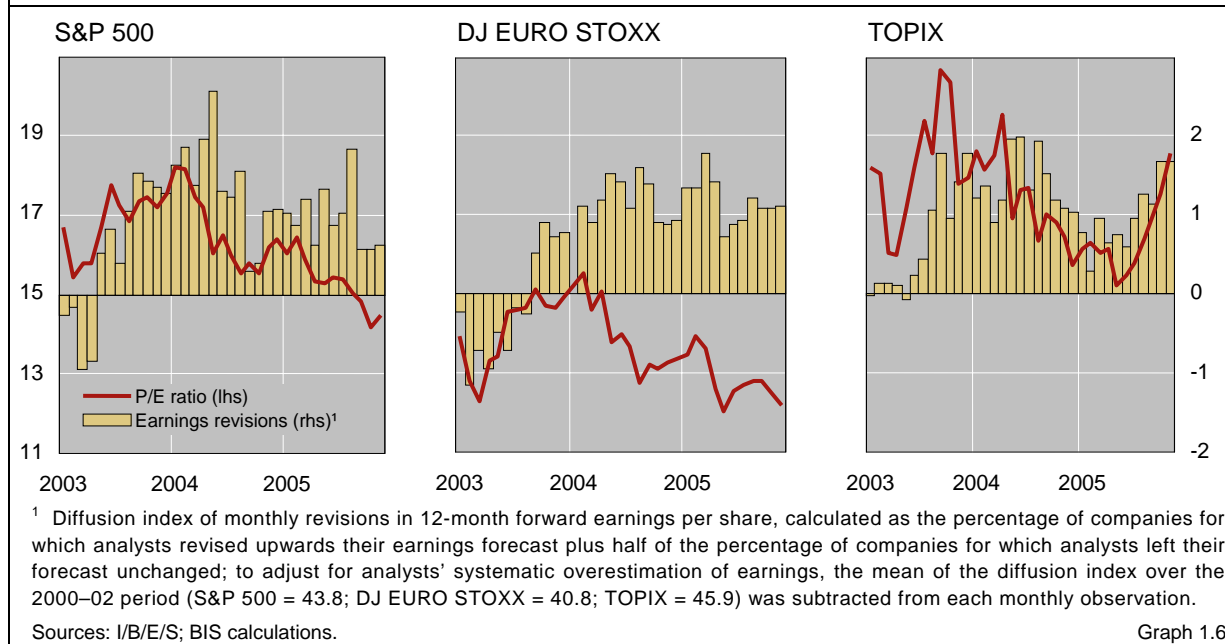
Concerns over prospective Federal Reserve tightening

Unusually high volatility ...



## Earnings expectations and equity market valuations

Based on 12-month forward earnings



prices of equity index options on the S&P 500, DAX 30 and FTSE 100, and their relation to realised volatility, suggest that the common component of risk appetite in the US, German and UK markets had reached its lowest levels of the year in October.

The rise in implied volatility also reflected growing uncertainty about the economic outlook. Many markets experienced large price swings in October. Indeed, for the S&P 500, five of the 10 largest moves in 2005 occurred in October alone. The swings were sometimes driven by macroeconomic news, such as a weaker than expected ISM survey of US non-manufacturing activity on 5 October. At other times earnings news dominated, with most companies reporting better than expected profits. At still other times, markets seemed to be focusing on political news, including the appointment on 24 October of a new chairman of the US Federal Reserve.

... reflects uncertainty about outlook

Eventually, the accumulation of signs that growth in the United States was still robust helped to calm investors. On 28 October, third quarter US GDP growth came in stronger than expected, leading to a 1.7% increase in the S&P 500. The following (trading) day, euro area markets posted their largest daily increase so far this year, rising by 2.2%. The rally continued into November, supported by announcements of higher dividends and share buybacks, as well as more mergers and acquisitions (see below). By mid-November, US and euro area equity markets had regained most of their early October losses.

Japanese markets greatly outperformed most other markets. The TOPIX rose by 20% between 1 September and 18 November. By contrast, the S&P 500 and the DJ EURO STOXX were up by only 2% and 4%, respectively, over the same period. As in the bond markets in Japan, equity investors focused on the steadily improving macroeconomic outlook. The largest daily increase in the TOPIX, of 2.5%, occurred on 11 October, due in part to a better

Japanese markets outperform ...

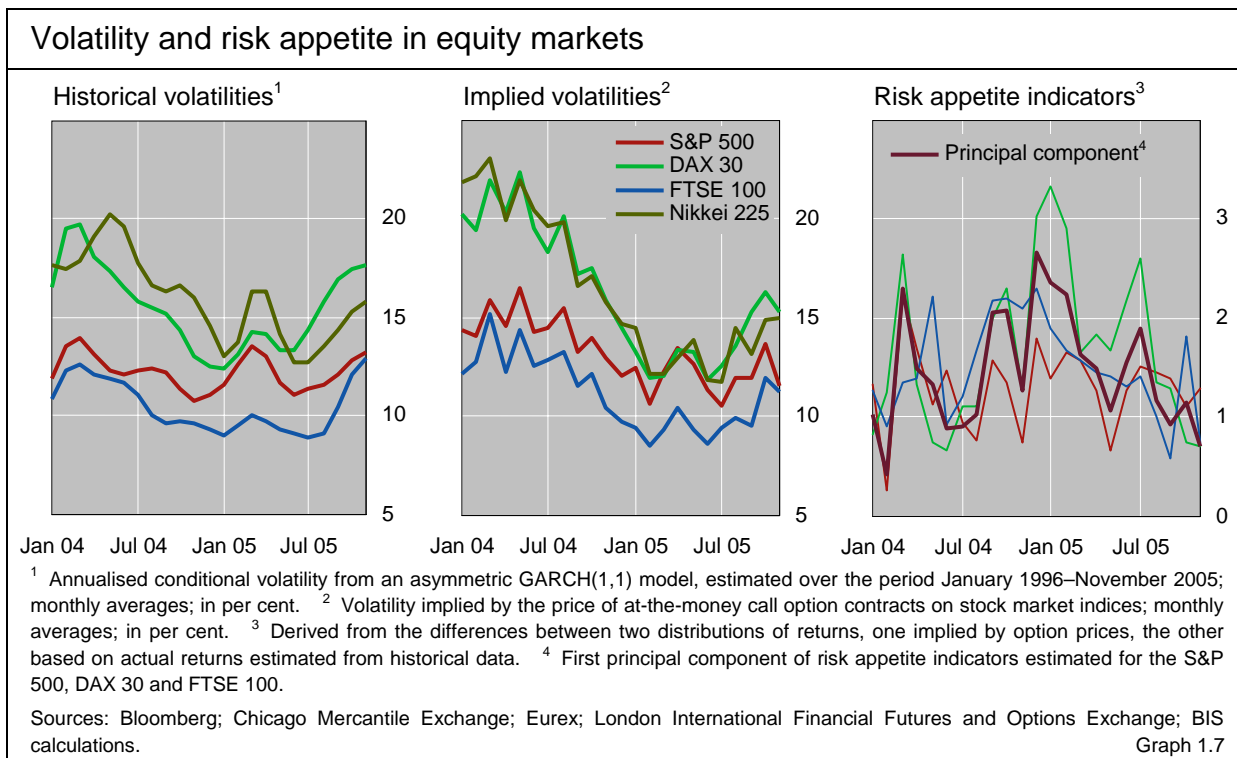
than expected machinery orders report. Political developments were also a key focus of attention. Voters' overwhelming support for the prime minister in Japanese parliamentary elections held on 11 September was perceived as facilitating further economic reform. Earnings news also impressed investors. Since early 2005, analysts have raised their earnings forecasts for a steadily increasing number of Japanese companies (Graph 1.6). This contrasts sharply with the United States, where fewer companies' earnings forecasts were revised upwards in September and October than in the first half of 2005.

... supported by foreign investors ...

In Japan, the increase in forecast earnings was outpaced by that in equity prices. As a result, price/earnings (P/E) multiples rose to their highest level since mid-2004. Whereas US and euro area equity market valuations have trended downwards in 2005, Japanese valuations have moved upwards. The exuberance of foreign investors partly explains the increase in Japanese equity market valuations, as Japan has been the favourite destination of global equity investors for much of the year.

... yet the yen weakens

In stark contrast with previous upswings in the Japanese equity market over the past six years, the 2005 bull market in Japan has coincided with a broad-based decline of the yen, which weakened to two-year lows against the US dollar in November. Part of this was due to Japanese investors sharply stepping up their overseas securities investments, suggesting to some observers that Japanese investors were less averse to currency risk than previously. Another likely reason for yen weakness was the much less pronounced increase in expected monetary tightening in Japan compared to the other developed markets, as described above. There were also anecdotal reports of a surge of carry trades undertaken by hedge funds contributing to yen weakness, where investors funded long dollar positions through short positions in low interest rate currencies, most notably the yen.



## Emerging markets prove surprisingly resilient

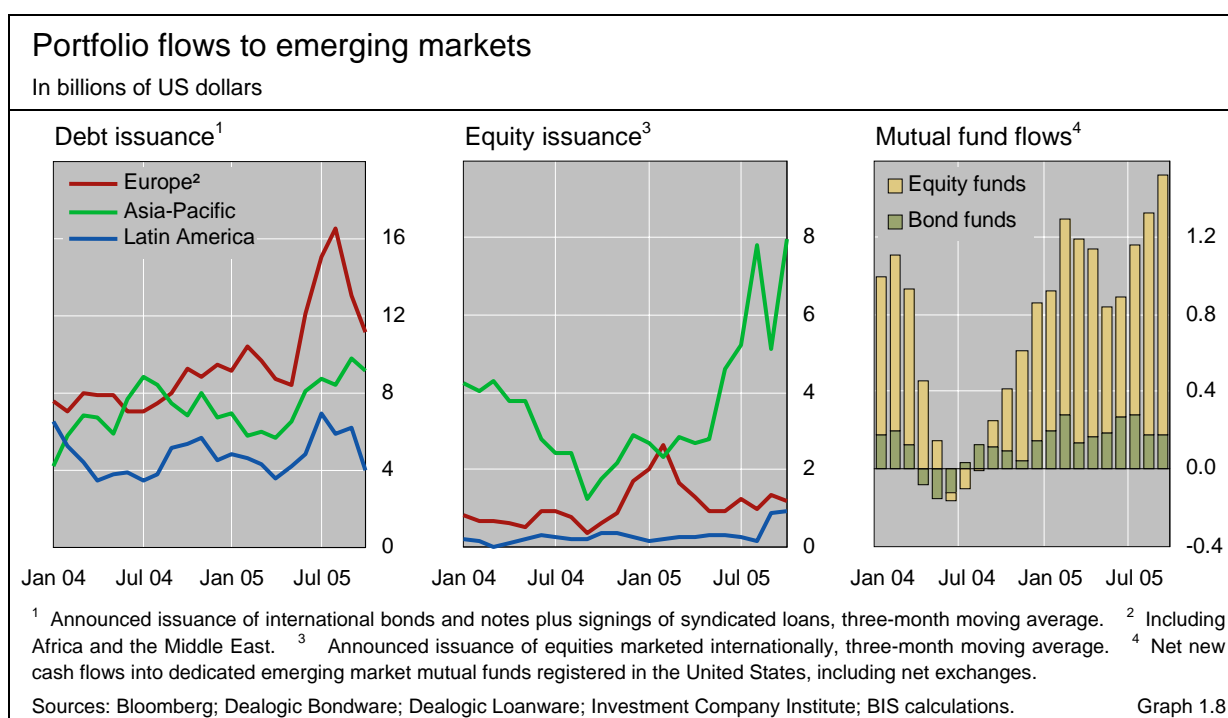
Upward revisions to the expected path of policy rates had a surprisingly muted impact on the prices of emerging market assets. In recent years investors' willingness to take on additional risk in an effort to sustain the nominal returns they were able to achieve when interest rates were higher has helped to drive emerging market asset prices up. This willingness seemed to remain intact despite the significant increase in short- and long-term US interest rates in September and October.

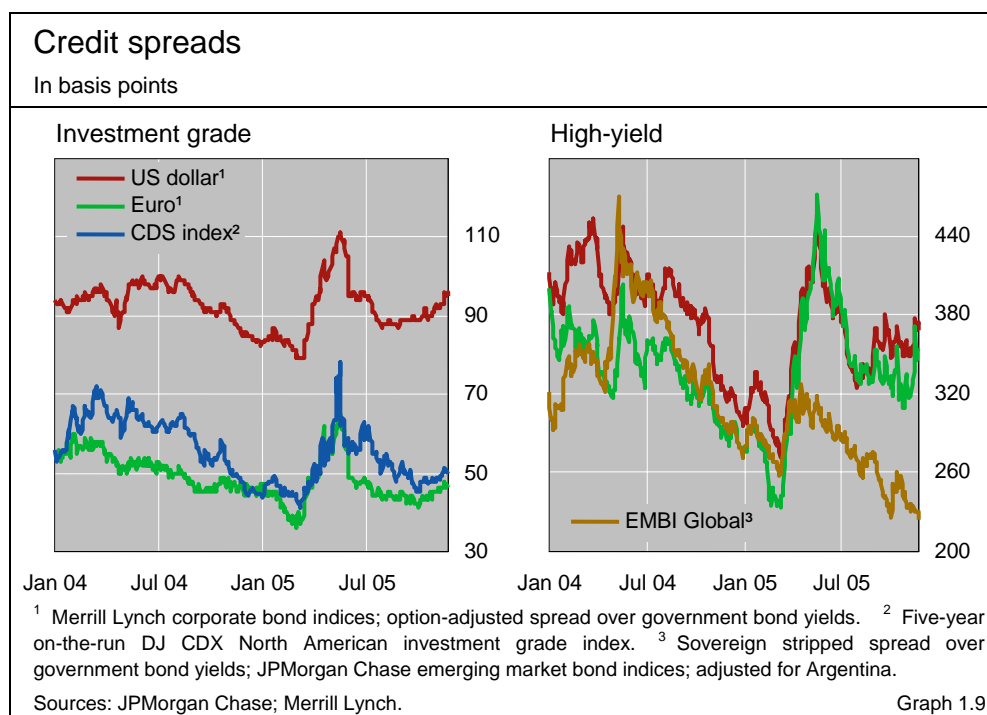
Emerging markets benefited from near record inflows of foreign portfolio investment in the third quarter of 2005 (Graph 1.8). These had helped to push many equity markets to their highest level in years and sovereign bond spreads to their lowest level ever. Between end-June and end-September, emerging equity markets had risen by 12% in local currency terms and the EMBI Global (excluding Argentina) had tightened by 60 basis points, to 229 basis points (Graph 1.9).

While emerging markets fell sharply in October, the sell-off proved to be mild compared to the price declines earlier in 2005 or in April-May 2004. Between 4 October and 28 October, eastern European equity markets declined by 13% in local currency terms and Asian equity markets by 9% (Graph 1.5). The prices of international sovereign bonds also dropped over this period: the EMBI Global widened by as much as 30 basis points (Graph 1.9). Many emerging market currencies too depreciated against the US dollar, especially higher-yielding currencies such as the Brazilian real and the South African rand. However, as concerns about slowing US growth eased, emerging markets bounced back strongly from their late October lows. By late November, equity and bond prices had returned to their end-September highs.

Near record inflows into emerging markets

October sell-off proves limited





During the sell-off in October, investors appeared to pay little heed to the strength of local conditions. Fundamentals in most emerging markets gave little cause for added concern. Indeed, credit rating upgrades of emerging market borrowers continued to exceed downgrades. Brazil and Russia were among those upgraded, to Ba3 and Baa2, respectively, by Moody's in October. One possible reason why the positive outlook failed to moderate the sell-off was that emerging market valuations seemed high even before factoring in the impact of higher interest rates on global growth.

Favourable financing conditions

Despite the weakening of demand for emerging market assets in October, new borrowing in international bond and loan markets remained well above last year's level (Graph 1.8). To be sure, some borrowers scaled back or postponed planned bond issues, especially Latin American borrowers. But for most borrowers, financing conditions remained favourable even at the peak of the sell-off. Indeed, in late October, Vietnam was able to issue its first ever international bond, at tighter spreads and in larger volumes than initially announced.

Chinese companies are active issuers

Issuance by emerging market residents in international equity markets also continued at a record-breaking pace. Chinese companies have been especially active, raising over \$20 billion in the first 10 months of 2005. This was almost as much as all other emerging market issuers combined. In October, China Construction Bank became the first of China's four largest banks to list its shares abroad. At \$8 billion, it was the largest ever initial public offering (IPO) by a bank, and the largest IPO globally since 2001. China is following the example of other emerging markets and gradually opening up its banking system to foreign competition and investment (see the special feature on page 69).

## Credit markets decouple

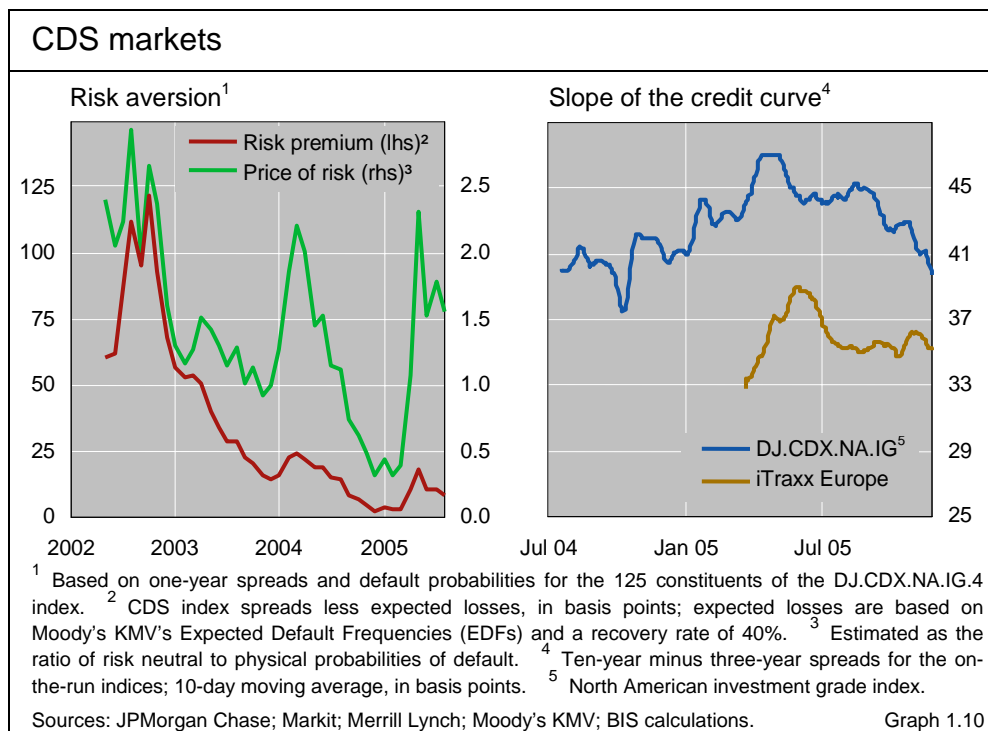
Corporate debt markets seemed to diverge from other markets. After rallying together with equity prices in 2003 and 2004, in recent months credit spreads have shown signs of decoupling. Even as long-term yields rose and equity markets fell, corporate credit default swap (CDS) and bond spreads remained more or less unchanged in October (Graph 1.9). In November, spreads inched wider despite the rebound in equity markets.

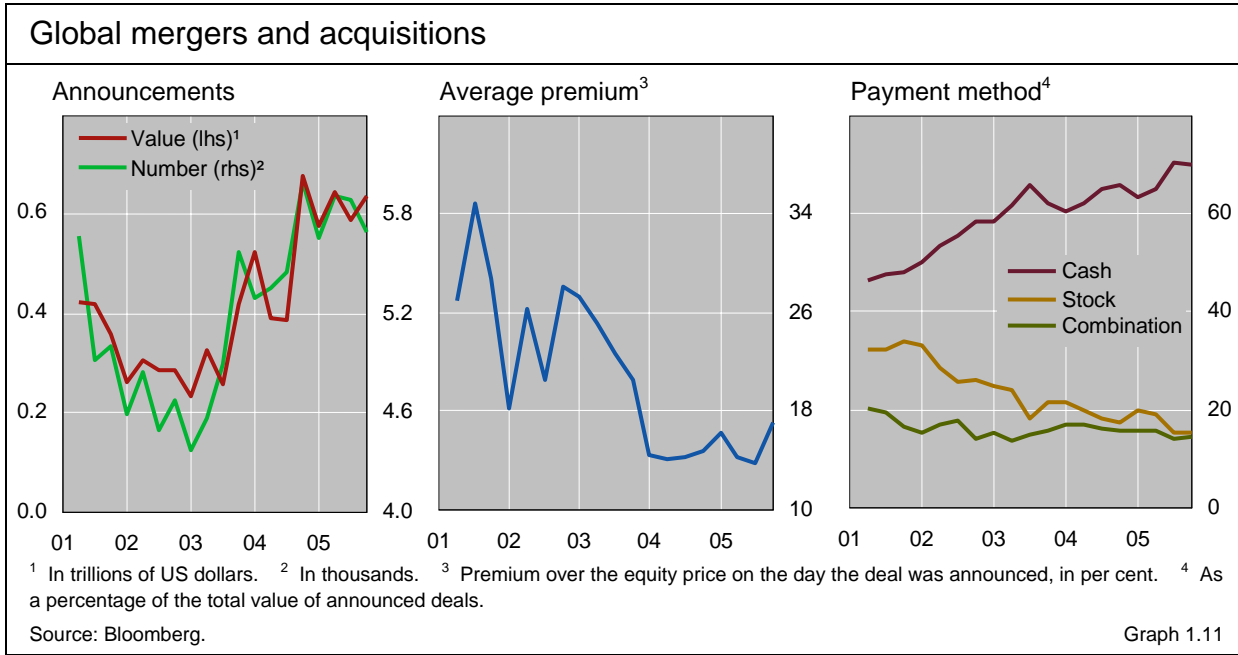
Credit markets were not immune from shifts in investor confidence. In August, corporate spreads had already started to drift higher, several weeks before other asset prices had begun to decline. Indeed, unlike equity markets and emerging market debt prices, which had rallied to new highs in September, corporate bond markets had not fully recouped the losses recorded earlier in 2005. In the US dollar market, investment grade corporate bond spreads stood at 87 basis points at the end of July, 10 basis points higher than their mid-March low. They subsequently widened by around 5 basis points over the next four months.

The asynchronous movements in equity prices and credit spreads, and the failure of corporate bond markets to recoup their earlier losses, largely reflected credit investors' greater sensitivity to event risk in the wake of developments earlier in 2005, including the downgrade of General Motors. While the strong rebound in demand for collateralised debt obligations (CDOs) in the second half of 2005 suggests that investors' appetite for risk remained high, it had weakened somewhat compared to late 2004 or early 2005. The left-hand panel of Graph 1.10 plots the compensation investors demand for bearing default risk (see the special feature on page 55). According to this measure, investors' appetite for risk never fully recovered from the turmoil in credit markets between March and May 2005.

Corporate spreads drift higher ...

... as risk appetite remains subdued





The growing number of companies announcing shareholder-friendly actions seemingly served as an ongoing reminder of the downside risk inherent in credit instruments. Companies are increasingly looking to acquisitions as a way to maintain their earnings growth. Mergers and acquisitions (M&A) announced between January and October 2005 were up by about 35% over the same period in 2004 (Graph 1.11). Acquisitions are not necessarily detrimental to the interests of creditors. Creditors can take some comfort from the fact that a large share of the deals announced this year have been financed using cash. While such deals might increase leverage, historically they have tended to give a bigger boost to earnings than deals financed using equities. Furthermore, the premium over the target company's equity price remains well below the premium paid by companies in 2000, during the last major wave of mergers.

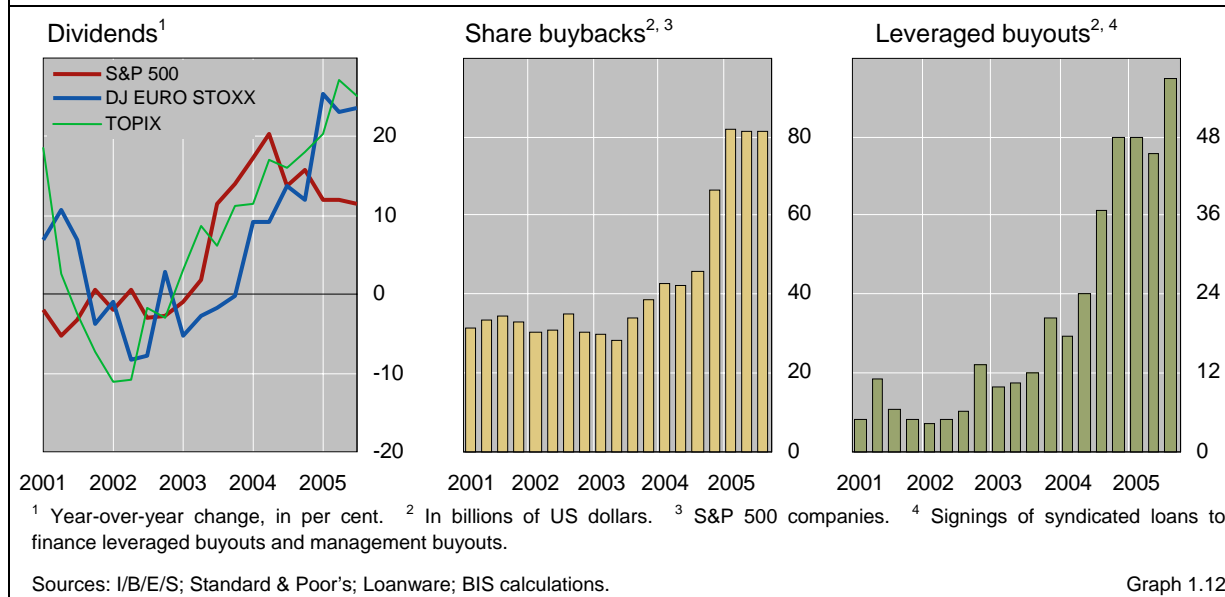
More worrying for creditors are changes in firms' capital structure. Financing for leveraged buyouts almost doubled over the first three quarters of 2005 compared to the same period in 2004 (Graph 1.12). Moreover, according to Standard & Poor's, debt/earnings ratios in such buyouts were at their highest level in many years. Furthermore, in the United States, share buybacks are well above their 2004 high. And dividends have been rising at double digit rates in the major markets.

The US auto sector remained a source of concern to credit investors. Delphi, the largest US auto parts supplier and former General Motors subsidiary, filed for bankruptcy in October. This triggered a further downgrade of GM, owing to extensive links between the two companies. Moreover, the default by Delphi led to downgrades of a large number of CDOs. As recently as December 2004, Delphi had been rated investment grade, and so it had been referenced in a broader range of CDOs than is typical for lower-rated borrowers. Despite this chain reaction, credit markets adjusted smoothly to the default. The adjustment was facilitated by initiatives to improve the functioning

Shareholder-friendly changes in capital structure

US auto sector a source of concern

## Shareholder-friendly actions



of the CDS market, including cash settlement of index contracts (see “Derivatives markets” on page 43).

Credit markets also reacted calmly to Hurricane Katrina, despite it being the most costly natural disaster ever recorded (see the box on page 13). Several insurers and reinsurers saw their credit default swap spreads increase noticeably in the weeks after Katrina hit. Spreads widened again in late September, before Hurricane Rita made landfall. Yet, many insurance companies’ spreads had widened by even more during the sell-off in credit markets earlier in 2005.

Notwithstanding such surprises and the trend towards shareholder-friendly actions, investors appeared to remain confident in the outlook for credit quality. In recent months short-term CDS spreads for US companies have moved up relative to long-term spreads, indicating that investors turned less optimistic (Graph 1.10). Yet, the slope remains as steep as in 2004, suggesting that investors do not expect credit fundamentals to worsen markedly over the near term. This view is consistent with most analysts’ projections. For example, while Moody’s forecasts that the (global) speculative grade default rate will increase going forward, the increase is expected to be gradual, rising from the cyclical low of 1.8% in mid-2005 to slightly more than 3% in a year’s time. Moreover, the default rate is expected to remain well below its 1990s average of 4.8%.

Gradual increase in defaults anticipated



## Impact of Hurricane Katrina on the reinsurance industry

*Ingo Fender and Philip Wooldridge*

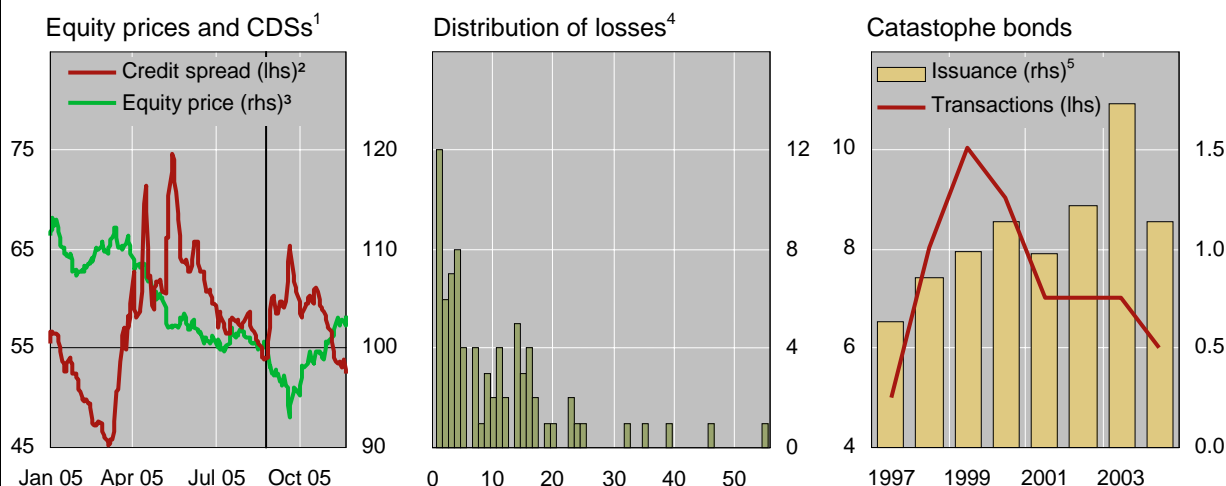
Hurricane Katrina, which struck the Gulf Coast of the United States in late August 2005 and decimated the city of New Orleans, is likely to be the most expensive natural catastrophe ever. Insured losses are estimated to be as high as \$60 billion. This is more than double the previous record loss, incurred following Hurricane Andrew in 1992. Because of the size and nature of the catastrophe, the reinsurance industry is likely to bear a larger proportion, as much as 50%, of total insured losses arising from Katrina than of those inflicted by earlier disasters. Despite the enormity of the losses, investors at no point expected Hurricane Katrina to lead to serious financial difficulties. While reinsurers' credit default swaps tended to widen in September, the widening was less pronounced than during the sell-off in credit markets earlier in 2005 (left-hand panel of the graph below). Moreover, spreads tightened again in October. The equity prices of reinsurers also quickly rebounded.

Reinsurers help to support the stability of the financial system. Through the provision of insurance for insurers, the reinsurance sector absorbs shocks that might otherwise undermine the solvency of primary insurers. In particular, they facilitate the diversification of risks. Through their investment activities they also contribute to market liquidity, especially in markets for risk transfer. Problems in the reinsurance sector, therefore, could have significant spillover effects on other sectors, either through outright failures or via rating downgrades, which could force them to withdraw from non-core business activities.

The resilience of the reinsurance sector in the face of Hurricane Katrina can be attributed in large part to its strong capital base. Following the terrorist attacks in the United States in September 2001, insurance premiums increased substantially, especially those covering catastrophic risks. This helped many reinsurers to rebuild their capital base, the sufficiency of which had been called into question by the attacks. Strong growth in premiums also attracted the interest of new private equity investors. Hedge funds were among those which provided seed capital for startup reinsurers, with CIG Re and Glacier Re being recent examples.

According to reinsurance statistics collected by the International Association of Insurance Supervisors (IAIS), reinsurers held capital of \$244 billion at end-2003. Therefore, losses from Hurricane Katrina will not impact the solvency of the industry as a whole. However, losses as a percentage of capital are estimated to be large for some individual reinsurers, triggering recapitalisation needs and the possibility of rating downgrades (centre panel of the graph below).

### Impact of Hurricane Katrina



<sup>1</sup> The vertical line indicates the landfall date of Hurricane Katrina (29 August). <sup>2</sup> Weighted average of the five-year CDS spreads of Swiss Re, Munich Re and ACE (denominated in US dollars), with modified restructuring clauses, in basis points. <sup>3</sup> Reinsurance sector relative to the global share index; 29 August 2005 = 100. <sup>4</sup> Estimated losses incurred by 78 insurance and reinsurance companies arising from Hurricane Katrina; the share of shareholders' funds lost (x-axis, in per cent) is plotted against the number of companies (y-axis). <sup>5</sup> In billions of US dollars.

Sources: Benfield Group; Datastream; Guy Carpenter; Markit; Swiss Re; BIS calculations.

Indeed, some reinsurers have already taken steps to replenish their capital. The willingness of investors to recapitalise these entities suggests that they remain confident in reinsurers' capacity to model and price the risk of natural disasters. However, concerns over risk modelling capabilities and increasing loss frequencies could still lead to changed rating criteria and downgrades over the medium term.

Capital markets' direct contribution to absorbing Katrina-related losses will be limited. This is despite efforts, following Hurricane Andrew, to promote the use of instruments such as catastrophe (CAT) bonds and options to spread catastrophic risks more broadly. CAT bonds outstanding totalled less than \$5 billion in mid-2005, and US Gulf Coast hurricane exposure accounted for only a small fraction of this amount. One factor behind the market's somewhat disappointing development is that the trade-off between basis risk and moral hazard limits the usefulness of CAT bonds in comparison to outright reinsurance. The latter avoids basis risk through contractual features tailored to the needs of the entity seeking to transfer risk, but this adds to the complexity of the contract and so increases monitoring costs. Standardised contracts, in turn, minimise moral hazard by conditioning payments on prespecified regional or industry-wide loss levels, but increase basis risk for the entity seeking to transfer risk.

## 2. The international banking market

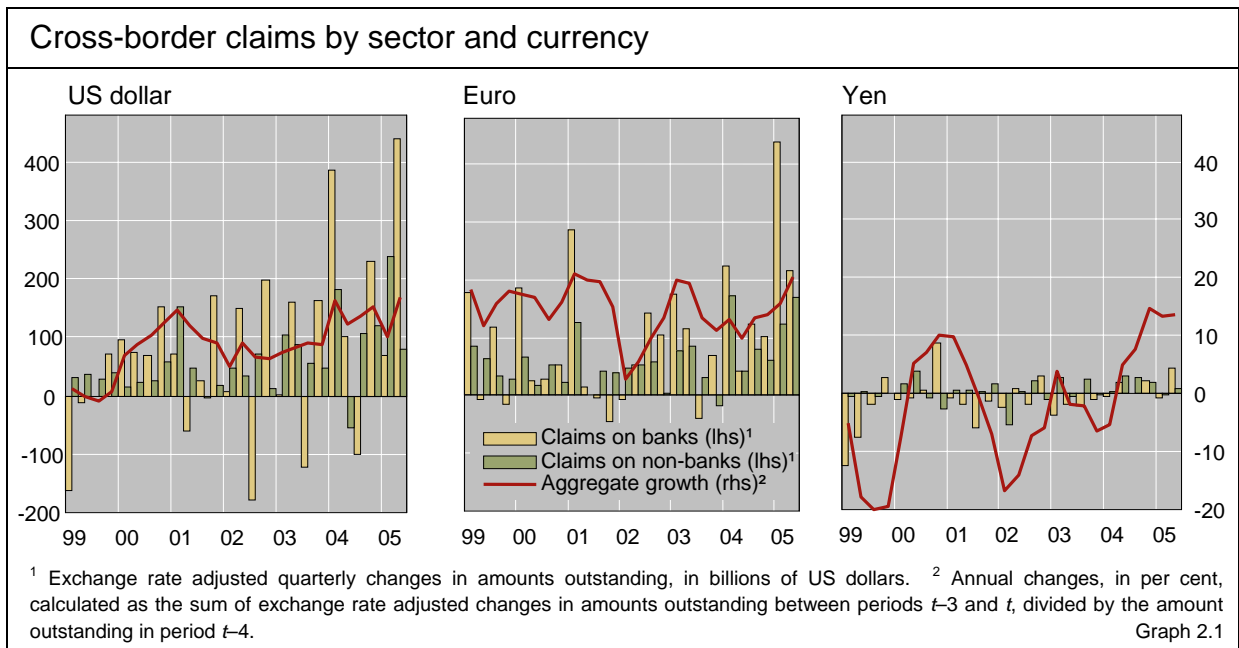
In the second quarter of 2005, interbank activity drove the strong growth in BIS reporting banks' cross-border claims. Banks channelled funds to other banks in the United States, the United Kingdom and offshore centres, with inter-office transactions accounting for roughly one third of the total. Credit to non-bank borrowers also continued to rise, as banks invested in debt securities, primarily issued in the euro area.

Emerging economies as a whole experienced a large net outflow of funds in the second quarter. The current rise in oil prices has led to large capital outflows from oil-exporting countries. As a result, deposits placed in BIS reporting banks have been on the rise as these countries have channelled a portion of these outflows into banks abroad. In the second quarter, increased placements by residents of Russia, Saudi Arabia, Venezuela and other oil-exporting countries were behind the relatively large net outflow of funds from emerging economies observed in the BIS data.

From a longer-term perspective, the recycling of petrodollars back into the international financial system in the most recent cycle differs in several important respects from the pattern observed during previous periods of rising oil prices. While oil-exporting countries historically placed a significant portion of their petrodollars in bank deposits, they have channelled a greater share of these funds elsewhere in the most recent cycle. This has contributed to a rise in the proportion of petrodollars that cannot be accounted for on the basis of counterparty data. Furthermore, while petrodollar deposits have once again become significant, the importance of OPEC as a source of funds for BIS reporting banks has nevertheless diminished over time.

### Cross-border expansion in claims reflects interbank activity

Total cross-border claims continued to grow strongly for a second consecutive quarter, mainly owing to interbank activity (Graph 2.1). BIS reporting banks' total claims rose by \$1.1 trillion in the second quarter of 2005 and reached \$23.1 trillion. This pushed the year-on-year growth in claims to 16%, the highest rate recorded in the BIS statistics since the first quarter of 1988. This interbank lending was primarily channelled to banks in the United States, the United Kingdom and offshore centres, with inter-office transfers of funds accounting for roughly one third of the total.



Credit to non-bank borrowers also continued to grow in the second quarter as reporting banks invested in debt securities, primarily issued by borrowers in the euro area. Total claims on non-banks rose by \$284 billion, the fourth consecutive quarter of strong growth in claims on this sector. Almost one quarter of this reflected increased claims on these borrowers in offshore centres, areas which host considerable non-bank financial activity. In addition, banks in Japan and the United Kingdom channelled a combined \$136 billion into debt securities, primarily issued by non-bank borrowers in the euro area and the United States. Overall, claims on non-banks in the euro area rose by \$147 billion, \$87 billion of which constituted intra-euro area activity.

Emerging economies as a whole experienced a large net outflow of funds as oil-producing countries deposited funds in BIS reporting banks. At \$43 billion, the net outflow of funds from emerging markets in the second quarter was the third largest recorded in the BIS statistics. Residents of OPEC member countries placed \$26 billion in deposits with BIS reporting banks in the second quarter, following \$8 billion in the previous quarter and \$23 billion in the third quarter of 2004. Similarly, banks in Russia have continued to deposit funds abroad, a trend evident since end-2001. Their record \$29 billion placement of (primarily euro-denominated) deposits in BIS reporting banks in the second quarter was only slightly larger than their placement in the previous quarter.

Oil exporters place deposits in BIS reporting banks

### Petrodollars and the international banking system

The rise in oil prices since 1999 has led to a surge in petrodollars, ie US dollar payments to oil exporters. These funds must either be spent on imports or invested elsewhere in the world in the form of foreign direct investment (FDI), purchases of securities or placements in bank deposits. The way in which oil-producing countries have reacted since 1999 differs from the patterns of consumption and investment following the second oil shock in 1979. Piecing

Cross-border claims of BIS reporting banks								
Exchange rate adjusted changes in amounts outstanding, in billions of US dollars <sup>1</sup>								
	2003	2004	2004			2005		Stocks at end-Jun 2005
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Total cross-border claims	1,076.7	2,284.8	240.1	227.2	588.7	1,033.4	1,083.9	20,263.2
on banks	530.6	1,367.7	191.3	-5.5	362.2	596.6	784.6	12,934.2
on non-banks	546.1	917.1	48.8	232.7	226.5	436.9	299.2	7,328.9
of which Loans: banks	453.4	1,074.8	130.1	37.0	300.2	394.1	710.3	10,971.1
non-banks	277.9	548.9	-25.8	178.5	124.4	292.1	92.1	3,755.5
of which Securities: banks	75.6	124.8	51.0	-153.5	36.5	110.0	44.7	1,376.8
non-banks	208.5	252.2	33.5	41.9	58.4	81.8	226.0	3,111.9
Total claims by currency								
US dollar	580.7	967.8	61.6	9.6	277.8	270.5	498.4	8,681.6
Euro	502.7	837.7	81.0	202.4	154.2	604.6	398.6	7,835.5
Yen	-127.2	251.5	50.7	36.8	185.4	-52.0	80.1	1,237.9
Other currencies <sup>2</sup>	120.5	227.9	46.8	-21.6	-28.8	210.3	106.8	2,508.2
By residency of non-bank borrower								
Advanced economies	452.3	672.5	29.4	128.9	149.7	373.4	212.2	5,647.7
Euro area	157.6	239.1	33.1	8.7	43.7	110.5	147.1	2,486.0
Japan	38.4	72.8	21.4	15.6	35.8	-31.5	10.6	235.3
United States	172.5	164.4	-25.1	38.9	45.5	207.2	28.9	1,889.0
Offshore centres	100.0	238.8	33.8	106.0	57.4	56.3	64.4	983.8
Emerging economies	6.1	49.9	2.3	1.2	22.0	13.2	23.6	649.2
Unallocated <sup>3</sup>	-13.5	-39.2	-14.3	-6.2	-2.8	-6.3	-2.2	19.5
<i>Memo: Local claims<sup>4</sup></i>	<i>415.1</i>	<i>220.1</i>	<i>34.2</i>	<i>3.2</i>	<i>-5.9</i>	<i>233.5</i>	<i>-3.3</i>	<i>2,850.5</i>

<sup>1</sup> Not adjusted for seasonal effects. <sup>2</sup> Including unallocated currencies. <sup>3</sup> Including claims on international organisations.

<sup>4</sup> Foreign currency claims on residents of the country in which the reporting bank is domiciled.

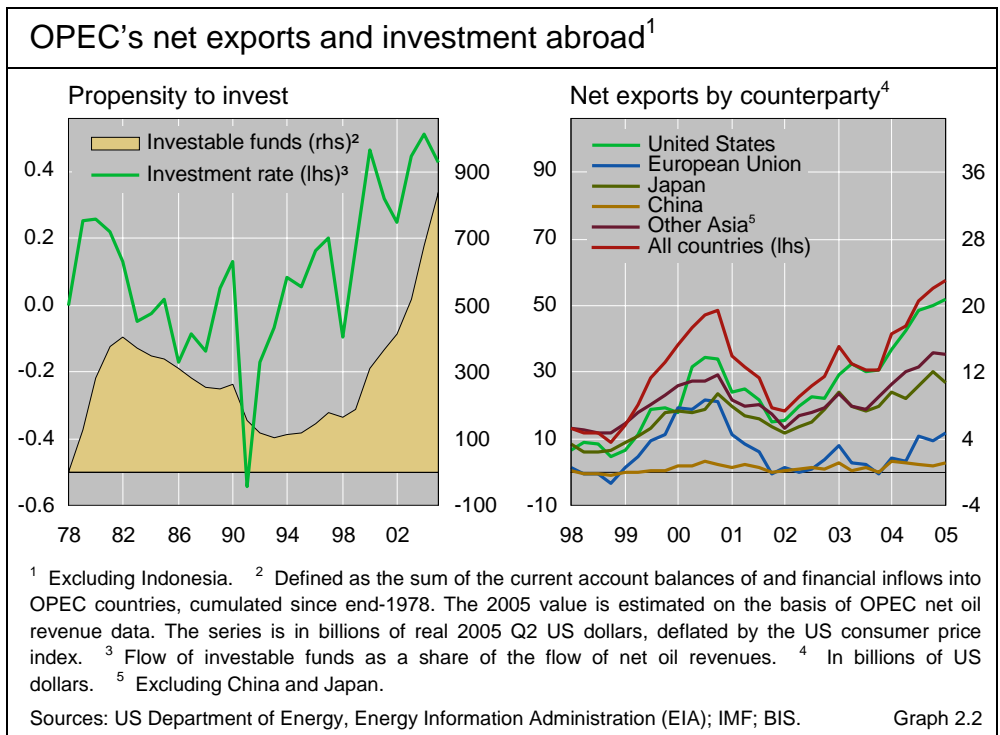
Table 2.1

together various sources of data, this section compares these two episodes, and highlights how the role of banks has differed across the two. The data suggest that petrodollars are being invested more broadly across assets and countries in the most recent oil price cycle. As a result, the international banking system is less important as a repository of these funds than it once was.

#### *Saving more of the surplus*

Surging oil revenues ...

The most recent oil price cycle started in 1999, and has generated substantial inflows into oil-exporting countries. Between the fourth quarter of 1998 and the third quarter of 2000, real oil prices rose by 207%. After falling by almost 50% in 2001, real oil prices have subsequently risen by about 170%, but remain below their peak of \$105 per barrel reached at end-1979. As a result, revenue from oil exports is surging. OPEC members have earned an estimated \$1.3 trillion in petrodollars since end-1998, while the world's other large



exporters, Russia and Norway, have received \$403 billion and \$223 billion respectively.<sup>1</sup> Overall, net oil revenues in oil-exporting countries in 2005 are expected to reach \$650 billion, although these estimates are thought to be on the low side because they are based on forecasts made in mid-2005.

Relative to previous oil cycles, the propensity for OPEC countries to invest these oil revenues abroad seems to have risen. An indirect estimate of OPEC's total foreign investment – or “investable funds” – is the sum of OPEC countries' current account surpluses and their gross financial inflows.<sup>2</sup> As shown in Graph 2.2, the ratio of the flow of investable funds to the flow of net oil revenues has been higher in the 1999–2005 cycle than in the 1978–82 cycle, implying a higher rate of foreign placements.

... lead to greater investment abroad by OPEC

The main sources of OPEC's investable funds have been the United States and Asia. Direction of trade data indicate that net exports from OPEC member countries to the United States cumulated over the 1999 Q1–2005 Q1 period totalled \$277 billion. Similarly, net exports to Japan over this period

<sup>1</sup> Estimates of net oil revenue are drawn from annual data from the US Energy Information Administration. Indonesia and Ecuador are not included as OPEC members in the discussion which follows. In addition to Russia and Norway, the other non-OPEC oil-producing countries (and their cumulative 1999–2005 estimated net oil revenue) that are included in the list of oil-exporting countries used in this discussion are Angola (\$65 billion), Egypt (\$12 billion), Mexico (\$105 billion) and Oman (\$60 billion).

<sup>2</sup> Gross financial inflows are partially based on estimated data. Some items in the balance of payments data for several countries are not available for recent quarters, and are estimated by extrapolating from earlier periods. In addition, no data on gross financial inflows are available for the United Arab Emirates, Qatar and Iraq. Estimates for these countries are based on their current account and foreign exchange reserves data. These estimates imply that cumulative financial inflows accounted for 18% of cumulative investable funds over the 1999–2005 cycle, but were negligible in the previous cycle.

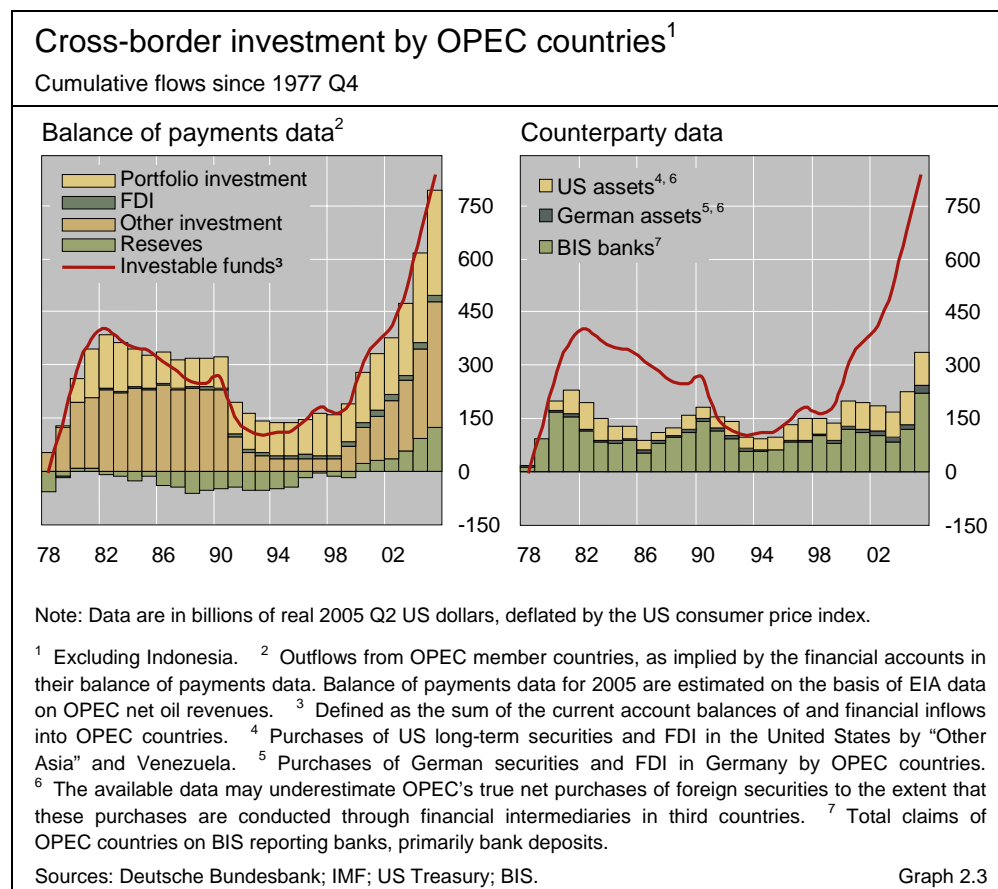
totalled \$186 billion, and those to China and other Asian countries \$245 billion. While gross oil exports to the countries in the European Union have also grown, imports from these countries have largely kept pace, leaving OPEC's net export position vis-à-vis the euro area, at \$76 billion, small by comparison with other countries (Graph 2.2, right-hand panel).<sup>3</sup> The increased trade between OPEC countries and the euro area is evident in the rising share of trade financing arranged by euro area banks, as discussed in the box on page 29.

#### Tracking the outflow of petrodollars

OPEC's investable funds show up as claims on the rest of the world, through purchases of foreign debt securities, FDI or foreign bank deposits. The left-hand panel of Graph 2.3 decomposes OPEC countries' investable funds into the change in foreign exchange reserves and the various components of the financial account, as dictated by the balance of payments identity.

These data indicate a marked change in the types of foreign investment across the two cycles. Since 1999, 28% of cumulative investable funds have been channelled into portfolio investment – or net purchases of foreign financial assets by non-monetary authorities – compared with 38% in the

OPEC's foreign investment ...



<sup>3</sup> Total net exports of OPEC countries cumulated over 1999–2005 reached \$852 billion. OPEC's aggregate current account surplus in 2004, at \$140 billion (excluding Indonesia), was roughly the same as that for the major emerging economies in Asia-Pacific (\$149 billion).

Cross-border bank flows to emerging economies									
Exchange rate adjusted changes in amounts outstanding, in billions of US dollars									
	Banks' positions <sup>1</sup>	2003	2004	2004			2005		Stocks at end-Jun 2005
		Year	Year	Q2	Q3	Q4	Q1	Q2	
Total <sup>2</sup>	Claims	64.9	131.2	26.0	1.6	35.8	70.6	21.8	1,267.8
	Liabilities	72.3	200.8	21.2	49.7	23.1	60.2	64.4	1,547.1
Argentina	Claims	-8.5	-5.3	-1.1	-0.8	-0.7	-1.3	-0.6	16.5
	Liabilities	-0.8	-0.3	0.1	-0.3	-0.5	-0.1	1.0	25.0
Brazil	Claims	-7.2	-7.4	-4.0	-2.1	-3.1	2.9	0.8	80.1
	Liabilities	14.4	-4.8	-3.6	-7.0	0.9	13.3	-9.3	55.7
China	Claims	13.5	24.0	9.9	-3.1	3.2	10.0	-2.7	97.3
	Liabilities	-6.4	25.8	20.3	-2.6	-13.6	-3.3	6.8	120.3
Czech Rep	Claims	3.7	2.7	0.8	0.4	3.1	0.7	-0.3	23.4
	Liabilities	-2.4	0.8	2.5	-0.6	1.5	-0.8	2.3	12.5
Indonesia	Claims	-4.6	0.3	-0.9	0.2	0.7	-0.6	1.9	31.0
	Liabilities	0.2	-2.3	-1.3	-0.1	-0.6	0.1	0.6	10.9
Korea	Claims	-1.0	12.6	-8.6	0.8	6.0	8.9	-2.5	95.4
	Liabilities	7.3	13.8	-4.9	2.9	-6.0	-4.6	-8.7	40.4
Mexico	Claims	-0.7	-0.8	-0.6	-6.7	-1.0	0.5	-1.8	63.7
	Liabilities	6.2	-4.7	-0.7	-6.4	-1.6	-1.5	2.3	58.1
Poland	Claims	3.3	5.9	2.0	1.5	-0.1	5.5	2.5	51.4
	Liabilities	-0.1	11.3	3.9	-0.2	4.6	1.6	1.4	33.2
Russia	Claims	12.1	8.9	-0.3	-1.8	7.6	3.3	1.7	66.8
	Liabilities	16.2	23.9	7.8	5.5	5.6	28.1	28.9	136.6
South Africa	Claims	-1.2	0.4	0.5	-0.3	0.3	-0.2	3.2	21.9
	Liabilities	9.5	6.8	1.9	0.7	0.1	0.6	1.6	41.0
Thailand	Claims	-1.6	0.2	-0.4	1.7	-0.1	0.5	4.3	24.0
	Liabilities	5.7	2.4	1.2	1.7	1.0	2.6	1.4	24.1
Turkey	Claims	5.3	9.1	3.4	0.0	1.5	3.0	2.0	58.8
	Liabilities	-0.4	6.9	0.9	1.1	2.0	-1.5	2.5	28.0
<i>Memo:</i>									
New EU countries <sup>3</sup>	Claims	20.9	30.3	6.6	8.4	11.5	15.1	8.2	189.4
	Liabilities	-0.4	17.4	4.8	0.0	9.4	0.7	1.9	85.7
OPEC members	Claims	-6.5	21.3	1.7	4.9	5.5	5.4	5.0	163.0
	Liabilities	-14.9	34.5	-1.7	24.1	-4.2	8.1	26.7	319.2

<sup>1</sup> External on-balance sheet positions of banks in the BIS reporting area. Liabilities mainly comprise deposits. An increase in claims represents an inflow to emerging economies; an increase in liabilities represents an outflow from emerging economies. <sup>2</sup> All emerging economies. For details on additional countries, see Tables 6 and 7 in the Statistical Annex. <sup>3</sup> Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

Table 2.2

1978–82 cycle. “Other investment”, which primarily constitutes deposits in foreign banks but also investment not classified elsewhere, has fallen as a share of investable funds, from 58% in the previous cycle to 47% in the current one. Foreign exchange reserves have risen by \$136 billion since end-1998, accounting for 19% of cumulative investable funds. In contrast, reserves



accounted for a negligible fraction of cumulative investable funds in the earlier cycle.<sup>4</sup>

A more detailed tracking of where these investable funds are placed is difficult because OPEC member countries generally do not provide a finer breakdown of their capital outflows. The right-hand panel of Graph 2.3, however, splices various sources of *counterparty* data in order to get a better handle on what is known about aggregate outflows from OPEC countries. Cumulative net purchases of US and German securities are combined with OPEC FDI in these countries. This, coupled with the gross deposits placed in BIS reporting banks worldwide, provides an estimate of OPEC's investable funds based on publicly available counterparty data.<sup>5</sup>

... is poorly tracked  
by counterparty  
data ...

While this combination of counterparty data roughly matches the outflow of investable funds from OPEC member countries in the late 1980s and early 1990s, it tracks the surges in these funds during periods of high oil prices far less accurately. Almost 70%, or \$486 billion, of cumulative investable funds cannot be identified in the counterparty data in the most recent cycle, compared with 51%, or \$103 billion, in the previous one.

Several possible explanations for the current large gap come to mind. First, the available counterparty data do not capture offshore purchases of securities. For example, the estimate of OPEC's cumulative net purchases of US securities based on the TIC data would tend to understate the total to the extent that these securities are purchased in London or other financial centres outside the United States. Second, cross-border investment in regional stock and bond markets is likely to have become a more important outlet for petrodollars than before. Many countries in the Middle East are, by some measures, experiencing an economic boom; the stock market indices in Saudi Arabia, Kuwait and the United Arab Emirates more than quadrupled between end-2001 and end-June 2005. Finally, there is some evidence that petrodollars are being invested more broadly – more diversified geographically and across the asset spectrum – than they once were. For instance, hedge funds and private equity funds, which have experienced large inflows worldwide in recent years but are not required to release information on the positions of their investor base, are one possible home for these investments.

... because of  
greater  
diversification

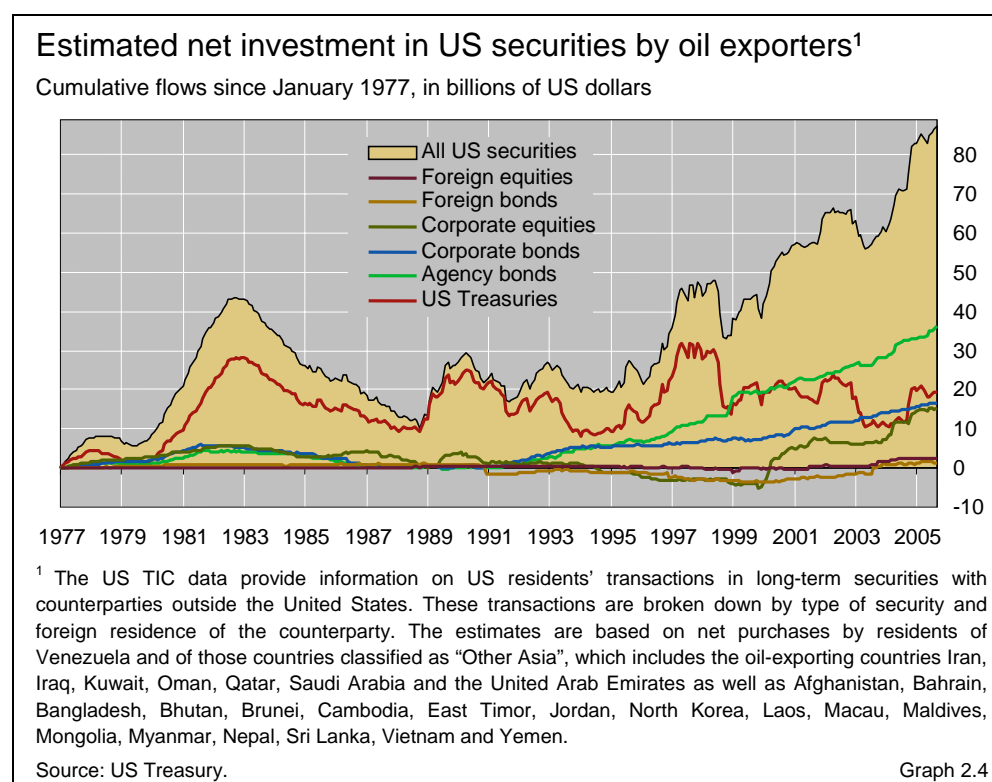
The greater diversification across asset types is evident in the limited counterparty data that are available. For example, a rough estimate of OPEC's cumulative net purchases of long-term US securities can be constructed using

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<sup>4</sup> Most OPEC member countries' oil industries are at least partially state-owned. See the 2004 OPEC Annual Statistical Bulletin for details.

<sup>5</sup> For a description of the US data, see footnote 6. France, Japan and the United Kingdom also provide some information on the geographical breakdown of their international investment position. The stock of OPEC's portfolio investment in France has increased by \$25 billion since 2000, the earliest date for which such data are available. Data on OPEC's investment in Japan are available for 2005 only. OPEC investment in the United Kingdom is negligible relative to the other identified investment according to the available data, which cover 1997–2003 (for FDI) and 2001–03 (for portfolio investment). These data, however, underestimate the true OPEC net purchases of securities to the extent that these purchases are conducted through financial intermediaries in third countries.

the US TIC data.<sup>6</sup> This estimate suggests that a smaller share of investable funds has been channelled into US securities in the most recent cycle, even though US securities still constitute the bulk of *identified* investment in foreign securities.<sup>7</sup> At the same time, their investment in German assets rose from 1% to 2% of investable funds across the two cycles. The available data also suggest diversification *within* the universe of US securities. Since 1997, many oil-producing countries have been net sellers of US Treasuries – the asset of choice in the early 1980s – while continuing to move into US corporate and agency bonds (Graph 2.4). Most striking in the current cycle is the increased investment in US equities since 2000, with cumulative net purchases of \$15.2 billion.<sup>8</sup>

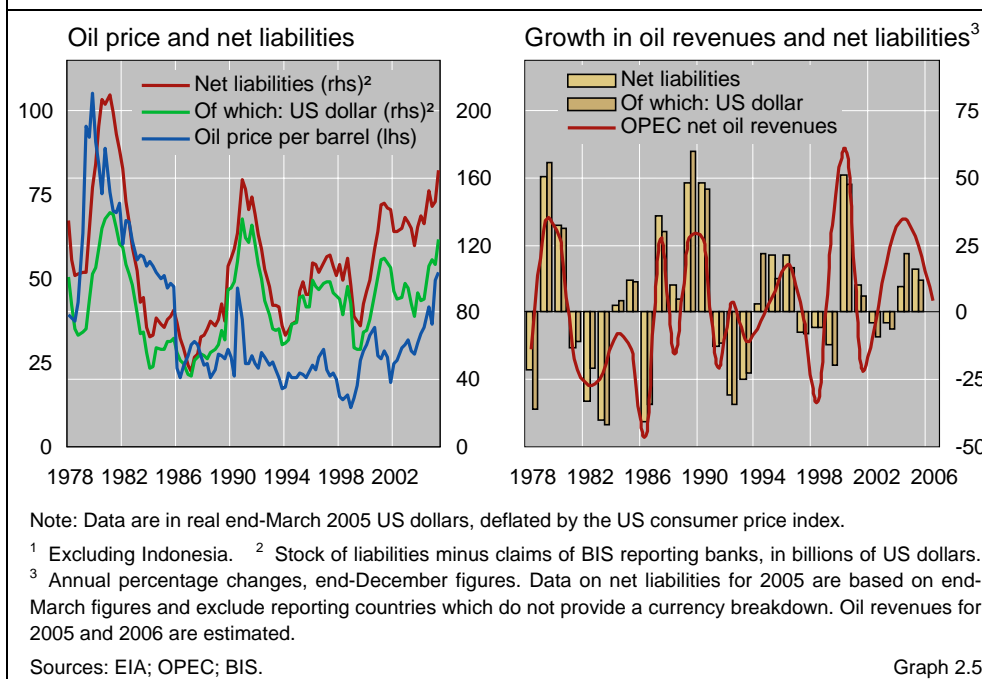


<sup>6</sup> The estimate of OPEC's cumulative net purchases of long-term US securities is constructed by adding together cumulative net purchases by residents of Venezuela with cumulative net purchases by residents of countries classified as "Other Asia" in the US TIC (transactions) data (see Graph 2.4). Estimates of the *stock* of securities held by Middle Eastern oil exporters are available in the "Report on Foreign Portfolio Holdings of US Securities as of 30 June, 2004". Their holdings of long-term US securities rose from \$19 billion at end-1978 to \$45 billion by end-1984. More recently, the outstanding stock rose from \$71 billion in March 1994 to \$103 billion in June 2004. Their holdings of short-term US debt securities rose as well, from \$4.5 billion in June 2002 to \$18.4 billion two years later.

<sup>7</sup> These data suggest that roughly 19% of OPEC's cumulative investable funds between 1978 and 1982 were directly channelled into purchases of US securities. In contrast, the same exercise applied to the most recent cycle suggests that only 8% of investable funds cumulated between 1999 and 2004 have been directly channelled into these assets.

<sup>8</sup> In contrast to the observed redistribution of asset holdings within the universe of US securities, OPEC investors have shifted out of German equities and into German government bonds.

## Petrodollars and BIS reporting banks' positions vis-à-vis OPEC<sup>1</sup>



Petrodollars are channelled into banks to a lesser degree

This expansion across the asset spectrum has led to a smaller share of investable funds being channelled into BIS reporting banks. Deposits placed in these banks between 1978 and 1982 accounted for 28% of investable funds accumulated over the same period, but only 20% of the cumulated funds between 1999 and 2005. As discussed in the next section, petrodollars are still an important source of funds for the international banking system, although less so than in previous decades.

### *Petrodollars as a source of funds for BIS reporting banks*

Historically, surplus oil revenue during periods of rapid growth was first deposited in banks abroad, and later reinvested in securities or other assets. Thus, past experience suggests a rough, but discernible, relationship between oil prices, oil revenue and the net stock of funds placed by OPEC member countries with BIS reporting banks. As shown in Graph 2.5 (left-hand panel), the real net stock of liabilities to OPEC member countries – a measure of their net funnelling of funds into the international banking system – has tended to rise with real oil prices, at times with a lag.

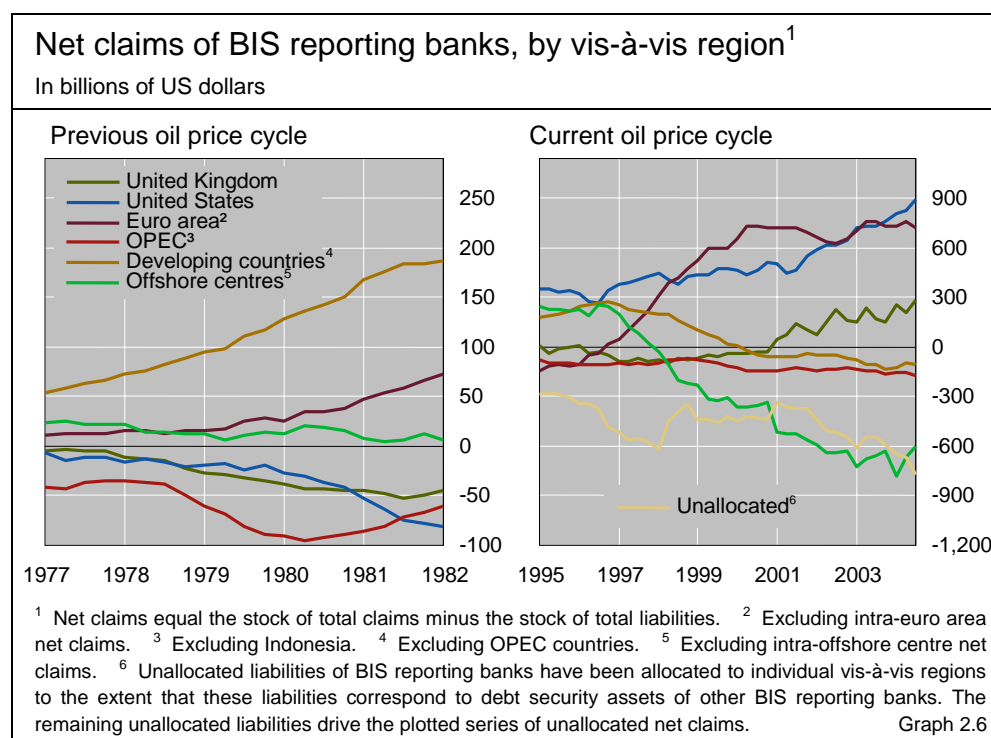
OPEC was a large supplier of funds to banks in the previous cycle ...

The importance of petrodollars is relatively clear in the 1978–82 cycle (Graph 2.6, left-hand panel). BIS reporting banks' net liabilities to OPEC member countries roughly doubled over this period, making OPEC countries one of the largest net suppliers of funds to the international banking system. Funds from these oil-producing countries fuelled the growth in BIS reporting banks' net long positions elsewhere, in particular vis-à-vis emerging economies, which eventually culminated in the 1980s debt crisis.

Since this earlier cycle, significant changes in global financial flows have reduced the relative influence of petrodollars on the supply of funds flowing through banks. The most striking change, as shown in Graph 2.6, is that BIS

reporting banks currently have much larger net short (liability) positions vis-à-vis *offshore centres* and *non-OPEC emerging economies*, and net long (asset) positions vis-à-vis the United States and the euro area, than they did previously.<sup>9</sup> In both cases, the 1997 Asian financial crisis seems to have been a contributing factor. Prior to the crisis, Asia-Pacific was a large net debtor region. However, since 1999, a portion of the combined funds generated from current account surpluses (cumulative \$599 billion) and capital inflows into the (major) emerging Asian economies<sup>10</sup> has been placed as deposits in BIS reporting banks. This rise in deposits, coupled with a drop in cross-border credit from BIS banks since 1997, has led to a reversal in the net claim position of BIS reporting banks vis-à-vis emerging economies. Specifically, the stock of BIS reporting banks' net claims on borrowers in emerging Asia fell from \$220 billion in the second quarter of 1997 to -\$97 billion four years later.<sup>11</sup>

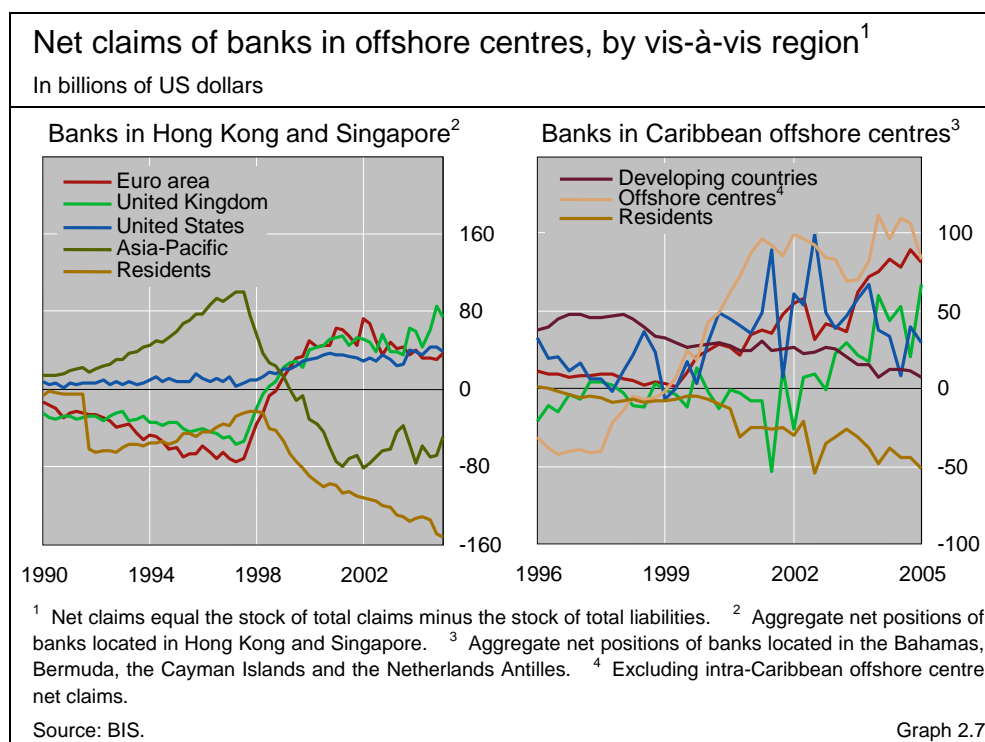
... but less so in the current cycle



<sup>9</sup> The figures used in the right-hand panel of this graph are estimated. A large portion of reporting banks' liabilities is not allocated to a particular country because, unlike *deposit* liabilities, reporting banks often do not know who holds their *debt security* liabilities. BIS reporting banks' liabilities for which the *residence of the counterparty* is unknown have grown to \$1.96 trillion, or 10% of reporting banks' total liabilities (from 2% in 1983). However, data on BIS reporting banks' debt security *claims on banks* are used to reallocate much of these unallocated claims by vis-à-vis country.

<sup>10</sup> These developments were discussed in the international banking markets chapter of the September 2005 *BIS Quarterly Review*. The major emerging market economies in Asia-Pacific include China, India, Indonesia, Korea, Malaysia, the Philippines, Thailand and Taiwan (China).

<sup>11</sup> More recently, in the fourth quarter of 2003, BIS reporting banks' net claims on Latin America turned negative as well.



The effects of the Asian crisis are also evident in reporting banks' positions vis-à-vis offshore centres. The large fall in Graph 2.6 reflects a shift from a net long to a net short position vis-à-vis residents of Hong Kong and Singapore. From a reporting country perspective, banks located in these areas cut back credit to borrowers in Asia-Pacific, and became a conduit through which net funds from the region – and net funds from residents of Hong Kong and Singapore – were channelled to banks in the United Kingdom and the euro area. This reflects the role of Hong Kong and Singapore as international funding centres. The fall in BIS reporting banks' net claims on offshore centres in Graph 2.6 also reflects a drop vis-à-vis residents of Caribbean offshore centres. In part, this is a result of larger net long positions of banks located in these areas vis-à-vis the euro area, the United States and the United Kingdom since 1999 (Graph 2.7, right-hand panel).

#### *OPEC's deposits with BIS reporting banks*

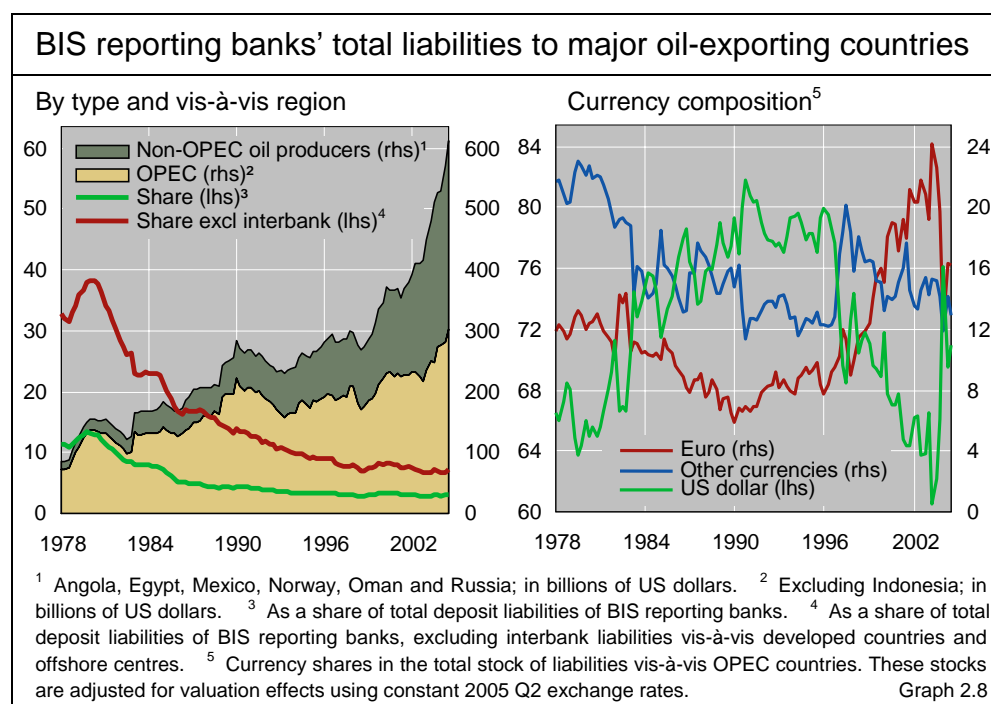
Even as oil exporters have become a relatively smaller source of funds for BIS reporting banks, it is clear that their gross deposits placed in reporting banks have been on the rise over the last year. Total liabilities of BIS reporting banks to these countries have grown at an average annual rate of 20% since the first quarter of 2004, reaching \$611 billion in the most recent quarter (Graph 2.8, left-hand panel). Despite this growth, however, residents of oil-exporting countries account for only 3% of BIS reporting banks' total deposit liabilities, down from a high of 13% during the previous oil price cycle. This drop is even more significant if interbank deposits, which can swell or contract as funds are passed between banks, are excluded.

As Graph 2.8 shows, non-OPEC oil-exporting countries account for a larger share of these “petro-deposits” with BIS reporting banks than they once did.<sup>12</sup> This primarily reflects Russia’s oil revenues, which have totalled \$403 billion since end-1998, second only to Saudi Arabia’s \$597 billion over the same period. Russia’s oil revenues have underpinned its accumulation of foreign exchange reserves and robust foreign placement of funds. A portion of these funds have been channelled into foreign banks. Specifically, deposits in BIS reporting banks have accounted for 38% of the \$250 billion rise in Russia’s total foreign financial assets over the current oil price cycle.

Non-OPEC oil exporters have grown in importance relative to OPEC

The currency composition of OPEC deposits in BIS reporting banks has undergone noticeable changes since 1999. These changes seem to be related to the evolution of the euro/US dollar exchange rate as well as interest rate differentials. OPEC deposits shifted towards the euro from early 1999 to early 2004 (Graph 2.8, right-hand panel), accompanied by a rise in the euro/US dollar interest differential over the first three years of that period, and a sharp depreciation of the dollar against the euro over the last two.<sup>13</sup> By the beginning of 2004, the share of euro-denominated deposits in total OPEC currency-adjusted deposits had risen by 13 percentage points. However, this quickly reversed as the euro/dollar exchange rate stabilised and policy rates in the United States started to rise. Between mid-2004 and the second quarter of 2005, new US dollar-denominated deposits placed by OPEC residents in BIS reporting banks led to a decline in the euro share by 8 percentage points.

Currency composition of OPEC deposits ...

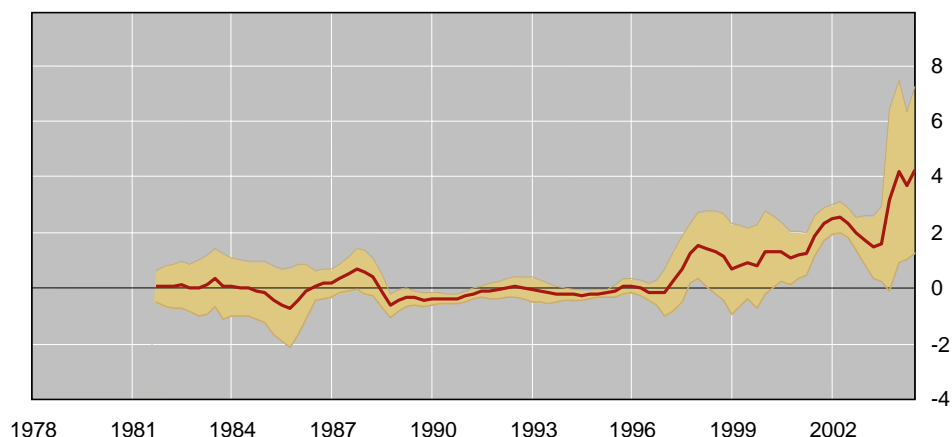


<sup>12</sup> The share of total deposit liabilities to oil-exporting countries, as defined in graph 2.8, accounted for by non-OPEC members rose from 14% at end-1977 to 50% in the second quarter of 2005.

<sup>13</sup> Throughout this exercise, exchange rate valuation effects are removed by recalculating the currency share on constant 2005 Q2 end-of-period exchange rates.

## Explaining the currency composition of OPEC<sup>1</sup> deposits

The impact of relative euro/US dollar yields<sup>2</sup>



<sup>1</sup> Excluding Indonesia. <sup>2</sup> Results from a 16-quarter rolling regression of the relative euro/US dollar share in OPEC residents' deposits in BIS reporting banks on the contemporaneous euro/US dollar interest rate differential and euro/US dollar exchange rate. The relative currency share equals the stock of euro-denominated deposits as a fraction of the sum of euro- and US dollar-denominated deposits placed in currency reporting countries. These deposit stocks are adjusted using constant 2005 Q2 exchange rates. The interest rate differential equals the difference between German and US one-year annualised government security yields. Deutsche mark/US dollar exchange rates are used prior to 1999. The line plots the slope coefficient of the interest rate differential. The shaded area indicates the two standard error confidence band.

Graph 2.9

This recent reshuffling of deposits across currencies appears similar to, albeit more pronounced than, that observed during the 1978–82 oil price cycle. There is evidence that the currency composition of OPEC deposits in BIS reporting banks has recently been more sensitive to changes in interest rate differentials than in the past. This is implied by the results of a 16-quarter rolling regression of the relative euro/US dollar share in OPEC deposits on the euro/US dollar interest rate and exchange rate differentials (Graph 2.9).

... seems to react to interest rate differentials

The regression is designed to capture the extent to which the currency composition of OPEC deposits reacts to changes in interest rates, given expectations of currency movements.<sup>14</sup> These expectations are assumed to be driven by the contemporaneous interest differential and exchange rate.<sup>15</sup> Since the currency shares are based on deposit stocks valued at a constant exchange rate, the regression captures changes in these shares which result only from new deposit flows.

The regression results provide evidence that the currency composition of OPEC deposits has reacted to the euro/US dollar interest differential only during the recent hike in oil prices. The coefficient on the interest differential is positive and statistically significant in all regression windows (save one) with an

<sup>14</sup> It should be kept in mind that the regression results are based only on deposits in BIS reporting banks and, thus, need not be valid for all cross-border investments of OPEC residents. In addition, the regression results provide on their own an incomplete picture of the market risk associated with OPEC deposits, which may be hedged.

<sup>15</sup> The euro/US dollar interest rate differentials and exchange rates do exhibit predictive power for actual changes in the euro/US dollar exchange rate between 1978 Q4 and 2005 Q2.

end date from the first quarter of 2001 onwards. During this period, the results have economic significance as well, implying that a 1 percentage point increase in the euro/US dollar interest differential tends to be associated with roughly a 2 percentage point increase in the relative share of euro-denominated deposits.<sup>16</sup>

This same relationship is not apparent in the earlier oil price cycle. The regression results suggest that, before 2001, the currency composition of OPEC deposits was insensitive to relative returns in either statistical or economic terms. Specifically, the high volatility of the euro/US dollar interest differential between 1978 and 1982 was not reflected in movements in the currency shares of deposits.

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<sup>16</sup> The slope coefficient of the exchange rate is statistically significant in most of the regression windows but its sign is unstable. For example, the coefficient is positive in regression windows with end dates between 1998 Q1 and 2002 Q2 and negative in regression windows with end dates between 2003 Q2 and 2004 Q2. The former result is consistent with perceived mean reversion in the euro/US dollar exchange rate, whereby a depreciation of the euro (ie a higher exchange rate) is expected to foreshadow an appreciation and triggers a shift into euros. The latter result is consistent with perceived persistence in exchange rate changes.



## Developments in the syndicated loan market

Blaise Gadanecz

### Market conditions remain favourable in the third quarter of 2005

After a very strong second quarter, activity in the international market for syndicated loans slowed down. New signings totalled \$522 billion in the third quarter, a 28% decrease from the previous period, but 13% higher than in the same quarter last year. On a seasonally adjusted basis, signings dropped by only 5%.

Market conditions remained favourable, especially in the United States, where spreads (unadjusted for credit quality) narrowed further, while average maturities were extended. The percentage of deals that had covenants or guarantees attached was at a record low for industrialised country borrowers, possibly a further indication of easy market conditions.

The low spreads observed on industrial country syndicated loans have been accompanied by a record low number of average participants in such loans: nine institutions per facility. Several banks may have withdrawn from the market because of the low spreads being offered.

Lending to emerging markets totalled \$56 billion, a record high not observed since the end of 1997. Activity was driven by exceptionally strong borrowing by the Middle East and Africa and Asia-Pacific regions (in the latter, China in particular). In these two regions, the energy sector was a large recipient of funds and average Libor spreads were low: 76 and 75 basis points, respectively (a level hardly observed in Asia since 1996). South Africa further boosted activity in its region by rolling over \$1.5 billion in sovereign facilities. After a long pause, Argentina returned to the market, with an engineering company there arranging a \$1.4 billion facility.

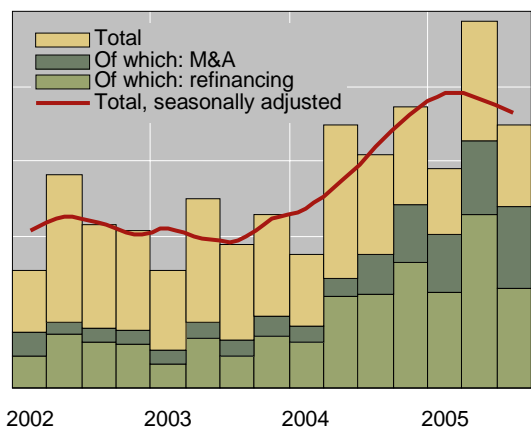
### The geography of syndicated lending to selected oil-exporting countries and to the oil industry

The analysis of syndicate structures makes it possible to determine the nationality of banks involved in loan syndications for selected oil-exporting countries and to the oil industry over the past 10 years. This exercise shows that the role of western European banks has been prominent and growing in this area.

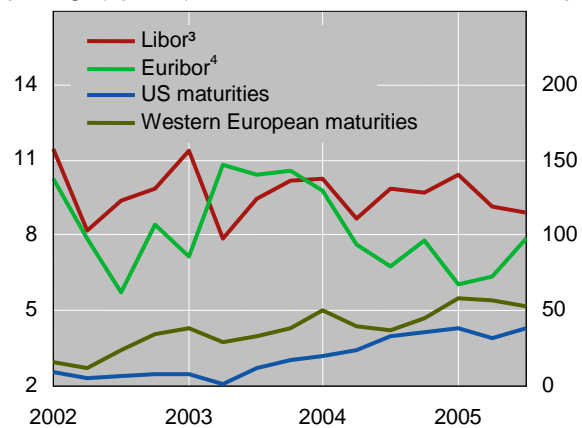
The majority of loans set up over the past 10 years for the OPEC countries of the Middle East (regardless of the industry of the borrower) have been arranged and funded by regional and western European banks (see Graph B). However, the role of regional banks has diminished over time. Indeed, while 30% of these loans had been arranged by banks from the region between 1994 and 1999, this share has dropped during the past five years to 24%, as more banks from

## Signings of international syndicated credit facilities

Total signings (USD billions)



Weighted<sup>1</sup> average maturities (years, lhs) and pricing<sup>2</sup> (bp, rhs), United States and western Europe



<sup>1</sup> By facility sizes. <sup>2</sup> Spreads + fees. <sup>3</sup> US dollar-denominated facilities with Libor pricing granted to US borrowers. <sup>4</sup> Euro-denominated facilities with Euribor pricing granted to western European borrowers.

Sources: Dealogic Loanware; BIS.

Graph A

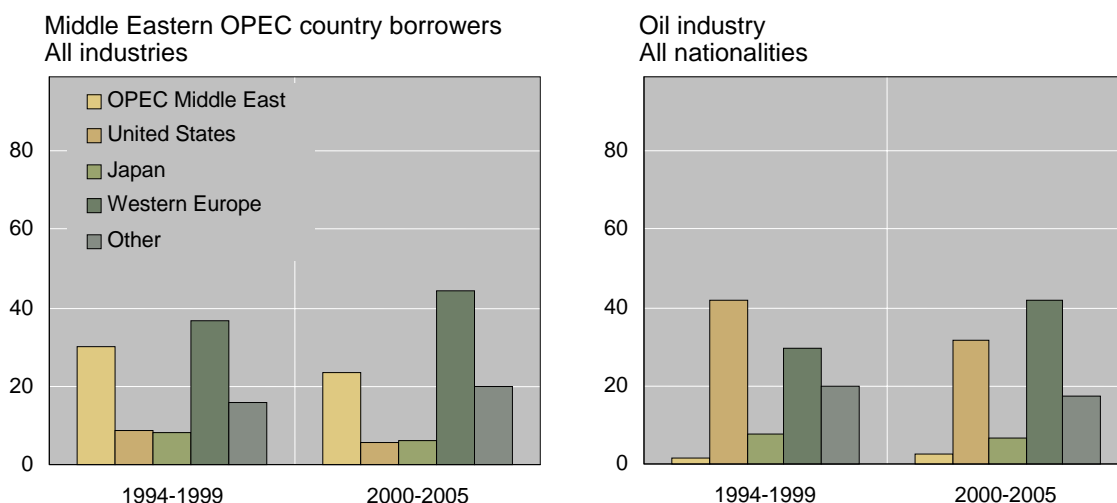
outside the region, especially from western Europe, have established a presence. Regarding the origin of funds, the share of western European banks has also increased to almost 50% of funds provided in 2004 and 2005, mainly to the detriment of regional lenders. The search for higher returns could have prompted western European banks to diversify their lending activity away from their domestic market, where the pricing of loans has been exceptionally low over the past couple of years.

Western European banks have also been heavily involved in the syndication of trade finance loans for OPEC country borrowers in the Middle East. During the past decade, they have, on average, arranged 56% of such loans and provided 74% of the corresponding funds.

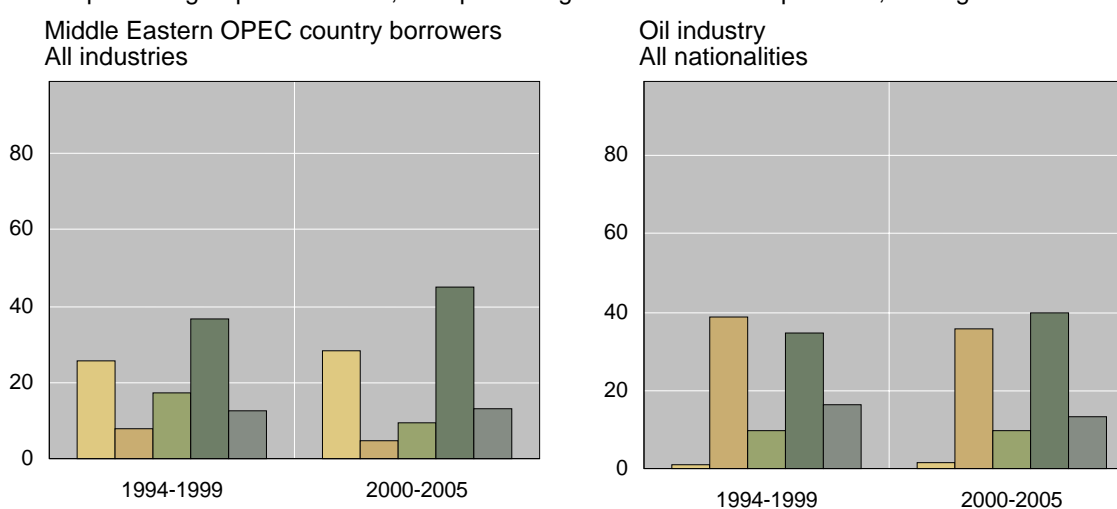
Banks from the United States and western Europe have been the most active in arranging and funding loans for the oil industry worldwide, jointly accounting for more than 70% of the market. Between 1995–99 and 2000–05, western European banks have gained 13 and 5 percentage points of market share as arrangers and funds providers respectively, to the detriment of US institutions.

### Geography of oil-related syndicated lending<sup>1</sup>

Arranger group nationalities, as a percentage of number of loans arranged, average for 1993–2005<sup>2</sup>



Fund provider group nationalities, as a percentage of loan amounts provided, average for 1993–2005<sup>2</sup>



<sup>1</sup> Including domestic deals. <sup>2</sup> 2005 up to Q3.

Sources: Dealogic Loanware; author's calculations.

Graph B

### 3. The international debt securities market

The pace of borrowing activity in the international debt securities market slowed in the third quarter of 2005, with gross issuance of bonds and notes down 19% from the second quarter. However, due to strong issuance earlier in the year, third quarter gross issuance was still up on a year-over-year basis by almost 10% (Table 3.1). One region where issuance picked up markedly was the United States, whereas issuance by euro area nationals declined. High-yield entities once again stepped up their borrowing in the international market, shrugging off a weak second quarter that had seen turmoil in the US auto sector. Global net issuance of bonds and notes fell sharply on both a quarterly and an annual basis (Table 3.2).

Borrowing by emerging market countries remained at a high level in the third quarter, as secondary market spreads on emerging market debt fell to a record low. Local currency issuance of international securities by emerging market entities continued to be particularly strong, and 2005 looks set to be a record year for this segment of the market. Latin American borrowers once again accounted for the vast bulk of local currency issuance, the government of Brazil being the main contributor with a \$1.5 billion issue in September.

#### US issuance surges

Pickup in US  
issuance is driven  
by the agencies

On the heels of several quarters of weak activity in the international bond and note market, gross issuance by US entities increased sharply in the third quarter from \$175 billion to \$219 billion. On a year-over-year basis, gross issuance increased by 29%. Consistent with past behaviour, the most active US entities were the agencies. Fannie Mae issued five- and 10-year bonds with a face value of \$3 billion each. Freddie Mac and Federal Home Loan Banks each completed two \$4 billion medium-term notes and three \$3 billion issues during the quarter. These issues were placed at several different points on the curve, with the larger issues from Freddie Mac at five- and 10-year maturities and those from Federal Home Loan Banks at the short end.

Net borrowing by  
Freddie Mac jumps  
up ...

The large jump in gross issuance by Freddie Mac coincided with positive net issuance by the agency, a sharp turnaround from the second quarter, when net issuance was -\$4.6 billion (Graph 3.1). Total net issuance of long-term debt securities (domestic and international) by the agency has been on an upward trend this year. The rise in the third quarter helped fund a \$20 billion

Gross issuance in the international bond and note markets							
In billions of US dollars							
	2003	2004	2004		2005		
	Year	Year	Q3	Q4	Q1	Q2	Q3
Total announced issues	2,885.0	3,300.1	726.0	822.5	1,077.6	977.0	795.9
Bonds	1,610.6	1,785.9	378.1	435.1	596.6	514.4	460.6
Notes	1,274.4	1,514.2	347.9	387.4	481.0	462.6	335.3
Floating rate	962.4	1,256.8	285.2	327.9	337.7	410.9	272.7
Straight fixed rate	1,834.5	1,985.9	430.3	483.3	723.7	559.7	517.0
Equity-related <sup>1</sup>	88.1	57.4	10.5	11.2	16.3	6.4	6.2
US dollar	1,171.8	1,154.1	255.5	284.1	314.1	300.0	326.7
Euro	1,287.6	1,597.5	350.2	389.8	571.9	532.5	304.4
Yen	102.7	111.4	22.4	25.9	30.5	27.0	30.6
Other currencies	322.9	437.1	97.9	122.6	161.1	117.5	134.2
Developed countries	2,620.7	3,009.4	655.8	752.1	954.8	885.7	704.3
United States	740.3	774.2	169.7	184.4	215.5	175.1	219.4
Euro area	1,301.9	1,469.4	306.1	362.9	532.8	510.8	286.0
Japan	48.3	62.0	12.1	9.9	13.9	13.3	18.7
Offshore centres	32.0	41.1	13.8	13.5	11.4	13.3	11.0
Emerging markets	139.7	152.4	35.0	35.1	83.1	49.8	46.3
Financial institutions	2,280.2	2,687.7	607.3	688.2	842.9	813.2	677.3
Private	1,913.4	2,282.3	506.6	592.2	697.8	681.3	602.7
Public	366.8	405.4	100.6	95.9	145.1	132.0	74.6
Corporate issuers	270.2	270.2	61.5	75.3	58.1	56.2	46.6
Private	218.9	232.7	56.8	60.9	54.7	43.4	38.6
Public	51.3	37.5	4.7	14.3	3.4	12.9	8.0
Governments	242.1	245.0	35.9	37.3	148.3	79.3	37.7
International organisations	92.5	97.1	21.3	21.8	28.3	28.2	34.3
Completed issues	2,866.1	3,303.7	708.8	864.4	1,017.3	1,019.8	739.6
<i>Memo: Repayments</i>	<i>1,503.0</i>	<i>1,750.1</i>	<i>405.0</i>	<i>439.8</i>	<i>521.8</i>	<i>516.0</i>	<i>527.8</i>

<sup>1</sup> Convertible bonds and bonds with equity warrants.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

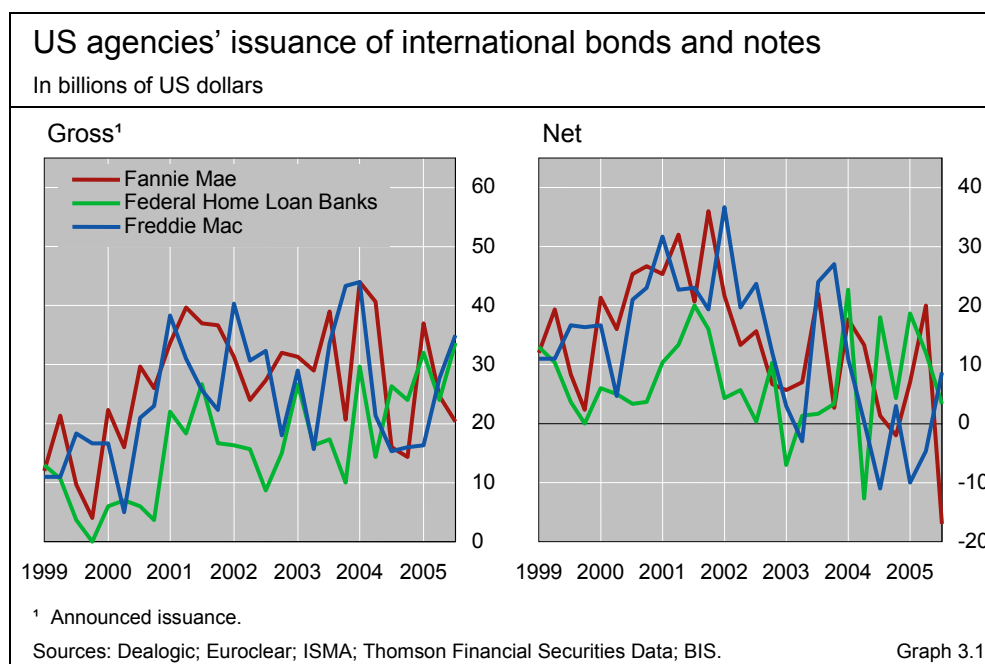
Table 3.1

increase in Freddie Mac's retained mortgage portfolio. By contrast, total net issuance of long-term debt securities by Fannie Mae has been negative in the year to date; in particular, a decline in net issuance of \$20.3 billion in the third quarter coincided with a sharp drop in the size of its mortgage portfolio, which reflected efforts to meet a 30% capital surplus requirement by end-September imposed by the Office of Federal Housing Enterprise Oversight (OFHEO).<sup>1</sup>

Total net US issuance of international bonds and notes fell by 22% in the third quarter. This decline was not in line with past seasonal patterns, as net issuance by US entities, unlike in many other countries, has tended to be

... while Fannie Mae's falls sharply to meet a capital requirement

<sup>1</sup> Subsequently, OFHEO confirmed that Fannie Mae had met its capital requirement target.



higher than average in the third quarter (see this chapter of the *BIS Quarterly Review*, September 2005).

### Large fall in euro area issuance

Euro area issuance declines ...

Gross issuance by euro area entities in the international bond and note market fell for the second consecutive quarter, though this time the decline, 44% on a quarterly basis to \$286 billion, was much larger than in the previous quarter. In part, the drop-off in issuance can be explained by seasonal factors: euro area issuance in the international market tends to be about 18% lower in the third than in the second quarter. The decline cannot be explained by valuation effects, as the exchange rate of the euro vis-à-vis the dollar depreciated by less than 0.5% during the quarter.

... with negative net issuance by German entities a major factor

Net issuance of international bonds and notes in the euro area fell sharply in the third quarter, from \$310 billion to \$33 billion. After a very strong first half of the year, net borrowing by German entities was negative in the third quarter at -\$13.4 billion. This decline was due to both financial firms and corporates, whereas net borrowing by the government actually increased slightly during the quarter. Net issuance was also negative in Italy. By contrast, Spanish and Dutch entities increased net borrowing by \$21.4 billion and \$15.4 billion, respectively.

Despite the sharp drop in gross issuance, there were some notable transactions by euro area entities during the period. First, the European Investment Bank came to the market with two large deals: a 10-year euro-denominated issue with a face value of €5 billion (\$6.1 billion) and a five-year US dollar-denominated bond for \$3 billion. The larger of the two issues has a coupon of 3.125% and was launched at a spread of 8.1 basis points over the 10-year bund. This was the first 10-year benchmark issue by the supranational

Main features of net issuance in the international bond and note markets								
In billions of US dollars								
	2003	2004	2004		2005			Stocks at end-Sep 2005
	Year	Year	Q3	Q4	Q1	Q2	Q3	
Total net issues	1,363.1	1,553.6	303.9	424.6	495.5	503.9	211.8	13,588.2
Floating rate	383.6	636.8	129.8	193.6	100.5	242.2	32.2	3,736.6
Straight fixed rate	958.5	922.9	176.8	235.4	397.4	266.8	188.4	9,521.1
Equity-related	20.9	-6.2	-2.7	-4.4	-2.4	-5.2	-8.8	330.4
Developed countries	1,282.2	1,433.2	276.6	396.6	462.1	474.1	167.8	12,044.0
United States	260.5	223.2	34.8	63.9	65.1	53.9	42.3	3,356.4
Euro area	731.8	779.7	139.8	220.2	283.8	309.6	32.7	5,902.1
Japan	-1.7	17.4	1.9	0.4	4.9	-2.4	4.6	269.4
Offshore centres	16.3	21.4	8.5	9.0	2.6	8.6	7.1	168.5
Emerging markets	42.1	76.1	13.0	21.6	28.8	15.6	15.3	831.5
Financial institutions	1,101.9	1,305.4	277.7	364.8	395.2	445.8	195.3	10,121.3
Private	907.3	1,095.5	226.4	316.4	319.2	369.4	186.3	8,562.8
Public	194.5	209.9	51.3	48.4	76.1	76.4	9.0	1,558.5
Corporate issuers	110.2	73.8	11.7	43.0	13.8	13.6	-4.6	1,494.1
Private	90.9	55.9	12.5	34.7	21.9	6.8	-6.2	1,260.2
Public	19.3	17.9	-0.9	8.4	-8.1	6.8	1.6	233.9
Governments	128.5	151.4	8.8	19.4	84.5	39.0	-0.6	1,428.5
International organisations	22.5	22.9	5.8	-2.7	2.0	5.4	21.7	544.3

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

Table 3.2

in the past two years, and it helped to fill out its benchmark curve from one to 30 years.

Second, there seemed to be strong demand for short-dated floating rate paper, with several large issues of this type coming to the market. Eurohypo AG, an A-rated mortgage bank, completed a €3 billion (\$3.64 billion) three-year floating rate eurobond on 8 September at 5 basis points over three-month Euribor. This issue was part of a €20 billion programme. BBVA Senior Finance SA Unipersonal, a Spanish commercial bank, issued a two-year €3 billion (\$3.73 billion) eurobond on 30 September at 2 basis points over three-month Euribor.

Large demand for shorter-dated paper

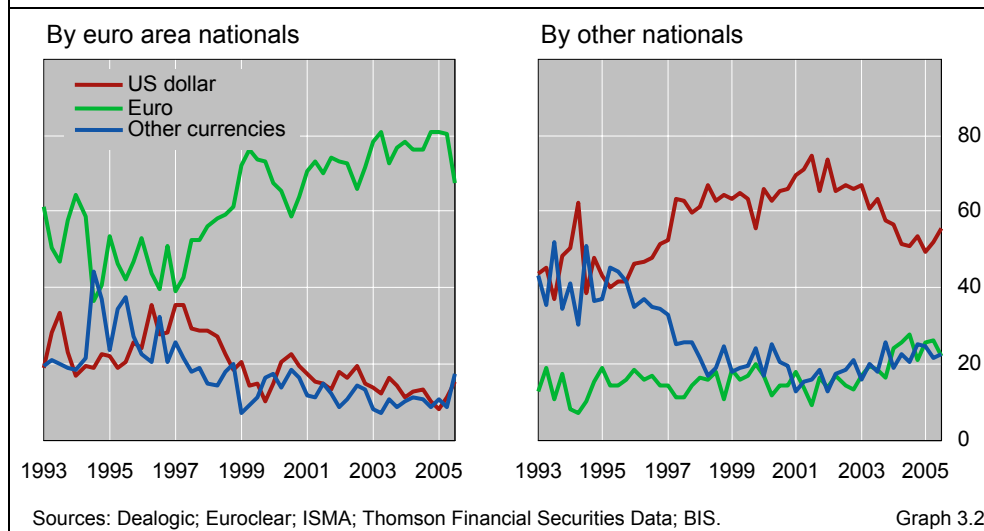
### Currency shares change significantly

Looking back in time, there has been a steady trend towards greater euro-denominated issuance by euro area entities since late 2000. In the run-up to European monetary union, the share of issuance by euro area nationals in euro area currencies in the international market rose significantly, from about 40% to 75% in a two-year span (Graph 3.2). After temporarily dipping to 60% in mid-2000, the share has steadily risen back to around 80% in the first half of 2005. By contrast, euro-denominated issuance in the international market by non-euro area nationals has not increased significantly. As shown in the graph, the share of gross issuance in euros and other currencies has increased relative to

Trend increase in euro-denominated issuance ...

## Currency shares in gross issuance of international bonds and notes

In per cent

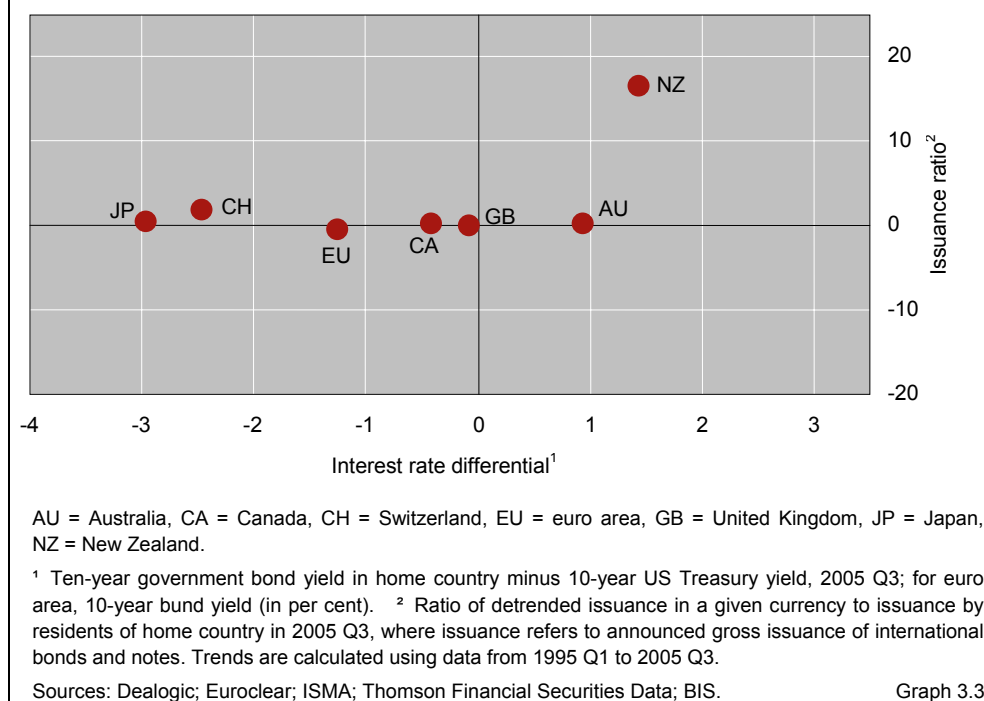


that in the US dollar since 2003, but the changes have been relatively modest to date.

... reverses in the third quarter

These trends aside, the share of euro-denominated issuance by euro area nationals declined in the third quarter along with the sharp fall in overall gross issuance by euro area nationals. Similarly, the shares of both gross and net issuance of international bonds and notes in euros by non-euro area nationals also dropped (Table 3.3). In fact, the amount of euro-denominated net issuance (\$60.5 billion) was lower than US dollar-denominated issuance (\$78.8 billion) for the first time since the third quarter of 2002.

## Interest rate differentials and issuance in selected currencies



Net issuance of international bonds and notes by region and currency <sup>1</sup>								
In billions of US dollars								
		2003	2004	2004		2005		
		Year	Year	Q3	Q4	Q1	Q2	Q3
United States	US dollar	204.9	134.8	5.0	51.0	42.6	56.3	14.0
	Euro	41.4	48.9	14.7	7.4	13.7	-3.2	12.1
	Pound sterling	12.0	22.9	10.6	4.7	5.5	1.1	6.9
	Yen	1.2	4.8	1.5	0.3	-1.1	-0.3	3.4
	Other	1.0	11.7	3.0	0.5	4.5	-0.1	6.0
Euro area	US dollar	74.7	56.8	9.7	15.7	15.2	15.0	14.9
	Euro	627.1	655.4	115.4	195.3	238.3	279.2	3.2
	Pound sterling	13.9	32.6	8.2	5.3	12.0	6.9	9.4
	Yen	-9.5	3.1	0.6	-3.0	5.0	0.4	-0.4
	Other	25.6	31.8	5.8	6.9	13.3	8.0	5.6
Others	US dollar	139.9	182.5	39.2	46.3	37.9	28.2	49.9
	Euro	115.0	218.5	62.6	47.8	61.1	56.0	45.2
	Pound sterling	58.9	78.7	8.2	29.1	31.4	25.7	27.5
	Yen	12.0	19.2	5.2	0.9	0.1	-6.5	-3.0
	Other	45.0	51.8	14.0	16.5	16.2	37.1	17.1
Total	US dollar	419.4	374.0	53.9	113.0	95.6	99.5	78.8
	Euro	783.5	922.9	192.8	250.5	313.0	332.0	60.5
	Pound sterling	84.8	134.2	27.0	39.0	48.9	33.7	43.8
	Yen	3.7	27.2	7.3	-1.8	4.0	-6.4	0.0
	Other	71.7	95.3	22.9	23.9	34.0	45.0	28.6

<sup>1</sup> Based on the nationality of the borrower.  
Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

Table 3.3

In addition to a rise in the share of US dollar-denominated issuance during the quarter, there was a jump in issuance in selected other currencies; in particular, gross issuance of bonds and notes in the Australian and New Zealand dollars increased by 39% and 88%, respectively. Past research has shown that the share of gross issuance in a currency tends to rise with the amount of home country issuance and the difference in the home country's long-term interest rates relative to US Treasury yields.<sup>2</sup> Consistent with this, long-term interest rates have been considerably higher in both Australia and New Zealand than in the United States in recent quarters (Graph 3.3). However, a deeper examination reveals that the relationship between issuance and interest rate differentials was not so clear-cut in the third quarter. For instance, issuance in the Canadian dollar and Swiss franc was also high on a historical basis even though these countries had lower long-term interest rates than the United States.

Issuance in  
Australian and New  
Zealand dollars  
surges

<sup>2</sup> See B Cohen, "Currency choice in international bond issuance", *BIS Quarterly Review*, June 2005, 53–66. The share of issuance in a currency also typically rises with the strength of the currency relative to the US dollar. The exchange rates of the currencies considered in Graph 3.3 were all relatively high in the third quarter compared to their average since 1995 (measured in US dollars per unit of domestic currency).



## Issuance in other developed economies remains robust

Borrowing in other developed economies keeps pace ...

Borrowers from several other developed economies were active in the international market in the third quarter. Gross issuance of bonds and notes was up by 128% in Switzerland, 40% in Japan and 6% in Canada (Graph 3.4). Admittedly, these countries form a relatively small segment of the international market, so their impact on total market activity is limited. For instance, the amount outstanding of international bonds and notes issued by UK, Canadian and Japanese entities was \$1.4 trillion, \$300 billion and \$269 billion, respectively, as of September 2005, compared to \$5.9 trillion and \$3.4 trillion for euro area and US nationals, respectively.

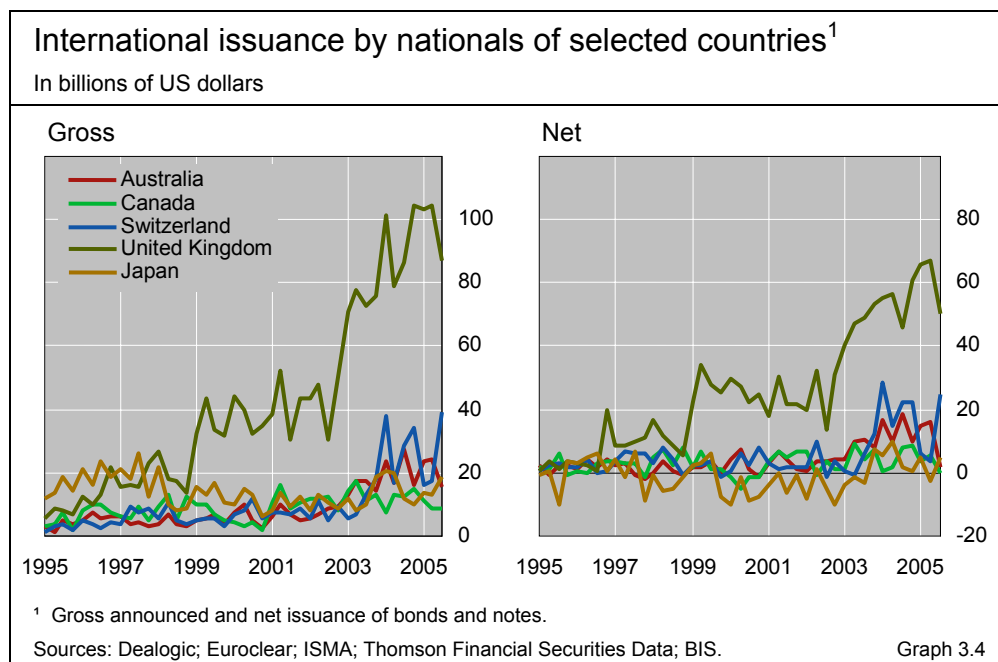
... including a large deal from Canada

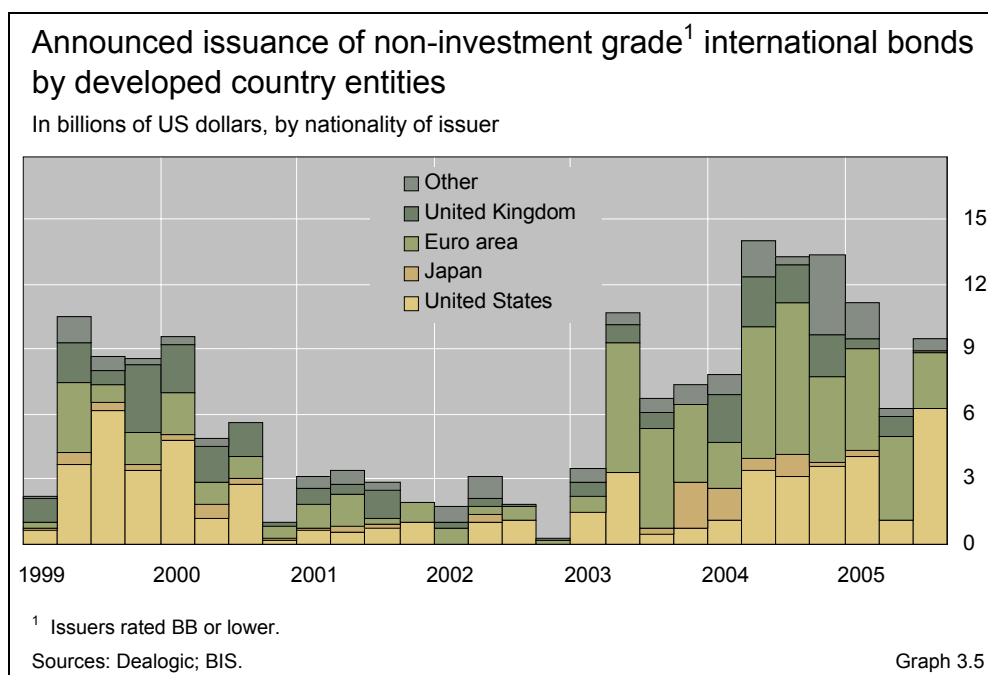
One of the largest deals in the international market in the third quarter came from Canada Housing Trust No 1, a special purpose vehicle that issued a fixed rate bond in the amount of 4.35 billion Canadian dollars (\$3.7 billion), guaranteed by Canada Mortgage and Housing Corporation. The bond has a maturity of five years and was launched at a spread of 8 basis points over the January 2010 Canadian government bond. With the declining supply of Canadian government debt, there has been increasing demand for issuance by highly rated government-sponsored enterprises. Another large issue in the third quarter was from The Royal Bank of Scotland. The UK-based bank completed a \$3 billion US dollar-denominated bond with a three-year maturity. The Royal Bank of Scotland has been one of the major issuers in the international debt markets in recent years, with gross issuance of bonds and notes averaging \$21 billion on an annual basis since 2003.

## High-yield issuance rebounds after spring's turmoil

High-yield issuance bounces back ...

Gross issuance of bonds and notes by high-yield entities in developed economies increased in the third quarter by over 50% on a quarterly basis to \$9.5 billion (Graph 3.5). In percentage terms, this largely offset the sharp





decline in borrowing in the previous quarter, when the high-yield debt market had contended with the ratings downgrades of General Motors and Ford to junk status and secondary market spreads had widened significantly. By early July, however, spreads on the Merrill Lynch high-yield spread index had narrowed back to late-March levels, and thereafter reached as low as 325 basis points on 29 July. In general, the appetite for riskier, higher-yielding debt returned to the market, and lower-rated issuers took advantage of the improvement in financing conditions, even if issuance was still below the levels witnessed in 2004.

One reason for the large increase in high-yield issuance during the quarter was greater leveraged buyout (LBO) activity. Specifically, Sungard Data Systems Inc completed a two-bond package as part of an \$11.3 billion buyout by private equity investors. The deal, at the time the largest LBO since RJR Nabisco in 1989, was financed by \$5 billion in loans, \$3 billion in bonds and the remainder in cash. Both bonds were rated B- by Standard & Poor's.

... in part due to increased LBO activity

### Emerging market borrowing on track for record-breaking year

Borrowers in emerging market countries put in another strong quarter in the international debt market. Gross issuance of bonds and notes fell slightly relative to the first two quarters of this year, but it was still above the levels reached in the past few years, including last year's record-breaking performance (Graph 3.6).<sup>3</sup> There is a strong seasonal pattern in borrowing by emerging market entities in the international market, with third quarter issuance

Emerging market issuance stays at an elevated level ...

<sup>3</sup> Excluding the Republic of Argentina's repackaged issues totalling \$35.6 billion from the first quarter of 2005. Further details on Argentina's debt exchange can be found in this chapter in the *BIS Quarterly Review*, September 2005.

typically 14% lower than the yearly average. In fact, on a year-over-year basis, gross issuance was up by 32% in the third quarter of 2005.

... as borrowers continue to face favourable financing conditions

The turmoil in the US credit markets in the spring had minimal spillover effects on emerging markets, and, therefore, there was little reason to expect emerging market issuance to surge along with the rebound in US high-yield issuance during the third quarter. To be sure, the financing environment was very positive, with secondary market spreads declining steadily throughout the period. By 3 October, spreads on JPMorgan Chase's EMBI+ index (excluding Argentina) had narrowed to a historical low of 235 basis points, 69 basis points lower than at the start of the third quarter. But with many issuers having already met a large proportion of their borrowing requirements for the year before the third quarter had even begun, there was less need to bring supply to the market. Indeed, as noted in the Overview, the start of the fourth quarter saw a sharp drop-off in borrowing by emerging market entities.

From a regional and sector perspective, two key features of last quarter's activity stand out. First, gross issuance of international bonds and notes increased on a quarterly basis in Asia-Pacific, Latin America and the Middle East and Africa, but declined significantly in emerging Europe (by 55% to \$8.9 billion). Net issuance by emerging markets overall declined by only 1.9% to \$15.3 billion, but there was almost zero net issuance in emerging Europe, where it fell sharply from \$14.9 billion in the previous quarter. Second, governments and financial institutions, which normally account for the bulk of issuance from emerging markets, scaled back their borrowing in the third quarter. In fact, governments actually retired more debt than they issued, with net issuance of -\$2.9 billion. Corporates, on the other hand, increased their presence in the international debt market, with gross and net issuance of \$11.6 billion and \$6.1 billion, respectively.

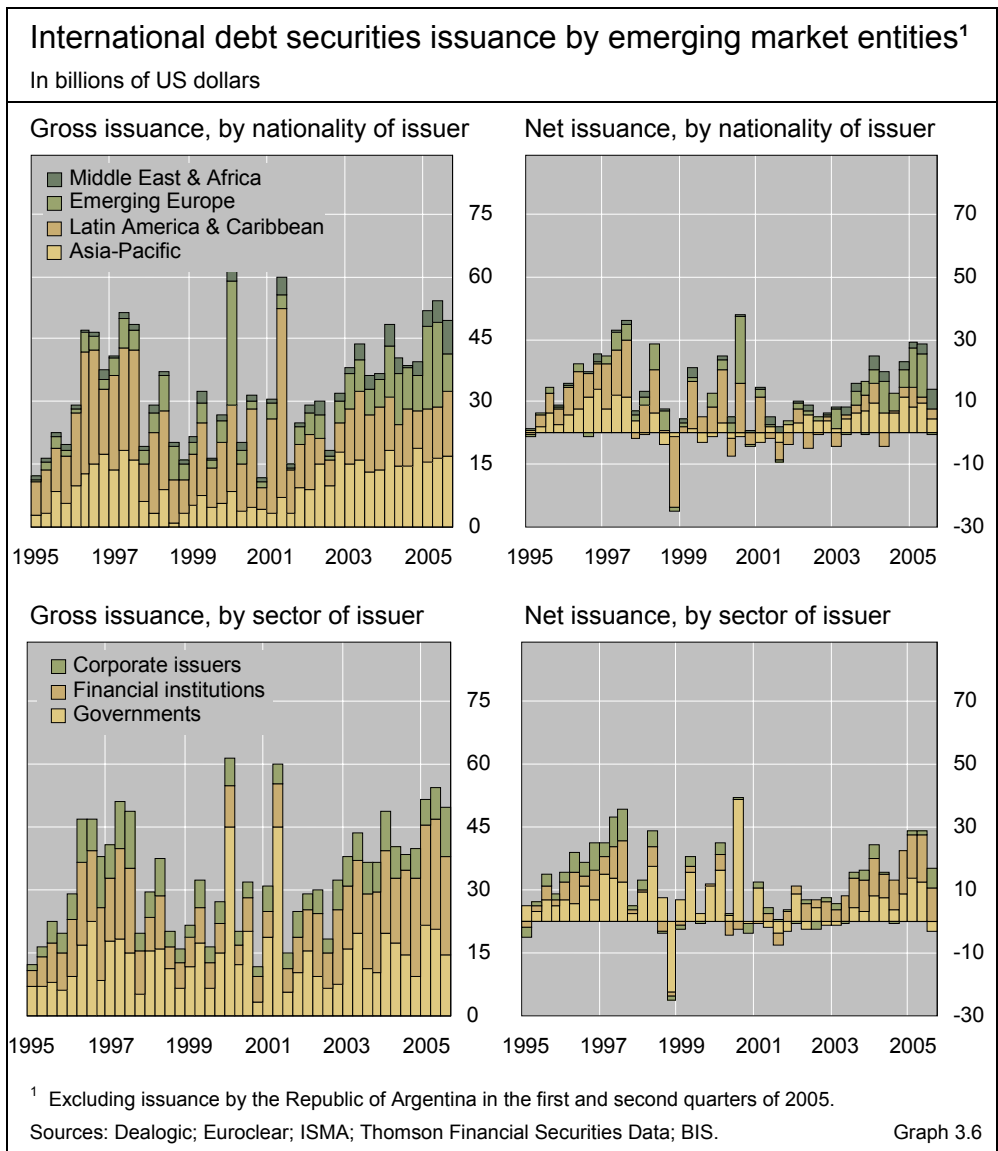
Corporates are the fastest growing sector in emerging markets

Most of the focus in Latin America was on Brazil. In particular, the Federative Republic of Brazil had a very active third quarter. First, the government announced in late July that it would exchange all outstanding Brady bonds for US dollar-denominated eurobonds. The face value of the new securities is \$4.5 billion and they have a maturity of approximately 12 years. This was followed up in early September with the announcement of another US dollar-denominated bond in the amount of \$1 billion, which has a maturity of almost 20 years. Soon after, the Brazilian government completed a large real-denominated issue on the global market (see below).

The government of Brazil is very active ...

Several Mexican issuers were also present in the international market in the third quarter. Even though gross issuance of bonds and notes (\$1.6 billion) was much smaller than that by Brazilian entities, net issuance was relatively high at roughly \$1 billion. Southern Peru Copper Corp, a Mexican firm operating in the United States, issued two US dollar-denominated bonds, one with a maturity of 10 years (\$200 million) and the other with a 30-year maturity (\$600 million). The relatively long maturity of the latter bond was indicative of a more general extension of maturity in deals by Latin American entities during the quarter; for instance, the average maturity of fixed rate issues by Latin American corporates increased from 10.5 to 13.2 years. The second largest Mexican deal during the quarter was actually a peso-denominated eurobond

... as are several Mexican entities



issued by a telecoms company, América Móvil SA de CV. The bond has a face value of five billion Mexican pesos (\$466 million) and 10¼ years until maturity.

The countries in Asia-Pacific that issued the most paper in the international market were China and Korea. Sovereign issuers of both countries were the subject of positive ratings actions during the quarter: Standard & Poor's upgraded China from BBB+ to A- on 20 July and Korea from A- to A on 27 July; Fitch put Korea on review for upgrade on 19 September. Yet the largest issues were not completed by the central governments. The Export-Import Bank of China and China Development Bank issued 10-year US dollar-denominated bonds for \$1 billion each. The latter also completed a \$500 million bond during the quarter. The largest issue from Korea was a five-year US dollar-denominated bond in the amount of \$750 million by the Korea Development Bank.

In mid-September, the Republic of the Philippines completed a 10½-year US dollar-denominated bond for \$1 billion. This completed the government's funding programme for 2005. Evidently, the Philippines government had little difficulty accessing global capital markets this year, despite political and fiscal

Chinese and Korean financial entities complete large bonds

The Philippines government accesses global markets once again ...

problems and several negative ratings actions. In fact, secondary market spreads on Philippines government debt narrowed during the quarter. The issue noted above was launched at a spread of 430 basis points over the 10-year US Treasury bond, which is roughly in the range where Philippines government debt had been trading just prior to the deal, according to JPMorgan's EMBI+ index.

... while the Republic of Poland cuts back on its borrowing

In emerging Europe, much of the decline in issuance can be traced to Poland and Turkey. In recent quarters, the Republic of Poland had been very active in the international debt securities market. During the third quarter, the government issued only one euro-denominated medium-term note with a face value of €750 million. Three of the five largest deals in the region were by Russian firms, two of which were US dollar-denominated bonds by the financial entity Gazstream SA.

Gross issuance of bonds and notes in the Middle East and Africa rose from \$4.9 billion in the second quarter to \$7.1 billion in the third quarter. Moreover, as of September, net issuance had already surpassed last year's total by \$1.3 billion. Egypt and Qatar each accounted for about one third of gross issuance in the region. In Qatar's case, this consisted solely of two US dollar-denominated bonds issued by Ras Laffan Liquefied Natural Gas Co Ltd.

### Local currency issuance continues to grow

Local currency issuance by emerging markets rises ...

Local currency issuance of international debt securities by emerging market entities grew further in the third quarter, by 10% to \$2.1 billion (Graph 3.7). This brought the total amount of local currency issuance in 2005 to \$5.5 billion, which is on pace to be a record year by a very wide margin for this segment of the market.<sup>4</sup>

In recent years, Latin American borrowers have been the most active issuers of local currency debt in the international market among emerging market entities.<sup>5</sup> According to the latest figures, Latin America once again accounted for the vast bulk of local currency issuance (\$2 billion). This can be mainly attributed to a Brazilian government issue in late September that has a face value of 3.4 billion reais (\$1.48 billion).<sup>6</sup>

... driven mainly by the Federative Republic of Brazil's large real-denominated issue

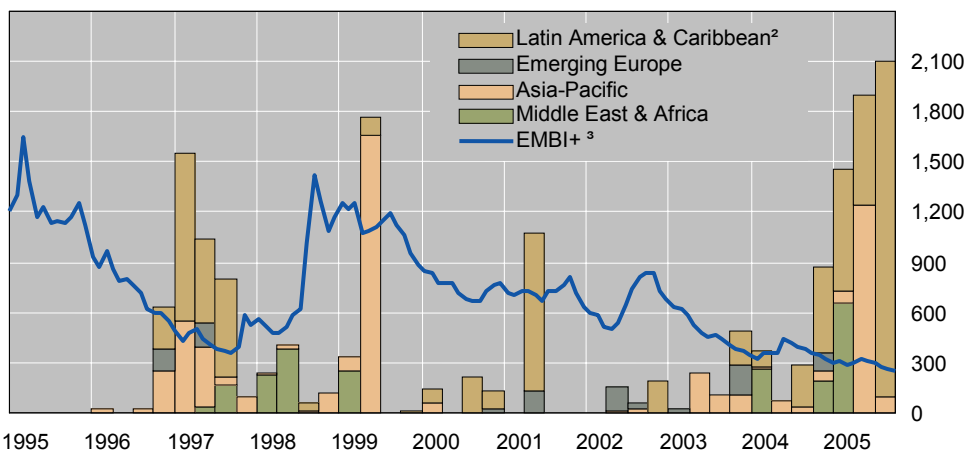
The Federative Republic of Brazil's bond is arguably a major breakthrough for the local currency segment of the international market in general, and the Brazilian government in particular. Notably, it is a large issue with a fixed rate (the coupon is 12.5%) and a long maturity (the redemption date is 5 January 2016). At launch, it was rated B1 by Moody's and BB- by Fitch. About two thirds of the issue was sold to investors in North America, with the remainder

<sup>4</sup> Excluding the Republic of Argentina's repackaged issues totalling \$15.7 billion from the first quarter of 2005.

<sup>5</sup> For further analysis of local currency international debt issuance by Latin American countries, see "International government debt denominated in local currency: recent developments in Latin America" on page 109.

<sup>6</sup> The other Latin American local currency issues were by two Brazilian banks and a Mexican telecoms company.

### International debt securities issuance in local currency by emerging market entities<sup>1</sup>



<sup>1</sup> Announced issuance by nationality of issuer in millions of US dollars. <sup>2</sup> Excluding issuance by the Republic of Argentina in the first quarter of 2005. <sup>3</sup> Adjusted for Argentina; monthly averages, in basis points.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

Graph 3.7

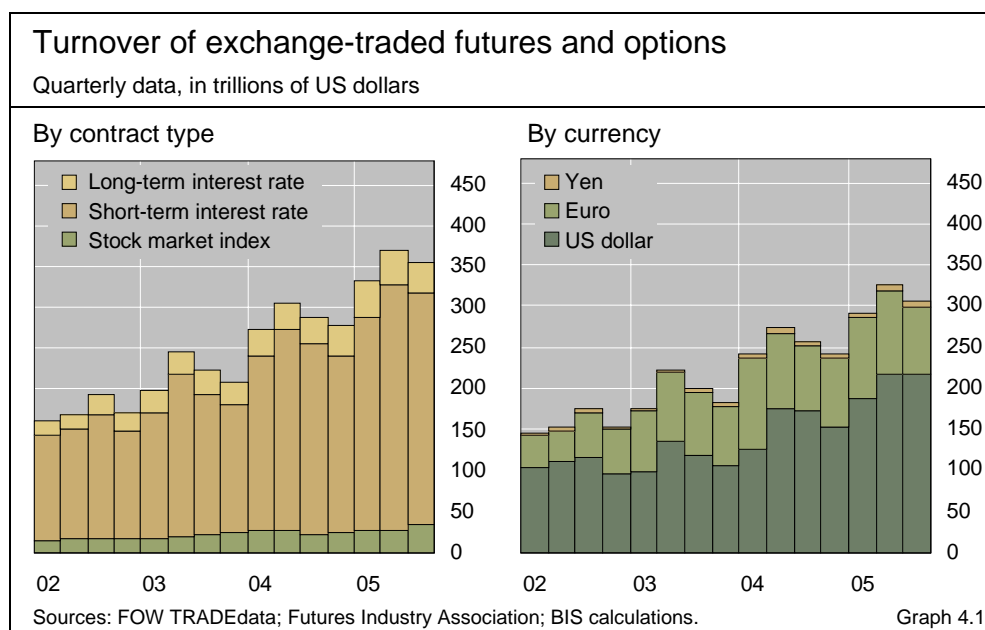
going primarily to European investors. Previous real-denominated issues in the international market were much smaller in size or were more complex instruments (ie structured notes). Given its relatively unique nature, there were no obvious benchmarks for pricing. The longest maturity on a fixed rate Brazilian government bond in the local market had been about seven years, and long-dated forwards markets have not developed. Brazilian interest rates had been falling just prior to the deal, as the central bank cut interest rates on 14 September, six days before the deal was announced. In the end, the issue was several times oversubscribed and was priced at a yield of 13.1%. Also, in initial trading, it was reported that the bond had fairly tight bid-offer spreads in comparison to real-denominated structured notes or smaller real-denominated bond issues traded in the global market.

## 4. Derivatives markets

Trading on the international derivatives exchanges declined during the third quarter of 2005. Combined turnover in fixed income, equity index and currency contracts fell by 4% quarter-on-quarter to \$357 trillion (Graph 4.1), although this was due to seasonal factors, which tend to depress activity in the interest rate segment in the third quarter. By contrast, the year-on-year rate of growth increased slightly to 23%, after 21% in the preceding quarter.

Growth was particularly strong in the market for futures and options on stock indices, which expanded by 22% to \$34 trillion in the third quarter, after lacklustre activity in the first half of the year. Turnover in contracts on Korean indices surpassed that in US stock index derivatives for the first time. On the currency front, the growth of the domestic bond market in Mexico has spurred the development of an increasingly sophisticated OTC Mexican peso derivatives market.

Growth in the market for credit default swaps in the first half of 2005 weathered the sell-off in credit markets in the wake of the US auto downgrades in spring. Notional amounts outstanding increased by 60% to \$10 trillion, far outpacing growth in the underlying credit contracts. This has increased the risk of squeezes, since most contracts stipulate physical delivery of the reference entity's debt in the case of a credit event. In addition, the assignment of trades without notifying

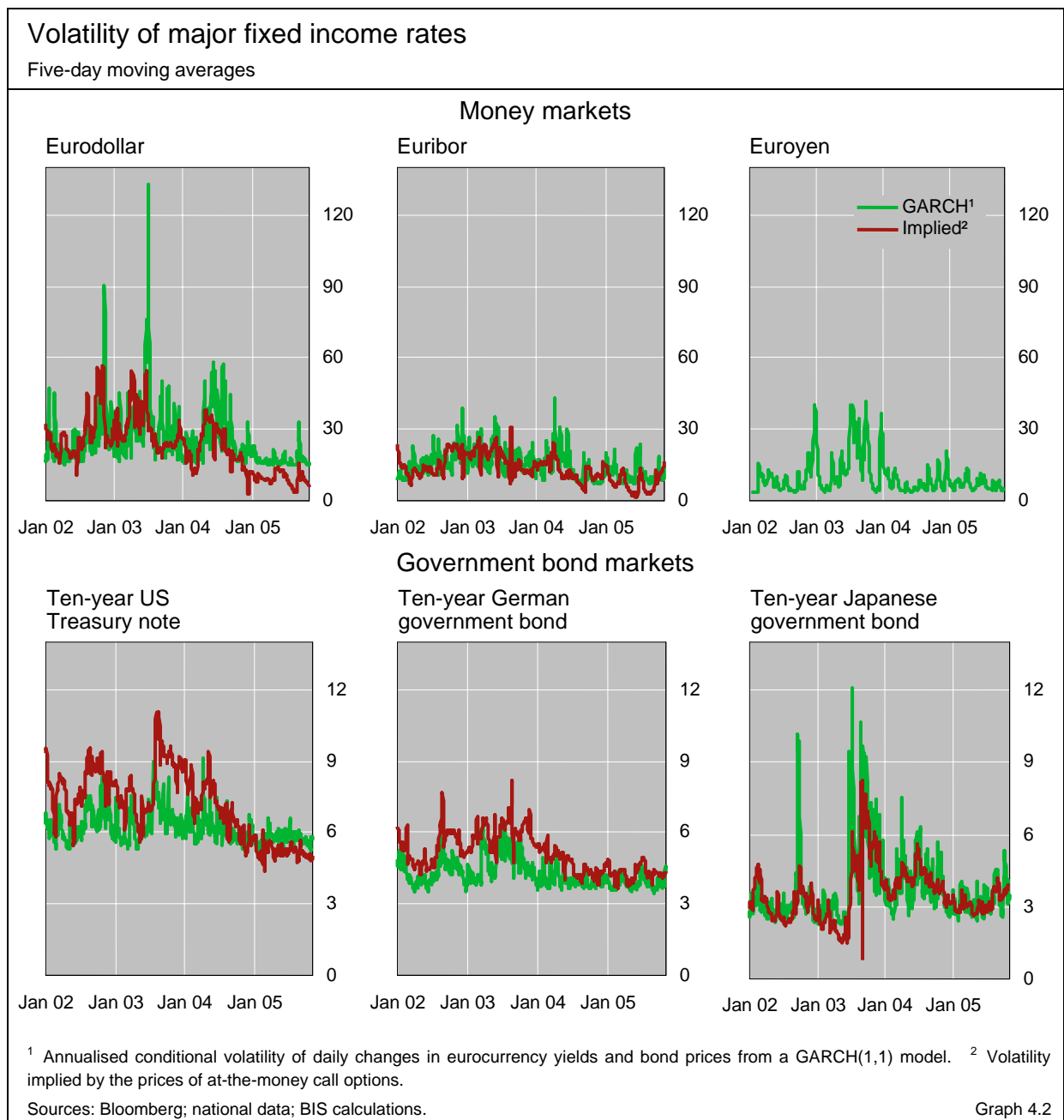


counterparties has contributed to a backlog in trade confirmations. While market participants have promised to address these problems, it is still too early to assess the degree of progress.

### Hurricane sustains trading in interest rate derivatives

Confirming the experience of the first half of the year, trading in interest rate derivatives in the third quarter of 2005 proved remarkably resilient in view of the generally low level of volatility in bond and money markets (Graph 4.2). The decline of activity in exchange-traded contracts appears to have been entirely due to seasonal factors, and the underlying growth of the market was highlighted by the fact that turnover in that quarter was the second highest on record, even without seasonal adjustment. Comparatively low activity in the

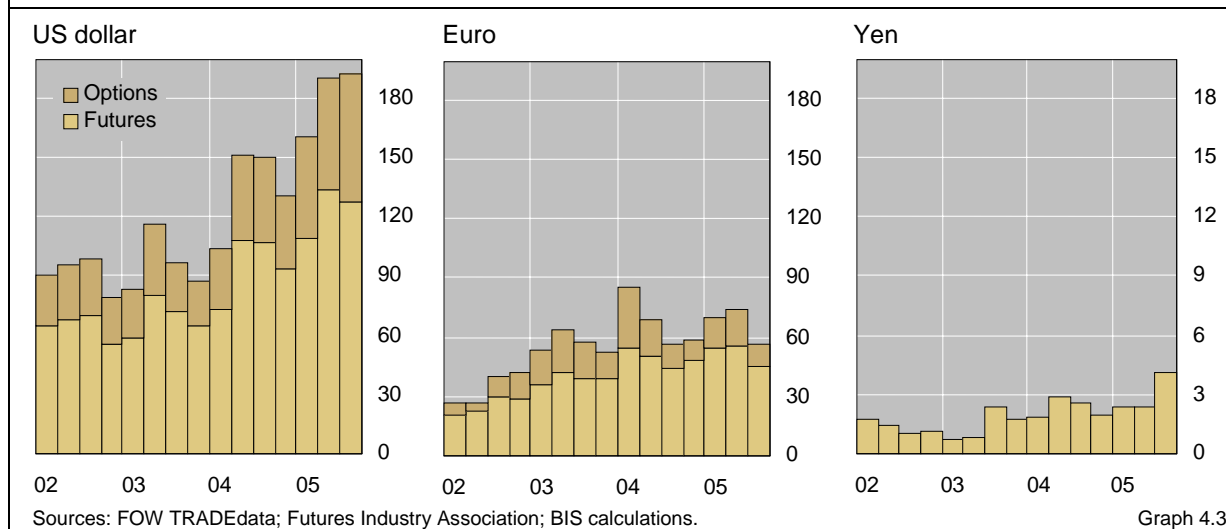
Turnover resilient in a period of low volatility





## Turnover of short-term interest rate contracts

Quarterly contract turnover, in trillions of US dollars



first two months of the quarter was followed by a burst of trading in the aftermath of Hurricane Katrina, which reached the US Gulf coast in late August (see also the discussion of commodity derivatives below).

Trading in money market contracts boosted by Hurricane Katrina ...

The impact of Hurricane Katrina on derivatives trading was particularly strong in the United States, where serious damage to the oil infrastructure sent energy prices to record highs and threatened to put a brake on economic activity. As a consequence, implied volatility from options on three-month eurodollar futures quadrupled in early September, although it remained well below the average of last year. Uncertainty about the future course of US monetary policy gradually declined during the following weeks as oil prices receded and the solidity of economic activity became more apparent. Turnover in derivatives on short-term US interest rates rose to \$83 trillion in September (Graph 4.3), surpassing the previous peak of \$71 trillion recorded in April (see the September issue of the *BIS Quarterly Review*). Open interest in US money market contracts rose from \$34 trillion at the end of July to \$37 trillion at the end of August, a few days after Hurricane Katrina struck. Weekly data from the US Commodities and Futures Trading Commission reveal that open interest remained high until mid-September, when it dropped by about one fifth.

... as well as the prospect of a rate hike in the euro area ...

The impact of the hurricane was not limited to the United States. High energy prices led to a resurfacing of concerns about inflation in the euro area. Market participants, who had priced in a small probability of a rate cut in June, became increasingly convinced that the ECB was tilting towards higher interest rates. Although the implied volatility of three-month Euribor contracts increased only slightly after the hurricane, it continued to rise as inflation edged up in late September. Turnover in derivatives on short-term euro interest rates increased by more than a third in September relative to the previous month, but at \$22 trillion remained considerably below the level reached in June (\$32 trillion).

## Lengthening maturities in the OTC options market

Maturities in the OTC options market lengthened in the first half of the year. In the interest rate segment, open positions in options with maturities over five years rose by 20% to \$7.8 trillion at the end of June, compared to a decline of 16% for contracts with maturities of one year or less (see graph). In the market for foreign exchange risk, growth in options with maturities of more than one year outpaced that in shorter-dated contracts, although the latter continue to account for the bulk of trading. According to market participants, the FX options market is liquid for maturities of up to five years, against maturities of up to 20 years for fixed income swaptions. This is in line with the observation that contracts with maturities of more than five years account for only 1% of all FX options but 29% of all interest rate options.

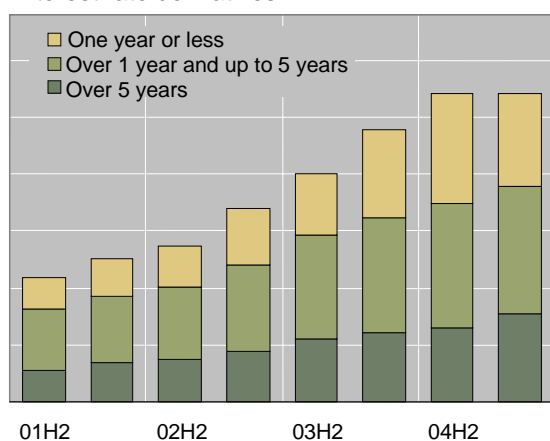
The extension of maturities of OTC options appears to have been driven largely by the high issuance of structured products during the first half of 2005. Structured products bundle a debt security with derivatives and are an important channel through which smaller financial institutions and non-financial investors participate in the options market. The dealers in such issues tend to hedge their exposures in the inter-dealer derivatives market.<sup>①</sup>

Another contributing factor has been a shifting of activity in the volatility market into longer maturities. As volatility remained at low levels, participants in this market have increasingly resorted to trading strategies that take advantage of movements in the slope and curvature of the term structure of volatility. For example, the implied volatility of 5x10-year swaptions (an option on entering into a 10-year interest rate swap in five years' time) may be "cheaper" than the implied volatility of a basket of 1x10 and 10x10 swaptions, making a relative position in these contracts attractive. Other trading strategies exploit the imperfect correlation of implied volatilities at different expiries.

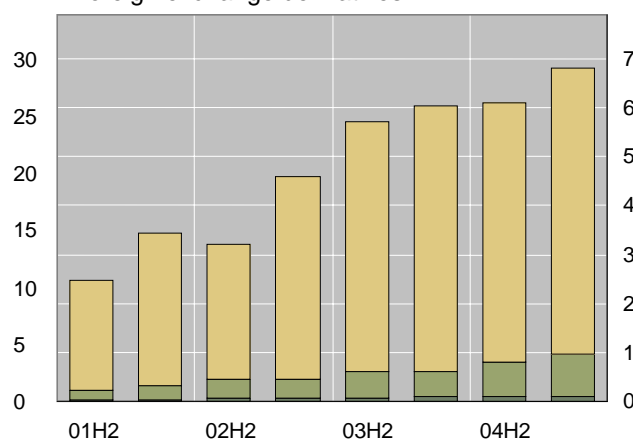
### Maturities in OTC options contracts

In trillions of US dollars

Interest rate derivatives



Foreign exchange derivatives



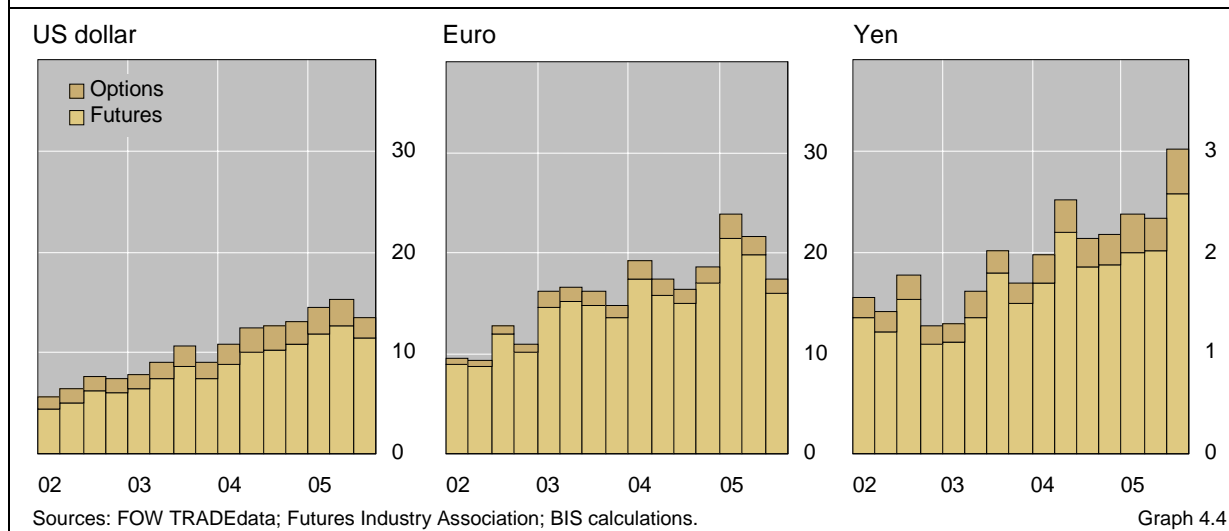
Source: BIS.

<sup>①</sup> Data on the issuance of structured products are provided by the commercial data provider mtn-i. The BIS OTC derivatives data contain the option component of structured notes issued by reporting dealers. They are reported according to the source of risk and type of counterparty involved.

In the market for derivatives on long-term interest rates, the impact of the hurricane was less noticeable than in short-term contracts (Graph 4.4). Trading in futures and options on government bonds fell in the third quarter of 2005, even if seasonality is taken into account. This is in line with the very moderate increase in implied volatility of US and euro area 10-year bond yields in the aftermath of Hurricane Katrina.

## Turnover of government bond contracts

Quarterly contract turnover, in trillions of US dollars



... and of a return to inflation in Japan

Trading activity in derivatives on yen interest rates reflected mainly improved domestic economic conditions. The possible return of inflation and the perceived end of the zero interest rate policy spurred trading in short-term interest rate contracts, which soared by 78% in the third quarter. Open interest rose by 36% to \$1.6 trillion, similar to the level recorded one year ago, before disappointing data dampened expectations of a return to “normal” economic conditions.

## Strong growth in East Asian equity derivatives

Korea overtakes United States as busiest market

Rising prices on most of the world’s stock exchanges boosted activity in equity derivatives during the third quarter of 2005, with trading volume in stock index futures and options rising by more than one fifth to \$34 trillion. The increase in activity was particularly strong on Asian derivatives exchanges. Turnover surged by 71% in Korea to \$12 trillion, overtaking the United States as the world’s busiest market for stock index derivatives. Turnover growth remains impressive even when expressed in terms of the number of contracts traded (+50%), which strips out the valuation effect arising from the sharp rise in the KOSPI 200 index over the period. Robust growth was also recorded in Japan, where turnover in stock index products increased by one third (20% in terms of the number of contracts). The number of contracts traded remained stable in the euro area, although stock price and exchange rate movements drove up volume measured in dollar terms by 10%. Turnover in derivatives on US stock indices declined slightly in terms of both notional amounts and the number of contracts traded.

Dominance of individual investors ...

The Korean market for stock index derivatives differs from more established markets in several important respects. First, trading is heavily geared towards options, which in the third quarter accounted for 93% of trading volume. By contrast, the share of options in total volume is just under one half in the US market and even lower in other markets. Secondly, the high trading

volume in Korea is not reflected in large open positions. Open interest in Korean stock index contracts at the end of September amounted to a mere \$64 billion, whereas that in US contracts stood more than 50 times higher at \$3.3 trillion, even as Korean turnover exceeded trading in US indices. Both the predominance of options and the low level of open interest are related to a third characteristic that sets the Korean derivatives market apart from those in other countries. Individual investors account for approximately two thirds of trading in options and one half of trading in futures on the KOSPI 200, far higher than in other markets.<sup>1</sup> Individuals tend to prefer contracts which involve smaller cash outlays, which explains the dominance of options over futures, and usually do not have large, diversified portfolios to hedge, hence the low level of open interest.

The Korean derivatives market is also characterised by a limited participation of institutional investors. Foreigners, predominantly institutions, in 2004 held 40% of all shares listed on the Korean Stock Exchange, but accounted for less than one fifth of derivatives trading. This may be related to a regulatory environment that restricts foreign access to the derivatives market to transactions which involve some trading in the underlying securities. The share of domestic institutional investors (other than securities companies) was even lower at 6% of derivatives turnover. Korean pension funds were not permitted to hold equities, let alone equity derivatives, until early 2004, after which this outright prohibition was replaced by ceilings on their holdings of equity instruments. While the available data suggest that the actual holdings remain below these ceilings, it may only be a matter of time before there is a higher participation of institutions in the derivatives market. The sale of several conglomerates' captive pension funds to independent financial institutions may also bring more sophisticated investors into the market.

... over institutions

## Local bond markets and emerging market derivatives

Many countries in Latin America and Asia have responded to the financial crises of the 1990s by developing markets for local currency bonds.<sup>2</sup> Foreign investors are important participants in some of these markets, and their presence has spurred the development of derivatives trading as they seek to hedge their currency and interest rate exposures from such bonds.

Local currency bond trading ...

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<sup>1</sup> In Japan, individual investors account for 12% of customer trading (ie excluding inter-dealer transactions) in Nikkei 225 futures and 8% in options, while their share in the more heavily traded TOPIX contracts is essentially zero. Comparable data for the United States and Europe do not exist, but all the available evidence suggests that individual investors account for only a small proportion of derivatives trading.

<sup>2</sup> This issue is explored in more depth in S Jeanneau & C Pérez Verdia, "Reducing financial vulnerability: the development of the domestic government bond market in Mexico", and in C E Tovar, "International government debt denominated in domestic currency: recent developments in Latin America", in this issue of the *BIS Quarterly Review*. For a discussion of the Asian experience see G Jiang & R McCauley, "Asian local currency bond markets", *BIS Quarterly Review*, June 2004.

... boosts OTC market for derivatives in Mexican pesos ...

The impact on the derivatives market of trading in local currency debt has been particularly noteworthy in Mexico, where a higher issuance of long-term domestic bonds has been complemented by a number of international peso-denominated bonds of foreign financial institutions taking advantage of the demand for highly rated peso paper. Since these issuers tend to swap the proceeds into other currencies, they provide a natural counterpart to foreign investors wishing to hedge peso bonds. As a consequence, the Mexican peso has become one of the few emerging market currencies with significant activity in OTC derivatives. At the end of June 2005, the notional amount of all outstanding derivatives reported by the dealers included in the semiannual survey stood at \$535 billion, almost twice as much as one year before.<sup>3</sup> Trading in OTC derivatives on the Mexican peso is heavily geared towards foreign exchange risk. Such instruments account for 86% of OTC trading in Mexican pesos, compared to only 12% of worldwide activity. The increasing sophistication of the market is reflected in a shift of turnover from relatively simple instruments such as forwards to more complex contracts like options and currency swaps. The share of options in the notional amount of all instruments on the peso rose from 12% in June 2002 to more than 50% three years later. Currency swaps with one leg denominated in pesos hardly existed three years ago and have since become the most rapidly growing part of the peso derivatives market. During the first half of 2005, their notional amounts more than trebled to \$53 billion.

... but not in Brazilian reais

It is interesting to compare the market for peso exchange rate risk with that in Brazilian reais. Brazilian currency risk is traded mainly on the Bolsa de Mercadorias & Futuros, where the corresponding contracts account for 14% of both turnover and open interest in financial derivatives. This is far higher than the 0.9% (turnover) and 0.3% (open interest) recorded on a worldwide level. By contrast, the OTC market for FX contracts denominated in reais appears to be fairly underdeveloped at present. Neither the semiannual survey nor the more comprehensive triennial survey record much activity in such contracts.

### Hurricanes prompt surge in energy derivatives trading

Hurricanes drove up oil prices and trading activity in the United States ...

The destruction of oil rigs in the Gulf of Mexico by Hurricanes Katrina and Rita and interruptions in the refining and transportation of oil left their mark on the market for energy derivatives. Prices for West Texas Intermediate crude oil rose throughout August and peaked at an all-time high of around \$70 per barrel at the beginning of September, a few days after Katrina had reached the Gulf coast. Trading in the "sweet" crude oil contract on the New York Mercantile Exchange (NYMEX) increased by more than one third from 5.7 million contracts in July to 7.6 million contracts in August, reflecting both heavier trading on short-term price movements and higher open interest. Oil

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<sup>3</sup> The only emerging market currency in which larger positions were recorded was the Hong Kong dollar (\$1,053 billion).

## Declining risk premia in the crude oil futures market

Marian Micu

Some energy market analysts have attributed the increase in the price of oil futures in recent years to the existence of a sizeable risk premium. In this box, we estimate the premium as the difference between the price of crude oil futures traded on NYMEX and the mean forecast of WTI oil prices per barrel over the same horizon.<sup>①</sup> <sup>②</sup> Between 2003 and August 2005, as oil prices steadily increased, so did the risk premia for three-month and 12-month contracts, to \$11 and \$14, respectively (see graph, left-hand panel). But in the subsequent two months, as oil prices receded slightly, the risk premium dropped to about \$0.5 and \$5. What explains these sharp movements?

Following the literature on this subject,<sup>③</sup> four leading factors are considered to explain changes in the risk premium: speculative activity, global oil demand, refining capacity and interest rates. Multivariate regressions are performed on monthly data ranging from July 1995 to October 2005. Speculative activity is approximated by net non-commercial positions in futures contracts, calculated as the difference between the positions of non-commercial investors who buy on the long side and those who buy on the short side. Positive net positions should indicate buying pressure and therefore be associated with a higher risk premium. Similarly, a high demand for oil or low spare capacity in the refining sector should increase the risk of bottlenecks that may result in sharp price movements and therefore be associated with a high risk premium. Interest rates, measured by three-month Libor, could impact risk premia through a variety of channels. For example, low interest rates boost economic activity and oil demand, which in turn raises the premium on oil futures. Alternatively, low levels of interest rates may prompt investors to search for higher yields and assume higher risks in commodity futures markets, exerting an upward pressure on the risk premium.

All of the variables have the expected sign and, with one exception, are statistically significant. The risk premium appears to be particularly closely related to net speculative positions, which dropped from more than 10% of total non-commercial positions in August to virtually zero in September (see table and graph, right-hand panel). Similarly, global oil demand declined and short-term interest rates increased, adding to the downward pressure on the risk premium. Taken together, these two variables explain two thirds of the \$7 decrease in the three-month risk premium and one half of the \$5 drop in the 12-month risk premium in September. According to the model, variations in the utilisation of refining capacity appear to have had only a small impact on the 12-month risk premium, and none on the three-month premium. This may be due to longer reaction lags of crude oil prices to refinery bottlenecks.

### Determinants of the risk premium in crude oil futures

	Changes in the three-month risk premium	Changes in the 12-month risk premium
Net speculative futures positions <sup>1</sup>	1.14 (3.82)***	0.63 (2.49)***
Global oil demand gap <sup>2</sup>	0.19 (2.03)**	0.15 (2.15)**
US spare refining capacity	-0.10 (-1.23)	-0.11 (-1.70)*
Three-month Libor	-0.12 (-2.01)**	-0.13 (-2.56)***

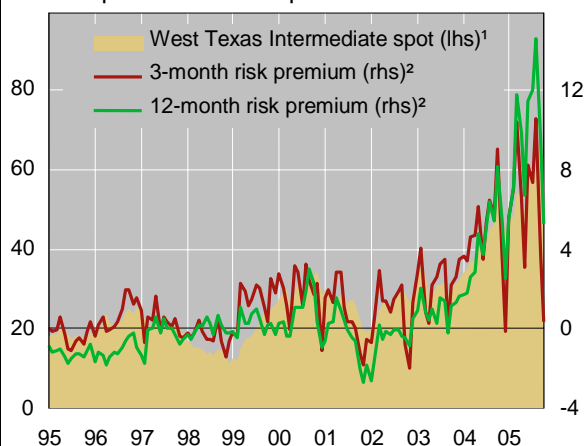
<sup>1</sup> Net non-commercial positions as a percentage of total non-commercial positions. <sup>2</sup> Detrended global oil demand using the Hodrick-Prescott filter. Regressions have been estimated with monthly data for the period July 1995–October 2005. Standard errors are corrected for heteroskedasticity using the Newey-West method. Asymptotic t-statistics are shown in parentheses. \* indicates a coefficient significantly different from zero at the 10%, \*\* at the 5% and \*\*\* at the 1% confidence level.

Sources: Bloomberg; Commodity Futures Trading Commission; BIS calculations.

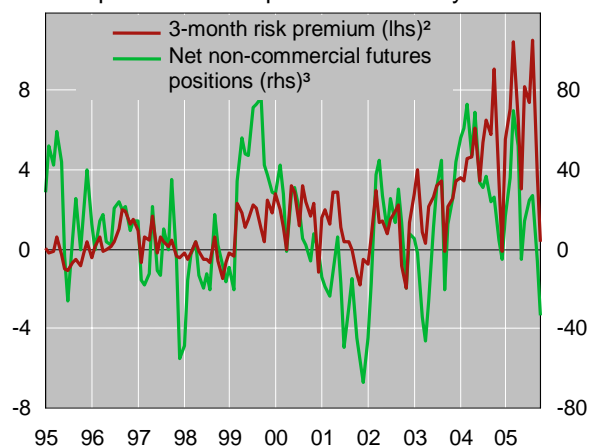
① The risk premium can be either positive or negative, depending on the balance of risk perceived by the marginal investor. It is distinct from the basis of the futures contract (the difference between futures prices and current spot prices). For a comparison of the two concepts, see E F Fama and K R French, "Commodity futures prices: some evidence on forecast power, premiums, and the theory of storage", *Journal of Business*, vol 60, no 1, 1987, pp 55–73. <sup>②</sup> Consensus Economics carries out surveys on forecasts for WTI spot prices at three- and 12-month horizons. These are combined with the futures prices on the day when the survey was made. The number of analysts contributing to the surveys ranges between 60 and 130. In our study we use the mean value of the individual forecasts. Statistical tests for the period from July 1995 to October 2005 suggest that these forecasts are unbiased but do not incorporate all information available. <sup>③</sup> See A Merino and A Ortiz, "Explaining the so-called "price premium" in oil markets", *OPEC Review*, vol 29, issue 2, 2005, pp 133–52.

## Risk premia in oil futures

Risk premium and oil price



Risk premium and speculative activity



<sup>1</sup> In US dollars per barrel. <sup>2</sup> In US dollars. <sup>3</sup> In thousands of contracts of one thousand barrels each.

Sources: Bloomberg; Consensus Economics; BIS calculations.

Despite its recent performance, over the entire 10-year sample period the estimated model explains only 10% of the variation in the risk premium at both three- and 12-month horizons. This suggests that other factors such as political and social tensions, terrorist attacks and military conflicts may have an even stronger impact on the risk premium over and above the fundamental factors suggested in the literature.

prices declined during the first half of September, before Hurricane Rita led to another, slightly lower, spike. Trading in futures and options on crude oil listed on the NYMEX fell back to 6.6 million contracts in September. Data from the Commodity Futures Trading Commission (CFTC) reveal that although open interest decreased only slightly that month, there has been an important change in the provision of liquidity to the market. Non-commercial users, or “speculators”,<sup>4</sup> held net short positions equivalent to over 4% of total open interest in July and August, suggesting that they were betting on declining oil prices. By the end of September, however, these positions had declined to 2% of total open interest, contributing to the drop in the risk premia in oil futures prices (see the box on page 50). A similar decline in the net open positions of non-commercial users occurred in April and May this year, when oil prices fell by around \$10 per barrel.

... but were less important elsewhere

Trading in energy contracts in other regions of the world was less affected by the hurricanes than activity in the United States, even though the high prices of oil were essentially a global phenomenon. Turnover in crude oil futures on the International Petroleum Exchange in London rose by 20% in August, well below the 32% increase in New York. On the Shanghai Futures Exchange,

<sup>4</sup> The CFTC distinguishes between commercial users, who are “... commercially engaged in business activities hedged by the use of futures and options markets” and non-commercial users. The latter group are often referred to as “speculators” and the former as “hedgers”. However, there are no restrictions preventing “hedgers” from engaging in purely speculative position-taking.

trading in fuel oil (there is no contract on crude oil) actually declined in August. In Japan, activity in oil-related contracts increased in August, but remained below the levels recorded during the previous quarters.

The impact of the hurricanes on commodity markets went beyond the energy sector. New Orleans was an important hub not only of the petroleum industry but also for the shipment of grains. In addition, the city housed important stockpiles of commodities ranging from coffee and sugar to zinc. It is not clear, however, to what extent this left a mark on turnover in commodity derivatives. Although trading in the main US-traded contracts on sugar, wheat and coffee did increase by more than 50% in August, outpacing growth in products less directly affected by the hurricanes, turnover in all three categories remained below the all-time high recorded in June.

### Growth in credit default swaps exposes cracks in market infrastructure

Growth in the market for credit default swaps (CDSs) was remarkably robust during the first half of the year, given the sell-off in credit markets triggered by downgrades in the US auto industry in March.<sup>5</sup> Notional amounts outstanding of CDSs rose by 60% during the first half of 2005 to \$10.2 trillion.<sup>6</sup> Growth was particularly strong in multi-name contracts, whose notional amount more than doubled to \$2.9 trillion. Single-name CDSs increased by 43% to \$7.3 trillion.

High growth in credit default swaps...

Growth in CDSs has far outpaced growth in the underlying loans and bonds. For many companies, the volume outstanding of CDS contracts now greatly exceeds the supply of deliverable debt. As the overwhelming majority of CDS contracts stipulate settlement through the physical delivery of debt owed by the reference entity,<sup>7</sup> this has increased the risk of “squeezes”, in which the demand for the debt of a firm exceeds the supply of such debt, resulting in the breakdown of the normal pricing relationship between credit derivatives and the underlying debt contracts. This in turn may cause traders to withdraw from the market, thereby draining liquidity.

... increases risk of squeezes ...

Since the bankruptcy of US auto parts supplier Collins & Aikman in June 2005, CDS dealers have repeatedly resorted to a resolution procedure involving a shift to cash rather than physical settlement following a credit event. Such a procedure has been applied to the resolution of CDS contracts on Delta Airlines, Northwest Airlines and, most prominently, Delphi. The debt of Delphi was included in various CDS indices as well as being referenced by a large volume of single-name contracts. Following the bankruptcy of Delphi on 8 October, dealers in a first step identified contracts that could be offset

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<sup>5</sup> See “Overview: repricing in credit markets”, in the *BIS Quarterly Review*, June 2005.

<sup>6</sup> The total notional amount outstanding is calculated as the sum of contracts bought and sold minus half of the sum of contracts bought and sold between reporting dealers.

<sup>7</sup> According to the British Bankers' Association, 86% of transactions were settled through physical delivery in 2003.



against each other while maintaining the existing net positions. Such multilateral netting is a key feature of organised exchanges but is not common in OTC markets. This procedure eliminated about 70% of open gross positions in single-name CDSs on Delphi. In a second step, the final price for the benchmark Delphi bond was fixed at 63.375% in an auction on 4 November. This price is in line with historical estimates of losses-given-default, although the wide range of such estimates makes it difficult to assess whether it differs from the one that would have prevailed without the influence of CDS trading. It is substantially lower, though, than the price at which Delphi's debt traded during the squeeze before the changeover to cash settlement. It is widely accepted that this price had been out of line with the firm's fundamentals.

Even before Delphi filed for bankruptcy, it had become apparent that the infrastructure of the CDS market had not kept up with the growth in volume. In particular, market participants and regulators had expressed concerns that incomplete documentation and the large backlog of unconfirmed trades posed risks to the normal functioning of the CDS market. This backlog is related to the fact that derivatives are mostly processed manually, often involving extensive paperwork.<sup>8</sup> Much of the incomplete documentation is linked to trades that have been assigned (transferred) to third parties. According to the Report of the Counterparty Risk Management Policy Group II (the "Corrigan Report"), assignments may affect as much as 40% of trading volume and play an important role in the provision of liquidity to the market. Although assignments require the written consent of all parties involved in the transactions under most master agreements currently in use, this rule does not appear to have been enforced in the past, leading to uncertainty about the identity of counterparties.

In response to an initiative by the Federal Reserve Bank of New York in September, the largest CDS dealers pledged to improve back office processes, including reducing the number of unconfirmed trades, clarifying procedures for assigning trades and automating the processing of trades. In addition, they committed to supply figures on whose basis progress in these areas could be judged. If implemented, such initiatives would greatly strengthen the infrastructure supporting CDS markets, thereby helping to ensure that they continue to function normally even during periods of market stress. Nevertheless, it remains to be seen to what extent the newly developed assignment ("novation") protocols will be implemented in practice. In particular, some hedge funds appear to be reluctant to subscribe to such standards. It is also unclear whether there is that much scope for further automation of back office procedures. Electronic confirmation should pose little problem for plain vanilla contracts but may be more of a challenge in the case of more complex products. Automation may also be slowed by the fact that many players in the market undertake only a limited number of trades, making them reluctant to invest in systems for the electronic processing of trades.

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<sup>8</sup> According to the survey by the International Swaps and Derivatives Association in June 2005, only about 40% of all trades are processed electronically.



## Risk aversion and risk premia in the CDS market<sup>1</sup>

*Credit default swap (CDS) spreads compensate investors for expected loss, but they also contain risk premia because of investors' aversion to default risk. We estimate CDS risk premia and default risk aversion to have been highly volatile during 2002–2005. Both measures appear to be related to fundamental macroeconomic factors, such as the stance of monetary policy, and technical market factors, such as issuance of collateralised debt obligations.*

*JEL classification: G120, G130, G140.*

One of the more difficult tasks in the analysis of financial markets is sorting out what portion of changes in asset prices are due to changes in economic factors affecting payoffs versus changes in risk premia. Credit markets are no exception. Was the large widening of credit spreads in the summer of 2002 the result of the rapid deterioration in the outlook or did investors suddenly become more risk-averse? Has the narrowing of corporate spreads to historically low levels since then been driven mainly by improving corporate balance sheets or a steady increase in risk appetite? And what of the spike in spreads in the spring of 2005 after downgrades in the US auto sector? The answers to these questions have implications for the signals policymakers take from credit markets, both during normal periods and in times of market stress. The answers should also interest academics for what they tell us about asset pricing models, as well as market participants searching for relative value opportunities across credit instruments and asset classes.

This article constructs measures of risk premia and risk aversion in credit markets using data from the fast growing credit default swap (CDS) market covering the period 2002–05. Spreads on default swaps should reflect expected losses from default and risk premia as compensation for bearing default risk. We find estimated premia to be highly volatile over time, consistent with the view of many market practitioners that changing attitudes towards risk can explain a good deal of the movements in asset prices. We also seek to identify the main determinants of risk premia in credit markets. Our findings

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<sup>1</sup> The author thanks JPMorgan Chase for providing data on synthetic CDO issuance, Claudio Borio, Frank Packer and Philip Wooldridge for helpful comments, and Jhuvesh Sobrun for research assistance. The views expressed in this article are those of the author and do not necessarily reflect those of the BIS.

suggest that default risk premia and risk aversion are strongly related to fundamental factors, such as indicators of real economic activity and the stance of monetary policy, and technical market factors, such as issuance of collateralised debt obligations (CDOs).

Our study begins by providing background on the CDS and CDS index markets that are the core of the empirical investigation. We then briefly discuss related literature and the data used in the analysis before turning to the construction of measures of CDS risk premia and default risk aversion. After analysing the determinants of these measures, we conclude with a summary and suggestions for future work.

## The CDS market

Our study focuses on the CDS market, one of the fastest growing segments of the global financial system in recent years. A CDS is an insurance contract that protects the buyer against losses from a credit event associated with an underlying reference entity. In exchange for credit protection, the buyer of a default swap pays a regular premium to the seller of protection (“investor”) for the duration of the contract.<sup>2</sup> Most of the initial development in the CDS market was in single-name contracts. However, since late 2003 there has also been increasing activity in contracts related to CDS indices, which are the main objects of our analysis. BIS statistics indicate that the total notional amount outstanding of single- and multi-name default swaps was \$10.2 trillion as of June 2005.<sup>3</sup>

There are several reasons to focus on the CDS market instead of the cash market. One is that default swaps now play a central role in credit markets: a broad range of investors use default swaps to express credit views; banks use them for hedging purposes; and default swaps are a basic building block in synthetic credit structures. Another is that the relatively high liquidity in the default swap market means that CDS spreads are presumably a fairly clean measure of default and recovery risk compared to spreads on most corporate bonds. This facilitates the identification of credit risk premia.<sup>4</sup>

There are also benefits to be gained by focusing on CDS indices. Swap contracts and notes based on CDS indices are traded in the market, unlike in the case of corporate bonds, and so our results could be used directly to analyse market index spreads. Our findings may also be useful in studies of

CDS market has grown rapidly ...

... and is suitable for examining credit spreads

CDS indices now underlie other important credit derivatives

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<sup>2</sup> Several sources contain descriptions of CDS contracts and their features (eg O’Kane, Naldi et al (2003)). Most contracts cover four types of credit event: bankruptcy, failure to pay, repudiation and material restructuring of debt (including acceleration). Hereafter, the term default will be synonymous with credit event.

<sup>3</sup> While the net value of exposures is much smaller (\$267 billion as of June 2005), trading volumes are estimated to be significantly greater than in the underlying bond markets.

<sup>4</sup> CDS contracts may be more liquid than bonds for several reasons. For instance, most default swaps benefit from having standardised contracts, where the credit events that trigger payment to the protection buyer are defined in the ISDA credit derivatives definitions (ISDA (2003)). Default swaps also allow market participants to short credit risk with less difficulty and at lower cost than with corporate bonds. See Longstaff et al (2005) for further discussion.

derivatives based on the indices, such as index tranches or default swaptions. Index tranches, which give investors the opportunity to take on exposures to specific segments of the CDS index default loss distribution, are priced and hedged partly based on the behaviour of index spreads.<sup>5</sup> Similarly, the valuation of options on the index depends upon the dynamics of index spreads.

## Related literature

Few studies have examined CDS risk premia

The results in this article add to a small but growing literature on the empirical properties of CDS spreads and the risk aversion of credit investors. The most closely related study is the paper by Berndt et al (2005), who estimate risk premia using CDS data on a set of 67 US firms in three industries and Moody's KMV's Expected Default Frequencies (EDFs<sup>TM</sup>) as measures of default probabilities. They identify default risk premia by estimating fully specified dynamic credit risk models for each entity. We adopt a simpler approach to measuring risk premia, though we consider a broader set of firms – the constituents in the main US investment grade CDS index – and we analyse the relationships of these measures with macroeconomic and credit market activity variables.

Past work has estimated large risk premia in bond spreads

Given the relatively short life of the CDS market, most research on spreads has been conducted using bond data. Elton et al (2001) examine how much of the variation over time in spreads (less expected loss and taxes) can be explained by the Fama-French factors, and then calculate a risk premium based on these contributions. Driessen (2005) estimates a dynamic term structure model by dividing spreads into several components. He finds evidence of large and time-varying default risk premia, as well as liquidity premia. Amato and Luisi (2005) estimate risk premia in a model that includes macroeconomic variables as determinants of the term structure of corporate bond spreads.

## Data

Our analysis utilises a synthetic CDS index ...

Given our methodology for estimating risk premia (see next section), we require data on CDS index spreads and default probabilities on the index constituents. We construct a historical synthetic time series of spreads for a fixed set of firms using data from Markit. This is done for two reasons. First, we focus on a fixed group of firms to achieve consistency in the series across time. The composition of the leading market indices has changed over time due to mergers and rolls in the indices every six months.<sup>6</sup> Second, we wish to analyse data over the longest period possible. Daily time series can be constructed for most of the firms in our sample beginning in May 2002. Since index contracts

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<sup>5</sup> See Amato and Gyntelberg (2005) for a general discussion of CDS indices and index tranches, and of some of the issues involved in pricing these instruments.

<sup>6</sup> The index market began with a set of competing indices, which then merged in the spring of 2004 to form the CDX and iTraxx families. The constituents in these indices are chosen every six months based on a dealer poll.

started trading in mid-2003, we could, in principle, use market quotes at the index level; but this would leave us with a short sample and a non-homogeneous set of firms due to changes in the “on-the-run” index.

The group of firms we consider are the members of the DJ CDX North America investment grade series 4 index (CDX.NA.IG.4).<sup>7</sup> Contracts on this version of the index were on-the-run from 21 March to 20 September 2005. There are 125 entities in the index; most have a credit rating in the range A+/A1 to BBB-/Baa3. We are mainly interested in the aggregate index, though we also analyse five sectors to determine to what extent sector patterns match up to aggregate behaviour. The sectors considered are: consumer, energy, financial, industrial and TMT. Synthetic series of index and sector spreads are constructed as equal-weighted averages of spreads on single-name contracts.

... based on the DJ  
CDX series 4  
constituents

The synthetic series we construct may differ from market quotes on the index for at least two reasons.<sup>8</sup> First, while in principle the mark to market index spread should equal the average of spreads on the 125 reference entities, in practice there have been discrepancies (a non-zero “basis”). This is probably due, in part, to the convenience of using index contracts for hedging macroeconomic risk. As such, caution should be exercised when interpreting our results directly in the context of market index spreads. Second, index contracts restrict the eligible types of credit event to bankruptcy or failure to pay. This corresponds to the no-restructuring documentation clause in single-name CDS contracts.<sup>9</sup> However, most single-name contracts in the United States are traded with a modified restructuring clause. To maximise the sample size, for each day and each firm we construct a weighted average, expressed on a no-restructuring basis, of the quotes available across clauses in the Markit database. It is probable that the value of the cheapest-to-deliver option on contracts allowing restructuring varies systematically with the credit cycle. Any such variation would introduce an error in our (fixed) weighting scheme, but it is likely to be small.<sup>10</sup>

Synthetic spreads  
can differ from  
market spreads

Daily time series of CDS spreads for the aggregate index at maturities of one, five and 10 years are plotted in Graph 1. A few features of the series are worth noting. First, the term structure of spreads is upward sloping at lower spread levels; in particular, there have been large differences over the past couple of years between one-year and five-year CDS rates. This means that care must be taken in choosing the maturity in our subsequent analysis. Second, spreads are highly persistent and much of their variation occurs over

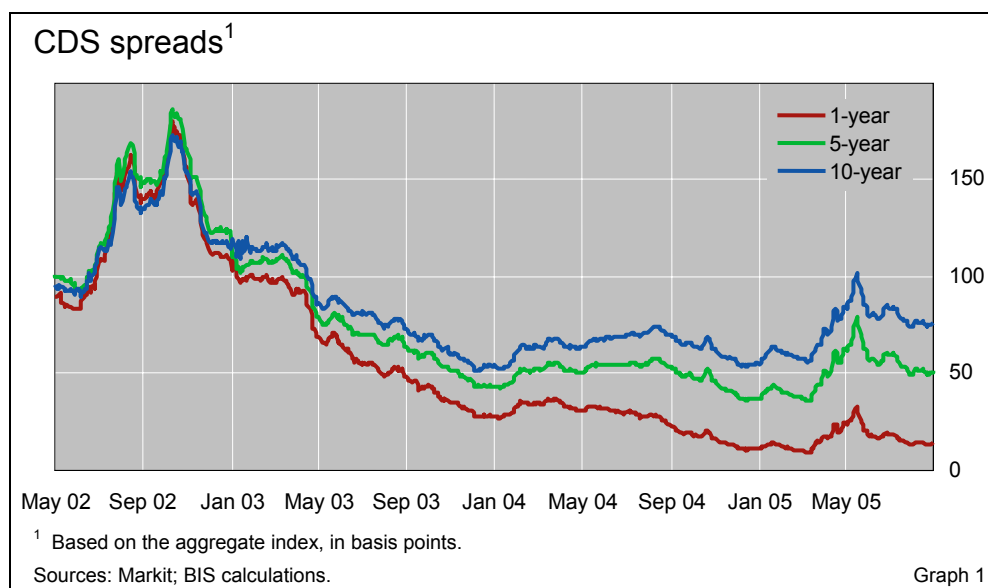
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<sup>7</sup> The constituents of this index can be found on Markit’s website at <http://www.markit.com>.

<sup>8</sup> We can compare our synthetic series to official index spreads from Markit. For the difference in daily five-year spreads over the period 21 March to 31 August 2005, the mean is 0.6 basis points, the mean absolute value is 1.9 basis points and the standard deviation is 2.6 basis points.

<sup>9</sup> See ISDA (2003) for a description of documentation clauses.

<sup>10</sup> The weights reflect observed patterns in spreads across clauses in a sample where quotes for more than one type of contract exist for an entity on a given day. See also O’Kane, Pedersen and Turnbull (2003) and Packer and Zhu (2005) for analysis of restructuring clauses.



lower frequencies, such as a month or more. Thus, even though we must aggregate CDS rates on a monthly basis for most of our analysis (to accord with the availability of other data series), there is a good deal of variation in spreads at this frequency.

EDFs™ proxy for default probabilities

To proxy for default probabilities, we use one-year EDFs™ as in the study by Berndt et al (2005). EDFs™ are constructed using balance sheet and equity price data under the principles of a Merton-type model for gauging the likelihood of default.<sup>11</sup> Our data on EDFs™ are available at a monthly frequency for all but two firms in the CDX.NA.IG.4 index. Aggregate and sector EDFs™ are constructed as simple arithmetic averages of existing data on the constituents.

### Measuring default risk premia

In this section, we provide estimates of CDS risk premia and default risk aversion using the synthetic CDS index data introduced above.

In order to see how we obtain measures of risk premia and risk aversion, note that CDS spreads can be roughly decomposed as follows:

$$\begin{aligned} \text{CDS spread} &\cong \text{expected loss} + \text{risk premium} \\ &= \text{expected loss} \times \text{risk adjustment} \end{aligned}$$

where

$$\text{risk adjustment} = 1 + \text{price of default risk}$$

CDS spreads are risk-adjusted expected loss

The first equation above says that the CDS spread is approximately equal to expected loss plus a risk premium, where the latter is compensation paid to investors for enduring exposure to default risk. In the second equation, the spread is re-expressed in terms of risk-adjusted expected loss, where the risk adjustment varies proportionally with the price of default risk. The price of default risk has the interpretation as the compensation per unit of expected

<sup>11</sup> See Kealhofer (2003) for further details.

loss. It is an indicator of investors' aversion to default risk: a positive price of risk means that investors demand that they be paid more than actuarial losses. Hereafter, we will use the terms "price of default risk" and "indicator of default risk aversion" interchangeably.

While the formulations of spreads above isolate a "risk premium" and a "price of risk", in principle there are two distinct types of default risk that may command a premium. One is cyclical variation in expected loss, which usually rises during economic downturns, when overall income growth is low. The other is the actual default of an entity and its impact on investors' wealth due to an inability to perfectly diversify credit portfolios. In the literature, these are generally referred to as systematic and jump-at-default risk, respectively.<sup>12</sup> In the following, we will construct measures of CDS risk premia and the price of default risk that implicitly incorporate both of these types of risk.<sup>13</sup> See the box for a more precise description of CDS pricing and the components of spreads.

Our method for estimating risk premia and risk aversion is straightforward. First, we construct a measure of the risk premium by subtracting an estimate of expected loss from CDS spreads. Expected loss is estimated using observable EDF<sup>TM</sup> data as a proxy for the probability of default and assuming that loss-given-default is constant and equal to 60%. This figure is based on historical loss rates on US senior unsecured bonds using data from Moody's.<sup>14</sup> Since our EDF<sup>TM</sup> data attempt to measure default probabilities over a one-year horizon, we mainly concentrate on the risk premium in one-year CDS rates. Second, the price of default risk is estimated as the ratio of CDS spread to expected loss.

Premium is estimated as spread minus expected loss ...

... and price of risk as spread over expected loss

Summary statistics <sup>1</sup>					
	One-year CDS	Five-year CDS	EDF <sup>TM</sup>	Risk premium <sup>2</sup>	Price of default risk <sup>2</sup>
Mean	55.33	75.07	35.40	34.09	1.42
Median	33.82	56.20	22.84	21.11	1.30
Standard deviation	44.62	37.01	22.88	31.95	0.66
Skewness	1.00	1.21	0.70	1.24	0.26
Kurtosis	2.81	3.35	2.01	3.57	2.51
Minimum	11.15	37.31	9.09	2.64	0.31
Maximum	167.81	175.70	81.43	121.95	2.92

<sup>1</sup> Based on the aggregate index, in basis points (except price of default risk). <sup>2</sup> Based on a one-year horizon.  
Sources: Markit; Moody's KMV; BIS calculations. Table 1

<sup>12</sup> This terminology is somewhat misleading, for the inability to perfectly diversify against single-name defaults is a "systematic" risk as well.

<sup>13</sup> Our formulation of the price of default risk is also non-standard. More specifically, in the literature, the price(s) of systematic risk is (are) typically identified as the compensation per unit of *volatility* of the risk factor(s); the price of jump-at-default risk is the compensation per unit of expected loss.

<sup>14</sup> Thus, we do not allow loss rates to vary systematically across the credit cycle. A growing body of evidence suggests that loss rates covary positively with default probabilities (eg Altman et al (2004)); however, the strength of the relationship depends on whether losses are measured by market prices shortly after default or by ultimate recovery rates.

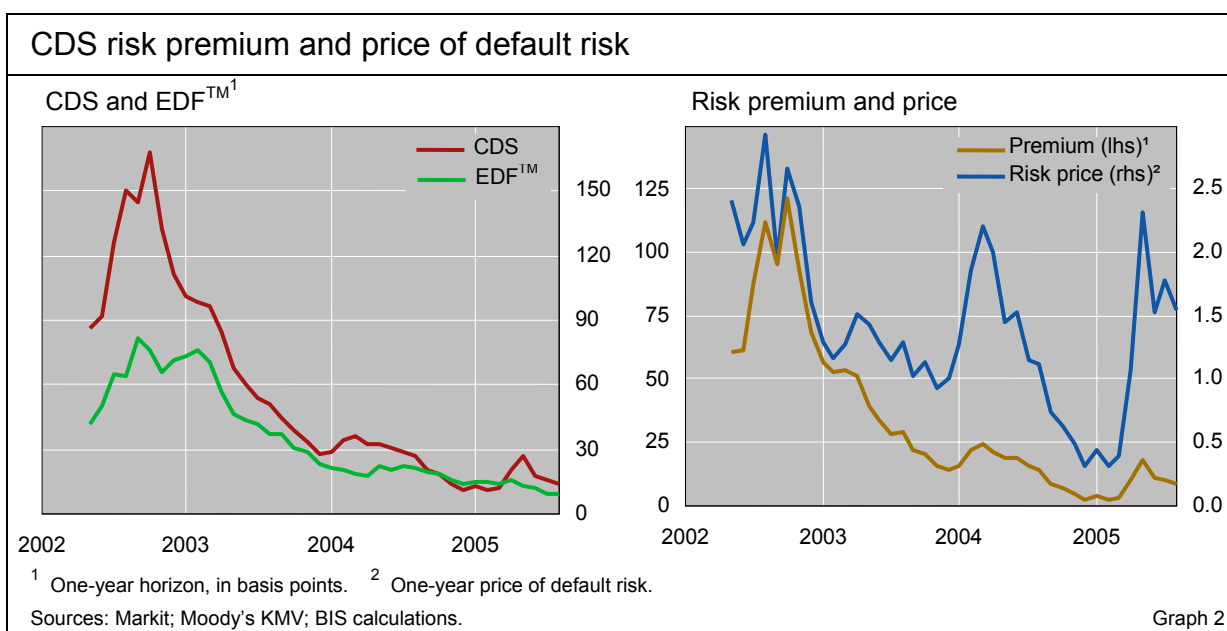


Risk-adjusted default probabilities are 140% larger than actual probabilities

Table 1 reports summary statistics on monthly time series of the main variables of interest for the aggregate index.<sup>15</sup> As shown in the table, CDS rates are higher than EDFs™ on average and more volatile; they are also more skewed. The one-year risk premium is positive on average, and its distribution (over time) is positively skewed and has fat tails. The average one-year price of default risk is 1.42. Under the assumption that loss-given-default is constant, this means that risk-adjusted default probabilities have been roughly 140% higher than actual default probabilities. The price of default risk also varies significantly, reaching a minimum of 0.31 and a maximum of 2.92.

Spreads and default risk aversion jumped in mid-2002 and in May 2005

Graph 2 shows the time variation in the variables. The left-hand panel plots time series of CDS spreads with a one-year maturity against EDFs™, and the right-hand panel shows estimates of the risk premium and price of default risk. The graph illustrates four key features of the series. First, it is evident that the largest changes in CDS spreads occurred in 2002.<sup>16</sup> This is true both on the upside, when one-year CDS rates widened by over 10 basis points in each of three weeks in July of that year, and on the downside, when spreads sharply narrowed in November. It was in July 2002 that WorldCom filed for bankruptcy with assets of \$107 billion, and this appears to have had a market-wide contagion effect on CDS spreads. Default probabilities on the aggregate index also rose during this period, but by much less, indicating that WorldCom's default mainly affected market risk premia. Second, starting in early 2003, both spreads and expected default frequencies declined and have since remained relatively stable, with spreads widening only briefly in the spring of 2005



<sup>15</sup> Monthly CDS spreads are constructed as averages of daily values.

<sup>16</sup> This is also evident at a higher frequency in Graph 1. For instance, nine of the 10 largest weekly changes in one-year CDS rates (in absolute value, measured on a Friday-to-Friday basis) occurred in 2002.

## The components of CDS spreads

This box illustrates how to obtain the (approximate) decomposition of CDS spreads used in this article as a basis for constructing measures of risk premia and the price of default risk. For concreteness, we model credit events (“default”) using an intensity-based framework.<sup>①</sup> This model assumes that defaults occur randomly, where the probability of default over a short time interval (eg a day or a month) is equal to the intensity, denoted by  $h^P$ . In principle,  $h^P$  may be a stochastic variable that varies in accordance with macroeconomic, sector-specific or firm-specific conditions. Other key inputs to the model include: loss-given-default ( $L$ ); risk-free interest rates for discounting cash flows ( $r$ ); and the prices of systematic risk and jump-at-default risk ( $\Gamma$ ). Each of these elements may also vary with economic conditions.

In general, the risk-adjusted intensity (denoted  $h^Q$ ) that is relevant for pricing CDS contracts will differ from the actual intensity  $h^P$ . This adjustment depends upon the price of jump-at-default risk, namely  $h^Q = h^P (1 + \Gamma)$ . If investors do not demand a premium for jump-at-default risk, then risk-adjusted and actual intensities are equal; otherwise, we would generally expect that  $\Gamma > 0$ , so that  $h^Q > h^P$ .

The spread on a CDS contract is obtained by solving for the quarterly premium that equates the expected present value of payments made by the protection buyer (“premium leg”) to the expected present value of default costs to be borne by the protection seller (“protection leg”). CDS contracts specify  $M$  quarterly payment dates,  $t = t_1, t_2, \dots, t_M$ , on which the premium is to be paid.<sup>②</sup> At origination of a contract at time  $t$ , the expected present value of the premium leg is equal to the expected sum of discounted premium payments, where the *effective* discount rate,  $r + h$ , is the risk-free rate adjusted for the possibility of default:

$$V_{\text{prem}}(t) = E_t^Q \left[ \sum_{i=1}^M \exp\left(-\int_t^{t_i} [r(s) + h^Q(s)] ds\right) \cdot CDS(t) \right]$$

$CDS(t)$  is the quarterly premium and  $E_t^Q(\cdot)$  denotes expectations adjusted for systematic risk.

The expected present value of the protection leg is the discounted value of the expected loss at possible default dates:<sup>③</sup>

$$V_{\text{prot}}(t) = E_t^Q \left[ \sum_{i=1}^M h^Q(t_i) \cdot L(t_i) \cdot \exp\left(-\int_t^{t_i} [r(s) + h^Q(s)] ds\right) \right]$$

The premium is found by setting  $V_{\text{prem}} = V_{\text{prot}}$  and solving for  $CDS(t)$ :

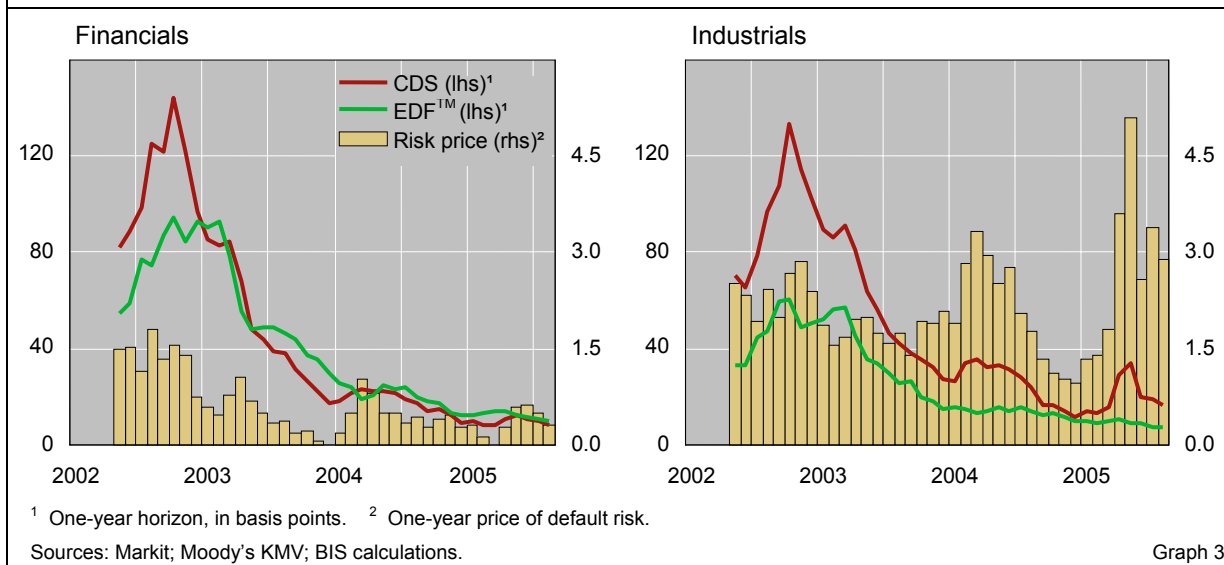
$$CDS(t) = \frac{\sum_{i=1}^M E_t^Q \left[ h^Q(t_i) \cdot L(t_i) \cdot \exp\left(-\int_t^{t_i} [r(s) + h^Q(s)] ds\right) \right]}{\sum_{i=1}^M E_t^Q \left[ \exp\left(-\int_t^{t_i} [r(s) + h^Q(s)] ds\right) \right]}$$

The above equation implies that CDS spreads are weighted averages of risk-adjusted expected losses,  $E_t^Q(h^QL)$ ; in other words,  $CDS(t) \cong E_t^Q(h^QL)$ .

There are potentially two differences between  $E_t^Q(h^QL)$  and actual expected loss,  $E_t^P(h^PL)$ , where  $E_t^P(\cdot)$  denotes expectations based on actual real-world probabilities. First, as noted above,  $h^Q$  may differ from  $h^P$  if investors demand compensation for jump-at-default risk ( $\Gamma > 0$ ). Second, expectations of  $h^QL$  are evaluated using probabilities adjusted to take account of investors’ aversion to systematic risk. This implies that CDS spreads are approximately equal to the sum of actual expected loss ( $h^PL$ ), a jump-at-default risk premium ( $h^PL \Gamma$ ) and a systematic risk premium.

<sup>①</sup> Previous studies of CDS spreads using intensity models include Berndt et al (2005), Longstaff et al (2005) and Pan and Singleton (2005). <sup>②</sup> Payment is made only as long as the reference entity has not already defaulted. <sup>③</sup> For simplicity, this assumes that default can only occur on premium payment dates. In practice, when default occurs between premium payment dates, sellers of protection receive an accrual payment.

## Selected CDS index sectors



around the events related to General Motors and Ford. Third, risk premia have largely followed the same path as spreads. Fourth, the price of default risk has experienced more ups and downs than risk premia, reaching its maximum value in mid-2002, but also rising to high levels in early 2004 when the slope of the Treasury curve steepened significantly, and again in May 2005 during the turbulence surrounding the auto sector downgrades.

Large differences  
across sectors

Turning to data at the sector level, Graph 3 plots one-year CDS rates and EDFs<sup>™</sup> against the implied estimates of the price of default risk for two sectors.<sup>17</sup> Trend movements in both CDS spreads and EDFs<sup>™</sup> are similar across sectors, and hence with the aggregate index. Nonetheless, the implied level and volatility of the price of default risk have varied significantly across these two sectors. For example, the level averaged 2.18 for industrial firms but only 0.62 for financial firms. Moreover, it rose precipitously on industrial firms in April-May 2005, whereas it hardly changed on financial firms during this tumultuous period.<sup>18</sup>

### What drives CDS risk premia?

Which variables are the main drivers of movements in CDS risk premia and our indicators of default risk aversion? Earlier we identified a few key episodes when these measures were at elevated levels. In this section, we use regression analysis to estimate possible relationships with macroeconomic and

<sup>17</sup> The other sectors are not shown to conserve space. Broadly put, the trends in CDS spreads and estimates of default risk aversion are similar across sectors. The estimated level of default risk aversion in the consumer sector is similar to industrials, whereas it has been much lower in the TMT sector since the beginning of 2003.

<sup>18</sup> Amato and Remolona (2005) find that the price of default risk is higher for firms with higher credit ratings. In the CDX index, however, financial firms have higher ratings on average than those in other sectors. This suggests that a different explanation, other than credit quality, is needed to explain sector differences in our estimates. Further examination of sector differences is a subject for future research.

credit market activity variables. Due to space considerations, we focus solely on the aggregate index.<sup>19</sup>

### *Choice of variables*

To the extent that the state of the macroeconomy affects the risk preferences of investors in the CDS market, we would expect to find statistically significant relationships between macroeconomic variables and CDS risk premia measures.<sup>20</sup> In our analysis we consider several series, including measures of inflation, real economic activity, consumer confidence, risk-free interest rates and the stance of monetary policy.

Impact of macroeconomy and monetary policy is examined ...

We also include measures of credit market activity in the regressions. The high-yield default rate is used as a monthly indicator for a host of other fundamental variables that would be expected to affect default risk premia. In addition, we consider the impact of straight bond and note issuance by US non-financial corporations, and global funded and unfunded issuance of synthetic CDOs. This latter variable is especially relevant for the CDS market, as CDO arrangers typically hedge deals by selling protection on single-name or index default swap contracts. There has been considerable speculation among market participants that this type of activity, known as the “structured credit bid”, has had a dampening effect on CDS spreads over the past two years.

... as well as default rates and issuance amounts

### *Regression results*

Table 2 reports results of selected univariate and multiple regressions for the CDS risk premium (top panel) and price of default risk (bottom panel).<sup>21</sup> The univariate regressions (columns 1–5 in each panel) indicate that the CDS measures have strong links to macroeconomic and credit variables. First, it is evident that real activity, as captured by housing starts or the change in non-farm payrolls, has a negative and statistically significant relationship with the risk premium and, to a lesser extent, the indicator of default risk aversion. This is consistent with results in Amato and Luisi (2005), who find that real activity has a large impact on risk premia in corporate bonds over a longer sample period.

CDS risk premia have a strong link to real economic activity

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<sup>19</sup> Regressions were also computed for each of the sectors and the estimates are broadly similar to those for the aggregate index. These and other unreported results discussed below are available from the author upon request.

<sup>20</sup> Similarly, measures of economic activity should account for systematic movements in the probability of default (EDFs<sup>™</sup> in our study). Indeed, in results not reported, we find that EDFs<sup>™</sup> have a negative and statistically significant relationship with several real activity variables. In addition, EDFs<sup>™</sup> are positively related to default rates.

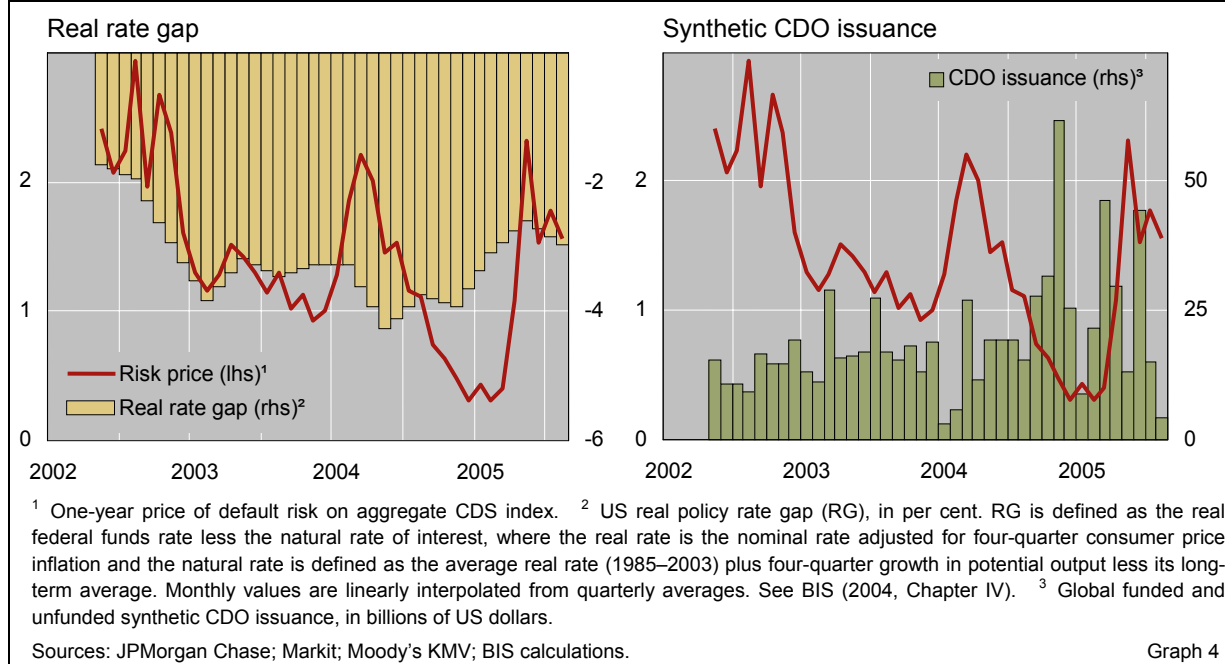
<sup>21</sup> We also found evidence of economically and statistically significant relationships with several other real economic activity indicators. In most cases, inflation measures and bond issuance generally have statistically insignificant coefficients.

Regressions of CDS risk premium and price of default risk <sup>1</sup>							
Dependent variable: Risk premium							
Variable <sup>2</sup>	1	2	3	4	5	6	7
HS	-0.140* (0.023)					-0.096* (0.030)	-0.102* (0.029)
NP		-0.120* (0.036)				-0.015 (0.035)	-0.019 (0.034)
RG			0.276* (0.071)			0.162* (0.059)	0.155* (0.059)
DEF				0.629* (0.198)		0.184 (0.168)	
CDO					-0.911* (0.439)		-0.355 (0.312)
R-squared	0.51	0.24	0.30	0.22	0.11	0.62	0.62
Dependent variable: Price of default risk							
Variable <sup>2</sup>	1	2	3	4	5	6	7
HS	-0.002* (0.001)					-0.002* (0.001)	-0.002* (0.001)
NP		-0.001 (0.001)				0.001 (0.001)	0.001 (0.001)
RG			0.006* (0.001)			0.004* (0.001)	0.004* (0.001)
DEF				0.009* (0.004)		0.004 (0.004)	
CDO					-0.025* (0.009)		-0.018* (0.007)
R-squared	0.24	0.04	0.32	0.11	0.20	0.44	0.51
<sup>1</sup> Based on aggregate index measures at one-year horizon, in basis points. * indicates significance at 5% level. Standard errors are in parentheses. <sup>2</sup> HS: housing starts (in thousands); NP: non-farm payrolls (change, in thousands); RG: real policy rate gap (in basis points); DEF: high-yield default rate (in basis points); CDO: global funded and unfunded synthetic CDO issuance (in billions of US dollars). RG is defined as the real federal funds rate less the natural rate of interest, where the real rate is the nominal rate adjusted for four-quarter consumer price inflation and the natural rate is defined as the average real rate (1985–2003) plus four-quarter growth in potential output less its long-term average. Monthly values are linearly interpolated from quarterly averages. See BIS (2004, Chapter IV).							
Sources: Bloomberg; JPMorgan Chase; Markit; Moody's; Moody's KMV; BIS calculations.							Table 2

Risk aversion is closely related to the stance of monetary policy ...

Second, there is a strong relationship between the real interest rate gap and default risk aversion, as illustrated in Graph 4 (left-hand panel). The real interest rate gap is an indicator of economy-wide demand conditions, but even more directly it is a measure of the stance of monetary policy. The real rate gap is constructed as the difference between estimates of the real federal funds rate and the natural rate of interest, where the latter is a proxy for the equilibrium real interest rate consistent with stable consumer price inflation (see Table 2 footnotes for more details). During the period under review, monetary policy was highly accommodative by this measure, and our results suggest that default risk aversion declined as the real federal funds rate fell further below the natural rate. As an inverse indicator of aggregate output, it is perhaps not surprising that the real rate gap varies positively with the price of

## Macro liquidity, CDO issuance and default risk aversion



default risk, since aversion to risk tends to decline during good times. Alternatively, the regression evidence is consistent with easy monetary policy having facilitated greater risk-taking, as investors took more highly leveraged positions that could be financed (relatively) cheaply.<sup>22</sup>

To be sure, a word of caution is in order when interpreting these results. The estimates imply that when the real rate gap was below its *sample* mean, risk appetite was abnormally high. Yet the real interest rate gap was *negative* during our entire sample period. By contrast, from a longer-term perspective, default risk aversion was relatively high in mid-2002 and again in May 2005. Thus, whether or not the estimated relationships with the real rate gap hold over a full business cycle has not yet been tested and is open to debate.

A third striking result is that months of relatively high synthetic CDO issuance coincide with a lower price of default risk (Graph 4, right-hand panel). This suggests that greater demand to sell protection in the single-name CDS market due to increased CDO issuance has a negative impact on measured risk aversion. However, these results might also be influenced by reverse causation; namely, that greater appetite for risk might lead to increased demand for, and hence greater issuance of, exotic credit products such as synthetic CDOs.

The statistical significance of default rates and synthetic CDO issuance in the univariate regressions may reflect correlations of these series with more fundamental macroeconomic variables. To control for this possibility, in Table 2 we also report results from multiple regressions that include the macroeconomic variables along with the default rate or CDO issuance. These regressions have much higher explanatory power as indicated by higher R<sup>2</sup>

... and synthetic CDO issuance

These relationships are robust to conditioning on the state of the economy

<sup>22</sup> See BIS (2005, Chapter VI) for further discussion.

statistics. In the case of the risk premium, housing starts and the real interest rate gap appear to be the most significant variables, while the coefficients on the high-yield default rate and CDO issuance are no longer significant. By contrast, CDO issuance remains statistically significant in the equation for the price of default risk, though its marginal impact is somewhat weaker when variables proxying for the state of the economy are included. This is further evidence that the degree of activity in the structured credit market – the so-called “structured credit bid” – may have lowered the effective degree of risk aversion in recent years.

## Summary and future work

Evidence points to links to macroeconomic variables ...

This article has provided estimates of CDS risk premia and default risk aversion over the period 2002–05. Both measures have been very volatile, implying that investor risk aversion changes frequently. Our measures are similar to and complement those obtained by Berndt et al (2005). Large spikes in the estimated series occurred following the default of WorldCom in 2002 and the turmoil surrounding the auto sector in April–May 2005. Furthermore, regression analysis indicates that changes in risk aversion are related to both macroeconomic factors and technical market factors. However, our conclusions should be qualified. We have made several strong simplifying assumptions to construct measures of risk premia and risk aversion. Moreover, the sample period spans just over three years, which does not cover a full credit cycle.

... but further work is needed to improve estimation and test robustness

There are several avenues to explore in future research. First, a more careful analysis would require building a model along the lines of Berndt et al (2005). Estimates obtained in this way would need to be tested for robustness to model specification. Recent work by Pan and Singleton (2005) on sovereign CDS spreads, for instance, indicates that estimates of risk aversion can be sensitive to the form of the model. Second, it would be desirable to relate measures of risk aversion and risk premia estimated using CDS data to those obtained from other credit instruments or asset classes, such as equities and government bonds. This would help further our understanding of the extent to which prices on assets in different markets are driven by common forces.

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## Foreign banks in emerging market economies: changing players, changing issues<sup>1</sup>

*Financial sector foreign direct investment in emerging market economies has surged over the past decade. While the benefits of heightened financial sector efficiency and better risk management are widely acknowledged, foreign ownership poses challenges for host countries due to the migration of decision-making and the incongruence of the organisational structures of foreign-owned banks and host country legal and regulatory systems. Many of these challenges will be best met by global coordination on the part of supervisors and central banks.*

*JEL classification: G200, F210, F230, F360.*

Foreign direct investment in the financial sectors of emerging market economies has expanded dramatically over the past 10 years. Growing foreign involvement has been instrumental in aligning the financial systems of emerging market economies (EMEs) more closely with international standards in terms of capital allocation, risk management and corporate governance. At the same time, there have been significant changes in the way in which foreign banks organise and conduct business in EMEs. The transformation of host country banks through foreign bank entry has generally improved the efficiency and stability of domestic financial systems. But it has also given rise to new challenges for host country authorities.

This special feature reviews the major issues and challenges surrounding financial sector foreign direct investment (FSFDI) in emerging markets. It draws extensively on the Cumming Report prepared by the Committee on the Global Financial System (CGFS), as well as discussions at three related workshops in 2004.<sup>2</sup> The first part of the feature analyses patterns in FSFDI in emerging Asia, central and eastern Europe and Latin America. The second discusses the changing character of foreign bank involvement. The third explores the main

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<sup>1</sup> The views expressed in this article are those of the author and do not necessarily reflect those of the BIS or the CGFS. I am grateful to Jhuvesh Sobrun, Marcus Jellinghaus and Gert Schnabel for excellent research assistance.

<sup>2</sup> See CGFS (2004) and CGFS (2005).

issues arising for host country regulatory authorities from this growing foreign bank involvement. The feature concludes with a brief review of the additional challenges facing authorities responsible for financial stability going forward.

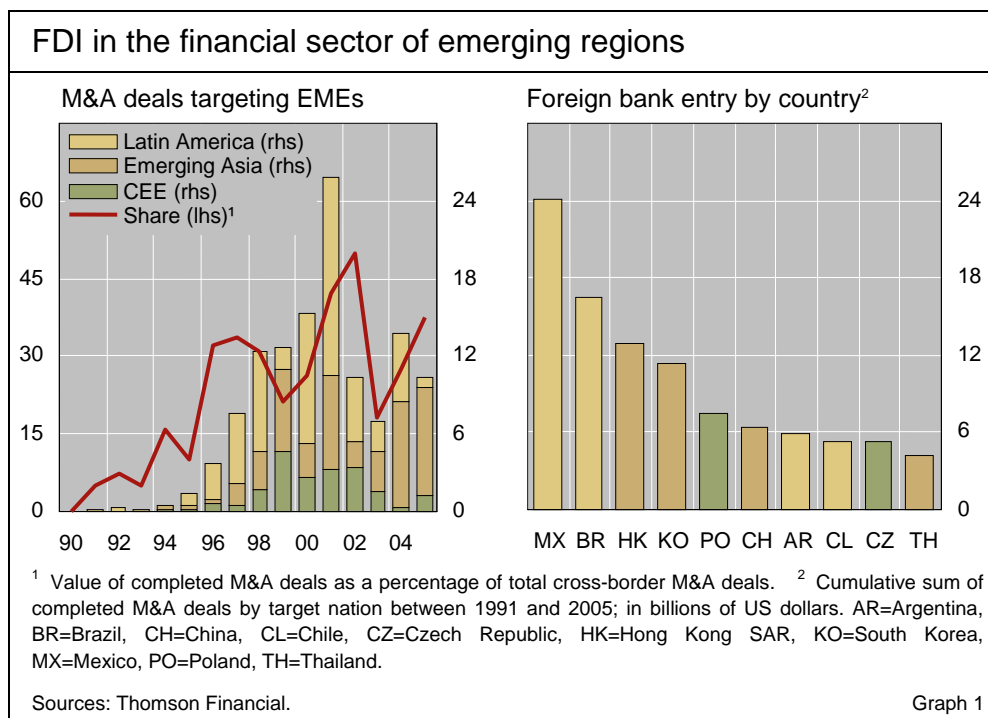
### Trends in FSFDI in emerging market economies

FSFDI in EMEs has become an increasingly important element of the globalisation of banking activities since the mid-1990s.<sup>3</sup> The value of FSFDI, as measured by cross-border mergers and acquisitions (M&As) targeting banks in EMEs, rose from about \$2½ billion in 1991–95 to \$51½ billion in the following five years and \$67½ billion from 2001 to October 2005.<sup>4</sup> FSFDI declined sharply after peaking in 2001, but has since stabilised well above the levels seen in the first half of the 1990s (Graph 1). FSFDI in EMEs also gained importance relative to cross-border mergers within developed countries. The share of cross-border M&A deals involving financial institutions from EMEs as the target increased from 13% of the global amount in 1991–95 to 28% in 1996–2000 and to 35% from 2001 to October 2005.

Sharp increase in FSFDI in the mid-1990s ...

FSFDI inflows have displayed considerable regional differences, in terms of both absolute amounts and time profile. Overall, the majority of flows went to Latin America. Between 1991 and 2005, transactions targeting banks in the region accounted for \$58 billion or 48% of total cross-border M&As targeting

... with important regional differences



<sup>3</sup> On the trends and factors that explain the rise in FSFDI in the 1990s, see Soussa (2003) and Focarelli (2003).

<sup>4</sup> The volumes of completed mergers and acquisitions are used as a proxy for FSFDI, as comprehensive and methodologically consistent data on sectoral FDI flows across countries are not available.

banks in EMEs. Latin America was followed by emerging Asia with \$43 billion (36% of total M&As) and central and eastern Europe with \$20 billion (17% of total M&As).

Investment in Latin America followed banking crises

Financial crises and the need to (re-)establish functioning banking systems created a one-time set of opportunities to invest in financial institutions and to expand business in EMEs in the second half of the 1990s. Encouraged by international financial institutions, EME governments typically responded to banking crises by accelerating financial liberalisation in order to facilitate the recapitalisation and consolidation of banking systems. This was the case in Latin America in the years following the 1994 Mexican crisis: FSFDI rose from 1995 onwards and remained high until 2002. The subsequent drop partly reflects the saturation of major financial systems with FSFDI. In Mexico, for instance, which received about 40% of the cumulative investment in the region from 1990 to 2002, the share of foreign-owned banking assets had reached more than 80% by end-2002. In addition, the Argentine crisis in 2002 apparently led foreign banks to reconsider the possible costs associated with FSFDI.<sup>5</sup>

Privatisation was the trigger in central and eastern Europe

Countries in central and eastern Europe became major recipients of FSFDI when the privatisation of their banking systems and preparations for EU membership took place in the second half of the 1990s.<sup>6</sup> In some instances the unsatisfactory results of early domestic privatisation schemes led the authorities to rely on foreign resources to recapitalise their banking sector and permit foreign ownership. Poland and the Czech Republic experienced the largest inflows with 38% and 28%, respectively, of the total volume of M&As targeting the region from 1991–2005. In the past three years, FSFDI has focused on countries that will join the European Union at a later stage, such as Bulgaria, Croatia and Romania. Overall, however, FSFDI flows to central and eastern Europe have ebbed, possibly indicating a certain saturation.

Emerging Asia lagged behind ...

Large-scale FSFDI is a relatively recent phenomenon in emerging Asia. The value of cross-border M&As targeting non-Japan Asian countries was only \$16 billion or 20% of total M&A flows into EMEs during 1991–96. To be sure, following the Asian crisis, foreign participation in the financial system increased as governments relaxed entry restrictions. Yet, the recapitalisation of failed banking systems occurred mainly through *domestic* investors, such as the government-owned asset management companies established to deal with non-performing loans.

... until 2003

However, since 2003 emerging Asia has been the most important target region for cross-border M&As, with a sizeable jump in activity occurring in

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<sup>5</sup> Interviews conducted by the CGFS working group with financial firms that have operations in EMEs reveal that the Argentine crisis has fundamentally altered the perception of risk associated with FSFDI. Parent banks have changed risk definitions such that potential losses may exceed the value of equity invested because of the possible reputational costs of not covering losses in excess of equity. See CGFS (2004).

<sup>6</sup> For a discussion of FSFDI in the EU accession countries, see Baudino et al (2004) and Hawkins and Mihaljek (2001).

Korea and Thailand.<sup>7</sup> In some cases limitations remain, especially on foreign majority ownership, and as a result foreign bank involvement measured by assets held with majority ownership still remains comparatively small.<sup>8</sup> But many foreign banks have recently acquired minority stakes (which are not included in the M&A data shown here), in particular in China. Foreign financial institutions hold between 10 and 25% of the equity of the three largest Chinese banks. In total, foreign interests in Chinese banks (state-owned, joint stock commercial banks and city banks) amount to almost \$18 billion.

Overall, the share of bank assets in EMEs held by foreign banks has increased considerably since 1990 (Table 1). The regional differences in FDI flows discussed above are also reflected in the share of assets that foreign banks hold in different regions and countries: foreign ownership of the banking sector is substantially higher in Latin America and central and eastern Europe than in Asia. In some countries foreign banks now control more than 50% of

Rising share of assets held by foreign banks

Share of bank assets held by foreign banks <sup>1</sup>				
	1990	2004 <sup>2</sup>	in per cent of GDP	in billions of USD
Central and eastern Europe				
Bulgaria	0	80	49	13
Czech Republic	10	96	92	99
Estonia	...	97	89	11
Hungary	10	83	67	68
Poland	3	68	43	105
Emerging Asia				
China	0	2	4	71
Hong Kong	89	72	344	570
India	5	8	6	36
Korea	4	8	10	65
Malaysia	...	18	27	32
Singapore	89	76	148	159
Thailand	5	18	20	32
Latin America				
Argentina	10	48	20	31
Brazil	6	27	18	107
Chile	19	42	37	35
Mexico	2	82	51	342
Peru	4	46	14	11
Venezuela	1	34	9	9

<sup>1</sup> Percentage share of total bank assets. <sup>2</sup> Or latest available year.  
Sources: CGFS (2004); ECB; national central banks; BIS calculations. Table 1

<sup>7</sup> FSFDI in Asia is discussed in Chua (2003), Coppel and Davies (2003), Hirano (2003) and Hishikawa (2003). For an overview on the regulatory treatment of foreign banks, see Hohl et al (2005).

<sup>8</sup> For instance, foreign ownership in locally incorporated banks is restricted (eg in Malaysia) or foreign participation has to be reduced after a certain period (eg in Thailand and the Philippines).

total banking assets. In Mexico or Hungary the share of assets owned by foreign banks is as large as 80%. Banking systems in some smaller economies such as the Baltic states are almost entirely foreign-owned.

## The changing character of foreign bank involvement

Changing investment opportunities ...

As investment opportunities and risks in EMEs changed, heightened competition in the traditional markets of major international banks increased the pressure on them to find new areas of growth. Improvements in risk measurement and management facilitated the expansion by financial institutions into EMEs. In part, investing institutions had gained experience in quantifying and managing market and credit risks using standard frameworks. In part, revamped macroeconomic policy frameworks and a greater reliance on market forces may have aligned the character of EME-related risks closer with those in mature economies.

... have led to a more diverse investor base

The range of foreign bank activity in EMEs has also broadened considerably. Traditionally, foreign banks focused primarily on the provision of financial services to their international corporate clients. Since the 1990s, however, foreign investments have increasingly been driven by more general profit opportunities in local markets. Broadly speaking, FSFDI has developed from a rather passive response to changing demand on the part of existing clients to the proactive exploration of new markets in host countries.

### *Major investor groups*

Three groups of investors:

Following the Cumming Report, this article distinguishes three groups of foreign investors. The first group comprises globally active banks that have established a global presence across a wide range of markets. Global banks are defined as institutions that have a broad-based presence in advanced economies and at least two of the three emerging regions considered here. The second group is made up of commercial banks with a strategic focus on one emerging region (defined as having more than 80% of the cumulative value of their FSFDI in one region). The third group is other investors, including private equity funds or finance corporations.

globally active banks ...

Globally active banks see EMEs as an increasingly important segment of their franchise in the worldwide provision of certain financial services. Such institutions accounted for about one third of the total volume of FSFDI between 1991 and 2005. Globally active banks have built a strong presence in Latin America and, more recently, Asia (Graph 2). Such banks have in many cases focused on specific products (such as credit card business or consumer lending) or clients. Expanding into EMEs has allowed them to further exploit economies of scale, for instance in product development, transaction processing, back office and control functions as well as risk management.

... banks with a regional focus ...

Within the second group of foreign investors, commercial banks with a regional focus, European banks have been particularly prominent since the 1990s. This phenomenon probably reflects both economy of scale considerations and a lack of opportunities to expand in home markets. Banks with a regional focus are responsible for more than 60% of FSFDI in Latin

America, and these tend to be Spanish banks, which account for almost half of total FSFDI in the region (Graph 3). In central and eastern Europe, banks with a regional strategy, mainly domiciled in western Europe, account for about 70% of FSFDI.

In Asia, about one quarter of FSFDI came from banks with an Asian focus, domiciled in the region. In particular, firms from established financial centres such as Singapore and Hong Kong SAR have pursued strategies of regional expansion over the past few years. In addition, Hong Kong has been of special importance as a hub for FSFDI in China, because Hong Kong-chartered banks obtain preferential access to mainland China.

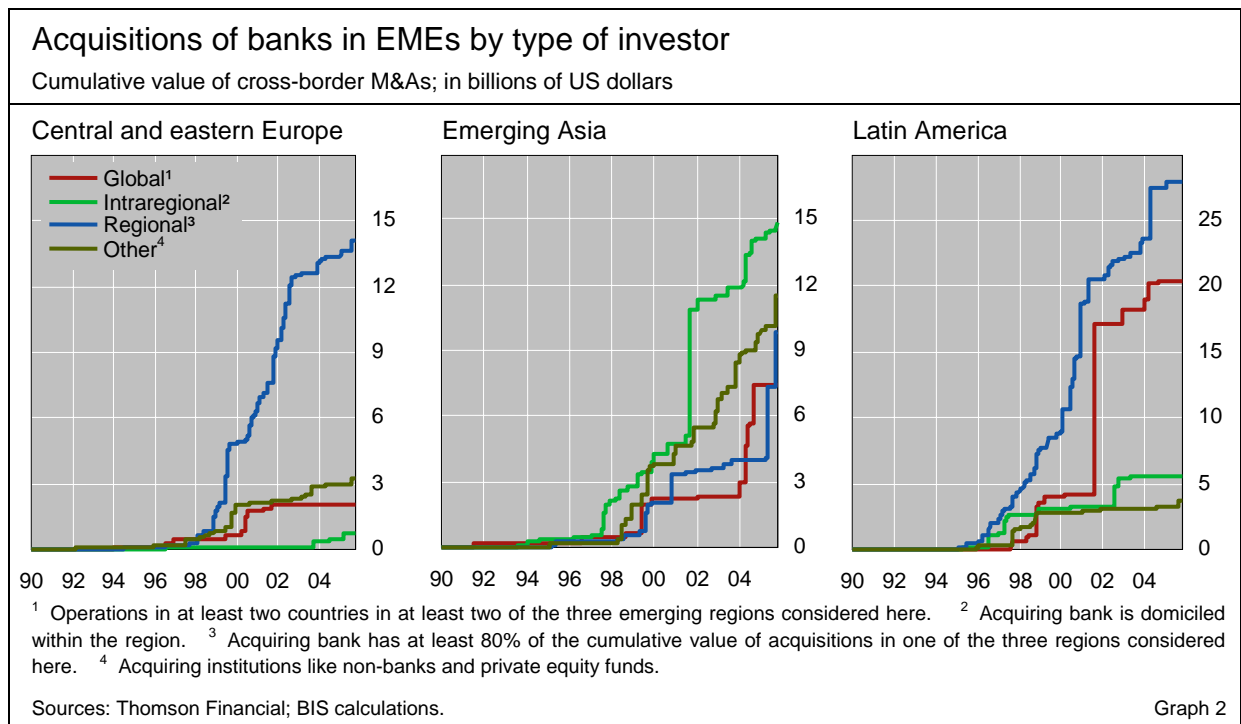
A greater diversity of investors is visible in the growing volume of FSFDI by the third foreign investor group, which includes non-bank investors such as finance corporations and equity funds. US finance corporations have established a broad-based presence in large economies in central and eastern Europe, with a focus on consumer finance. In Asia, a number of investment funds, which usually emphasise the restructuring of acquired firms, acquired Asian banks in the aftermath of the financial crises. In Korea, until 2004 investment funds were the largest foreign majority owners.

... and non-bank investors

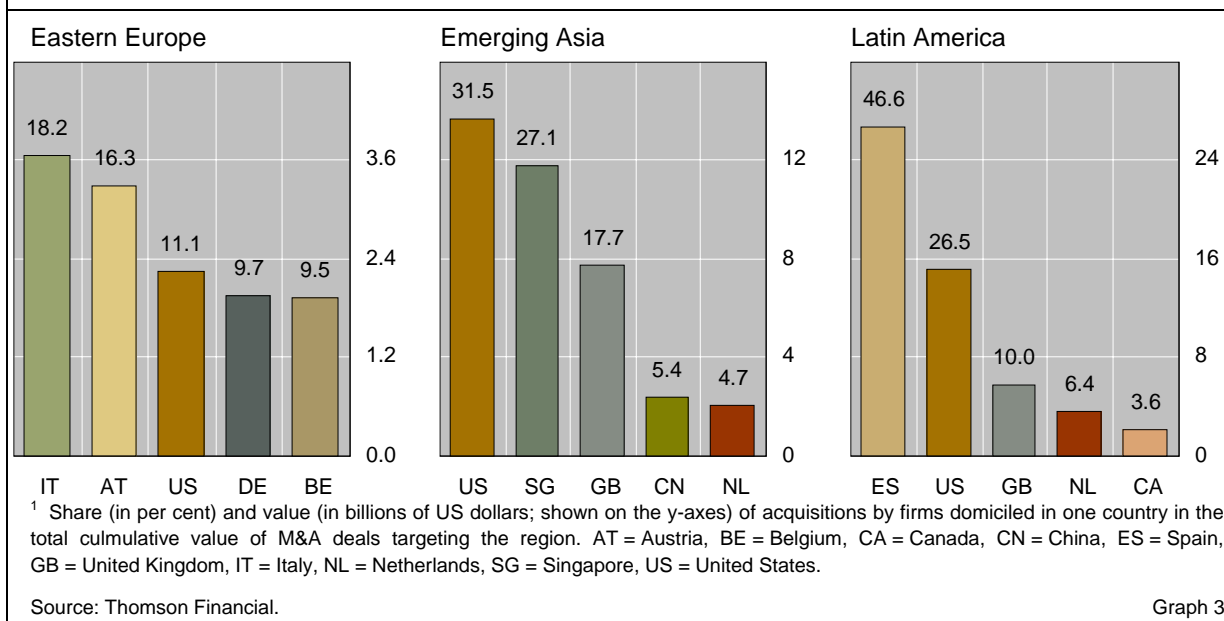
*Changes in the organisation of operations in EMEs*

The focus on the domestic markets of host countries is also reflected in the organisation of foreign-owned financial institutions in EMEs. The establishment of subsidiaries through the acquisition of local banks (as opposed to the creation of foreign branch offices) has become the prevalent mode of foreign entry. In central and eastern Europe, by the end of 2003 more than 85% of

Subsidiaries ...



## Regional composition of foreign ownership<sup>1</sup>



foreign bank operations were run as subsidiaries, which also accounted for about 95% of total foreign bank assets (Table 2). In Latin America, the number of new sovereign operations established as subsidiaries increased from six to 56 between 1994 and 1998.<sup>9</sup>

... as a flexible form of operation

Acquiring domestic banks and establishing subsidiaries was the natural method of entry in the context of the privatisation or recapitalisation of the banking system. Furthermore, investing institutions sought to make investments that were sufficiently large to obtain a critical mass, and exploit economies of scale when entering retail markets. Typically, subsidiaries possess the branch network necessary to enter these markets. The legal form of a subsidiary has apparently proved sufficiently flexible to implement a variety of business strategies and different degrees of centralisation.<sup>10</sup>

Integration into the parent institution

The focus on the domestic market has also broadened the transfer of resources. In addition to the transfer of human capital usually associated with FDI, acquired institutions benefit from the adoption of the parent's infrastructure, such as back office routines or credit control systems. Complementary to this, decision-making and risk management of the local operation are integrated into those of the parent. Strategic decisions are generally taken at the head office while most control functions remain with the local management. Moreover, the acquisition often involves the transfer of reputation as the acquired banks frequently operate under the parent's brand name.

<sup>9</sup> Gallego et al (2003).

<sup>10</sup> The choice of the legal form of operations is, of course, also influenced by the regulatory framework in the host country. Some countries restrict the establishment of branches while allowing subsidiaries. Many countries require deposit-taking or securities business to be conducted through a subsidiary.

Presence of foreign banking groups in selected central and eastern European countries <sup>1</sup>						
	Baltic states <sup>2</sup>	Czech Republic	Hungary	Poland	Slovakia	Total
Number of subsidiaries	15	18	28	45	16	122
Number of branches	5	9	0	1	3	18
Total	20	27	28	46	19	140
Assets of subsidiaries <sup>3</sup>	14.2	62.3	33.7	74.7	19.8	204.8
Assets of branches <sup>3</sup>	1.5	7.6	0.0	0.7	3.0	12.8
Total <sup>3</sup>	15.7	69.9	33.7	75.4	22.8	217.6

<sup>1</sup> End-2003. <sup>2</sup> Estonia, Latvia and Lithuania. <sup>3</sup> In billions of euros.  
Source: ECB (2005). Table 2

## Issues for host countries

The discussion at the CGFS workshops generally concluded that FSFDI is beneficial to the host country. FSFDI exposes domestic banks to international competition, thereby promoting efficiency and improvements in price formation. Indeed, increases in productivity are a well documented phenomenon in banking markets after foreign bank entry.<sup>11</sup> Experiences with foreign bank participation tend to be especially positive when financial firms expand into markets where they have acquired specific expertise and introduced sophisticated risk management techniques.<sup>12</sup>

Benefits of FSFDI are widely acknowledged

At the same time, the greater globalisation of host country financial systems due to increased FSFDI raises new issues for emerging market investors and policymakers alike. The CGFS workshop discussions focused on the impact of foreign banks on economy-wide credit allocation, the side effects of the integration of acquired banks into the multinational firm, and the effect of foreign acquisitions on the availability of information at the host country level.

Issues raised by foreign bank entry

*Foreign banks and domestic credit.* Foreign banks have become heavily involved in lending through domestic affiliates since the mid-1990s. The ratio of foreign banks' local claims in local currency to total foreign claims (international claims and local claims in local currency) has increased sharply in all the emerging market regions considered here. In Latin America, this ratio rose to about 60% by the end of 2004 (Graph 4).<sup>13</sup> The trend has been similar in

Foreign banks are focusing more on domestic lending ...

<sup>11</sup> See CGFS (2004).

<sup>12</sup> Australia, for example, when vetting foreign banks' subsidiaries in the 1980s, preferred entrant banks which were willing to offer a broad range of products. This stance resulted in foreign banks competing with domestic banks in highly competitive segments, leading to large losses for foreign banks. In the early 1990s, however, the entrance criteria were changed, with the focus now on whether the bank would bring something unique to the Australian financial system (CGFS (2005)).

<sup>13</sup> An important side effect of the shift towards local lending in local currency for financial stability has been the reduction of currency mismatches (see Goldstein and Turner (2004)). For a discussion of foreign bank lending to EMEs, see also the international banking markets chapter in the *BIS Quarterly Review* (BIS, (2005b))



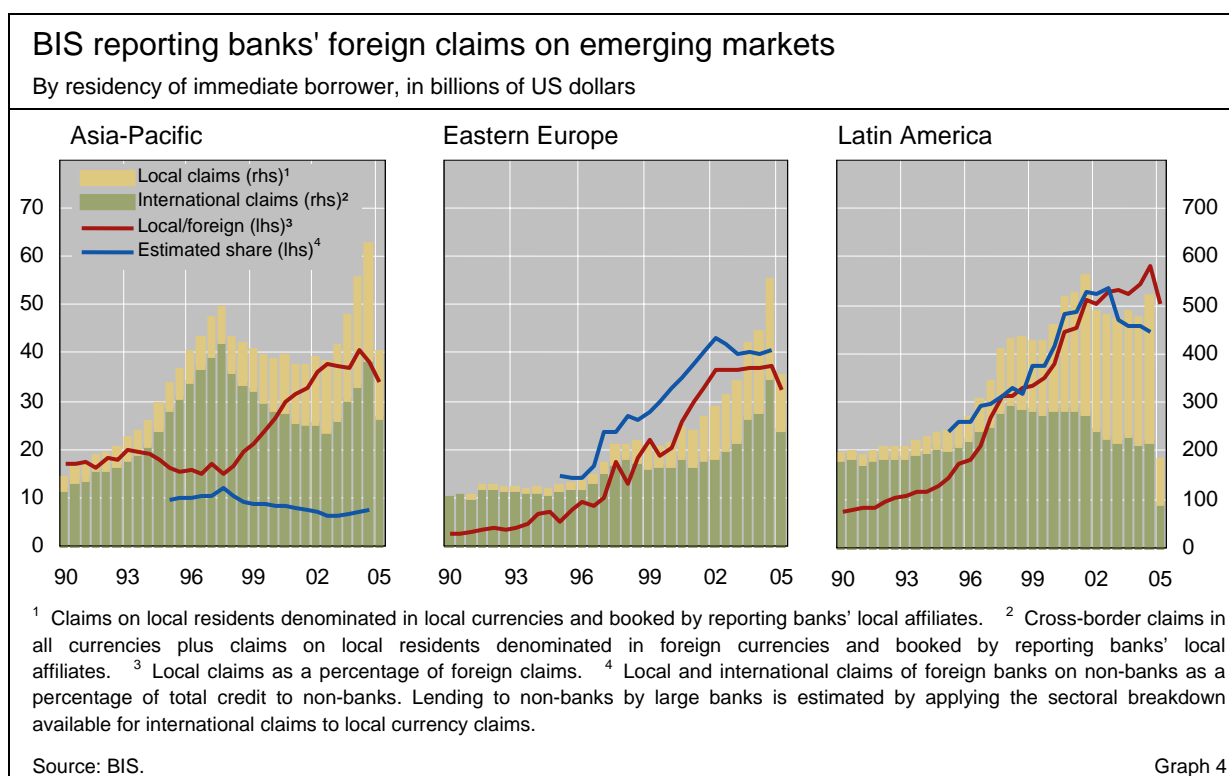
central and eastern Europe and emerging Asia, with the ratio of local to foreign claims in both regions increasing to 35% by the end of 2004.

... but the share in total domestic lending varies considerably

While local lending has generally become more important for foreign banks, the importance of foreign banks in *total* lending to host country non-bank sectors varies considerably.<sup>14</sup> Measures presented in the international banking markets chapter of the *BIS Quarterly Review* show that foreign banks' share in total domestic lending has increased in central and eastern Europe and Latin America, broadly in tandem with foreign banks switching from international towards local lending. By contrast, although it has grown as a percent of GDP, the share of foreign participation in domestic lending in Asia has remained rather stable at about 10%.

Foreign banks do not appear to be "cherry-picking"

The rapid expansion of domestic credit by foreign banks in central and eastern Europe and Latin America suggests that foreign banks have *not* focused only on a small group of highly creditworthy customers. Indeed, more recent research generally does not provide evidence of foreign banks "cherry-picking" a selective group of highly rated clients.<sup>15</sup> Still, comments made at the CGFS workshops suggest that small and medium-sized enterprises (SMEs) often have difficulties in obtaining credit from foreign banks, which are more dependent on standardised credit evaluation. Consequently, lending to SMEs from foreign banks depends on the availability of reliable accounts, and transparent procedures for posting collateral and foreclosure.



<sup>14</sup> For details regarding the calculation of this and related measures, see BIS (2005a).

<sup>15</sup> See Cardenas et al (2003) for an overview.

The rapid credit expansion by foreign banks also raises financial stability issues for host country authorities. Lending to households has been a particular concern in central and eastern Europe, where household credit increased by an annual average of 17% between 2000 and 2004. Some of this growth is the result of the aggressive expansion by foreign banks due to much higher spreads.<sup>16</sup> To be sure, household credit growth is occurring from a low base and in rapidly growing economies, so the debt burden is still relatively low. It is also not clear how much slower this credit growth would have been in the absence of foreign bank participation. Still, the development underscores the need for host country authorities to have adequate information to assess the activities of all financial institutions in their markets.

Rapid credit expansion and financial stability

*Integration of acquired banks into an international financial firm.* In background interviews for the Cumming Report, many financial institutions indicated that they are managing their affiliate operations in EMEs as part of an investment portfolio, based on risk-adjusted return considerations. Thus, changes in business strategy and risk appetite at the parent level can affect the resources allocated to specific countries. Such decisions, which could include exiting the country, can in turn influence the overall provision of financial services in host countries, especially if foreign ownership is highly concentrated.

Migration of decision-making ...

The degree of existing involvement clearly increases the cost of reducing or even closing operations in a country. In valuing their EME investments, institutions regard their local operations as a bundle of assets, including intangible elements such as host government goodwill, client relationships and reputation. The value of these assets is likely to suffer when significantly reducing service levels or even exiting a country. Notwithstanding this generally greater commitment, however, foreign ownership exposes local banking systems more directly to changes in global conditions.

... but increasing involvement in local markets

*Availability of information to markets and supervisors.* The acquisition (and subsequent delisting) of the shares of subsidiaries on local stock exchanges can adversely affect the quality of information available to market participants and host country supervisors. For one, it dilutes the available pricing signals on the profitability of domestic banking business. For instance, after the foreign acquisition of Mexico's two largest banks, the correlation of the prices of the domestic and the (newly) foreign-owned banks dropped significantly (Table 3), consistent with the view that the share prices of foreign-owned banks reflect domestic financial market conditions less. Another effect of foreign acquisition is that local financial analysts usually drop their coverage of banks that become foreign subsidiaries. As local analysts tend to have an informational advantage over their international counterparts, this may also diminish the quality of available information.<sup>17</sup>

Diluted pricing signals ...

... and reduced analyst coverage

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<sup>16</sup> Bank Austria (2004) calculates an average retail spread (spread between average deposit and loan rate) of 6 percentage points for the Czech Republic, Hungary, Poland, Slovakia and Slovenia, compared to 3 percentage points for the euro area.

<sup>17</sup> Bae et al (2005).

Foreign bank entry and equity price correlation in Mexico				
	Acquisition of Bancomer by BBVA <sup>1</sup>		Acquisition of Banamex by Citigroup <sup>2</sup>	
	pre-acquisition	post-acquisition	pre-acquisition	post-acquisition
Equities of domestically owned banks:				
Banorte <sup>3</sup>	0.76	0.58**	0.79	0.25**
Inbursa <sup>3</sup>	0.75	0.60**	0.73	0.45**
Mexbol index <sup>3</sup>	0.87	0.70**	0.81	0.22**

Note: \*\* indicates a change in the correlation coefficient from the previous period that is significant at the 1% level.

<sup>1</sup> Acquisition: June 2000, delisting: March 2004. <sup>2</sup> Acquisition: May 2001, delisting: October 2001.

<sup>3</sup> Correlation of monthly returns with the equity returns of the acquired bank.

Sources: Bloomberg; BIS calculations. Table 3

Information available to supervisors

Information requested by supervisors and made publicly available can to some degree substitute for information provided by markets. In part for this reason, bank supervisors often prefer subsidiaries to be legally organised as a domestically chartered bank. However, the integration of local operations into the parent institutions and in particular the centralisation of decision-making processes often mean that foreign subsidiaries functionally resemble branches, and foreign parents might choose to transform subsidiaries into branches in order to reduce costs.<sup>18</sup> This is especially the case in central and eastern Europe, where the adoption of the single EU passport has streamlined the process of changing the legal form of operations.

### Looking forward

Growing foreign bank participation has exposed EMEs to three underlying trends in the global financial system: consolidation, capital allocation based on risk-adjusted profitability and corporate governance based on widely dispersed ownership by private shareholders at the parent level. The benefits of this kind of financial globalisation in the form of heightened financial sector efficiency, improved pricing and better risk management are widely acknowledged.

At the same time, to exploit the benefits of foreign bank involvement, more scope remains to develop the institutional infrastructure. This includes the improvement of legal and accounting frameworks as well as bankruptcy procedures in EMEs, and their harmonisation at the global level.

Foreign ownership can also pose challenges to supervisory authorities because of the migration of decision-making and the incongruence of foreign-owned banks' organisational structures and host country legal and regulatory systems. To deal with these challenges, the need to coordinate between host and home country authorities is widely recognised, not least to identify the

<sup>18</sup> Bednarski and Osinski (2002). For another model, see the discussion in Goldberg et al (2005) of the implementation of a fully integrated strategy across four countries in the case of Nordea.

information needs of those charged with financial and macroeconomic stability in both home and host countries.

Against this backdrop, international cooperation between central banks appears likely to play an ever more important role. One reason is that liquidity problems may increasingly affect banks operating in different currency areas, and hence different central banks. Another reason is that central banks, with their focus on systemic stability, might be particularly well equipped to assess the risks arising from global activities. The discussion in the three CGFS workshops underlined the usefulness of bringing together home and host country central banks to discuss these topics.

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## Corporate bond markets in Asia<sup>1</sup>

*Corporate bond markets in Asia differ widely in size. Some primary markets have opened up to foreign issuers while others have relied on quasi-government issuers. Secondary markets often suffer from illiquidity, due in varying degrees to narrow investor bases, inadequate microstructures and a lack of timely information about issuers.*

*JEL classification: G140, G180, M400, O160.*

Since the 1997 Asian financial crisis, bond market development has become a high priority for Asian policymakers. The development of local currency bond markets has often been seen as a way to avoid crisis, with these markets helping reduce potential currency and maturity mismatches in the economy. Indeed, several Asian economies have succeeded in developing fairly active primary and secondary markets in domestic government bonds.

In recent years, policymakers in many Asian economies have started to turn their attention to local currency non-government (“corporate”) bond markets. They recognise that a robust financial system requires multiple channels of financing, in which banks and other types of investor compete for borrowers. As the Asian financial crisis itself demonstrated, short-term credit markets are prone to creditor runs, and a corporate bond market can provide an economy with an important source of long-term finance.<sup>2</sup>

While the primary markets for corporate bonds in Asia have grown significantly, the growth in some cases seems to have been driven largely by quasi-government issuers or issuers with some form of credit guarantee. These markets may have developed in this way because investors have had little access to the kind of information that would allow them to adequately evaluate

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<sup>1</sup> The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS. We thank Claudio Borio, Muhammad Ibrahim, Kim Ng, Indra Sakti, Jeong-Ho Suh, Jim Turnbull and Frank Packer for helpful comments and discussions.

<sup>2</sup> In Greenspan's (2000) words, a functioning capital market might have provided the Asian countries with a “spare tire” and made the crisis more benign. Diamond (2004) shows formally why it is in the nature of short-term credit markets to be prone to creditor runs.

the credit risks of other potential issuers. The secondary markets have developed less, with relatively little trading activity to be seen in many markets. Here we suggest that this inactivity may stem from a combination of a lack of investor diversity, inadequate market microstructures, market opaqueness and insufficient flows of timely information to creditors.

In what follows, we first describe primary corporate bond markets in Asia-Pacific in terms of their size and issuer composition. We then characterise the secondary markets and suggest reasons for the lack of liquidity in some of these markets.

## Primary markets: size and composition

Relying on statistics from the BIS as well as data from Dealogic Bondware, we characterise the size and composition of the markets for local currency corporate bonds in Asia-Pacific. These markets include the currencies of Australia, China, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand. We define “corporate bonds” to include all non-government long-term debt issues in a given currency. We include quasi-government issuers, financial and non-financial issuers and both resident and non-resident issuers.

### *Market size, liquidity thresholds and crowding-out*

At the end of 2004, the 12 local currency markets included in this study had corporate bonds outstanding of almost \$3 trillion. The Japanese market alone is \$2 trillion in size, accounting for two thirds of the total (Table 1). Behind Japan are three markets that can still be considered relatively large: Korea with \$355 billion, China with \$196 billion and Australia with \$188 billion. These four markets are “large” in the sense that they exceed the \$100 billion threshold estimated by McCauley and Remolona (2000) as the size that would tend to be required for a deep and liquid government bond market.<sup>3</sup> Because corporate bond issues are by definition more heterogeneous than those of government bonds and issue sizes smaller, such a threshold for corporate bond markets would tend to be much higher. Factors other than size that would affect liquidity are discussed in the second part of this special feature.

Four markets  
qualify as large

Whatever the actual liquidity threshold, the remaining corporate bond markets would seem to have far to go to reach it. The next largest market is Hong Kong with \$62 billion, followed by Malaysia with \$50 billion, Thailand with \$32 billion, New Zealand with \$30 billion, India with \$24 billion and Singapore with \$22 billion. Two other economies – Indonesia and the Philippines – have even smaller markets. As discussed below, opening up to foreign issuers and investors may help a market overcome the disadvantages of a small size.

The size of the market would depend not only on the size of the economy but on the level of its development. In addition, market size may be affected by

Crowding-out of  
issuers or investors

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<sup>3</sup> This is, of course, only a rough threshold and it does not take into account a number of other factors that would affect liquidity.



Size of corporate bond markets and other channels of local currency funding					
At end-2004					
	Corporate bonds <sup>1</sup>		Other channels as a percentage of GDP		
	Amounts outstanding (USD billions)	As a percentage of GDP	Domestic credit	Stock market capitalisation	Government bonds outstanding
Australia	187.5	27.1	185.4	111.5	13.8
China	195.9	10.6	154.4	33.4	18.0
Hong Kong SAR	61.9	35.8	148.9	547.7	5.0
India	24.5	3.3	60.2	56.8	29.9
Indonesia	6.8	2.4	42.6	24.5	15.2
Japan	2,002.0	41.7	146.9	76.9	117.2
Korea	355.6	49.3	104.2	74.7	23.7
Malaysia	49.7	38.8	113.9	140.8	36.1
New Zealand	29.9	27.8	245.5	41.1	19.9
Philippines	0.2	0.2	49.8	37.5	21.8
Singapore	21.7	18.6	70.1	211.4	27.6
Thailand	31.9	18.3	84.9	67.1	18.5
<i>Memo: United States</i>	<i>15,116.6</i>	<i>128.8</i>	<i>89.0</i>	<i>138.4</i>	<i>42.5</i>

<sup>1</sup> Defined as bonds and notes issued in the country's currency by either residents or non-residents, in both domestic and international markets.

Sources: IMF; World Federation of Exchanges; Dealogic Bondware; national data; BIS.

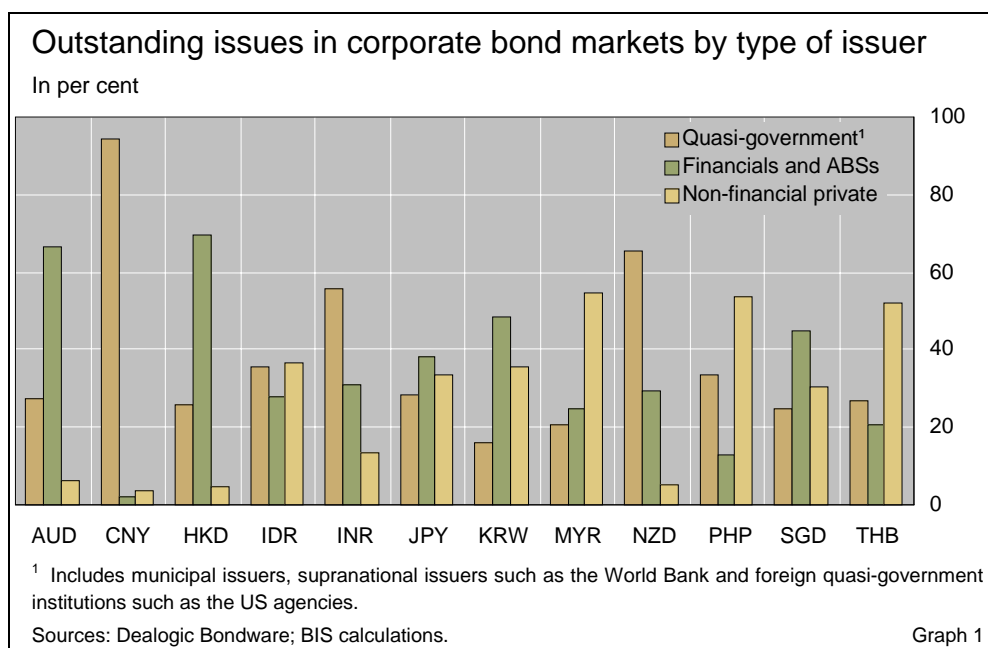
Table 1

competition among financing alternatives on either the issuer or investor side. While a banking sector or equity market would compete with the debt securities market for the same potential corporate issuers, the financing of large government budget deficits may crowd out potential investors. Still, it is not surprising that the deepest corporate bond markets are those of the higher-income economies of Australia, Hong Kong, Japan, Korea, Malaysia and New Zealand. In each of these cases, as shown in Table 1, the size of the market exceeds 25% of GDP. It is also unsurprising that the shallow markets relative to GDP are those of the lower-income economies of China, India, Indonesia and the Philippines.

#### *Composition of issuers*

The types of issuer we find in a given market may give us a sense of how well developed the markets are in the 12 currencies. The natural issuers in a corporate bond market are the large firms, for which investors would find it worthwhile to evaluate their credit quality based on publicly available information. Hence, beyond the size of a market, a measure of its development would be the range of credit quality of the borrowers that come to the market. At the same time, the presence of non-resident issuers may represent a vote of confidence, indicating a market that is able to provide funds on terms that are competitive with those available in other currencies.

In Asia, issuers in some markets still seem to be concentrated near the high end of the credit quality spectrum. In Malaysia, about 40% of the market consists of issuers with the local ratings of triple-A and another 40% of issuers



with double-A ratings. In Korea, some 80% are single-A or above.<sup>4</sup> In the absence of more systematic data on the credit quality of issuers in the different markets, we can turn to indirect evidence in the form of the division of issuers into quasi-government issuers, financial institutions and non-financial issuers. Quasi-government issuers are likely to borrow with government guarantees, whether explicit or implicit.<sup>5</sup> Hence, they are likely to have the highest credit quality available in the country. As shown in Graph 1, quasi-government issuers dominate three of the markets: China, India and New Zealand. It should be noted that since the Asian crisis, the Korean market has graduated from one dominated by issues backed by credit guarantees to one in which such issues are a negligible fraction.

Quasi-government  
issuers dominate  
three markets

While financial institutions often have implicit guarantees, this does not seem to be the case in the markets dominated by such institutions: Australia, Hong Kong, Korea and Singapore. In fact, the pattern of financial issues making up the larger part of the market is no different from that in European markets, and at least in the case of Australia many of the financial issues are in fact asset-backed securities.

A further indication of the importance of quasi-government issuers in Asian corporate bond markets is the composition of the HSBC Asian Local Bond Index (ALBI). The index is designed to track the performance of liquid local currency bonds in China, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, Taiwan (China) and Thailand. It has a large number of

<sup>4</sup> Ratings composition estimates based on information provided by Bank Negara Malaysia and the Bank of Korea. For comparison, the US market has its highest concentration of corporate issuers in the single-A grade category, followed by the triple-B grade category.

<sup>5</sup> Here we include in our quasi-government categories supranational issuers such as the Asian Development Bank (ADB) and the International Bank for Reconstruction and Development (IBRD), municipal bonds and a number of foreign quasi-government financial institutions such as the US agencies.

constituent issues and includes non-government ones. Significantly, however, these “non-government” constituent issues are restricted to those by quasi-government borrowers.

Is the available public information inadequate?

The evidence presented above is incomplete and indirect, but it does give a strong sense that issuance in at least a few of our 12 markets is dominated by issuers with high credit quality. In the markets where this pattern persists, it is likely that institutional investors have internal guidelines that limit them to investing only in highly rated securities. Nonetheless, such guidelines may merely reflect the fact that the publicly available information may not be adequate for investors to assess the creditworthiness of potential issuers with significant default risk. Indeed, this possibility is supported by Bhattacharya et al (2003), who report measures of the opacity of earnings releases that tend to be higher for Asian countries. Moreover, Fan and Wong (2002) argue that such releases in Asia tend to be less informative because of cross-holdings and pyramid ownership structures.

Foreign issuers a vote of confidence

As discussed earlier, the presence of foreign issuers may indicate how well developed a market is. It may also reflect the efforts of policymakers in a small economy to find ways to enlarge their market and make it more viable. As shown in Table 2, the New Zealand, Hong Kong and Singapore dollar markets host the highest proportions of non-resident issuers, with these issuers comprising 86%, 56% and 36% of the market respectively. The Australian dollar market also has a relatively high proportion of 28%. These proportions include non-residents who issue local currency bonds offshore, in London for example. Also, data on onshore and offshore issuance are not fully comparable and so these proportions might overstate the non-resident share. Nevertheless, they suggest that, by this metric, these four markets may be the best developed in the region.

Local currency corporate bonds by residence of issuer <sup>1</sup>				
At end-2004				
	Residents (USD billions)	As a percentage of total	Non-residents (USD billions)	As a percentage of total
Australia	134.0	71.5	53.5	28.5
China	195.9	100.0	0.0	0.0
Hong Kong SAR	27.3	44.1	34.6	55.9
India	24.5	100.0	0.0	0.0
Indonesia	6.8	99.8	0.0	0.2
Japan	1,646.1	82.2	355.9	17.8
Korea	355.2	99.9	0.4	0.1
Malaysia	49.5	99.6	0.2	0.4
New Zealand	4.1	13.8	25.8	86.2
Philippines	0.2	86.8	0.0	13.2
Singapore	13.9	64.0	7.8	36.0
Thailand	31.8	99.8	0.1	0.2
<i>Memo: United States</i>	13,535.9	89.5	1,580.7	10.5

<sup>1</sup> See footnote 1 to Table 1 for definition of corporate bonds.  
Sources: Dealogic Bondware; BIS.

Table 2

## Secondary markets

### *Liquidity in corporate bond markets*

Before considering the problems of liquidity in the Asian markets, it is worth keeping in mind that even a large market such as that of the United States is not perfectly liquid either. There, liquidity is concentrated in the so-called “benchmark” bonds. Most other corporate bonds are traded actively only in the first few weeks after issuance as part of the “allocation process”. After this period, liquidity is typically low, with two-way pricing provided by a few market-makers, primarily the lead underwriters of the issue. Whereas bid-ask spreads in the inter-dealer market for US Treasury securities are less than 1 basis point, bid-ask spreads in the corporate bond market are about 3 to 5 basis points.<sup>6</sup> In recent years, the introduction of standardised credit default swap (CDS) indices in North America has added greatly to the liquidity of the underlying names.<sup>7</sup> Still, these indices are limited to only 125 names each. This experience demonstrates how challenging it is to create liquidity even in very developed corporate bond markets.

Even the largest markets are not perfectly liquid

The secondary markets for local currency corporate bonds in Asia have also lagged behind their government bond counterparts. While in the last few years government bond markets and in some cases swap markets have become reasonably liquid, corporate bond markets remain relatively illiquid in Asia. The turnover ratios in most Asian corporate bond markets are typically a smaller fraction of that of their government counterparts than is the case in the United States (Graph 2).

Corporate bond markets in Asia relatively illiquid

Four salient factors appear to be keeping liquidity low in the Asian corporate bond markets: a lack of diversity in the investor base, inadequate market microstructures, market opaqueness and a limited flow of timely information about issuers to creditors. We discuss each of these factors below.

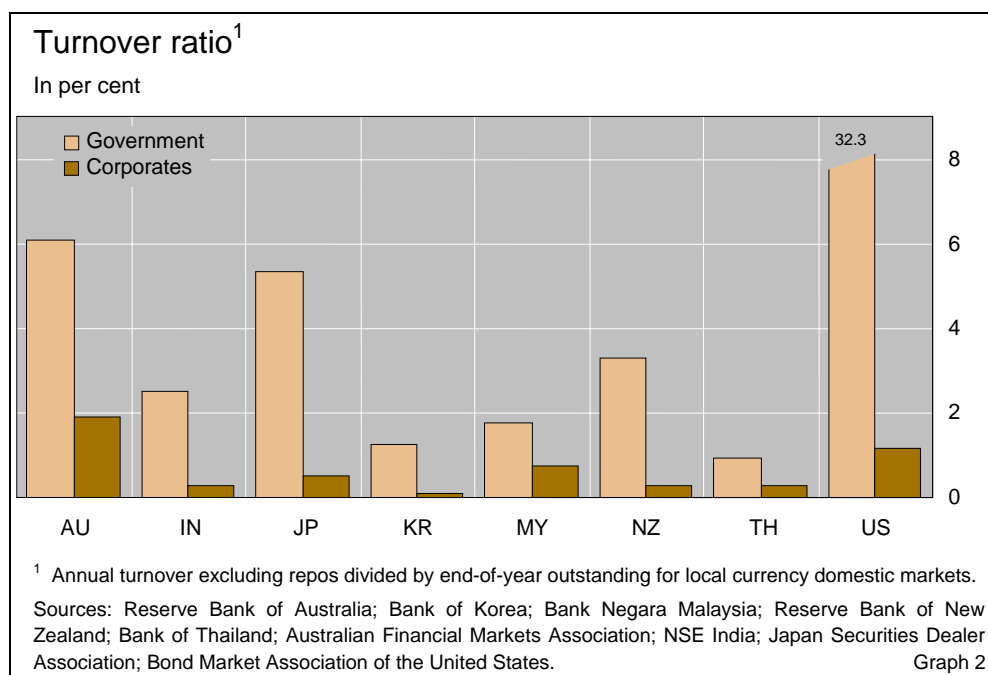
### *Diversity of investor base*

A diversity of investors fosters trading activity. With such diversity, it becomes less likely that different investors will find themselves on the same side of the market, either as sellers or buyers. They are more likely to disagree on the credit quality of an issuer and thus be more willing to trade, and they are less likely to need liquidity at the same time. In Asia, such diversity seems to be rather limited. Here the investor base for corporate bonds tends to be dominated by government-controlled provident funds, insurance companies and banks. Once a bond is issued, it normally disappears into the portfolios of buy-and-hold investors. Those who might trade more actively, such as fixed

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<sup>6</sup> Fleming and Remolona (1999) calculate the bid-ask spread for US Treasury securities to be between a sixth and a third of a basis point on the yield. Chakravarty and Sarkar (2004) estimate the average bid-ask spread of corporates to be about 21 cents per \$100. For a five-year bond, this amounts to about a 4 basis point bid-ask spread on the yield.

<sup>7</sup> These indices include the DJ CDX Index in North America. See Amato and Gyntelberg (2005).



income funds and hedge funds, are typically missing from these markets or are only allowed very limited credit risk exposures.

Important class of investors missing

An important class of investors that is missing from some Asian markets is foreign investors, including global financial intermediaries. In general, myriad market impediments discourage them from participating in the local markets. Among the impediments are withholding taxes and the lack of a market for hedging instruments, such as currency swaps. Policymakers in Asia are aware of these. In setting up the Asian Bond Fund 2 (ABF2), as Ma and Remolona (2005) explain, central banks in Asia were able to reduce some of these impediments. The Philippines, for example, recently removed documentary stamp taxes on the secondary trading of fixed income securities, which had discouraged foreign investors from participating in its local market.

#### *Market type*

Fixed income debt securities tend to trade more actively on over-the-counter (OTC) markets than on exchanges.<sup>8</sup> The most liquid OTC markets are those for government securities, which tend to rely on designated market-makers, as discussed by Sundaresan (2002). Inter-dealer brokers allow dealers to trade with each other anonymously. Such microstructures have often required government encouragement to establish. In China, India, Japan, Korea, Malaysia, Singapore and Thailand, as in the United States, such primary dealers and market-makers for government securities are appointed by the authorities and required to make markets for government securities. Compared to government bonds, corporate bonds are handicapped by the fact that issues tend to be rather heterogeneous and issue sizes to be smaller. Hence, they

Government has role in setting up microstructures

<sup>8</sup> OTC markets are said to be “quote-driven” markets requiring dealers willing to maintain inventories, while exchanges are often “order-driven” markets requiring a continuous flow of buy and sell orders.

may require even more help from the authorities in removing obstacles to the provision of liquidity as well as setting up microstructures.

In Asia, efforts to foster liquidity in corporate bonds have included having them listed on existing stock exchanges or even the setting-up of exchanges devoted to fixed income securities. Such measures are often also aimed at improving transparency. However, trading so far remains concentrated in the OTC market. In Seoul, for instance, over 90% of the secondary trading in corporate bonds still takes place in the OTC market and only 10% on the exchange. In Thailand, the turnover ratio has been 30% in the OTC market and only 1% on the local exchange. In China, because of regulatory fragmentation, financial issues have been traded only on the local interbank OTC market, while non-financial names have been traded either on the two domestic stock exchanges or on the interbank OTC market.

Several of the Asian secondary markets for corporate bonds tend to be less competitive, resulting in wide bid-ask spreads that discourage trading. Market participants suggest that bid-ask spreads in many of the Asian markets are about 5 to 10 basis points even for the most liquid issues (Table 3). In a number of markets, there tend to be one or two dealers for a single issue, often the lead underwriters. In addition, while indicative quotes from dealers are sometimes available on Bloomberg, in many markets ex ante transparency consists of different dealers faxing quote sheets to potential investors, which often contain only a limited and non-comparable subset of the names in the corporate universe. Formal inter-dealer markets or inter-dealer brokers who specialise in corporate bonds have a significant presence only in the more developed markets.

#### *Post-trade transparency*

A third and related factor affecting liquidity is transparency about trades. Such ex post transparency encourages competitive pricing and makes investors confident that they are getting good prices. The US experience helps highlight its relevance. Until about two years ago, trading in US corporate bonds had been lacklustre. Since July 2002, however, dealers in corporate bonds have been required to report OTC trades to the Trade Reporting and Compliance

Selected secondary corporate bond markets			
	Market type	Bid-offer spread <sup>1</sup> (basis points)	Ex-post transparency
Australia	OTC/Exchange	2–10	...
China	OTC/Exchange	5–10	...
Hong Kong SAR	OTC	10–15	...
Korea	OTC/Exchange	2–5	Yes (KSDA)
Malaysia	OTC	5–10	Yes (BIDS)
New Zealand	OTC	5–15	...
Singapore	OTC	10–15	...
Thailand	OTC	5–10	Yes (ThaiBMA)

<sup>1</sup> Bid-offer quotes of bonds on the countries' local currency domestic bond markets (exchange or OTC).  
Sources: Citigroup (2005); Bloomberg; informal discussions with market participants.

Table 3

Engine (TRACE) of the National Association of Securities Dealers (NASD). TRACE then publicly disseminates the trade data. Though some market participants argue that immediate disclosure reduces the liquidity available for large trades, Edwards et al (2005) find that such transparency has reduced bid-ask spreads by an average of 5 basis points.

Malaysian BIDS as good as TRACE

In recent years, some Asian markets have started to enact reporting requirements similar to or even surpassing that of TRACE. Much of this transparency, however, has been limited to dealers. Malaysia has the Bond Information Dissemination System (BIDS), in which dealers are required to enter trades (price and volume information) into the system within 10 minutes of a trade. (The public receives summary information with a 10-minute delay.) This information then becomes available to the BIDS screen subscribers, which tend to be the participants on the “sell” side of the market. At least for those with access to BIDS, this system seems to provide better ex post transparency than even TRACE. The Thai Bond Market Association (ThaiBMA) requires traders to report OTC trades within 30 minutes and distributes the trade information to ThaiBMA members four times a day.<sup>9</sup> The Korea Security Dealers Association (KSDA) requires dealers to report their transactions within 15 minutes via its information distribution system, which disseminates the information to the public on a website the same day. Even greater ex post transparency may be required if the markets are to become more liquid.

#### *Flow of timely information*

Trading thrives on disagreement

The fourth limiting factor is perhaps the most critical one. Many corporate bond markets in Asia seem to have a limited flow of timely information about issuers. In markets such as those for corporate bonds, much liquidity can be generated by the activity of investors who disagree about fundamentals. Such information-based trading provides spillover benefits to those who are in the market for purely liquidity reasons. And such trading tends to be active when there is a significant flow of information about the credit quality of issuers, with every new piece of information creating a new reason to disagree.

In the United States, the flow of market-relevant information takes various forms. Issuers themselves provide quarterly financial reports and profit warnings, the financial press and information services report on major transactions and important corporate events, and credit rating agencies make various announcements about changes in their views about rated companies. Trading in corporate bonds tends to pick up around these information events.

“Reviews” most timely agency announcement

The market reactions to rating agency announcements illustrate the importance of timely information. Rating agencies have chosen to be very careful and deliberate about changing a credit rating, and hence rating changes tend to lag significantly the arrival of the relevant information in the markets. In their effort to be timely, rating agencies have devised “review” announcements – “Watchlist” in the case of Moody’s and “CreditWatch” in the case of Standard & Poor’s. These announcements are made immediately after

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<sup>9</sup> This information is made available to the public at the end of the day. The ThaiBMA also publishes price quotes by its members on a biweekly basis.

the arrival of significant information, and they signal the possibility of a rating change within a few months. Micu et al (2004) have documented that price reactions to rating agency announcements are strongest for these review announcements.

Such information flows are often more limited in Asian markets. A large number of issues carry one form of government guarantee or another, making the credit quality of the issuer on a standalone basis less relevant. In addition, Ball et al (2003) find a pattern in which financial reporting in some Asian markets tends not to recognise losses in a timely way. One reason given for this is the lack of incentives for timely reporting in the Asian context where personal networks in business are so important. Local credit rating agencies do exist in Asia, and often ratings are mandatory for bond issues. Many such rating agencies, however, are quite new and need more time to develop a historical record on which to build a reputation. While a handful of foreign agencies are active in Asian markets, they often do not provide ratings across the full array of bond issuers in individual countries.

Local rating agencies still too young

## Conclusion

In their effort to develop their local currency corporate bond markets, policymakers in Asia face fundamental dilemmas. In the case of the primary markets, should they emphasise further growth even if issuance remains concentrated in quasi-government issuers or in issuers with explicit or implicit credit guarantees? Or should they focus their efforts on disclosure rules, accounting standards and transparency so that investors may have the information for assessing credit risk for a broader class of potential issuers? While the former approach may be good way to start, Asian authorities may have reached the stage where they are doing one at the expense of the other. If the least risky issuers saturate the market with their bonds, this may crowd out the riskier ones and retard the development in the market of a culture of credit assessment and pricing of credit risk.

In the case of the secondary markets, the policy dilemma is whether to focus on developing market microstructures, on diversifying the investor base or on strengthening the institutions that foster flows of market-relevant information. These approaches are not necessarily substitutes and may be pursued together for greater effectiveness. In practice, however, developing market structures – for example, setting up fixed income exchanges – appears to be the most straightforward approach while the two others appear more complex and their payoffs more long-term. Nonetheless, diversifying the investor base and improving the flow of credit risk-relevant information are perhaps more important in the longer run.

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## Reducing financial vulnerability: the development of the domestic government bond market in Mexico<sup>1</sup>

*There is broad evidence that various initiatives undertaken by the Mexican government have been successful in helping to develop the domestic government bond market. The market has grown rapidly, its maturity structure has lengthened and secondary market liquidity has improved. Primary market auctions have also become more efficient. Notwithstanding these significant advances, some vulnerabilities remain.*

*JEL classification: E440, G180, H630, O160.*

The domestic government bond market has expanded rapidly in Mexico since the mid-1990s. In part, this has reflected a conscious effort by the authorities to develop domestic sources of financing as a means of reducing the country's dependence on external capital flows. The abrupt withdrawal of external capital in late 1994, in what became widely known as the "tequila crisis", resulted in a deep economic and financial crisis in Mexico. This made policymakers acutely aware of the vulnerabilities associated with a heavy reliance on external financing.

The Mexican government has promoted the shift to financing in the domestic market through macroeconomic and structural reforms aimed at strengthening the demand for domestic debt, as well as through the introduction of a clearly defined debt management strategy. These measures have been broadly successful: the government has been able to issue a growing amount of domestic fixed rate securities and to create a long-term yield curve. These are notable developments in a region where short-term or indexed debt remains the rule.

This article describes the efforts made by the authorities to develop the domestic government bond market and analyses the impact that they have had on the amount, composition and liquidity of public sector debt. It concludes with an assessment of the progress made so far and highlights some of the remaining challenges to the market's development.

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<sup>1</sup> The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS or the Bank of Mexico. The authors are grateful to Claudio Borio, Gregor Heinrich, Frank Packer, Camilo Tovar and William White for comments and to Dimitrios Karampatos, Rodolfo Mitchell Cervera, Francisco Pérez Estrada, Michela Scatigna and Claudia Tapia Rangel for excellent research assistance.

## Tequila crisis prompts reconsideration of debt management policy

Domestic bond markets have remained underdeveloped for much of Mexico's modern history. Consistent with the general results of Burger and Warnock (2003) for emerging market economies, a poor inflation record and the consequently weak credibility of monetary policy made it practically impossible for the government or other Mexican borrowers to introduce standard long-term debt securities in the domestic market. Indeed, entrenched inflationary expectations meant that lenders were only willing to lend in domestic currency at very short maturities or with returns indexed to inflation, short-term interest rates or the US dollar. They were, of course, also prepared to lend in foreign currencies, principally in US dollars.<sup>2</sup>

The tequila crisis of late 1994 was a good example of the risks of relying heavily on dollar-indexed securities. The early 1990s had been characterised not only by a substantial appreciation of the Mexican peso but also by a significant deterioration of the country's current account in spite of steadily improving public sector finances (Agenor and Montiel (1999)). The rapid growth in Mexico's external liabilities created rising fears among investors that the country would have to devalue and/or default on its obligations. During the course of 1994, investors became increasingly reluctant to roll over their short-term peso-denominated cetes and instead shifted their funds to short-term dollar-indexed tesobonos. This provided a temporary respite for the government, but the short-term nature of outstanding securities also meant that the transformation in the structure of debt towards tesobonos was extremely rapid. Whereas tesobonos had accounted for about 4% of domestic debt at the beginning of 1994, they accounted for most of that debt at the end of that year. The sudden withdrawal of foreign investment from the domestic market at the end of 1994 and the ensuing sharp drop in the Mexican peso resulted in an explosive growth in the peso value of dollar-indexed government liabilities, thereby adding a fiscal dimension to the external crisis. The withdrawal of foreign investment led to severe financial instability, followed by a protracted recession.

The tequila crisis demonstrated that, despite the accomplishments of the Mexican government in the fiscal area in the previous years, the weakness of its debt structure made it vulnerable to the sudden withdrawal of foreign investment. To reduce its reliance on short-term external financing, the government has since made considerable efforts to develop a viable domestic bond market.<sup>3</sup> These efforts have largely focused on improving the demand

Tequila crisis highlights risks of relying on indexed debt ...

... and prompts efforts to develop domestic market

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<sup>2</sup> The inability of a country to borrow domestically at longer maturities and/or abroad in its own currency has been referred to in the literature as "original sin" (Eichengreen et al (2003)). Proponents of this hypothesis argue that this condition heightens a country's vulnerability because the accumulation of external liabilities by the public or private sectors makes it hard for countries to service their obligations whenever the exchange rate depreciates. In turn, this exposure reduces the willingness of non-residents to finance countries, makes that financing more sensitive to adverse economic conditions and limits policymakers' room for manoeuvre (Goldstein and Turner (2004) and Borio and Packer (2004)).

<sup>3</sup> For a detailed account of those early efforts, see Sidaoui (2002).

and supply conditions for government debt. Both of these aspects are discussed in the sections that follow.

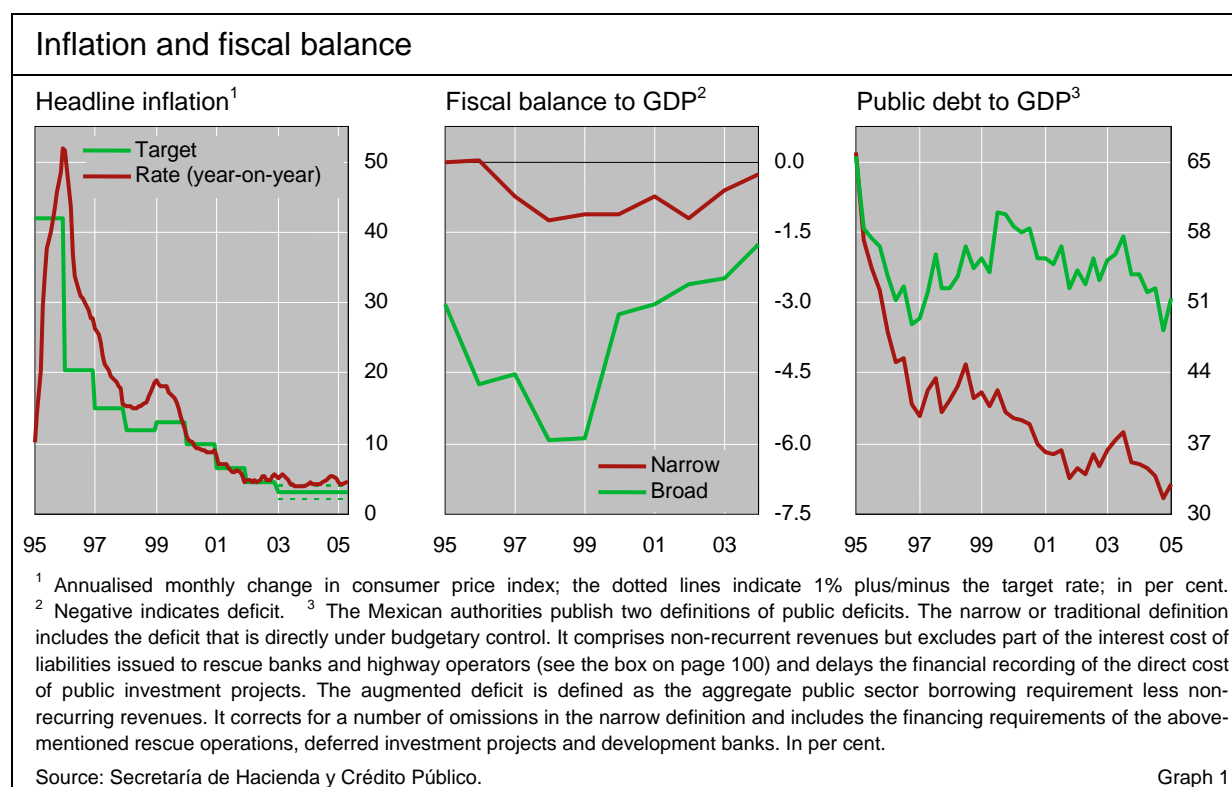
## Strengthening the demand for government debt

Demand for government debt boosted by stable macroeconomic environment ...

One objective of the government's strategy to develop a domestic bond market has been to improve the demand conditions for government debt. Indeed, increased demand has been a major by-product of the more stable macroeconomic environment since the mid-1990s. The Bank of Mexico's monetary policy framework has led to a sustained reduction in inflation, with the rate of increase in the consumer price index declining from 52% in 1995 to slightly below 5% in 2004 (Graph 1). At the same time, the government has been broadly successful in meeting its targeted reductions in the narrow fiscal deficit.<sup>4</sup>

... reform of institutional investment ...

Another key element in boosting demand for government debt has been a reform of institutional investment. In 1997, the government implemented a sweeping reform of its pension system for workers in the private sector (schemes for public sector workers were not affected). The existing defined benefit system was replaced by a compulsory defined contribution plan that is fully funded by individual accounts managed by private administrators known as Administradoras de Fondos para el Retiro (AFORES). The new privately managed pension system has experienced rapid growth since its inception, with assets under management rising from virtually nothing in 1997 to



<sup>4</sup> While improvements to the broader public sector deficit have been slower than initially hoped, there has nevertheless been considerable progress (Bank of Mexico (2004)).

MXN 470 billion at the end of 2004, or 6.5% of GDP. About MXN 400 billion of AFORES assets are invested in government securities.

At the end of 1998, a derivatives exchange specialising in the trading of contracts on financial assets, the Mercado Mexicano de Derivados (MexDer), was launched. Activity in fixed income instruments has developed rapidly, although close to 100% of transactions in fixed income contracts have been accounted for by the trading of contracts on the 28-day TIIE rate. Nevertheless, such trading on short-term rates is reported to have benefited the longer segment of the yield curve, to the extent that short-term contracts have been used in the hedging and pricing of longer-term interest rate swap contracts.

... the introduction of derivatives trading ...

In 2000, the government adopted a new bankruptcy law that permitted the holders of collateral under repurchase agreements to terminate in advance their transactions by netting their rights and obligations with a defaulting counterparty. The new law was an improvement on the previous bankruptcy legislation, which had required market participants to first settle their obligations and then collect the money owed out of the bankruptcy proceedings. In 2003 and 2004, the government issued new regulations for the repurchase market and securities lending operations, which are expected to boost local and foreign demand for government debt securities.

... and greater legal certainty for repos

## Managing the supply of government debt

Since the early 2000s, Mexico has followed a clearly defined public debt management strategy aimed at improving and streamlining the supply of government debt. This overall strategy encompasses five main elements: a shift to the domestic financing of fiscal deficits; a lengthening of the maturity structure of government debt; the development of a liquid domestic yield curve; a move to greater predictability and transparency of debt issuance; and structural initiatives aimed at strengthening the market for government debt.

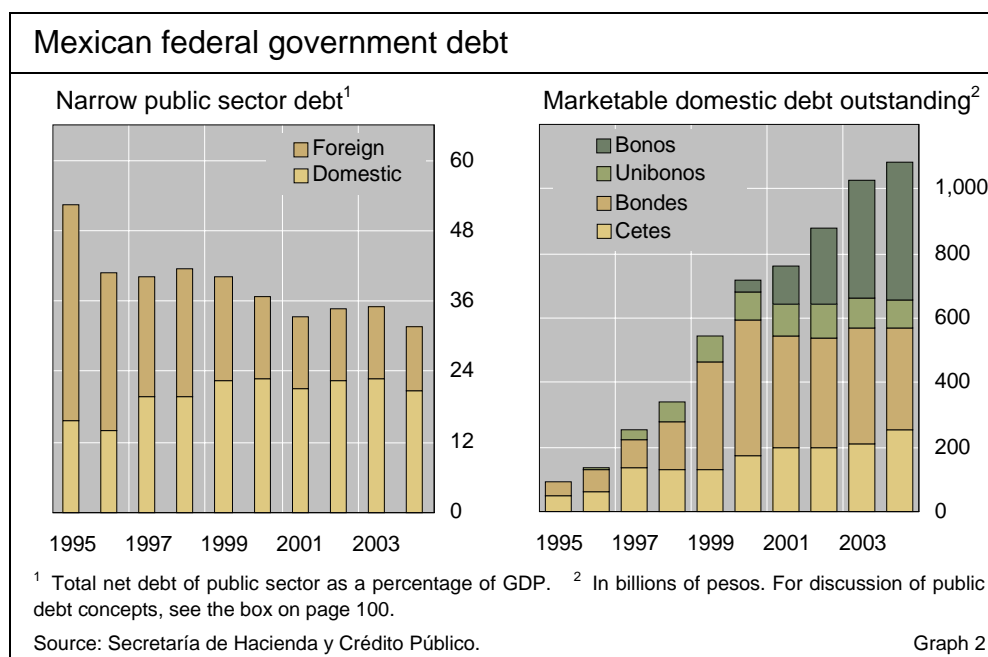
Mexico is following a clear debt strategy ...

In order to fulfil the first of these broad objectives, the federal government began to shift the financing of its fiscal deficit to the domestic market and to decrease the country's external debt exposure (Graph 2). Since 2001, the entire fiscal deficit has been financed domestically. In 2004, domestic borrowing was used to repay \$1.8 billion in external debt, an amount well in excess of the government's planned external debt reduction target of \$500 million for that year. As a result, the domestic component of narrow public sector debt rose to 65% at the end of 2004, compared with 30% at the end of 1995.

... which includes a shift to domestic financing ...

Since 2000, the federal government has also sought to reduce refinancing risk by a gradual lengthening in the maturity structure of its debt. This has been implemented by lengthening the maturity of debt indexed to short-term interest rates and inflation and by introducing fixed rate bond issues. Fixed rate bonds, with maturities of three and five years, were first issued in 2000, followed by 10-year bonds in 2001, seven-year bonds in 2002 and 20-year bonds in 2003. The federal public debt management programme for 2005 emphasised that the net financial requirements of the federal government would continue to be met largely through longer-term fixed rate securities.

... a lengthening in the maturity structure of debt ...



... the development of secondary market liquidity ...

The federal government has also taken other steps to develop secondary market liquidity. In particular, it has frequently reopened a small number of reference issues with the intention of building the outstanding amount of each issue until an acceptable degree of liquidity has been reached. In order to avoid an excessive concentration of redemptions on given dates, the government has also adopted a proactive liability management strategy. It recently announced a programme to swap short- for long-maturity bonds. The programme is expected to reduce refinancing risk and the impact on market liquidity of large debt amortisations.

... greater transparency of debt management ...

Predictability and transparency have also been at the heart of the government's debt management strategy. An initial step in the direction of greater predictability was taken in 2002 when the government waived its right to set a cap on the interest rate at which it was willing to accept bids at primary market auctions. Since 2004, the government has been publishing its debt strategy for the whole year, as a complement to the publication of quarterly auctioning targets for each type of government security. Currently, the government announces a quarterly auction calendar specifying supply by type of instrument at each weekly auction and the particular issues to be auctioned during the quarter.

... and structural reform of the primary market ...

In addition, the government has reformed the structure of the domestic debt market. Over the years, primary market auctions of government securities have been opened to a wider range of investors, such as pension funds, mutual funds and insurance companies. The move to a more equitable participation in the bidding process has been accompanied by improvements in the Bank of Mexico's electronic bidding platform, guaranteeing the publication of results within half an hour of the auction's completion, down from five hours in 1993.

## Structure of the Mexican domestic federal debt market

The Mexican authorities monitor two concepts of public debt, a narrow and a broad one. The narrow concept comprises the net debt of the federal government and that of a number of other federal entities under direct budgetary control (including social security). The broad definition of debt encompasses the net liabilities of the federal government and those of all other public sector entities. Thus, in addition to the debt of the federal government, it includes the debt of non-financial public enterprises, development banks and extra-budgetary trust funds. It also includes the debt of the Savings Protection Institute (Instituto para la Protección al Ahorro Bancario or IPAB), that of the Trust Fund for the Rescue of Toll Highways (Fideicomiso de Apoyo para el Rescate de Autopistas Concesionadas or FARAC) and that resulting from public sector investment projects with different financial accounts (Proyectos de Infraestructura Diferidos en el Registro del Gasto or PIDIREGAS).

IPAB became operational in 1999 and manages the debt resulting from the rescue of the banking sector in the wake of the financial crisis of late 1994. The federal government provided an implicit guarantee on most bank liabilities at the time and bore much of the cost of banking resolution. IPAB began to issue Bonos de Protección al Ahorro (BPAs) in 2000. FARAC was also established in the aftermath of the financial crisis, with the aim of rescuing private toll companies. It

### Main Mexican public sector securities

#### Securities issued by the federal government

Instrument	Type of coupon	Maturity	Frequency of issuance	Amount outstanding at end-2000 <sup>1</sup>	Amount outstanding at end-2004 <sup>1</sup>
Certificados de la Tesorería de la Federación (cetes)	Zero	28, 91, 182 and 364 days	Weekly and monthly	182.7	257.5
Bonos de Desarrollo del Gobierno Federal (bondes)	Indexed to cetes rate	5 years	Biweekly	416.5	310.5
Bonos de Desarrollo del Gobierno Federal Denominados en Unidades de Inversión (udibonos)	Indexed to inflation rate	10 years	Monthly	85.6	84.6
Bonos a Tasa Fija (bonos)	Fixed	3, 5, 7, 10 and 20 years	Monthly	33.3	427.9

#### Securities issued by other major public sector issuers

Instrument	Type of coupon	Maturity	Frequency of issuance	Amount outstanding at end-2000 <sup>1</sup>	Amount outstanding at end-2004 <sup>1</sup>
Bonos de Protección al Ahorro del IPAB (BPAs)	Indexed to cetes rate	3, 5 and 7 years	Weekly and biweekly	69.0	382.5
Bonos de Regulación Monetaria del Banco de México (BREM)s)	Indexed to interbank overnight rate	1 and 3 years	Weekly	22.0	232.9
Pagares de Indemnización de Carreteras (PICs) del FARAC	Indexed to inflation rate	20 and 30 years	Monthly	51.1	110.5

<sup>1</sup> In billions of pesos.

Source: The Secretaría de Hacienda y Crédito Público's federal debt programme for the second quarter of 2005.



should be noted that some of the debt issued to finance PIDIREGAS projects is initially assumed by the private sector but then transferred to the federal government upon completion of the projects. Such debt is thus included in the federal debt statistics.

The Secretaría de Hacienda y de Crédito Público (SHCP) has full responsibility for all activities related to federal government debt and coordinates its activities with other federal agencies in determining the type of instruments to be marketed, their amount and the timing of issues. The two main issuers of marketable debt in the domestic market, the federal government and IPAB, announce quarterly calendars which provide guidance to the markets about the volume and composition of forthcoming issuance.

The federal government issues instruments in a wide range of maturities (cetes, bondes, udibonos and bonos) but IPAB focuses on medium-term BPAs that are indexed to 28-, 91- and 182-day cetes rates. The outstanding domestic marketable debt of the federal government and IPAB amounted to MXN 1,081 billion and MXN 383 billion, respectively, at the end of 2004.

The Bank of Mexico has also been an important participant in the domestic debt market. It has traditionally used government securities to add/subtract liquidity to/from the money market, but in 2000 it began to issue its own liabilities, Bonos de Regulación Monetaria del Banco de México (BREMs), to sterilise the steady inflows of foreign exchange reserves. The BREMs, which are securities indexed to daily interbank rates, amounted to MXN 233 billion at the end of 2004. For the Bank of Mexico, sterilisation through such instruments enables it to better meet its monetary policy objectives while causing fewer distortions in the market for government debt. BREMs are not included in the public sector's debt statistics.

... and the secondary market ...

In 2000, the government introduced a market-making scheme for government debt. Market-makers committed themselves to bid for a minimum amount of securities at primary market auctions, to make two-way quotes at all times for a minimum amount of fixed income securities and to maintain a cap on the bid-offer spread (currently at 125 basis points). In return for those obligations, market-makers were given the right to participate in a “green shoe” auction<sup>5</sup> that follows the public auction, hold regular meetings with federal debt management authorities and have access to the Bank of Mexico's securities lending window.

... along with easier access to market prices ...

The availability of market-determined prices is an essential element for the development of secondary markets and the valuation of intermediaries' portfolios. In recent years, the Bank of Mexico, the Comisión Nacional Bancaria y de Valores (CNBV) and the Bolsa Mexicana de Valores (BMV) have worked together to ensure that market participants have easy access to daily market prices for tradable fixed income securities. These efforts have led to the creation of private price vendors that are in charge of compiling market information from brokers and disseminating it to broader market participants. Most financial intermediaries are now required to use the services offered by authorised price vendors.

... and the launch of a “strips” programme

In 2005, the government launched a Strips Market Operation Programme, which allows participants in the government bond market to strip and reconstitute any bonos and udibonos. The regular reopening by the government of issues with semiannual coupon payment dates allows for the

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<sup>5</sup> A green shoe option is given by an issuer to the underwriters for the issuance of additional securities to cover any short position generated by an over-allotment of securities. In this particular case, underwriters can buy up to 20% of the initial amount auctioned at the weighted average price of the auction.

individual interest components of instruments with different maturities to be perfectly interchangeable. The availability of long-dated zero coupon bonds should prove particularly attractive to institutional investors with long investment horizons. It should also help enhance the depth of the secondary market.

### Assessing the results of policy initiatives

There is broad evidence that the various policy initiatives implemented by the Mexican government are achieving their objectives. The domestic government bond market has grown rapidly, its maturity structure has lengthened and secondary market liquidity has improved. There are also signs that the reform of the primary market's structure has had a positive impact on its efficiency.

Policy initiatives are achieving their objectives

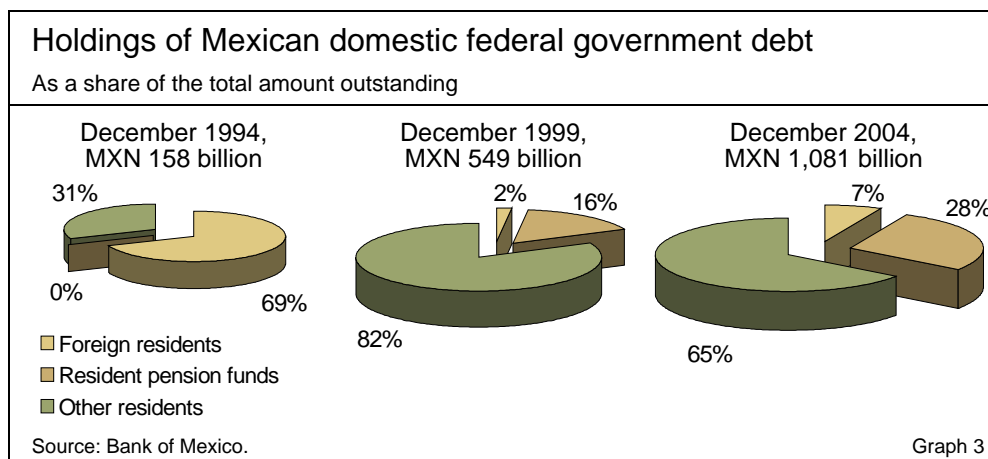
The most evident outcome of the government's new debt strategy is that issuance of domestic marketable debt by the federal government has expanded rapidly in recent years, with the stock of outstanding liabilities rising from MXN 158 billion on the eve of the tequila crisis in December 1994 (or 10% of GDP) to MXN 1,081 billion at the end of 2004 (14% of GDP). To be sure, much of the increase in government debt in the second half of the 1990s reflected the issuance of liabilities associated with the rescue of the banking sector and a number of other large private sector entities. Nonetheless, the policy shift to the domestic financing of deficits, combined with the growth of domestic institutional investment and the return of foreign investors to the domestic debt market, has also been important in recent years. Greater foreign involvement in the market is a particularly remarkable development given that foreign investors had largely deserted the market in the second half of the 1990s (Graph 3). By the end of 2004, foreign investors held 7% of the total stock of domestic government debt, up from 2% at the end of 1999.

The domestic market has grown rapidly

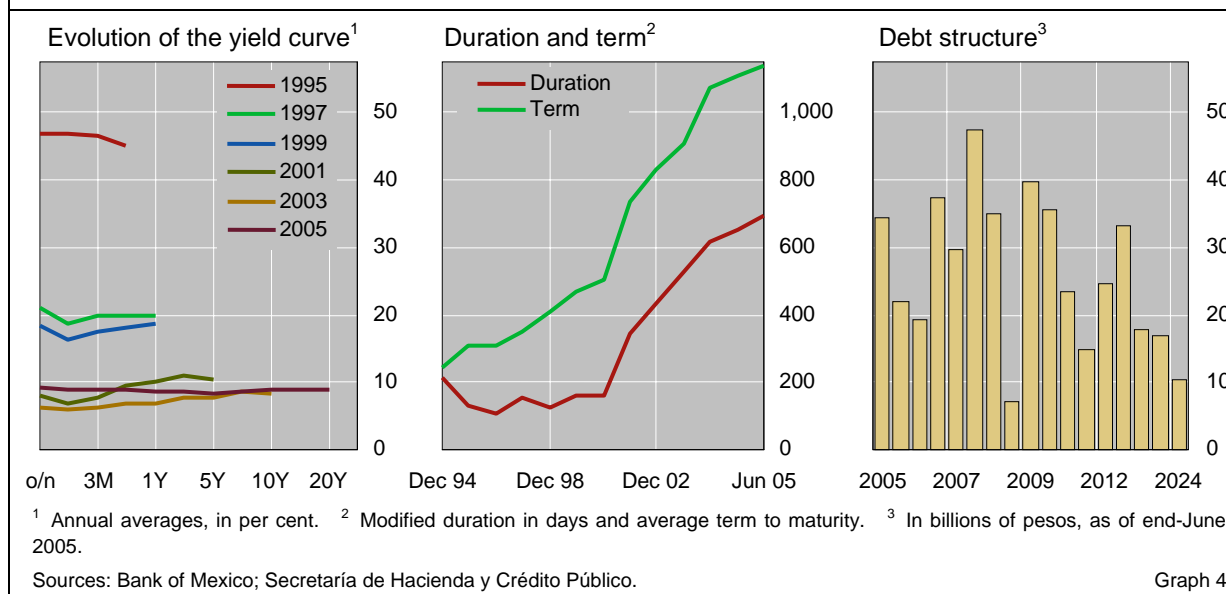
Greater foreign involvement is remarkable

Another significant development has been the lengthening in the maturity structure of government debt (Graph 4). At the end of 1995, domestic debt outstanding had consisted entirely of short-term debt instruments with a maturity of a year or less and debt instruments indexed to short-term interest rates or inflation. By the end of 2004, fixed rate bonds with a maturity longer than one year accounted for 40% of the total stock of debt. As a result, the average maturity of federal securities rose from 288 days in 1995 to 1,070 days

The maturity structure has lengthened



## Yield, duration and maturity structure of Mexican domestic government debt



in 2004.<sup>6</sup> An important benefit of this extension of maturities is that Mexico is now less vulnerable to refinancing risk. The federal government estimated that at the end of 2004 the impact of an increase in interest rates on the financing cost of its gross debt was about 40% lower than at the end of 2000 (Gil Diaz (2005)).

Foreign investors  
move to longer-term  
bonds

The introduction of fixed rate issues in 2000 was made in a context of declining benchmark rates, which ensured a favourable reception by investors. Interestingly, while the tightening of monetary conditions in 2004 prompted Mexican pension funds to shift to shorter-duration assets, foreign investors seemingly adopted an opposite strategy and significantly increased their holdings of longer-term bonds. Foreign investors held 54% of 10-year securities and 84% of 20-year securities at the end of 2004. Their growing participation has helped Mexico to develop the longer-term segment of its domestic bond market.

Contrasting picture  
of secondary  
market activity ...

Data on secondary market business provide a contrasting picture of activity over time and across debt instruments. There is nevertheless some evidence that the authorities' efforts to improve market liquidity are beginning to bear fruit.

... with declining  
turnover ...

Although secondary market turnover has declined since the early 2000s, this has largely been the result of temporary factors. For one, the introduction of the market-making scheme for government debt in 2000 was accompanied by an initial burst of transactions as intermediaries sought to boost their ranking; this has since given way to a more "normal" pattern of business. Another negative factor that reduced investor demand was the tightening of monetary conditions in 2004. In

<sup>6</sup> It should be noted again that progress has been somewhat slower in the case of broader public sector debt. The marketable debt issued by IPAB has ranged between three and seven years in maturity but has been largely indexed to short-term interest rates, which means that the duration of IPAB securities has remained low (between 30 and 50 days in 2004). However, the average maturity of securities issued by FARAC has been considerably longer, within a range of 20 to 30 years, with all of those securities linked to inflation.

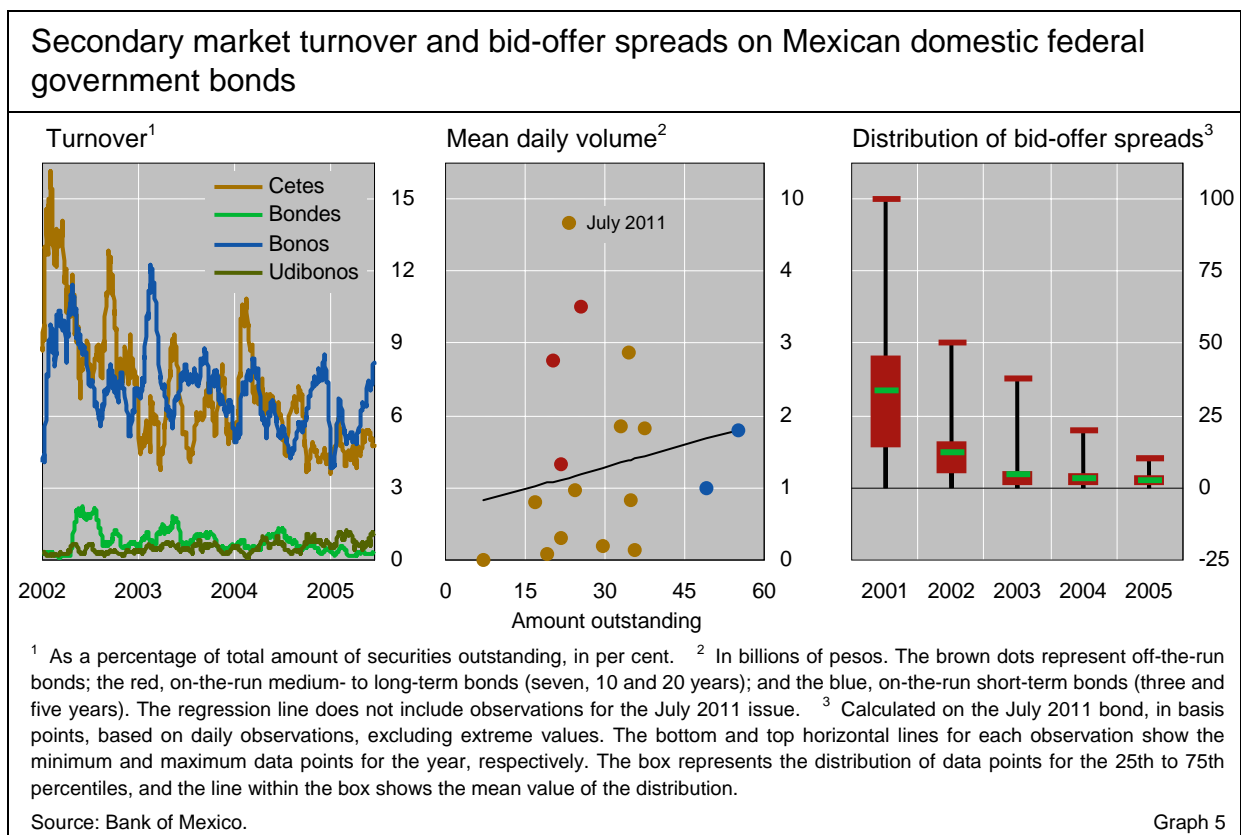
spite of these factors, Mexican domestic government debt has remained the most actively traded local debt in emerging market countries according to the Emerging Markets Traders Association (EMTA (2005)).

An analysis of activity across instruments shows that trading in bonos is high but, as is generally the case with indexed securities, activity in bondes and udibonos is limited given that such securities are usually held until maturity by institutional investors (Graph 5). Moreover, trading is uneven across issues of bonos, reflecting the strong popularity of certain on-the-run issues. The notably high concentration of trades in one particular issue, the July 2011 bono, is somewhat surprising. Such concentration of trading probably reflects a preference on the part of intermediaries for tax-exempt securities.<sup>7</sup>

... uneven trading across instruments ...

Notwithstanding this uneven pattern of secondary market activity over time and across instruments, there is evidence that the authorities' policy of nurturing liquidity through the creation of increasingly large benchmark issues is producing positive results. The centre panel of Graph 5 shows that there is a positive, even if weak, relationship between the outstanding stock of securities and turnover. Moreover, as shown by the right-hand panel of Graph 5, secondary market liquidity appears to be improving: bid-offer spreads on benchmark issues have come down significantly since the introduction of longer-term securities. In particular, there has been a pronounced reduction in the bid-offer spread on the July 2011 bono as well as a decline in its variation.

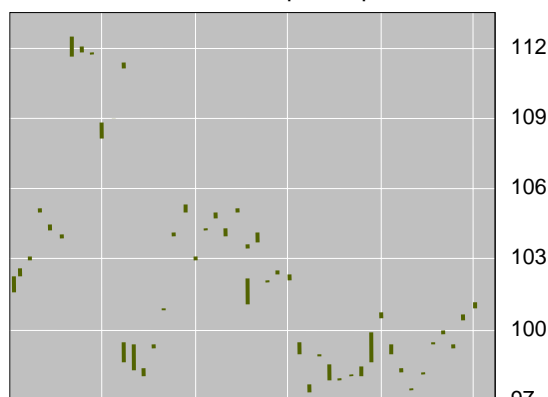
... but improving secondary market liquidity ...



<sup>7</sup> Taxes on interest income were imposed in January 2003. Securities issued before that date remain exempt. The July 2011 bond is the longest tax-exempt bond in circulation.

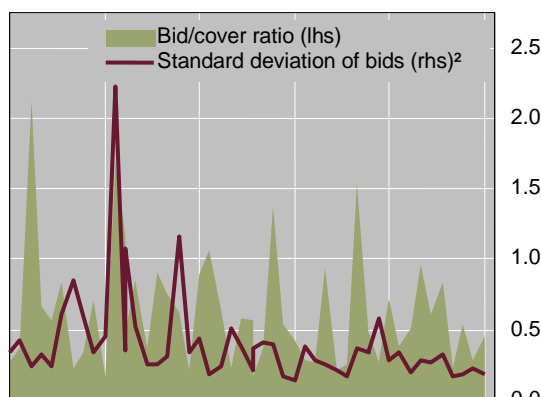
## Primary market prices and coverage ratio of Mexican domestic federal government bonds

Maximum and minimum price spread at auction<sup>1,2</sup>



Jan 02 Oct 02 Jul 03 Apr 04 Jan 05 Oct 05

Bid/cover ratio



Jan 02 Oct 02 Jul 03 Apr 04 Jan 05 Oct 05

<sup>1</sup> Refers to the auction of three-year securities. Each vertical line represents the dispersion of bids submitted at the primary tender, while the dots represent allocated prices. <sup>2</sup> In pesos.

Source: Bank of Mexico.

Graph 6

Such an evolution is also observable on other longer-term securities. With bid-offer spreads in the interbank market tending to fluctuate between 3 and 10 basis points for on-the-run issues, participants can generally find a reasonably priced market to increase or unwind their positions. Greater liquidity in the secondary market has reduced the risk premia faced by investors and thus helped lower the government's financing costs.

... and a more efficient primary market

Meanwhile, the measures aimed at the primary market also seem to have improved its efficiency. In contrast to the latter half of the 1990s, primary auctions are no longer plagued by uncertainty regarding amounts to be auctioned and the effects of interest rate ceilings. As a result, the level of maximum and minimum bid prices at primary auctions and their dispersion have followed a declining trend in recent years (Graph 6). This has reduced the price risks faced by intermediaries in the primary market, thus encouraging their participation.

### Achievements and remaining challenges

Mexico has made substantial progress in developing its domestic government bond market. This should help mitigate economic and financial stress in the face of potential external shocks. In particular, the shift away from dollar-indexed liabilities has eliminated one potential source of vulnerability of the fiscal accounts, while the move to longer-maturity liabilities has helped to reduce refinancing risks. Moreover, the development of the domestic debt market has led to some improvement in secondary market liquidity, helping to lower the cost of financing for the government. In addition, the greater efficiency of the primary market is contributing to reducing the price risks faced by intermediaries.

Despite these positive developments, there is room for further improvement. The domestic market remains subject to a significant degree of refinancing risk given that short-term and indexed securities still account for 60% of the total stock of debt. What is more, secondary market liquidity remains undeveloped for certain types of securities, particularly index-linked bonds. The wide array of public sector instruments available in the domestic market suggests that efforts to further increase consolidation across instruments could increase liquidity.

One remaining question is whether the return of foreign investors to the domestic market is largely the result of the macroeconomic and structural reforms introduced by the Mexican government over the last decade or primarily reflects international investors' greater appetite for relatively risky assets. Such investors have increased their exposures to a wide range of emerging market country assets in recent years, including to assets from countries that have made little progress in the areas of macroeconomic and structural reforms. A shift to less favourable conditions in global fixed income markets could thus provide an important test of the solidity of Mexico's achievements.

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## International government debt denominated in local currency: recent developments in Latin America<sup>1</sup>

*Governments in Latin America have traditionally faced significant difficulties in issuing debt denominated in local currency in international markets. However, three countries in the region have recently issued this type of debt, perhaps signalling a permanent change in the manner in which Latin American borrowers tap international bond markets. Nonetheless, the degree to which issuing international debt in local currency complements the development of domestic debt markets remains to be seen.*

*JEL classification: E440, F340, G150, H630, O160.*

Governments in emerging markets can finance themselves domestically or internationally and in domestic or foreign currency. In Latin America, around two fifths of government bonds have been issued internationally, and virtually none of this is denominated in local currency. The fact that dependence on foreign currency borrowing contributes to currency mismatches and can make countries more vulnerable to crises in the event of adverse external shocks is by now well known.

Even as governments in Latin America have increased the size of their domestic bond markets, international issuance in local currency has remained modest. However, three countries have recently issued external debt denominated in local currency: Uruguay in 2003 and 2004; Colombia in 2004 and 2005; and, more recently, Brazil in September 2005. These debt issues have attracted the attention of policymakers and financial markets alike and represent an important change in the manner in which borrowers from these countries seek access to foreign investors.

This special feature focuses on the recent issuance by Latin American sovereigns of international debt denominated in local currency. It starts with a review of the specific characteristics of the securities issued. Next, it discusses critical changes in structural and cyclical factors that supported the issuance of these bonds. The third part of this feature assesses the prospects for such bonds to become a permanent fixture of the funding environment for these

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<sup>1</sup> The views expressed in this article are those of the author and do not necessarily reflect those of the BIS. I thank Angus Butler, Claudio Borio, Gregor Heinrich, Corrinne Ho, Serge Jeanneau, Ana Fernanda Maihuasca, Ramón Moreno, Frank Packer, Michela Scatigna, Philip Turner, Agustín Villar and William White for their comments.

economies. The fourth section reviews their potential impact on the development of domestic bond markets in the region. A final section offers some concluding remarks.

### Sovereign global bonds denominated in local currency

The difficulties some countries encounter in borrowing abroad in their own currency have often been referred to in the academic literature as “original sin”, which suggests deeply rooted structural shortcomings as well as intrinsic characteristics of the global financial system.<sup>2</sup> Indeed, as noted above, Latin American sovereigns have only rarely borrowed in global markets in their own currency. Yet, over the past few years, three Latin American sovereigns have sought to break with this tradition.

In October 2003, Uruguay issued UYU 7.3 billion (\$290 million) worth of global bonds denominated in domestic currency as part of its debt restructuring programme (Table 1). These bonds are indexed to domestic inflation with a 10.5% coupon and have principal and interest settled in US dollars.<sup>3</sup> In August 2004, a new issue of global bonds was made for UYU 8.2 billion (\$250 million), this time with no inflation indexation. The issue turned out to be very costly for a bond with such a short maturity (two years), as its coupon exceeded 17%.

In Colombia, the government issued COP 954.2 billion (\$375 million) in November 2004, also settled in US dollars. The bonds (TES Global) were issued on very favourable terms for the borrower, as reflected by a coupon of 11.75% and a maturity of over five years. The demand for these bonds was strong, with subscriptions reaching \$1.1 billion. US investors reportedly purchased 65% of the bonds, Europeans 30% and Latin Americans 5%. The success of the issue was further reflected by its reopening in January 2005 for COP 293.7 billion (\$125 million). Both tranches of this bond were issued below comparable costs in the domestic bond market (by 50 and 31 basis points, respectively). In February 2005, a new issue was made on very similar conditions but with a longer-term maturity (10.7 years). The cost of external financing was again more favourable than domestic financing (20 basis points below the extrapolated cost of similar paper issued in the domestic market).<sup>4</sup>

More recently, in September 2005, Brazil followed the example of Uruguay and Colombia by issuing BRL 3.4 billion (\$1.5 billion) worth of global bonds with a maturity of over 10 years and a 12.5% coupon. These bonds, like the others described above, have interest and principal settled in US dollars. The

Global bonds in local currency that are settled in US dollars ...

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<sup>2</sup> According to proponents of the concept, original sin can have two dimensions: an international one that refers to an inability to borrow abroad in local currency, and a domestic one that refers to an inability to borrow domestically at long-term fixed rates. See Eichengreen et al (2005).

<sup>3</sup> Before being converted into and paid out in US dollars, the redemption amount of the bonds in Uruguayan pesos will be determined in accordance with changes in inflation-indexed monetary units (UI) from the time of issuance to the date of payment of the redemption amount. Similar calculations apply to interest payments at the rate stated over the cover.

<sup>4</sup> As reported by the Ministry of Finance and Public Credit of Colombia in the corresponding press release. See [www.minhacienda.gov.co](http://www.minhacienda.gov.co).

Selected international government debt in local currency						
Country	Issue date	Maturity date	Amount issued <sup>1</sup>	Coupon rate	Rating: Moody's/ Fitch/S&P	Market
Argentina	Dec 1996	Dec 1998	250	8.75	Not available	Eurobond
Argentina	Feb 1997	Feb 2007	500	11.75	Ca/D/D	Private placement
Argentina <sup>2,3</sup>	Jun 1997	Jul 2049	500	8.75	WR/D/NR	Private placement
Argentina <sup>3</sup>	Jul 1997	Jul 2049	500	8.75	WR/D/NR	Eurobond
Argentina <sup>4</sup>	Jun 2001	Sep 2008	931	12.00	Ca/NA/D	Global
Brazil	Sep 2005	Jan 2016	1,479	12.50	B1/NA/BB-	Global
Colombia <sup>5</sup>	Nov 2004	Mar 2010	500	11.75	Ba2/BB/BB	Global
Colombia	Feb 2005	Oct 2015	325	12.00	Ba2/BB/BB	Global
Uruguay <sup>6</sup>	Oct 2003	Oct 2006	290	10.50	B3/B/B	Global
Uruguay	Aug 2004	Feb 2006	250	17.75	B3/B/B	Global

Note: A private placement avoids the cost of registration with the Securities and Exchange Commission (which is required for a global issue), and has more restrictive protective covenants that are easier to renegotiate in the event of a default. Also, the cost of distributing bonds is lower.

<sup>1</sup> Calculated using the monthly average exchange rate when official numbers were not available; in millions of US dollars. <sup>2</sup> Issued under Rule 144A. <sup>3</sup> Offered in exchange for new debt. <sup>4</sup> Issued in exchange for eligible Argentine peso bonds. <sup>5</sup> This issuance was reopened in January 2005 for an additional amount of \$125 million. <sup>6</sup> These bonds are indexed to inflation and contain collective action clauses.

Source: Bloomberg. Table 1

Brazilian global issue was a successful placement as it was oversubscribed several times and the distribution was truly international, being purchased mainly by investors from Europe and the United States. The issue also extended the maturity of the yield curve for real-denominated fixed rate government debt to over 10 years. In the domestic market, it only goes up to seven years.

... transfer currency risk to investors while freeing them from convertibility risks

The Brazilian and Colombian issues are of particular interest for several reasons. First, in contrast to Uruguay's, they were not the result of a debt restructuring process. Second, the securities have relatively long maturities. Third, the bonds are not indexed to inflation, but denominated in local currency at a fixed interest rate, transferring both inflation and exchange rate risk from the government to investors. At the same time, in common with the Uruguayan issue, being settled in US dollars, the securities free investors from any *convertibility risks* associated with exchange controls.<sup>5</sup>

## Supporting factors

Past financial crises forced governments to find alternatives for financing

What made these bond issues possible? To some extent, the governments have had little choice but to explore new financing alternatives as a result of financial stress. In the past, countries that gradually overcame difficulties in

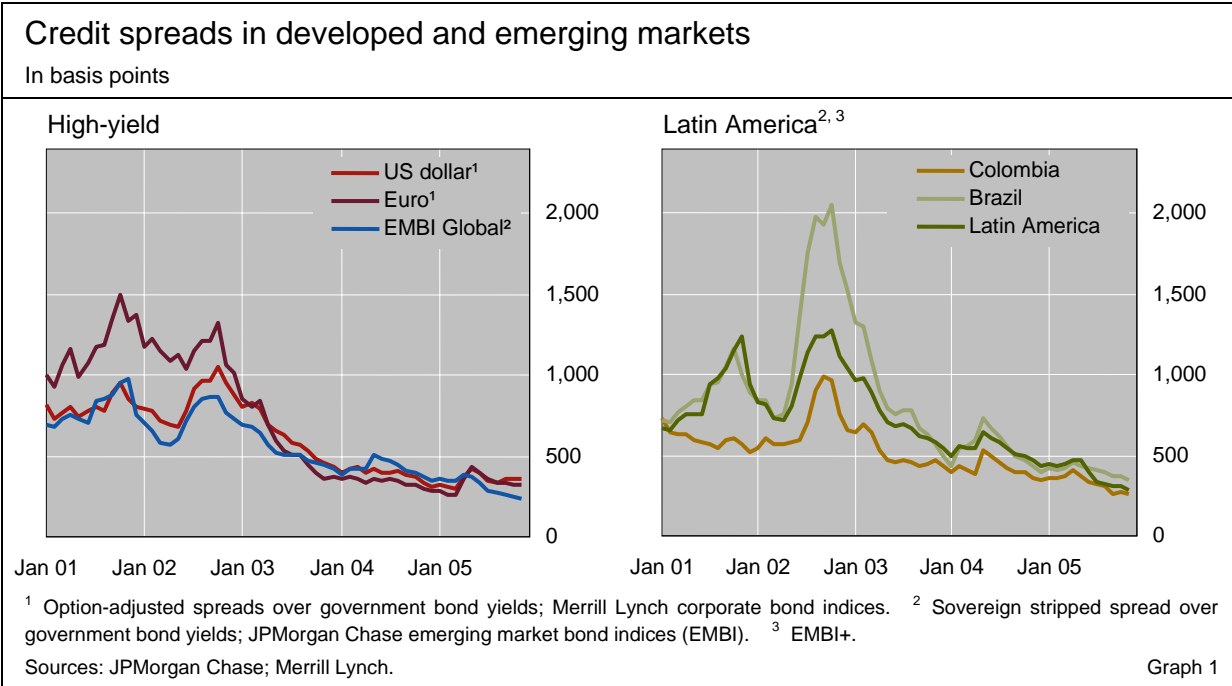
<sup>5</sup> Colombia recently adopted administrative controls that require a minimum holding period of one year for new short-term portfolio inflows from abroad. The measure took effect on 15 December 2004 and is still in place.

issuing local currency debt did so after significant shocks that encouraged them to bear the high startup costs of issuing in local currency.<sup>6</sup> In the cases at hand, the financial turmoil of the late 1990s and early 2000s forced the governments to search for alternative sources of financing to reduce their external vulnerability. Since the crises, the authorities have moved towards issuing debt in international markets with longer maturities, have avoided refinancing problems related to the bunching of maturities, and are now gravitating towards local currency issuance to avoid currency mismatches.

The crises also gave impetus to domestic structural improvements that attract investors. Brazil and Colombia furthered key economic and institutional reforms that were initiated in the early 1990s, and have made significant progress in adopting a flexible exchange rate regime and a credible inflation targeting scheme.<sup>7</sup> Major reforms have also been implemented in Uruguay since the debt restructuring of the early 2000s that have improved the economic and financial profile of the country.

Reforms and improved fundamentals attract investors ...

Structural changes on a global level have also facilitated international issuance in domestic currency. For one, the trend towards global disinflation has supported the efforts by emerging markets to control inflation, and the perceived risks associated with high inflation in emerging markets appear to be



<sup>6</sup> Bordo et al (2005) indicate that, in Canada's case, the shock was World War II. For Australia, New Zealand and South Africa, it was the breakdown of the Bretton Woods system with the advent of nominal floating and the end of capital controls. For measures of the aggregate currency mismatch of a country's assets and liabilities as an indicator of a country's vulnerability to crisis, see Goldstein and Turner (2004).

<sup>7</sup> The building-up of a credible monetary policy is an essential element of these reforms. Jeanne (2003) has argued that monetary policy credibility is a key determinant of the currency denomination of debt.

Macroeconomic indicators for Brazil, Colombia and Uruguay 2000–04						
	Brazil		Colombia		Uruguay	
	2000	2004	2000	2004	2000	2004
Real GDP <sup>1</sup>	4.4	4.9	2.9	4.0	-1.4	12.0
Consumer prices <sup>1</sup>	7.0	6.6	9.2	5.9	4.8	9.2
Budget balance <sup>2, 3</sup>	3.5	4.6	-6.8	-4.5	-4.0	-2.4
Current account <sup>2</sup>	-4.0	1.9	0.9	-1.0	-2.8	-0.8
Real effective exchange rate <sup>4</sup>	83.3	67.1	100.8	92.6	114.1	97.2
External debt <sup>2</sup>	39.5	36.4	43.1	41.1	72.7	99.3
Foreign exchange reserves <sup>5</sup>	32.5	52.7	8.4	12.8	2.4	2.5

<sup>1</sup> Year-on-year changes, in per cent. <sup>2</sup> As a percentage of GDP. <sup>3</sup> Primary balance. <sup>4</sup> 1995 = 100.  
<sup>5</sup> In billions of US dollars.  
Sources: IMF; IIF; national data. Table 2

declining. Meanwhile, the increasing integration of emerging and developed financial markets has broadened the range of investors investing in emerging market securities.<sup>8</sup>

... as do favourable cyclical factors ...

Other factors, more cyclical in nature, have also been supportive. An important global development has been the combination of the low level of interest rates in developed economies and abundant liquidity in financial markets. This has resulted in a willingness on the part of financial market participants to accept greater risk across a variety of instruments, including emerging market debt. Indeed, spreads on the debt of both developed country corporate and emerging markets have been in secular decline since 2002. Spreads for emerging market sovereign debt – including Latin America – have fallen to historically low levels over the last couple of years (Graph 1).

Another, probably largely cyclical, factor that has attracted investors has been the sustained exchange rate appreciation in Latin America. This appreciation has been magnified by international developments such as the recent increases in commodity prices and the weakness of the US dollar, together with the improved fundamentals of these economies (eg current account), all of which have a strong cyclical component.<sup>9</sup>

... but improved fundamentals are not sufficient to spur local currency debt issuance

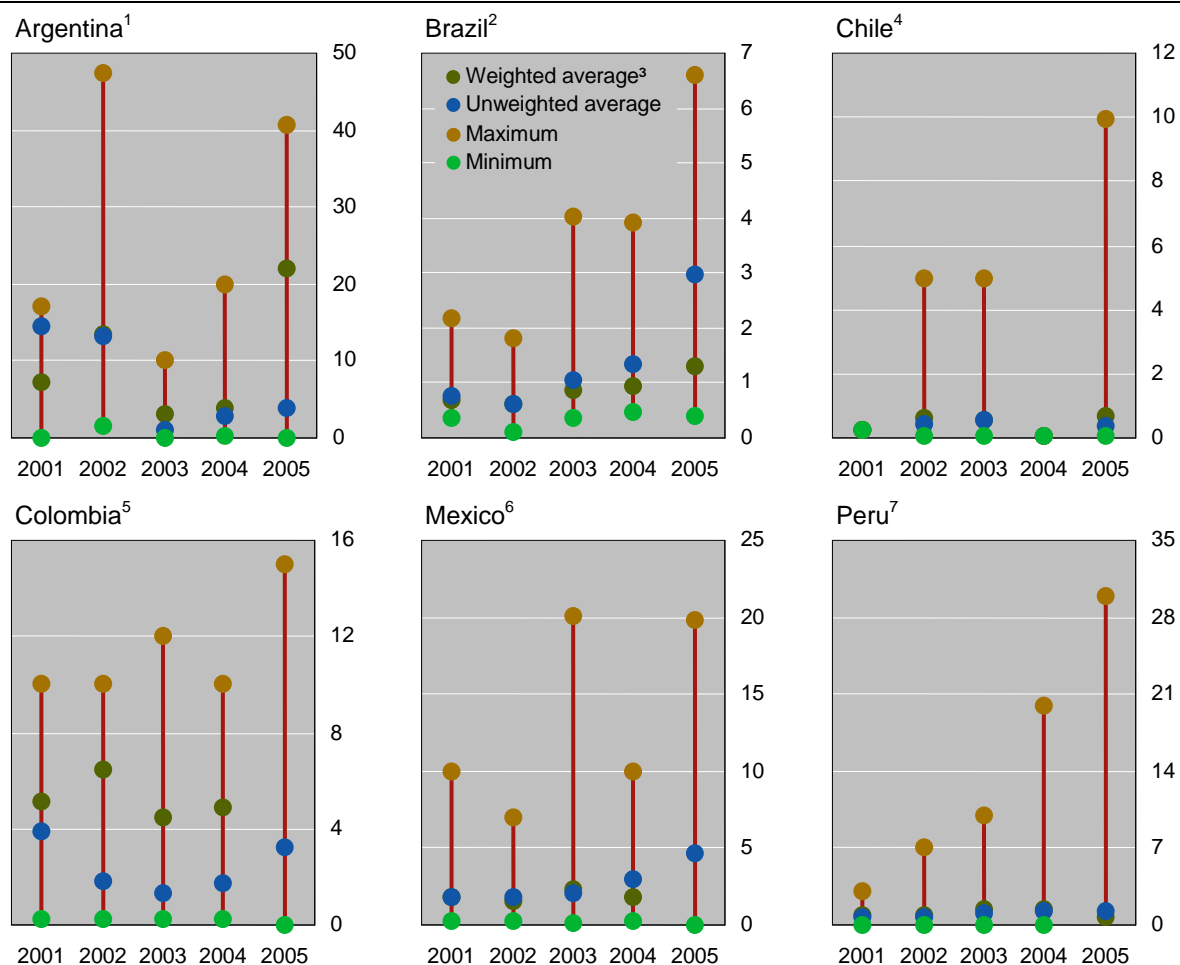
Nevertheless, a puzzle remains. The improvement in the fundamentals for the three countries in our sample (Table 2) was not noticeably better than in those of most other economies in the region that have not issued global bonds in local currency. The cases of Chile and Peru, where macroeconomic conditions have also improved significantly, suggest that improved fundamentals and a supportive external environment are not sufficient to spur global debt issuance denominated in local currencies. For Chile, there was

<sup>8</sup> See Wooldridge et al (2003) for a discussion of the changing links between mature and emerging financial markets.

<sup>9</sup> Cohen (2005) investigates the determinants of the currency denomination of international debt issuance and finds that there is more issuance in a given currency when the currency is strong relative to historical averages and when long-term interest rates in that currency are high relative to those available in other major currencies.

## Maturities of new domestic government bond issues in Latin America

Maturities at issue in years



<sup>1</sup> Treasury bills and bonds, and central bank securities; in 2002, most of the issues were placements related to the crisis. <sup>2</sup> LTN issues. <sup>3</sup> Weighted by the amounts. <sup>4</sup> Central bank issues. <sup>5</sup> TES issues. <sup>6</sup> Treasury bonds, savings protection bonds, udibonos and cetes. <sup>7</sup> Certificates of deposit, Treasury bills and government bonds.

Sources: Bloomberg; national data.

Graph 2

probably little need to experiment with new debt instruments as the country had maintained fiscal surpluses for years. In Peru, government officials focused rather on developing the local bond market in domestic currency, with the added aim of extending the maturity of the yield curve (Graph 2). In addition, both Chile and Peru have regulations that make it easier for foreign investors to access the domestic market than in Brazil or Colombia, which leaves local currency global bonds less attractive on a relative basis.

### The sustainability of recent trends

Are global issues of local currency denominated bonds here to stay in the region? On the face of it, there would appear to be considerable room for growth. For Brazil, real-denominated global bonds represent just 2% of total outstanding international government debt, while for Uruguay the share of peso-denominated debt in total international debt is only 4.8%. Despite the

Room for growth in the issuance of these bonds ...

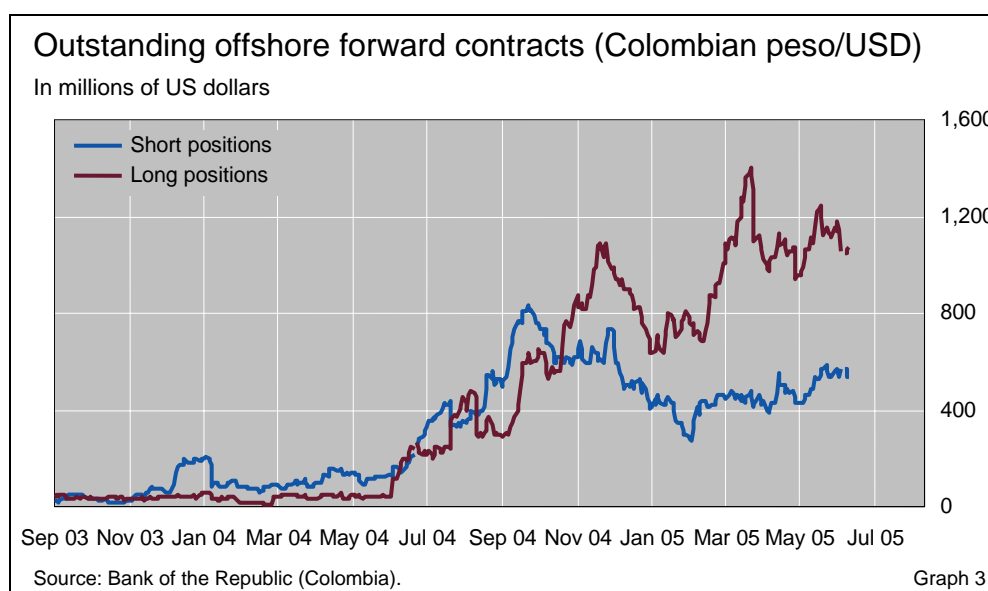
positive reception given to Colombian bonds, they still represent only 7% of the country's outstanding external government bond debt.

Yet, even given this potential, it remains unclear whether the recent trend towards global issues in local currencies will be permanent or transitory. The ability of a country to issue such debt in international capital markets at a given point in time does not guarantee a similar ability to do so in the future. For instance, Argentina issued a number of bonds denominated in local currency during the 1990s (Table 1), including \$500 million worth of bonds in 1997, denominated in pesos with a 10-year maturity that had no indexation at all. Though many might have argued at the time that access to international markets was no longer a problem for Argentina, it became much more difficult in the wake of the Russian government default in 1998.

Still, it is likely that increased commitment to more flexible FX regimes bodes well for the sustainability of this type of issuance. All three countries in our sample are in the process of consolidating a liberalised monetary and financial regime together with flexible and market-determined exchange rate policies. Floating regimes expose investors to higher short-term volatility but may lower future risks and vulnerabilities; in contrast, fixed regimes eliminate short-term volatility but carry the risk of sudden devaluation. In addition, currencies that are not fixed (or quasi-fixed) to the US dollar might offer greater diversification possibilities than those with virtual pegs.<sup>10</sup>

At the same time, it may be necessary to develop hedging markets to issue local currency denominated global bonds on a significantly larger scale.<sup>11</sup>

... though historical precedent provides no guarantee



<sup>10</sup> McCauley and Jiang (2004) analyse how local currency bond markets may fit in a global bond portfolio, and find that Asian local currency bonds offer scope for diversification. Turner (2005) reports correlations for monthly returns of 0.4, 0.14, 0.42 and 0.43 between a portfolio of Asian local currency bonds and dollar-denominated funds in emerging markets, Japan, the United States and Europe, respectively.

<sup>11</sup> Burger and Warnock (2004) argue that US-based investors that participate in local currency bond markets worldwide have historically avoided returns with high variance and negative skewness. For these investors, currency hedges play a key role since the variance of local currency bond returns is dominated by exchange rate risk volatility. In fact, Bordo et al (2005)

Though Uruguay has no formal market whatsoever, there is a well established and liquid non-deliverable forward contracts market for the Brazilian real. The Colombian peso has a liquid non-deliverable forward market (onshore and offshore), which at present is concentrated on short-term maturities. Interestingly, the turnover of the Colombian peso in the forward market increased significantly following the November 2004 issue (Graph 3), which suggests that local currency issuance can *stimulate* markets for hedging currency risk.

## Implications for the development of domestic bond markets

Latin American domestic bond markets are not particularly large (\$651 billion in 2004) compared with those of other emerging market regions of the world (Table 3). So why did certain governments prioritise the issuance of global bonds denominated in local currency rather than the development of their domestic markets?

Indeed, there are a number of respects in which issuance of local currency denominated global bonds might be detrimental to domestic bond market development. In particular, liquidity is essential for the development of domestic bond markets, and international issues of debt in local currency might fragment that liquidity.<sup>12</sup> Nonetheless, the three countries analysed in this feature seem to have been swayed by various other considerations.

In Uruguay's case, the decision was mostly driven by the debt restructuring process, where the principal objective was to reduce the debt burden over time. Domestic issuance was simply not an option in the aftermath of financial crisis, and global issues provided a reference on which to build future markets.

In Brazil and Colombia, institutional factors restricted the entry of foreign investors into local bond markets, so "going global" in local currency may have provided a "second best" solution for broadening a country's pool of investors, and reducing the risks of currency mismatch. In many cases, global bonds have allowed foreigners to short-circuit the impediments to foreign purchases in local markets.<sup>13</sup> For instance, the global bonds considered in this note all fall under the jurisdiction and laws of the State of New York, which make them

Issuance of global bonds in local currency might be detrimental to the domestic bond market ...

... but still optimal given impediments to foreign purchases of domestic securities

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stress that the innovation of FX derivative instruments was essential for former British dominions to issue external debt in their own currencies.

<sup>12</sup> McCauley and Remolona (2000) argue that a larger outstanding stock of publicly issued central government debt results in higher turnover in cash and futures trading and this, in turn, in better liquidity of government bond markets. Jiang and McCauley (2004) also find size to matter for liquidity in the context of Asian local currency bond markets.

<sup>13</sup> In Brazil, investment can only take place after registration with the Brazilian Securities and Exchange Commission and with the central bank. In addition, a legal representative is required. Investment is subject to 15% capital gains tax; other taxes may also apply in some cases. In Colombia, several restrictions apply for foreigners willing to invest in paper in the domestic market. For instance, an investment trust must be established, taxes must be paid depending on the tax status and investment types of the investor (currently, income tax rates go up to 35%; however, a 10% surcharge applies which raises the maximum rate to 38.5%; a 0.4% financial transaction tax is also in place), and since late 2004 there are capital controls that establish a minimum period of one year for all portfolio investment.



Size of local debt securities markets in Latin America in 2004				
Amounts outstanding				
	Government		Total	
	In billions of US dollars	As a percentage of GDP	In billions of US dollars	As a percentage of GDP
Argentina	9.6	6.3	24.3	16.0
Brazil	295.9	49.0	371.6	61.5
Chile	20.0	21.2	41.8	44.4
Colombia	29.6	30.4	30.2	31.0
Mexico	153.1	22.7	176.9	26.2
Peru	4.0	5.8	7.1	10.3
Latin America <sup>1</sup>	512.2	30.3	651.8	38.5
<i>Memo:</i>				
<i>Czech Republic</i>	<i>58.0</i>	<i>54.2</i>	<i>65.8</i>	<i>61.5</i>
<i>Korea</i>	<i>170.5</i>	<i>25.1</i>	<i>567.6</i>	<i>83.4</i>
<i>Indonesia</i>	<i>51.0</i>	<i>19.8</i>	<i>57.9</i>	<i>22.5</i>
<i>Philippines</i>	<i>24.9</i>	<i>29.4</i>	<i>25.2</i>	<i>29.7</i>
<i>South Africa</i>	<i>78.3</i>	<i>36.7</i>	<i>104.6</i>	<i>49.1</i>

<sup>1</sup> Sum of countries above.  
Sources: IMF; BIS.

Table 3

more attractive for international investors relative to domestic market bonds in the event of default. In addition, as they are issued in international markets, investors avoid any constraints (eg registration requirements, withholding taxes and capital controls) associated with purchases of domestic securities.

## Conclusion

The successful issuance of international debt denominated in local currency by Brazil, Colombia and Uruguay has offered important benefits for both governments and investors. Governments benefit from the improvement in the currency composition of their external debt and from the reduction of *currency risk*, thus diminishing any vulnerability associated with currency mismatches. Investors, in turn, benefit by broadening their portfolio and securing higher potential returns while avoiding any costs associated with the purchase of local currency securities in domestic markets. In addition, since settlement is in US dollars, investors avoid *convertibility risks* associated with the imposition of capital controls.

At the same time, there is no guarantee that the recent increase in this sort of issuance by sovereigns in the region reflects a permanent trend. History provides many examples of rapidly shifting preferences on the part of international investors. The degree to which the global market might be a stable source of local currency funding in turbulent times remains to be seen.

A major question going forward is the extent to which global bond issuance in local currency complements the development of the domestic bond market. On the one hand, the historical experience of some countries suggests that domestic markets can develop without the help of global issuance in local

currency. In fact, issuing global bonds could conceivably hinder the development of the domestic bond market if they limit the economies of scale in liquidity. However, in the presence of institutional impediments to foreign investment in domestic markets, local currency global bonds may provide a second best solution that helps to broaden the pool of investors and extend the maturity of the local currency yield curve, at least until such obstacles are eliminated.

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## Recent initiatives by the Basel Committee on Banking Supervision, the Financial Stability Forum and the Group of Ten

In the third quarter of 2005, the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Forum (FSF) took a variety of initiatives. In addition, the G10 released a report on the implications for financial markets and economic policies of ageing and pension system reform. The G10 discussed this report and other issues at a meeting in late September. Table 1 provides a selective overview of these recent developments.

### Basel Committee on Banking Supervision

The BCBS made further progress towards the implementation of Basel II. In particular, clarification was provided regarding the validation of low-default portfolios, and there was further advancement in the area of the fifth Quantitative Impact Study.

Clarification regarding the validation of low-default portfolios

The Basel Committee Accord Implementation Group's Validation Subgroup (AIGV) set forth views regarding the *validation of low-default portfolios in the Basel II framework*. They were released in a newsletter on 5 September, in response to questions and comments received from the industry. While confirming that Basel II is generally flexible enough to allow banks to meet the minimum internal ratings-based (IRB) qualifying criteria for all types of portfolios, the document clarifies the appropriate treatment in the IRB approaches of portfolios where banks may have limited loss data. The note summarises the various methods and tools available to compensate for such data scarcity, and underlines the implications for supervisors.

Release of new materials on QIS 5

Furthermore, additional guidance was provided on the *fifth Quantitative Impact Study (QIS5)*. It comprised templates for the QIS 5 workbook, accompanying instructions (based on the drafts published in July), a data quality questionnaire, and a compilation of frequently asked questions. While the structure of the workbooks used for the QIS 5 data collection exercise will be the same in all participating countries, national supervisory agencies will have discretion to adjust the forms to reflect country practices.

## Financial Stability Forum

The FSF held its *14th meeting in London* on 8–9 September. Members discussed risks and vulnerabilities in the international financial system and current efforts to enhance financial system resilience. On this occasion, the FSF also exchanged views with a group of financial market practitioners on financial markets and institutions, and on private sector work under way to strengthen financial system stability.

The economic and financial context appeared generally benign, and financial systems had weathered several challenges over the previous six months. But high oil prices, low risk premia, low long-term interest rates, increased exposures to complex and illiquid products, rising household indebtedness and persistent or growing external and fiscal imbalances were seen as issues that might over time lead to strains in financial markets.

Potential sources of strain in financial markets

In the light of these developments, it was considered particularly important that market practitioners, supervisors and policymakers take an appropriately medium-term view of risks and pay particular attention to ensuring the adequacy of market discipline, credit and operational standards, and levels of provisioning. While it was recognised that financial institutions had made significant advances over the past few years in risk management practices and that market infrastructure had been strengthened, structural changes in markets, the presence of new market participants, the growing complexity of financial products, as well as the important role of large complex financial institutions, pointed to the need for sustained improvements. In this context, the FSF welcomed the report of the Counterparty Risk Management Policy Group II and strongly endorsed its recommendations for reviewing and strengthening industry practices. Members also discussed past disruptions to market liquidity and the lessons that could be drawn from them with a view to resolving potential future episodes of market illiquidity. The importance of stress testing was emphasised in this connection.

Despite recent progress, need to further improve industry practices

Lessons from past episodes of market illiquidity

The FSF also reviewed ongoing work to mitigate sources of vulnerability, particularly with regard to convergence and dialogue on accounting and auditing issues, progress on the implementation of standards and codes and on strengthening standard-setting processes, promoting improvements in offshore financial centres, and the development of a set of high-level business continuity principles. Members also received an update from the International Association of Insurance Supervisors (IAIS) concerning work to develop supervisory guidance on finite risk reinsurance.

Chairman Ferguson reported on the FSF meeting to the International Monetary and Financial Committee on 24 September in Washington DC.

## Group of Ten

At the request of its Deputy Ministers and Governors, the G10 prepared a *report on ageing and pension system reform, and the implications for financial markets and economic policies*. The report highlights the ways in which retirement schemes are currently changing, in the context of ageing

Recent changes to pension systems ...

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	<i>Validation of low-default portfolios in Basel II</i>	<ul style="list-style-type: none"> <li>Clarification on the appropriate treatment in the IRB approaches of portfolios where banks may have limited loss data</li> </ul>	September 2005
	<i>Further guidance on QIS 5</i>	<ul style="list-style-type: none"> <li>Release of QIS 5 workbook templates, accompanying instructions, data quality questionnaire, and FAQs</li> </ul>	
FSF	<i>Fourteenth FSF meeting held in London</i>	<ul style="list-style-type: none"> <li>Discussion of current financial system strengths and vulnerabilities and of ongoing work to enhance system stability. Particular focus on risk management practices, lessons from past market liquidity crises, implementation of standards and codes, accounting and auditing issues, and reinsurance</li> </ul>	September 2005
Group of Ten <sup>1</sup>	<i>Report on ageing and pension system reform; meeting of finance ministers and central bank Governors</i>	<ul style="list-style-type: none"> <li>Ageing and pension system reform: implications for financial markets and economic policies</li> </ul>	September 2005

<sup>1</sup> Giulio Tremonti, Minister of the Economy and Finance of Italy, was elected Chairman of the G10 for the coming year.  
Source: Relevant bodies' websites (www.bis.org and www.fsf.org). Table 1

... and their impact on financial markets

populations. In particular, it notes the increased reliance on private (as opposed to official) retirement saving schemes, and in some cases a shift from defined benefit to defined contribution schemes. The changes under way in public and private pension schemes, and the greater role of pension funds, may increase significantly the influence of retirement saving and related capital flows in financial markets. For instance, given the large and growing size of pension funds' portfolios, shifts in asset allocation in response to the evolution of their own investment strategies or to accounting and regulatory changes could affect the level and volatility of asset prices.

Policy implications for supervision and regulation ...

The policy conclusions of the report relate to (i) supervision and regulation, (ii) the supply of suitable financial instruments, and (iii) the protection of pension beneficiaries and financial education. First, regulators and supervisors have a role to play by setting out standards to enhance risk management, transparency, governance and accounting standards at pension funds, as well as promoting consistency between funding and prudential requirements.<sup>1</sup> Second, governments could promote the development of financial market segments – particularly for very long-dated and index-linked bonds or payout instruments such as annuities and flexible real estate products

... for the development of long-term instruments ...

<sup>1</sup> This might be achieved with appropriate tax incentives.

– that will be useful for retirement savings and the provision of retirement benefits. Third, as risks are increasingly being shifted to individual households, the protection of pension beneficiaries, and the need to improve financial education and the provision of advice, were highlighted as important issues.

... and for the protection of pension beneficiaries

Ministers and Governors of the G10 discussed the report at their meeting on 25 September. Generally, they noted that policy responses can involve trade-offs, such as between free choice of investments and effective prudential control or between maximising returns and ensuring secure retirement incomes. Striking the right balance between such competing objectives is largely a matter of social preference, and it is not to be expected that all countries will make the same choices.