

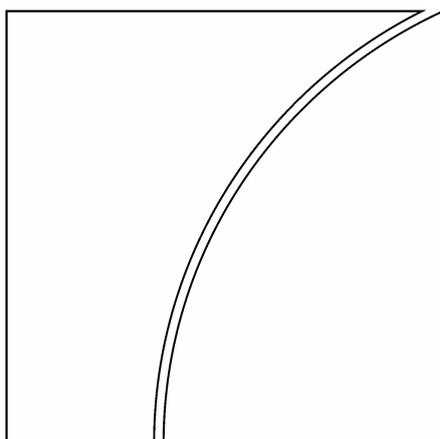


BANK FOR INTERNATIONAL SETTLEMENTS

BIS Quarterly Review

June 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: repricing in credit markets

Credit and equity markets fell starting in March 2005 as investors retreated from investments with higher risks. Credit markets experienced their largest sell-off since 2002, while equity markets gave up most of their gains from 2004. At the same time, long-term yields in the major markets fell close to or even below their previous lows, pushed down in part by the flight to quality. Markets seemed to stabilise in mid-May, although it remained to be seen whether the turbulence in credit markets had truly passed.

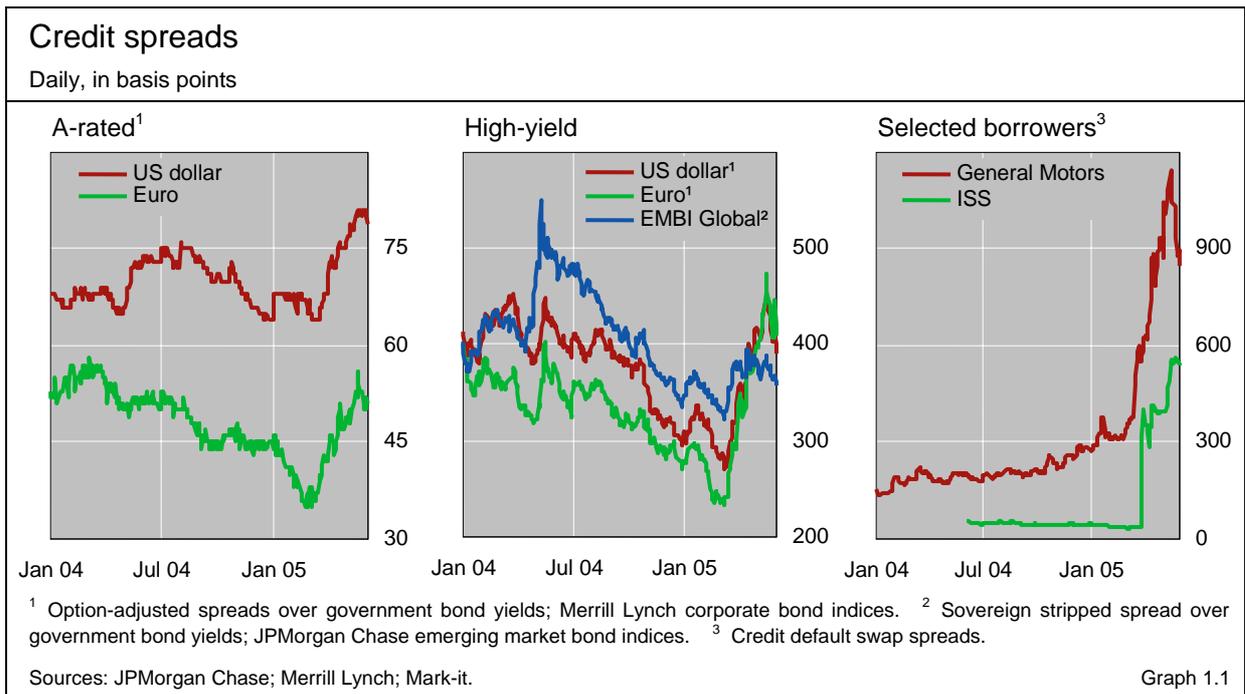
Firm- or sector-specific news, particularly the troubles of US auto makers, played an important role in the retreat from riskier assets. So too did weak economic news, especially during April. In May, stronger than expected data releases helped equity markets to rebound. However, credit spreads continued to widen – and government yields to fall – through to mid-May in response to nervousness about possible downside risks. Unusual volatility in the default swap market added to uncertainty in May, although, in general, markets were orderly during the sell-off.

Despite the widening of credit spreads, financing conditions for many borrowers remained favourable. In fact, owing to the low level of nominal yields, borrowing costs stayed close to historical lows at longer maturities. Some new bond issues were postponed or cancelled, but better-quality borrowers had little trouble raising funds. Many emerging market borrowers were in this latter group; emerging market spreads widened by far less during the most recent sell-off compared to earlier repricing episodes.

Credit spreads widen

After narrowing almost continuously since October 2002, corporate and emerging market spreads reversed direction in mid-March 2005 (Graph 1.1). From their low on 9 March, spreads on A-rated dollar-denominated corporate bond indices widened by almost 20 basis points to a peak of 81 basis points on 17 May. Spreads on high-yield corporate bond indices widened by 185 basis points to 457 basis points over the same period. Credit spreads seemed to stabilise in mid-May. Nevertheless, in early June it was still unclear whether the sell-off represented a significant turning point or only a temporary setback in the long downward trend in credit spreads.

Credit spreads
widen starting in
March ...



The widening in spreads between mid-March and mid-May was neither exceptionally abrupt nor especially detrimental to overall credit conditions. Credit spreads had widened by much more during previous episodes, for example following the Russian default in August 1998 and the collapse of WorldCom in mid-2002. Furthermore, even at their most recent peak, corporate and emerging market spreads traded close to their levels a year ago and still well below their 2002 and 2003 levels.

Nevertheless, the sell-off was significant because it was broadly based. Whereas during the long rally in credit markets starting in October 2002 spreads on high-yield bonds had on occasion widened, spreads on investment grade bonds had rarely done so. Between mid-March and mid-May 2005, however, all borrowers regardless of credit quality saw their spreads widen. In fact, there was arguably a larger impact on investment grade credits than high-yield. Graph 1.2 illustrates the daily value-at-risk (VaR) for various credit indices at the 95% confidence level, calculated from actual excess returns over 100 days. In February 2005, there had been a 5% probability that daily losses for the investment grade corporate bond index would exceed 0.04%. During the sell-off, the VaR increased more than fourfold to 0.16% in mid-May. By contrast, the VaR for the high-yield corporate bond index only doubled, from 0.26% in February to 0.49% in May.

... especially investment grade spreads

Catalysts

The latest repricing in credit markets appears to have been set off by a series of adverse and unexpected developments in the corporate sector. The most important among these was a warning from General Motors on 16 March that its earnings in 2005 would be weaker than the company had previously forecast. The warning prompted the major rating agencies to revise their outlook for GM's credit rating to negative. This in turn heightened investors'

Profit warning from General Motors ...

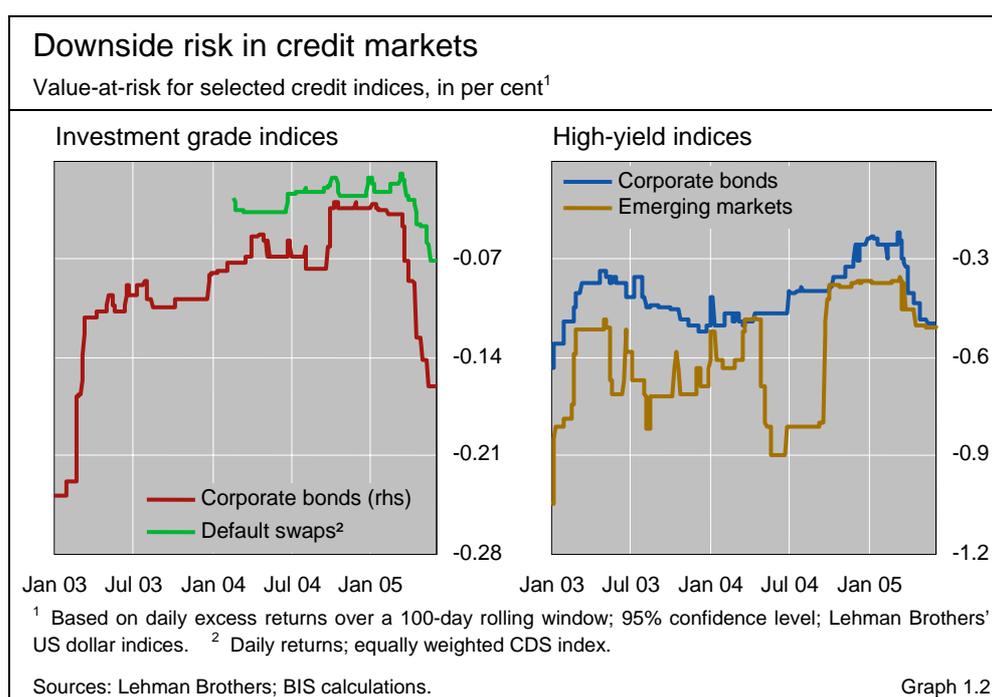
concerns about the impact on credit markets of a downgrade to below investment grade of such a large borrower. Credit default swap (CDS) spreads on GM rose by about 90 basis points immediately following the warning, to 473 basis points on 16 March, and by another 400 basis points over the following month (Graph 1.1).

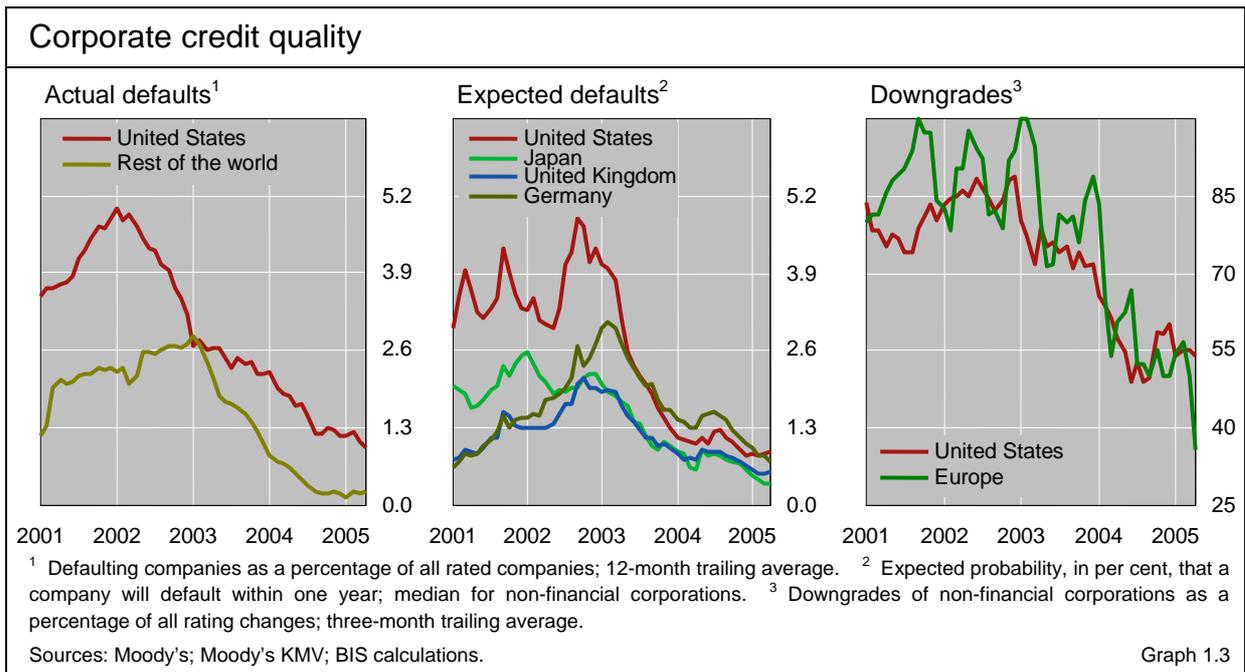
... accounting irregularities ...

Accounting irregularities and related regulatory investigations added to investors' concerns. The acknowledgment by American International Group – the largest insurer in the world and (until recently) one of very few AAA-rated firms – of inaccuracies in its financial statements gave pause to investors. In late March, uncertainty about the extent of these inaccuracies caused AIG's default swap spreads to double and its rating to be downgraded. AIG was not alone in facing accounting problems. The number of firms which missed the US Securities and Exchange Commission's March deadline for filing annual financial statements increased markedly in 2005, with shortcomings in accounting practices and internal financial controls commonly cited reasons for the delay.

... and leveraged buyouts ...

Several capital restructuring actions also caught credit investors by surprise. In the early part of 2005, many firms announced plans to increase their dividend or to buy back their shares – in some cases with the express intention of releveraging their balance sheets – while other firms were the targets of leveraged buyouts. Such actions had been increasing in number since at least mid-2004. Nevertheless, the leveraged buyout of the Danish cleaning company ISS in late March was especially unsettling. It highlighted the slippage in creditors' insistence on covenants to protect their interests that had accompanied the narrowing of spreads over the past few years, in high-yield debt markets in particular. ISS's outstanding bonds did not contain a clause allowing bondholders to accelerate repayments in the event of a change in control. This effectively permitted the private equity investors bidding for the





company to subordinate the existing bonds. Owing to the prospect of an increase in leverage, ISS's default swap spreads rose eightfold on the day the deal was announced, from 39 basis points to 315 basis points (Graph 1.1).

To be sure, these events were not necessarily perceived as indicative of underlying weaknesses in the corporate sector as a whole. Indeed, credit quality has improved significantly in recent years. Moreover, while there were signs that credit quality has peaked, most notably in the United States, it is not commonly expected to deteriorate over the near term. In the United States, downgrades kept close to their most recent low, although since late 2004 they have increased slightly as a percentage of all rating changes (Graph 1.3). Similarly, probabilities of default estimated from balance sheet information and equity price volatility stayed near their cyclical low. In Europe and Japan, upgrades continued to exceed downgrades and probabilities of default remained low.

Flight to quality

The strength of underlying conditions suggests that an increase in the price of risk, rather than in perceptions of risk, was responsible for much of the widening in credit spreads. Risk aversion had fallen to unusually low levels in late 2004 and early 2005, owing partly to investors' willingness to discount risks when seeking higher returns. General Motors' profit warning, ISS's buyout and similar events reminded investors of the downside risk inherent in credit instruments and prompted a repricing of risk. Disappointing economic news in March and April exacerbated the increase in risk aversion.

... trigger a repricing of risk

While confidence began to return in the latter half of April, bolstered in part by earnings reports from GM and Ford that were in line with investors' expectations, it proved ephemeral. Credit spreads widened further in May on continuing concerns about event risk. Standard & Poor's downgrade on 5 May of GM, Ford and their finance subsidiaries to below investment grade added to

Downgrade of Ford and General Motors

investors' worries. Many market participants were surprised by both the timing and the size of the downgrades, with S&P downgrading GM by two notches to BB and Ford by one notch to BB+.

Conditions in corporate bond markets remained orderly following the downgrades. Indeed, in the days immediately after the announcement, A-rated corporate bond spreads were little changed. Credit derivatives markets were more unsettled than cash markets, however (see the box on page 6). Some hedge funds reportedly lost substantial amounts on trades involving General Motors and CDS index tranches. The possible systemic consequences if some of these highly leveraged players were to fail weighed on credit markets in the first half of May. Credit markets were also said to be pressured by hedge funds' moves towards more liquid positions, with some funds anticipating an increase in redemptions in response to their lacklustre returns in recent months.

Unclear whether the sell-off has run its course

A rally in equity markets helped stabilise credit markets starting in mid-May. Credit spreads reached their widest on 17 May, well after equity markets had begun to move upwards (see below). The North American CDS index then narrowed by a remarkable 16 basis points, to 62 basis points, over the next two days. Corporate bond spreads also tightened, albeit at a more subdued pace. Nevertheless, as of early June it remained unclear whether the sell-off in credit markets had run its course.

Emerging markets outperform

Emerging market spreads are not as adversely affected ...

Emerging market spreads were not as much affected as corporate spreads over the period under review. They peaked earlier than corporate spreads, around 15 April during the flight to quality, and were not as volatile. Moreover, they were not as much affected as during the sell-off in 2004. Whereas in April and May 2004 the EMBI Global had widened by approximately 150 basis points, to a high of 549 basis points, in March and April 2005 the index widened by only 73 basis points, to a high of 395 basis points.

One reason emerging market spreads were less affected than corporate spreads was that the events that brought about repricing in credit markets – profit warnings, accounting problems and leveraged buyouts – had little relevance for sovereign debt markets. In addition, the strength of domestic conditions in emerging economies helped limit the reaction.

While emerging markets were not free from surprises, unlike in the corporate sector these surprises were not perceived to have broader consequences. Problems in Ecuador, for example, were regarded as unique to that country. Civil unrest led to the resignation of the president and increased uncertainty about the future course of economic policy. As a result, in the week beginning 18 April, spreads on Ecuador's sovereign dollar bonds widened by 150 basis points even as most other countries' sovereign spreads tightened. Also in April, the prospect that French voters might reject the proposed EU constitution, which in turn could complicate EU accession negotiations, put upward pressure on Turkish spreads. Delays in the finalisation of Argentina's debt restructuring did not prevent the government from tapping local bond markets in May for the first time since the default. In February, investors

Stress testing of credit markets: the downgrade of General Motors and Ford

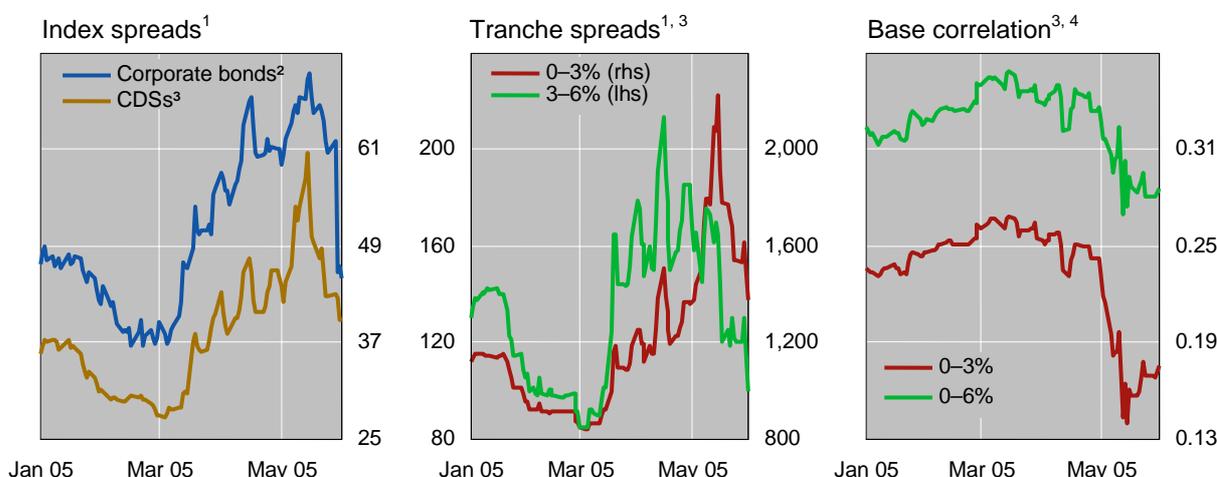
The downgrade by Standard & Poor's of Ford, General Motors and their finance subsidiaries to below investment grade tested the resilience of credit markets. Ford and GM are among the largest borrowers in the corporate bond market: together they accounted for approximately 3% of the investment grade bond market at the time of the downgrade and could eventually account for as much as 15% of the global high-yield bond market. Their debt was widely held and included in many collateralised debt obligations (CDOs). Consequently, the downgrade of the auto makers had the potential to cause dislocation in credit markets. In the event, cash markets appeared to adjust in an orderly way to the downgrade. Credit derivatives markets were more adversely affected, with CDS spreads "gapping" higher on several days in the first half of May and lower in the second half (left-hand panel of the graph below). Yet spillovers from credit derivatives markets to other markets were limited.

The adjustment of corporate bond markets to the downgrade of Ford and GM was facilitated by three factors. First, the downgrade had long been anticipated and so asset managers had ample opportunity to adjust their portfolios. Since mid-2003, the auto makers' spreads had been trading closer to those on speculative grade issuers than those on other BBB-rated issuers. Second, Ford is still rated investment grade by Moody's and Fitch, and GM by Moody's. Several of the largest bond index providers base their indices on the average of three ratings, and so Ford will remain in some investment grade indices despite S&P's downgrade. Last but not least, in recent years many fixed income managers have moved away from tracking market indices and towards customised benchmarks, for example by removing outliers from indices and imposing stricter exposure limits. There has also been a trend towards increasing the allowable tracking error. Such changes would tend to diminish the market impact of mechanical changes in indices.

Notwithstanding the orderly adjustment of cash markets, the downgrade appeared to have an adverse impact on the functioning of credit derivatives markets. It is easier to take positions – especially short positions – in credit derivatives markets than in corporate bond markets. Therefore, leveraged investors, such as hedge funds and investment banks' proprietary trading desks, tend to be more active in credit derivatives markets than in their cash counterpart. Leveraged investors play an important role in promoting market liquidity and improving price discovery. Yet at times their activities can exacerbate price movements. May 2005 seems to have been one such time.

The downgrade of Ford and GM caused relationships between the prices of certain assets to change in unexpected ways. Consequently, some "relative value arbitrage" trades – strategies in which approximately offsetting positions are taken in two securities that have similar but not identical characteristics and trade at different prices – suffered large mark to market losses. One

CDS markets



¹ In basis points. ² Asset swap spread (over Libor); JPMorgan euro credit index for investment grade industrials; break in series on 1 June 2005 following the removal of Ford and GM from the index. ³ On-the-run five-year iTraxx Europe indices. ⁴ Default correlation implied by the price of a synthetic first loss tranche.

Sources: JPMorgan Chase; BIS calculations.

such trade was motivated by discrepancies between the price at which convertible bonds issued by GM were trading and the price of a replicating portfolio (consisting of regular bonds plus equity call options). Investors expecting this pricing discrepancy to narrow lost money on both legs of the trade: on 4 May GM's stock price increased by 18% after an offer from turnaround specialist Kirk Kerkorian to buy a large stake in the company, and then on 5 May the company's bond and CDS spreads increased after S&P's downgrade.

Another relative value trade on which investors reportedly lost money involved supposed anomalies in the pricing of CDO tranches. Spreads on the equity, ie first loss, tranche of CDOs tend to be much higher than the cost of a (delta) hedged position in the underlying CDO (or alternatively in the mezzanine tranche, which absorbs losses in excess of 3% of the notional amount and up to 10%). In early 2005, an investor who sold protection on the equity tranche of the iTraxx Europe CDS index and then hedged against market-wide changes in credit spreads by buying protection on the underlying index would have earned a spread of 300 to 400 basis points. Such a trade is exposed to changes in default correlation and so is commonly referred to as a long correlation position. Investors expecting default correlations to remain stable or increase were surprised in May when they instead fell sharply (right-hand panel of the graph). Starting in mid-April, investors appeared to have become increasingly concerned about idiosyncratic risks. This led to a widening of the spread on equity tranches and losses on long correlation positions (centre panel). The widening accelerated following S&P's downgrade of GM and Ford. Some correlation traders apparently sought to limit their losses by unwinding their positions. This temporarily put downward pressure on the spread of mezzanine tranches and thus exacerbated market losses. Whereas normally changes in the spread of the mezzanine tranche are positively correlated with changes in the index, at times in early May the two moved in opposite directions.

As losses on such relative value arbitrage trades accumulated, investors rebalanced their portfolios to adjust their hedges, meet margin calls and reduce their risk exposure. This in turn caused liquidity to deteriorate, especially in CDS index and tranche markets. Many leveraged investors had similar positions, and this concentration of activity magnified the deleveraging process. The circle of deterioration was similar in nature, albeit certainly not in magnitude, to what had occurred in 1998, following the default by Russia and near collapse of Long-Term Capital Management.^① However, whereas in 1998 volatility had swiftly spread from one financial market to another, in May 2005 events in credit derivatives markets had only a limited impact on other markets. The perceived strength of underlying economic conditions helped limit contagion. So too did improvements in risk management after the 1998 crisis. In particular, hedge funds today appear to be significantly less leveraged than in 1998.^② As of early June, there was little evidence of any counterparties experiencing severe financing difficulties as a result of losses following S&P's downgrade of the carmakers.

^① See Committee on the Global Financial System, *A review of financial market events in autumn 1998*, BIS, October 1999. ^② See P McGuire, E Remolona and K Tsatsaronis, "Time-varying exposures and leverage in hedge funds", *BIS Quarterly Review*, March 2005, pp 59–72.

holding 76% of the defaulted debt had opted to accept the government's offer, but legal challenges stalled the planned exchange until early June.

... but are sensitive to changing macroeconomic conditions

Compared to corporate spreads, macroeconomic conditions made a more important contribution than event risk to the repricing of emerging market spreads. Continuing the pattern evident since at least early 2004, emerging market spreads exhibited greater sensitivity than corporate spreads to changing expectations regarding the course of US monetary policy. For example, after 10-year Treasury yields had risen by 15 basis points on 9 March, emerging market spreads widened by 6 basis points while investment grade corporate spreads were unchanged. Again on 22 March, a jump in yields

induced an increase in emerging market spreads but little reaction in corporate bond markets.

The increase in risk aversion led many emerging market borrowers to postpone their borrowing plans. The decision to do so was made easier by the fact that many had prefinanced in the first quarter of 2005, when financing conditions had been exceptionally favourable. Emerging market borrowers had raised approximately \$70 billion in international bond and loan markets in the first quarter of 2005, up 13% from the same period a year earlier (see “The international debt securities market” on page 31). Issuance slowed in April and May but was in line with 2004 levels.

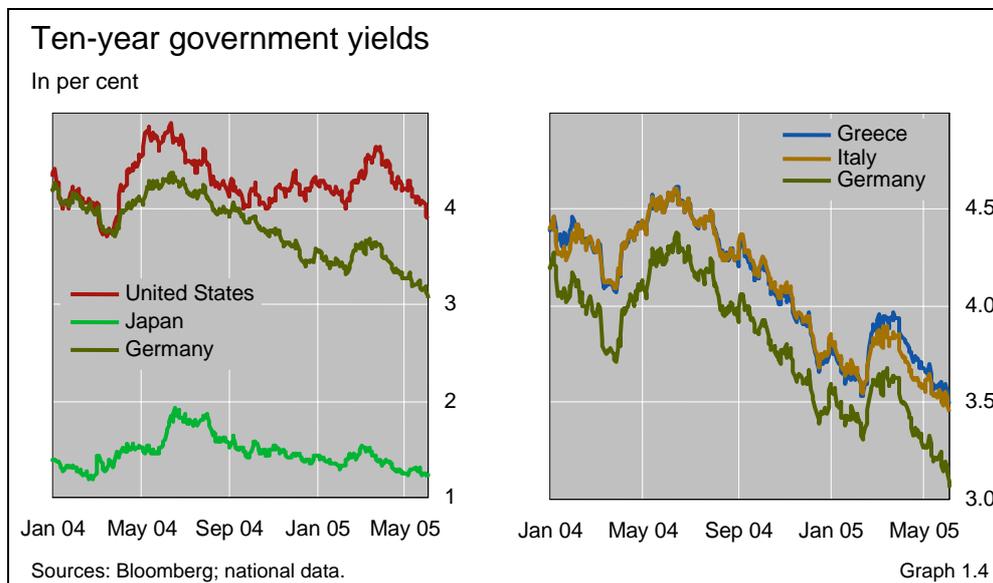
Long-term rates resume their downward trend

Despite the widening of credit spreads, many corporate and emerging market borrowers saw their financing costs remain unchanged or even decline owing to a fall in nominal yields. Following a brief increase in February, long-term yields in the major markets resumed their downward trend in late March (Graph 1.4). From their peak on 22 March, 10-year US Treasury yields decreased by 60 basis points to nearly 4.0% on 24 May – below the low levels which had posed a “conundrum” a few months earlier to the Federal Reserve Chairman (Graph 1.5). Over the same period, 10-year bund yields fell by 40 basis points to 3.3%, their lowest level since European monetary union.

Dollar yields declined in no small part due to disappointing macroeconomic data. In fact, the 8 basis point rise in the 10-year yield following the Federal Reserve’s renewed emphasis on a pickup of inflationary pressures in its statement of 22 March marked the peak in long-term interest rates over the period. Subsequently, soft macroeconomic data released in late March and April weighed considerably on yields (Graph 1.6). For instance, poor consumer confidence data released in mid-April and a surprisingly below par GDP report announced a few weeks later contributed to outsized declines in yields. This was despite the continuation of Fed rate hikes over the period, as

Wider spreads are offset by lower yields

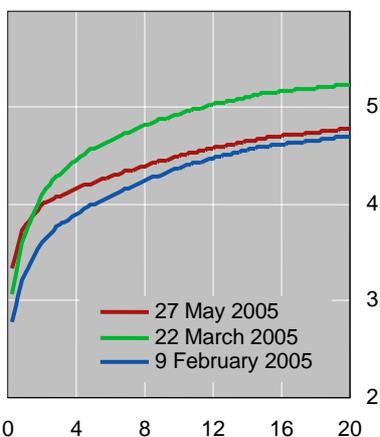
Yields decline on disappointing data releases ...



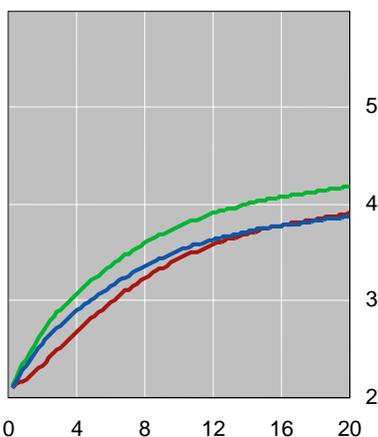
Swap yield curves

In per cent

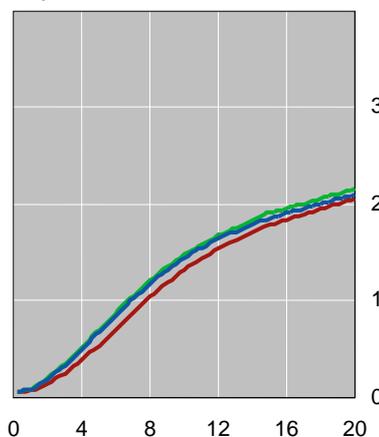
United States



Euro area



Japan



Note: For three-month US dollar and yen maturities, Libor; for three-month euro maturities, euro deposit rates; for all other maturities, annual swap yields at the close of trading in London.

Sources: Bloomberg; ICAP; BIS calculations.

Graph 1.5

well as repeated indication by US policymakers of their anticipation of further “measured” rate increases.

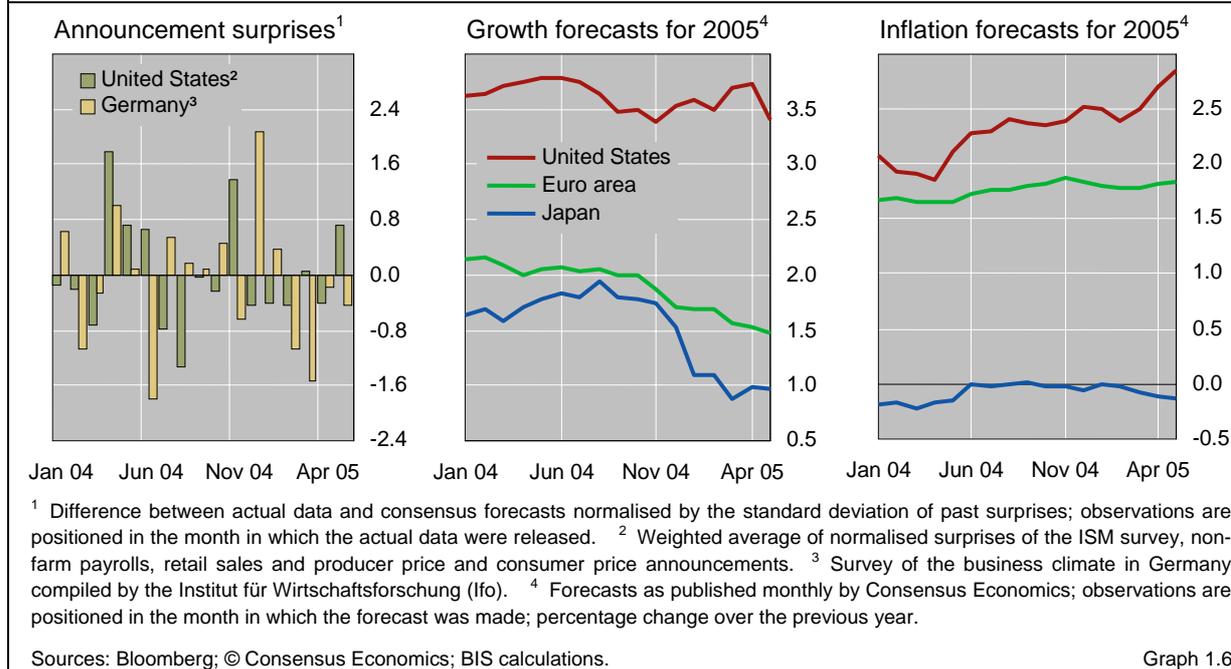
... and safe haven demand

Disappointing macroeconomic data were not the only sources of the fall in US yields, though; there was also evidence of safe haven demand for Treasuries, stemming from the increase in risk aversion and sell-off in credit markets discussed above. Macroeconomic news in the United States took on a more favourable tone in May, starting with the positive job report announced on 6 May, but yields remained contained. On 10 May, speculation of hedge fund losses and declining bank shares were reported to have boosted demand for Treasuries, and benchmark yields fell significantly. A few days later, while stronger than expected April retail sales led to some initial selling pressure in Treasuries, a sharp sell-off in equities and reports of funds shifting into government securities resulted in yields declining for the day by another 3 basis points. And though the US Treasury’s announcement in May that it was considering reissuing the 30-year note after a five-year hiatus resulted in a marked sell-off in the longest-dated Treasury bonds, the yields on the benchmark 10-years rose only slightly.

Bund yields fall to record lows

In the euro area, disappointments in the macro data were even more persistent, and bund yields hit new all-time lows over the period. The spreads between the US and euro area 10-year yields widened from about 80 basis points in the first quarter to 90 basis points more recently. The key IFO index of business sentiment fell in a downward surprise to the lowest value in more than a year on 25 April, which coincided with a 4 basis point decline in bund yields. This and other weak euro area macro data up to May led many analysts to push back their expectation of ECB rate hikes. As is often the case, bunds were also sensitive to macroeconomic news emanating from the United States. For instance, in response to the poor US GDP report on 28 April, bund yields fell a few basis points.

Macroeconomic news



Increasing differentials among euro area government yields were also evident in the period under review, as investors became more sensitive to countries' fiscal difficulties. Italy and Greece saw their spreads over bunds gradually widen on scepticism about their ability to meet budget targets (Graph 1.4). There were also reports of safe haven demand for both bunds and Swiss franc bonds over the period, as carry trades on bonds of EU countries anticipated to enter the currency union were unwound in a general retreat from such speculative positions.

In Japan, though yields also declined during the period, the size of the contraction was much less than that seen in the euro area or the United States. The bond market seemed to take its cue more from falling share prices than from signals of a stagnant macroeconomic environment. Admittedly, the Bank of Japan Policy Board's downward revision of the outlook for CPI, announced on 28 April, consistent with the trend of consensus forecasts (Graph 1.6), did lead to a modest decline in yields of a few basis points. However, much worse than expected industrial production figures released on 30 March, as well as poor expected business conditions announced in the March *Tankan*, had a negligible impact on yields. Rather, relatively large one-day declines in 10-year bond yields over the period, of 3 and 4 basis points, on 15 and 18 April, occurred during the two sharpest one-day falls in share prices. Another factor weighing on yields in late May was the announcement of an extension in duration for a major bond index, which reportedly increased the demand for long-maturity bonds by pension funds.

Yen yields move with equity markets

Equity markets decline on reduced risk appetite

Share indices are weak in March and April ...

Equity markets were patchy from early March to May (Graph 1.7). Major equity indices tumbled in March and April following a decline in risk appetite and weak macro data releases. Despite a rebound in May for a number of major indices, the S&P 500, DJ EURO STOXX and Nikkei 225 lost 2%, 1% and 6%, respectively, from 7 March to 27 May, with both the US and Japanese indices close to or below the levels at which they had begun the new year.

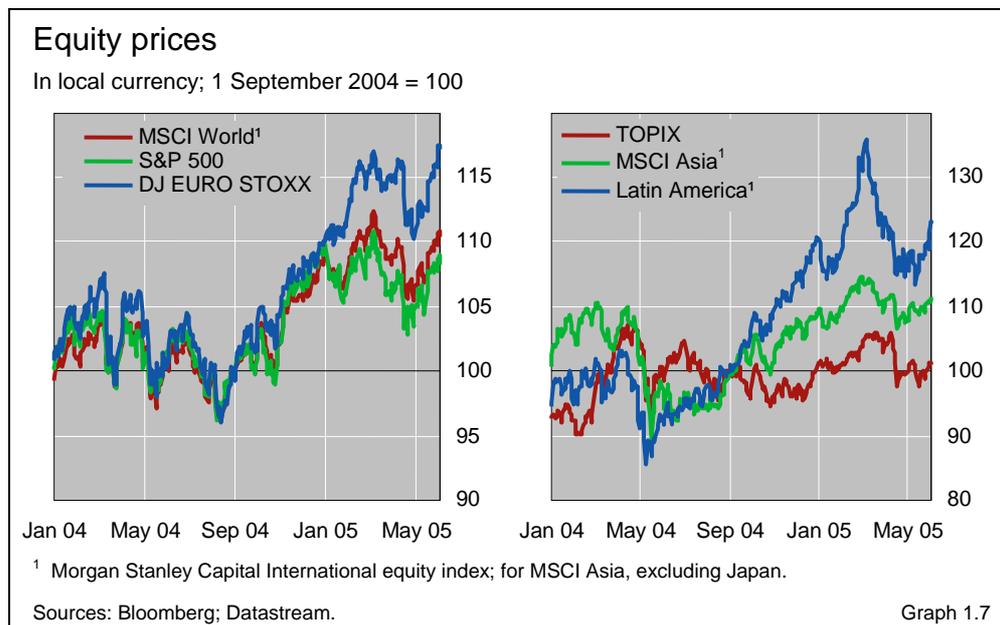
Partly in parallel with the sell-off in credit markets, volatility rose sharply in mid-April in all major equity markets. Both implied and historical volatilities, which had fallen by early 2005 to their lowest levels in nearly 10 years, appeared to break out of the long-term downtrend, though they declined somewhat in May, and were still well below the levels of 2002 (Graph 1.8, left-hand panel).

... as investors turn risk-averse ...

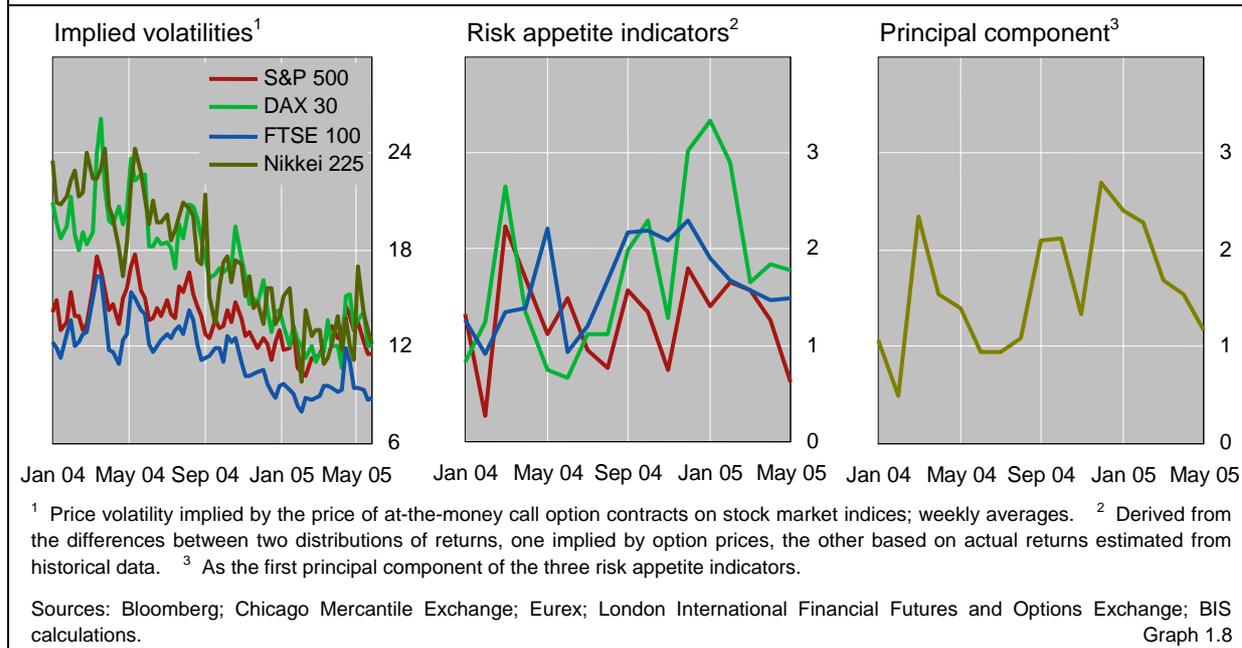
In addition to having higher expectations of risk, investors in equity markets turned more risk-averse. Our measure of risk appetite, derived both for different markets and globally from the pricing of equity index options and historical volatilities, is meant to capture the difference between the expectation of risk in equity markets and its price. After being range-bound at historically high levels, risk appetite has declined markedly in Germany, the United States and the United Kingdom since the beginning of the year. A summary measure of risk appetite across these markets had by mid-May dropped to levels that had last been observed in mid-2004 (Graph 1.8, centre and right-hand panels).

... and the economy disappoints ...

Uninspiring news on the macroeconomic front was clearly part of the reason for the weakness in US indices up to April. In March, investors appeared to focus on inflation concerns and a potential need for higher policy rates to counter them; and stock indices fell sharply after disappointing producer and consumer price reports as well as the FOMC statement on 22 March pointing to increased inflationary pressures. In April, attention shifted to a possible slowdown in demand, with share prices again falling significantly



Volatility and risk appetite in equity markets



amidst mediocre retail sales figures announced on 13 April and poor consumer confidence and manufacturer confidence numbers released on 15 April.

Equity markets in the United States suffered during the period despite earnings announcements that were, on balance, better than expected. Granted, a disappointing earnings announcement from IBM was cited as contributing to the 2% decline in major market indices on 15 April. However, other market bellwethers such as Citigroup and General Electric posted better than expected earnings that day. In aggregate, the ratio of positive to negative earnings surprises for S&P 500 companies, which had risen slightly in the last quarter of 2004, has remained stable in 2005. The trend in profit warnings has also been positive (Graph 1.9, right-hand panel). Eventually, the accumulation of positive earnings announcements, along with renewed M&A activity and improved macroeconomic news – in particular, a restrained core inflation announcement on 18 May – contributed to a marked rebound in the major indices in May.

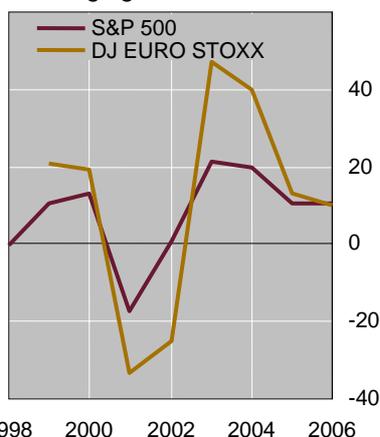
European equity indices followed a similar general pattern to US indices, with a sharp fall in March and April followed by a May rebound. Unlike in the United States, though, the macroeconomic news flow in Europe remained grim; nevertheless, the German stock market gained notably on expectations that structural reform policies might be strengthened following the announcement on 22 May of early German elections. In addition, increased merger and acquisition activity in the euro area provided an impetus towards higher valuations.

Japanese equities also saw a very sharp sell-off in mid-April, but for a somewhat different set of reasons. Admittedly, the context was one of continuing macroeconomic disappointment: for instance, a poor household spending report was followed by a plunge in major share indices on 29 March. However, rising political tensions with China greatly contributed to deteriorating sentiment, culminating in a 3.8% drop in the Nikkei 225 index on 18 April, the

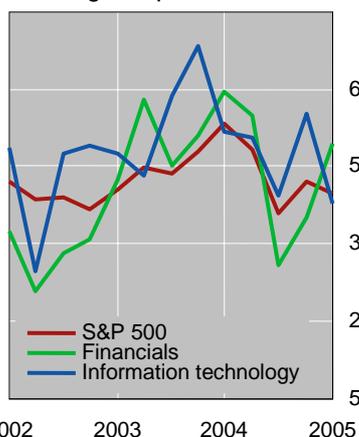
... while Japanese stocks suffer on tensions with China

Corporate earnings

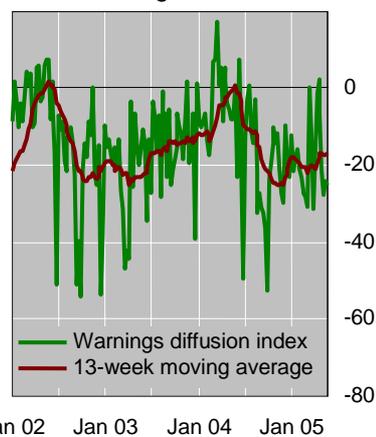
Earnings growth¹



Earnings surprises^{2,3}



Profit warnings^{2,4}



¹ Annual percentage change of weighted average operating earnings per share; for 2004, estimate; for 2005–06, forecast.
² Companies included in the S&P 500 Index. ³ Number of companies which announced higher than expected quarterly earnings minus the number which announced lower than expected earnings; as a percentage of companies announcing quarterly earnings.
⁴ Number of companies which announced positive revisions to their earnings outlook minus companies which announced negative revisions; as a percentage of companies announcing positive, neutral or negative revisions.

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

Graph 1.9

largest one-day decrease since 10 May 2004. This capped a string of six consecutive daily declines for a cumulative fall of more than 8%. Indeed, over this period the share prices of Japanese manufacturers and exporters of heavy industry that rely on sales to China contracted disproportionately. Major Japanese share indices then sat out the May rebound of other developed markets, in part because of the absence of the type of positive restructuring news that characterised these other regions.

2. The international banking market

New lending to all sectors, but especially to banks, led to a relatively large expansion in BIS reporting banks' cross-border claims in the fourth quarter of 2004. Much of the swelling in interbank activity reflected intra-euro area lending and the channelling of US dollars to banks in major financial centres. Claims on non-bank borrowers rose as well, partially the result of new loans to borrowers in offshore and other major financial centres, but primarily reflecting greater credit to non-banks in Japan and the United States.

Emerging market economies experienced a net inflow of funds, although differences across regions were apparent. Large placements of deposits with BIS reporting banks were behind a net outflow from Latin America, while repatriation of deposits by banks in China and Korea contributed to a net inflow to Asia-Pacific. In emerging Europe, a noticeable rise in claims on all sectors by euro area banks offset the placement of deposits abroad by banks in Russia, and contributed to a second consecutive net inflow.

Over the longer term, BIS reporting banks have channelled funds into investment in debt securities. This shift has coincided with growth in the euro area bond market and an expanding external deficit in the United States. The BIS statistics also provide evidence suggesting that the degree of foreign bank participation in national lending markets has been edging upwards in recent years. While foreign banks continue to play a smaller role in domestic lending in the euro area than in the United States, cross-border claims account for a growing share of total credit to non-banks in most industrialised countries.

Interbank lending fuels claim growth in fourth quarter

Greater interbank activity, as well as a second consecutive quarter of strong growth in credit to the non-bank sector, boosted BIS reporting banks' cross-border claims in the fourth quarter of 2004. Total cross-border claims rose by a relatively robust \$571 billion to \$19.2 trillion (Table 2.1), pushing the year-over-year growth in total claims up slightly to 14% (Graph 2.1).

Interbank activity swelled in the fourth quarter of 2004. Over half of the total rise in claims, or \$338 billion, resulted from interbank lending, primarily in the US dollar segment of the market. Much of the \$227 billion rise in US dollar denominated interbank claims reflected greater loans to banks in offshore centres. A rise in intra-euro area interbank activity offset reduced claims on

A surge in claims
due to greater
interbank activity ...

Cross-border claims of BIS reporting banks								
Exchange rate adjusted changes in amounts outstanding, in billions of US dollars ¹								
	2002	2003	2003	2004				Stocks at end-Dec 2004
	Year	Year	Q4	Q1	Q2	Q3	Q4	
Total cross-border claims	740.1	1,075.1	315.8	1,228.8	240.2	235.1	571.0	19,192.9
on banks	425.0	530.2	277.1	819.8	191.5	33.3	338.1	12,261.3
on non-banks	315.2	544.9	38.7	409.0	48.7	201.7	232.8	6,931.7
Loans: banks	395.1	452.2	249.5	722.6	120.7	-102.1	259.1	10,427.2
non-banks	103.8	276.4	17.9	200.4	-22.8	52.1	113.2	3,496.1
Securities: banks	36.3	75.6	34.9	75.7	56.5	24.0	44.9	1,360.8
non-banks	202.2	208.5	6.7	189.9	32.1	136.9	48.1	2,968.0
Total claims by currency								
US dollar	260.3	584.2	259.6	612.9	33.5	-26.6	292.0	7,744.9
Euro	458.0	503.4	53.6	399.1	87.0	216.0	139.5	7,713.1
Yen	-62.8	-128.9	-45.2	-21.3	57.5	106.7	-23.2	1,156.1
Other currencies ²	84.5	116.5	47.8	238.1	62.2	-61.0	162.7	2,578.8
By residency of non-bank borrower								
Advanced economies	315.1	458.8	47.1	348.2	15.7	138.5	127.0	5,387.0
Euro area	117.4	157.3	-17.7	151.1	33.2	10.3	42.1	2,467.5
Japan	4.1	38.4	-5.2	0.1	21.4	15.5	35.6	268.4
United States	153.1	179.6	53.0	91.3	-38.9	47.1	28.5	1,664.1
Offshore centres	18.8	99.8	-10.2	41.6	33.9	61.7	54.5	845.5
Emerging economies	-16.5	5.0	3.1	23.9	1.9	0.0	18.8	609.5
Unallocated ³	-1.0	-19.8	1.1	-1.5	-0.2	-1.4	32.2	58.1
<i>Memo: Local claims⁴</i>	<i>44.5</i>	<i>414.9</i>	<i>94.0</i>	<i>188.6</i>	<i>34.8</i>	<i>6.8</i>	<i>-14.7</i>	<i>2,648.9</i>

¹ Not adjusted for seasonal effects. ² Including unallocated currencies. ³ Including claims on international organisations.
⁴ Foreign currency claims on residents of the country in which the reporting bank is domiciled. Table 2.1

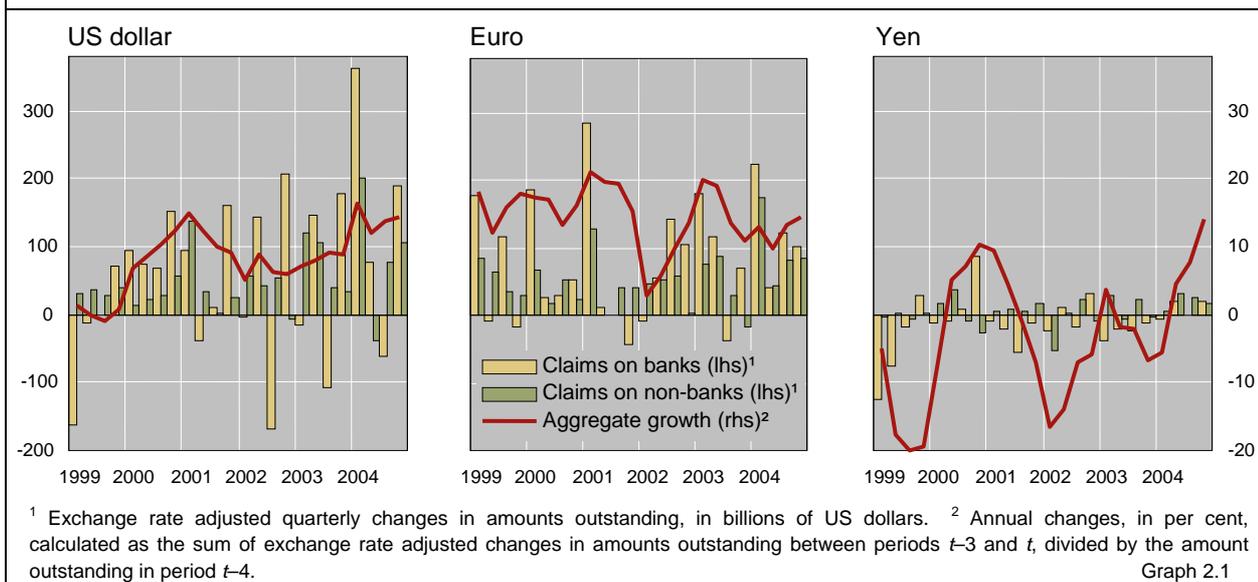
banks in the United States and the United Kingdom, contributing to a \$58 billion rise in euro-denominated interbank claims.

Claims on non-bank borrowers also expanded noticeably, for a second consecutive quarter. Driven by new loans, total claims on these borrowers rose by \$233 billion to \$6.9 trillion. Over a quarter of these claims flowed to non-bank borrowers in offshore centres and the United Kingdom, areas with considerable non-bank financial activity. As a result, outstanding claims on borrowers in these areas accounted for 21% of total claims on non-bank borrowers in the fourth quarter, up from 19% a year earlier and 17% in the fourth quarter of 2002.

Excluding the claims on these financial centres, claims on non-banks in Japan and the United States rose the most in the fourth quarter. Banks in the United Kingdom and the United States contributed to a total of \$15 billion in new loans and \$21 billion in purchases of debt securities and equities issued by non-bank borrowers in Japan. This was the fourth consecutive rise in claims on these borrowers, pushing total claims on non-banks in Japan to \$268 billion. A rise in claims on non-bank borrowers in the United States was also

... and credit to non-banks in the United States and Japan

Cross-border claims by sector and currency



noteworthy. Total claims on these borrowers rose by \$29 billion, the result of investment in debt securities and equities.¹

Banks channel deposits into debt securities

Greater investment
in debt securities ...

Since at least the mid-1990s, BIS reporting banks' balance sheets have gravitated away from the traditional loan business and towards investment in securities. That is, the deposits placed in BIS reporting banks worldwide have increasingly been used to finance purchases of bonds in both the euro and the US dollar segments of the market. Overall, the net stock of debt security claims of BIS reporting banks has quadrupled, rising from \$604 billion at end-1995 to \$2.4 trillion in the most recent quarter (Graph 2.2). At the same time, the net loan position of all BIS reporting banks – ie their total loans to all borrowers net of deposits received – fell from -\$422 billion in mid-1995 to -\$2.3 trillion in the most recent quarter.

... has coincided
with growth in euro
area bond
markets...

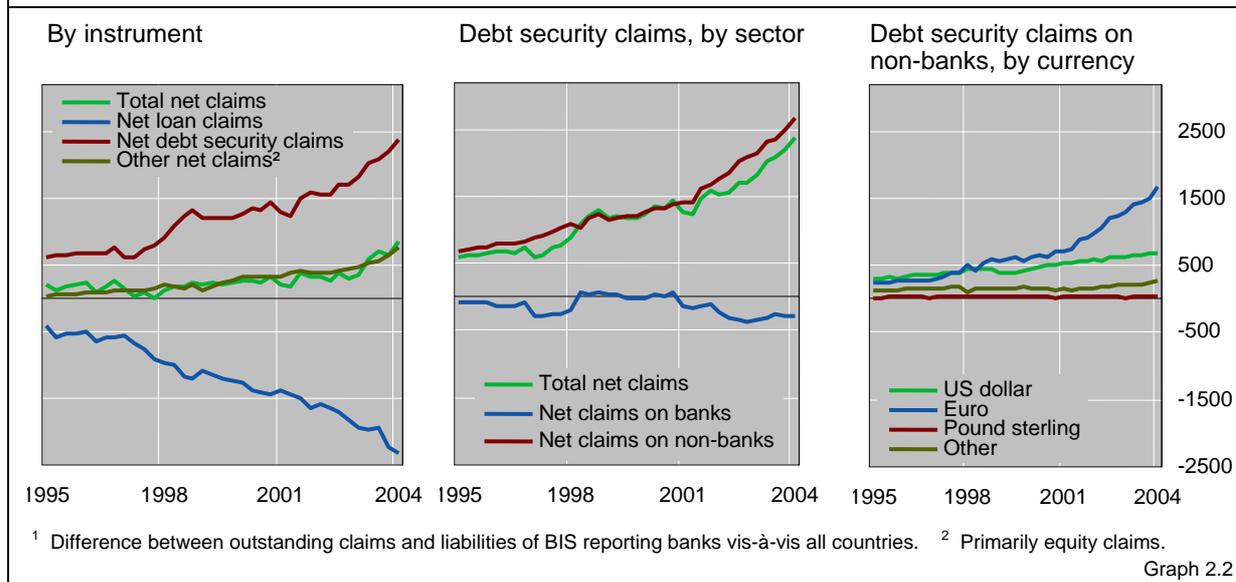
This net investment in debt securities has been most noticeable in the euro segment of the international banking market, mirroring the rise in euro area bond issuance since the introduction of the common currency (Graph 2.2, right-hand panel). Since 2000, euro area non-financial corporations have gravitated towards bond financing, while the outstanding stock of euro area government debt has continued to rise (Graph 2.3, left-hand panel).² The rise

¹ Overall, the growth in loans to non-banks in the United States was flat from the previous quarter; a \$56 billion contraction in loans from banks in offshore centres was offset by greater loan credit from banks in the United Kingdom, Japan, Switzerland and the euro area.

² ECB data on the main liabilities of euro area non-financial corporations indicate that outstanding securities debt rose from €363 billion in the first quarter of 2000 to €613 billion in the third quarter of 2004, or from 11% to 14% of their main liabilities. Over this same period,

Net claims¹ of BIS reporting banks

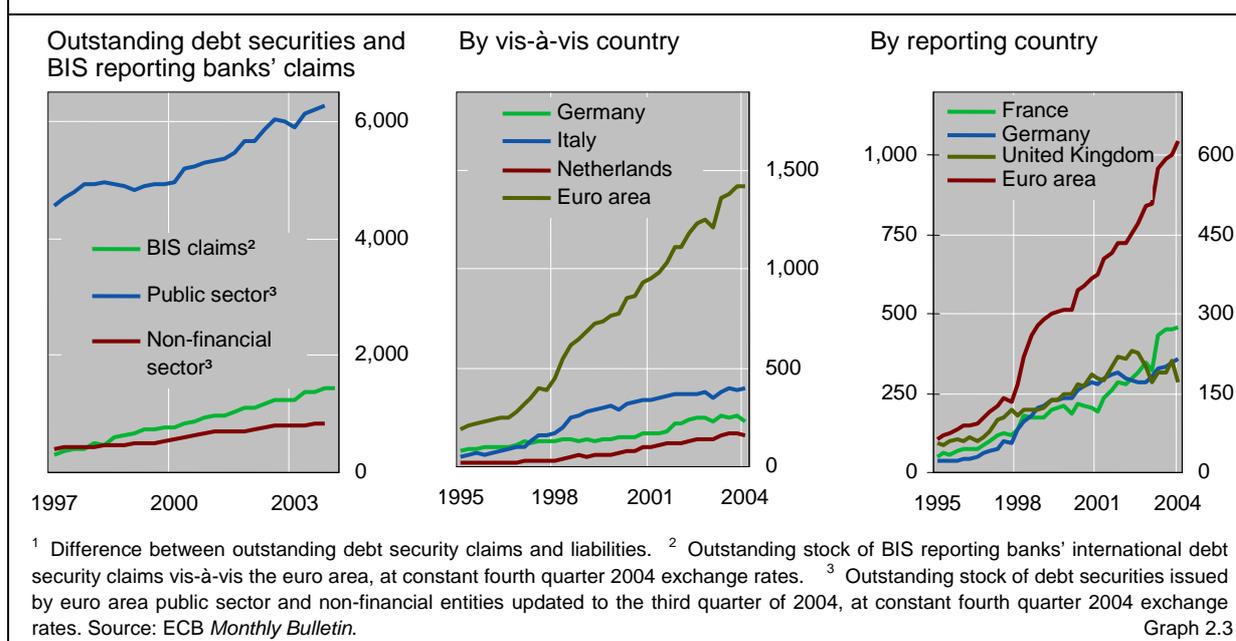
In billions of US dollars



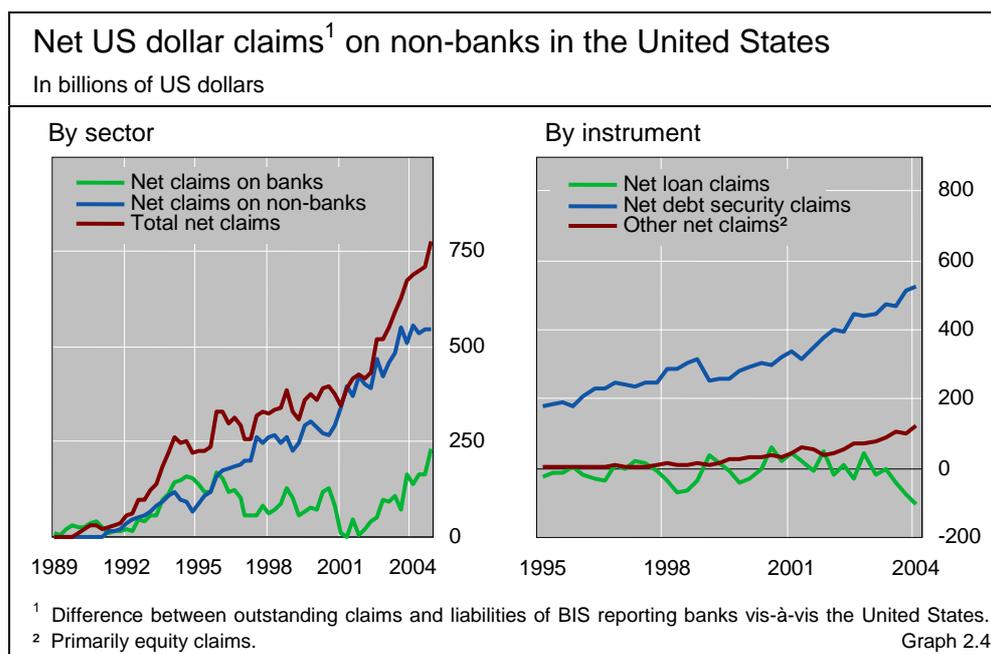
in euro area bond issuance has been reflected in the composition of BIS reporting banks' balance sheets. Their net stock of euro-denominated debt security claims on euro area non-banks has more than doubled since 2002, rising from \$631 billion in the first quarter of that year to \$1.4 trillion in the most recent quarter. Investment in bonds issued by Italian residents is the most substantial, followed by those of German and Dutch residents (Graph 2.3, centre panel).

Net euro-denominated debt security claims¹ on euro area non-banks

In billions of US dollars



the outstanding stock of securities debt of euro area governments rose from €3.6 trillion to €4.6 trillion, or from 80% to 83% of their main liabilities.



... and rising US external deficits

A similar, albeit smaller, rise in net investment in debt securities has also been evident in the US dollar segment of the market. BIS reporting banks have invested primarily in securities issued by borrowers in the United States, helping to fund the growing US external deficit. The net claim position of BIS reporting banks vis-à-vis all sectors in the United States surpassed \$800 billion in the fourth quarter, from a near zero balance in 1991 (Graph 2.4). While the US banking sector remains a net user of funds from the international banking system, the level of net claims on this sector has remained relatively flat since 1994. In contrast, net debt security claims on non-banks in the United States have grown over this period, reaching \$637 billion in the fourth quarter of 2004 from \$359 billion in the second quarter of 2002 and \$194 billion at end-1995.

Repatriation of deposits contributes to inflow to emerging markets

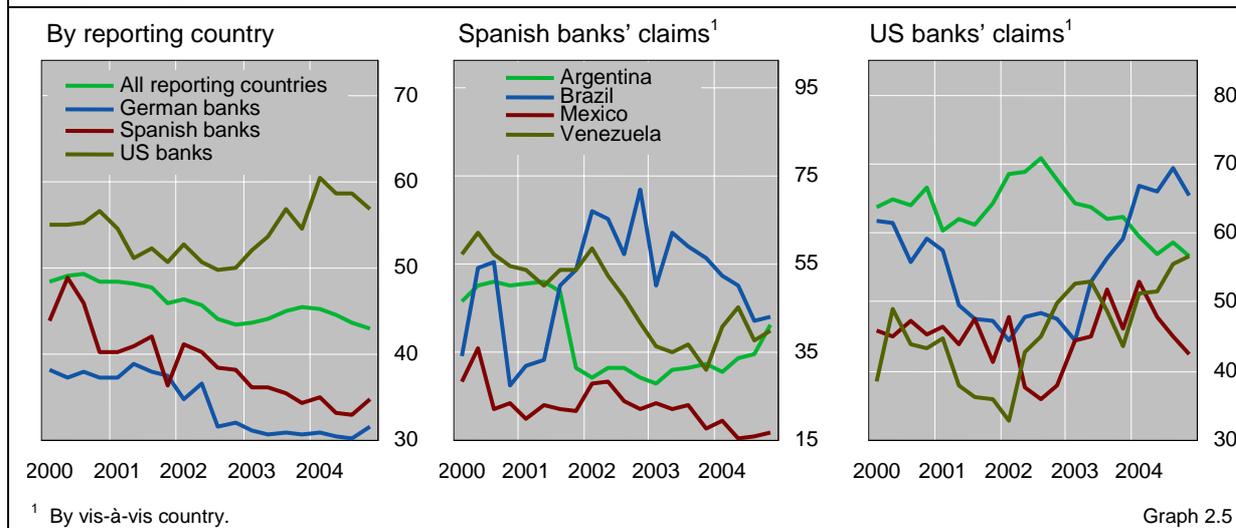
An overall net inflow to emerging economies masked significant differences in net claim flows across regions. The largest net inflow occurred in Asia-Pacific, the result of increased claims on all sectors in the region and large deposit repatriations by banks in China and Korea. New claims on non-banks in the new EU member states and Russia outweighed the placement of deposits abroad, yielding a net inflow to emerging Europe as well. In contrast, funds flowed out of Latin America for the 11th consecutive quarter, this time owing to reduced claims as well as a large placement of deposits in BIS reporting banks.

Short-term lending to Latin America trends downwards

A net outflow of funds from Latin America in the most recent quarter was primarily the result of a relatively large placement of deposits in BIS reporting banks. Overall, total liabilities vis-à-vis the region rose by \$7 billion to

Short-term consolidated international claims on Latin America

As a percentage of total international claims



\$289 billion, contributing to a \$9 billion net outflow.³ On the claim side, BIS reporting banks reduced credit to the region by \$2 billion, the third consecutive quarterly decline. This pushed down claims on the region to 22% of total claims on emerging markets, from 27% a year earlier.

Since 2000, short-term credit to the region has trended downwards as a share of total international claims (Graph 2.5). While this trend is evident in several borrowing countries, it has primarily reflected reduced short-term positions on borrowers in Argentina. The BIS consolidated banking statistics, which provide a maturity breakdown, indicate that the US dollar value of the stock of *international* claims on the region has fallen by \$69 billion since the fourth quarter of 2000, almost half of which was accounted for by reduced short-term credit to residents of Argentina.⁴ As a result, short-term claims accounted for 43% of total international claims on the region in the most recent quarter, down from 45% a year earlier and 48% at end-2000.⁵

Short-term lending in Latin America has fallen

³ The largest placement of deposits by residents in Latin America was recorded by banks in the United States. While this partially reflected deposits placed by residents of Mexico (\$1.6 billion) and Venezuela (\$1.3 billion), the bulk of the \$7 billion rise for these banks was not allocated to a particular country.

⁴ In the BIS consolidated banking statistics, "foreign claims" are composed of "international claims" (cross-border claims in all currencies and foreign currency claims extended locally) and "local currency claims extended locally". The data include a maturity breakdown for international claims, but not for local currency claims, which accounted for 58% of BIS reporting banks' total foreign claims on Latin America (up from 52% a year earlier).

⁵ The fall in international claims since end-2000 has been mirrored by a roughly equivalent rise in local currency claims on the region (\$72 billion), primarily the result of greater local currency claims on residents of Mexico. As a result, the outstanding stock of all BIS reporting banks' foreign claims (immediate borrower basis) on the region is little changed since end-2000 (totalling \$519 billion in the fourth quarter of 2004). Outstanding foreign claims on the region fell between the fourth quarter of 2001 and the third quarter of 2002, but have trended upwards since.

The presence of foreign banks in national credit markets

The integration of financial markets over the past two decades has led to greater participation of foreign banks in national lending markets. However, comprehensive measures that help quantify such a development are hampered by incomplete data. This box explains how the BIS international banking statistics can be combined with IMF data on locally extended credit to provide an estimate of total lending to non-bank residents of major industrialised countries. Furthermore, the box details the construction of three simple indicators of foreign bank participation in national markets. While none of these indicators is perfect, they do, when considered together, paint a fairly consistent picture across developed economies. Broadly speaking, foreign bank participation in national lending markets has been on the rise, although differences across countries are apparent. In addition, foreign banks account for a greater share of total credit to non-bank borrowers in the US and UK lending markets than in the euro area and Japan.

Constructing measures of foreign bank participation

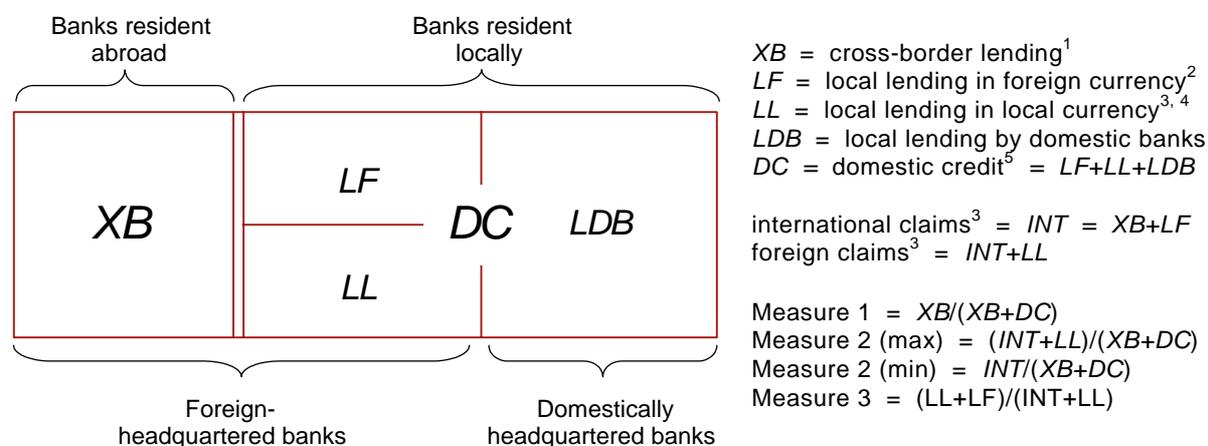
The objective is to estimate the fraction of total credit to resident *non-bank* borrowers that is provided by foreign-headquartered banks. The denominator of the targeted ratio, total credit to non-bank borrowers, corresponds to the large rectangle in the figure below. This is calculated as $(XB + DC)$, where cross-border credit (ie credit extended directly from abroad), XB , is taken from the BIS locational statistics, and domestic credit extended by resident institutions, DC , is taken from the IMF's International Financial Statistics.

The numerator of this ratio, ie the estimated total credit to non-banks from foreign-headquartered banks, is more problematic. Ideally, this should equal the sum of cross-border credit (XB) and credit granted by local offices of foreign banks, in local (LL) and foreign (LF) currency (see figure). Unfortunately, the available data do not allow this to be calculated exactly because of an incomplete sectoral breakdown in the statistics (see below). Nevertheless, the data do suggest two alternatives to the ideal measure.

The first alternative, Measure 1, is an estimate of the share of total bank credit to non-banks that is obtained directly from abroad. This measure equals $XB/(XB + DC)$ and may underestimate the role of foreign institutions because it ignores local lending by foreign bank offices located in the country. At the same time, Measure 1 may overestimate the role of foreign institutions if domestic banks' offices located abroad account for a significant share of the cross-border credit received by domestic non-bank borrowers. The so-called "round-tripping" of loans, which characterised Japanese banks' international lending behaviour until the late 1990s, is a case in point (see below).

The second alternative, Measure 2, relies on the BIS consolidated banking statistics and includes locally extended credit from foreign-headquartered banks. Owing to data limitations,

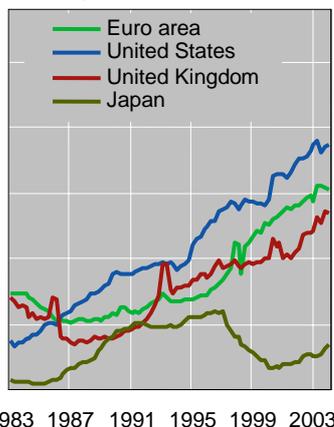
National market for bank credit



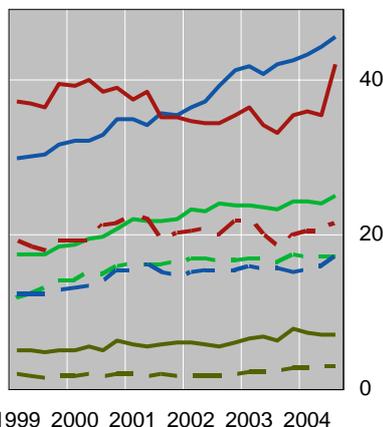
¹ BIS locational banking statistics. ² BIS locational banking statistics by lender nationality. ³ BIS consolidated banking statistics. ⁴ The statistics do not disaggregate LL by vis-à-vis sector. ⁵ IMF, *International Financial Statistics*.

Foreign banks' presence in national lending markets¹

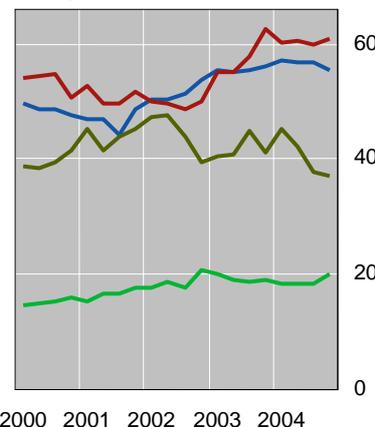
Measure 1: cross-border lending²



Measure 2: foreign lending³



Measure 3: local lending by foreign banks⁴



¹ By vis-à-vis region. ² As a fraction of total credit to non-bank residents: Measure 1 = $XB/(XB+DC)$. ³ Consolidated foreign lending, as a fraction of total credit to non-bank residents. The dashed lines plot Measure 2 (min) = $INT/(XB+DC)$; the solid lines plot Measure 2 (max) = $(INT+LL)/(XB+DC)$. ⁴ As a fraction of total foreign credit to bank and non-bank residents: Measure 3 = $(LL+LF)/(INT+LL)$.

Measure 2 is best considered in two versions, which provide an upper and a lower bound for the fraction of bank credit extended by foreign institutions to domestic non-banks. The larger Measure 2 (max) is constructed as $(INT + LL)/(XB + DC)$.[Ⓞ] In this measure, local claims in local currency, *LL*, complement “international claims”, *INT*, which include cross-border claims in all currencies and local claims in foreign currencies. Unfortunately, the data on *LL* are not broken down by sector and, thus, also include lending to banks (excluding inter-office bank claims). This can lead to an overestimation of the importance of foreign lending in total credit to non-banks. Measure 2 (min), constructed as $INT/(XB + DC)$, provides a lower bound for the true share of foreign lending to non-banks; it would match that share exactly if all local claims in local currency, *LL*, were on resident banks.

A third indicator of foreign bank participation, Measure 3, relies only on the BIS international banking statistics, and pertains to all borrowers (both bank and non-bank). This indicator, which equals $(LL + LF)/(INT + LL)$, captures the extent to which foreign-headquartered banks rely on local offices for their total credit (in both foreign and domestic currency) to a particular country. Local lending in foreign currencies, *LF*, is taken from the BIS international banking statistics, which provide a breakdown of local lending by parent country of resident banks.

Foreign bank participation in major industrialised countries

Applying the above measures to the United States, the United Kingdom, Japan and the euro area countries reveals that the aggregate role of foreign banks in national markets has been on the rise over the last two decades. Measure 1 suggests that cross-border claims have been increasing as a share of total lending in the 15 industrialised economies, reaching 13.5% in the most recent quarter, up from 10% four years earlier and 4% in 1987. Thus, the purely domestic statistics provided by the IMF currently capture less than 87% of total credit to non-bank borrowers in the major industrialised countries.

Incorporating local lending by foreign banks raises the indicator of foreign bank participation in national markets. Specifically, switching from Measure 1 to Measure 2 (min), which accounts for local lending by foreign banks in non-domestic currencies, adds on average 1 percentage point to the cross-border measure and preserves its upward path. Assuming that all the local lending (in all currencies) is extended to non-banks, ie considering Measure 2 (max), almost doubles the aggregate indicator of the relative importance of foreign bank claims. Finally, Measure 3 reveals that lending granted locally stood at 40% of total foreign bank credit to all sectors at end-2004, up from 35% at the beginning of 2000.[Ⓞ]

[Ⓞ] This measure is suggested by R N McCauley, J S Ruud and P D Wooldridge, “Globalising international banking”, *BIS Quarterly Review*, March 2002. [Ⓞ] Elsewhere, this chapter reports a similar trend in emerging Europe and Latin America.

These aggregate results mask substantial differences across national economies. Measure 1 indicates that cross-border banking in the United States, which currently accounts for 19% of total credit to non-banks in the country, has been considerably larger than in the euro area and the United Kingdom since the second quarter of 1987 (see graph, left-hand panel). In the euro area, the steadily increasing share of cross-border lending has been driven by banks located in the region; intra-euro area lending increased sharply after the introduction of the common currency, accounting for 63% of cross-border lending to the region in the most recent quarter, up from 40% at end-1983. Japan is an outlier country, as cross-border lending has accounted for less than 5% of total credit to non-banks located there. The hump in the measure for Japan, which persisted for most of the 1990s, was partially the result of Japanese banks routing their loans to domestic residents through offshore centres, and thus overestimates the share of cross-border lending by foreign-headquartered banks.

Accounting for local lending by foreign banks reveals pronounced differences in their penetration of the US and UK lending markets, on the one hand, and the euro area markets, on the other. Measures 2 and 3 both indicate that local lending is a substantial share of total foreign credit to non-banks in the United Kingdom. In particular, Measure 2 (min) implies that foreign banks have extended at least 19% of the credit received by non-banks in the country since the first quarter of 2000. This is higher than the average share of 11% over the same period under Measure 1, which considers only credit originating abroad. Likewise, local offices seem to operate a sizeable share of the claims of foreign banks on the United States, although it is quite uncertain what portion of these operations have targeted non-banks: Measures 2 (min) and (max) have on average been 22 percentage points apart since mid-1999.⁶ Local lending has the smallest effect on the indicators of foreign bank penetration in the euro area countries. This is consistent with the message of Measure 3 that a stable but small share of total foreign claims on all borrowers in the region (20% in the most recent quarter) has been extended locally.

⁶ The US international banking statistics do not allow one to distinguish local claims in foreign currencies (LF) from local claims in local currencies (LL). Both items are reported under LL, which is not broken down by vis-à-vis sector. This depresses Measure 2 (min) but raises Measure 2 (max) for non-bank borrowers.

Both US and Spanish banks, the region's largest creditor banking systems, have contributed to this shift, although differences in their regional lending patterns are apparent. The international claims portfolio of both banking systems has shifted away from Argentina and towards Mexico since 2000.⁶ Overall, Spanish banks' international claims on the region have gravitated away from short-term lending, reflecting the scaling-back of short-term credit to Argentina and a (relative) rise in longer-term international claims on Brazil, Mexico and Venezuela since 2002 (Graph 2.5, centre panel). Conversely, even as US banks have reduced short-term international claims on residents of Argentina, their overall international claim portfolio vis-à-vis the region has shifted towards shorter-term lending over much of this period (Graph 2.5, right-hand panel).⁷

⁶ Spanish banks' international claims on Argentina declined from 40% of their total international claims on the region in the second quarter of 2000 to 12% in the most recent quarter. At the same time, their international claims on Mexico increased from 18% to 48%.

⁷ The outstanding stock of US banks' international claims on Brazil, Colombia and Venezuela has in each case fallen since end-2000. These banks' international claims on Argentina dropped from 19% of their total international claims on the region to 5% over this period, while their claims on Mexico rose from 27% to 46% in the first quarter of 2004, and fell to 40% in the most recent quarter.

Cross-border bank flows to emerging economies									
Exchange rate adjusted changes in amounts outstanding, in billions of US dollars									
	Banks' positions ¹	2002	2003	2003	2004				Stocks at end-Dec 2004
		Year	Year	Q4	Q1	Q2	Q3	Q4	
Total ²	Claims	-37.0	64.9	14.7	67.9	26.3	-0.9	35.4	1,180.2
	Liabilities	-45.9	72.1	43.1	107.2	20.9	50.0	19.8	1,457.0
Argentina	Claims	-11.8	-8.5	-2.1	-2.6	-1.1	-1.1	-0.4	18.9
	Liabilities	0.0	-0.8	0.7	0.3	0.1	-0.2	-0.6	24.8
Brazil	Claims	-11.2	-7.2	-9.1	1.8	-4.0	-2.9	-2.2	77.3
	Liabilities	-8.0	14.4	-3.4	5.0	-3.6	-7.0	0.9	53.2
China	Claims	-12.4	13.5	-1.0	13.9	10.0	-3.0	2.4	86.7
	Liabilities	-3.6	-6.4	1.8	21.6	20.5	-2.6	-14.3	116.4
Czech Rep	Claims	2.3	3.7	1.7	-1.7	0.8	0.4	3.1	24.1
	Liabilities	-3.7	-2.4	-0.9	-2.6	2.5	-0.6	1.5	11.4
Indonesia	Claims	-6.0	-4.6	-0.8	0.3	-0.9	0.2	0.7	30.3
	Liabilities	-2.4	0.2	0.3	-0.2	-1.3	-0.1	-0.6	10.4
Korea	Claims	8.2	-1.0	0.1	14.3	-8.5	0.8	5.5	91.0
	Liabilities	0.5	7.3	12.1	21.7	-4.8	2.8	-6.3	54.3
Mexico	Claims	3.1	-0.8	-0.9	7.5	-0.6	-8.0	0.4	65.2
	Liabilities	-11.4	6.2	-0.1	4.0	-0.7	-6.2	-1.8	58.1
Poland	Claims	2.9	3.3	0.4	2.4	2.0	1.6	-0.2	41.8
	Liabilities	-3.1	-0.1	1.2	3.0	3.9	-0.2	4.5	31.1
Russia	Claims	3.6	12.1	5.8	3.4	-0.3	-1.8	7.6	62.3
	Liabilities	9.6	16.2	7.9	5.0	7.8	5.5	5.4	83.8
South Africa	Claims	-0.4	-1.2	-0.7	-0.1	0.5	-0.3	0.2	19.7
	Liabilities	2.7	9.7	2.8	3.9	1.6	0.7	0.5	39.8
Thailand	Claims	-5.0	-1.6	-1.6	-1.0	-0.4	1.7	-0.1	19.5
	Liabilities	-4.6	5.7	3.2	-1.5	1.2	1.7	0.9	20.8
Turkey	Claims	-2.8	5.3	0.1	4.1	3.4	0.0	1.3	55.0
	Liabilities	0.0	-0.4	0.9	2.9	0.9	1.1	1.9	28.2
<i>Memo:</i>									
New EU countries ³	Claims	9.2	20.9	8.5	3.9	6.6	8.4	11.5	160.8
	Liabilities	-5.9	-0.5	0.8	3.2	4.8	0.1	9.4	82.4
OPEC members	Claims	-9.9	-6.5	2.0	9.2	1.7	5.0	5.2	156.1
	Liabilities	-8.8	-15.1	12.2	16.5	-1.7	24.2	-5.3	291.8

¹ 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. ² All emerging economies. For details on additional countries, see Tables 6 and 7 in the Statistical Annex. ³ Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

Credit to EU member countries drives inflow to emerging Europe

A sharp rise in claims on emerging Europe led to a second consecutive net inflow of funds. Total claims on the region jumped by \$25 billion, with strong growth in claims on borrowers in the new EU member countries and Russia. This pushed claims on the region to \$318 billion, or 27% of total claims on emerging economies, up from 25% in the previous quarter and 24% a year

earlier. Liabilities vis-à-vis emerging Europe also rose, yielding a net inflow of \$6.5 billion.

Countries that have recently joined the European Union accounted for just under half of the new claims on emerging Europe, with much of the rest extended to Russia. Credit from banks in Germany, Austria and the Netherlands contributed to the \$11 billion rise in claims on the new EU member states. Over \$4 billion of this reflected increased investment in debt securities issued by residents of these countries, particularly Hungary and Poland. Elsewhere, cross-border claims on Russia experienced their largest quarterly increase ever recorded in the BIS statistics. Total claims on the country rose by \$8 billion, with new loans to both the bank and non-bank sectors being extended primarily by banks in the United Kingdom and Germany.

Funds placed abroad primarily reflect central bank activity

Banks in emerging Europe continued to place deposits in BIS reporting banks. In the most recent quarter, deposit liabilities to the region's banking sector rose by \$19 billion, as banks in Russia, Poland, the Czech Republic and Hungary deposited funds abroad. The \$5 billion rise in deposit liabilities vis-à-vis banks in Russia, primarily US dollar- and euro-denominated deposits, coincided with a 32% jump in the stock of Russia's official reserve assets, which reached \$121 billion in the fourth quarter. An estimated 38% of these assets were deposited in banks abroad, suggesting that almost two thirds of the \$75 billion stock of deposit liabilities vis-à-vis banks in Russia were central bank deposits.⁸

Lending trends in emerging Europe during the last decade ...

Over the longer term, the growth of claims on emerging Europe has masked two patterns of lending across the region. The BIS consolidated statistics indicate that foreign claims on emerging Europe, which include both cross-border and local lending, have increased by a factor of 4.6 since mid-1994 to reach \$545 billion at the end of 2004. It is noteworthy that borrowers from new EU member states (mainly Poland, Hungary and the Czech Republic) accounted for 77% of this increase. In contrast, BIS reporting banks' claims on Russia and Turkey grew somewhat less over the last 11 years (Graph 2.6, left-hand panel).⁹ Foreign lending to these two countries rose steadily through most of the 1990s but then plummeted as a result of local financial crises. The outstanding stocks of foreign claims on Russia and Turkey have tracked each other closely over the last four years, and have recovered somewhat since the trough in 2002. Nevertheless, these claims currently account for only 22% of total foreign lending to the region, down from 54% at end-1994.

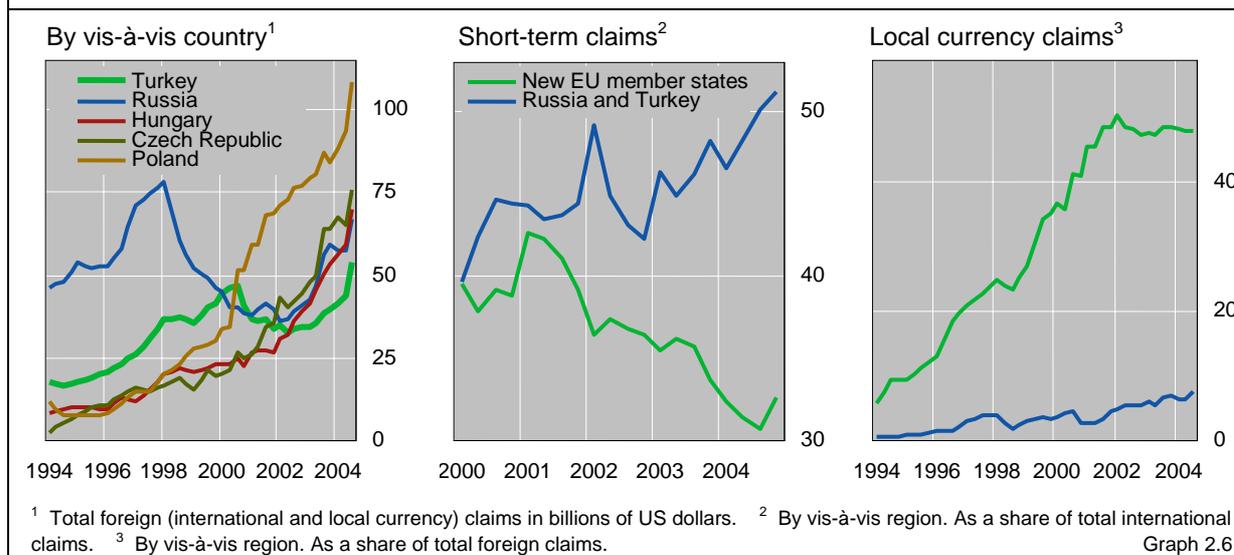
... distinguish new EU member states from Russia and Turkey

The geographical redistribution of lending to emerging Europe has been mirrored by trends in the maturity of the exposures to the region, and by changes in the portion of foreign lending conducted locally. As shown in the centre panel of Graph 2.6, short-term credit (ie claims with a remaining maturity

⁸ The estimate is based on the end-January 2005 figures for Russia's total official reserve assets and bank deposits held abroad as reported by the Russian central bank.

⁹ Since 1994, exposures to Russia, Turkey and the new EU member states have generally accounted for more than 85% of the claims of BIS reporting banks on emerging Europe.

Consolidated claims on emerging Europe



of up to one year) was distributed evenly between the two groups of countries in the region at the beginning of 2000. Since then, however, such credit has increased by about 10 percentage points as a share of total international lending to Russia and Turkey, while dropping by a similar relative amount in the new EU member states. In parallel with these developments, claims transacted locally and in local currency grew as a share of total foreign claims on the new EU member states, and have plateaued at just under 50% since the second quarter of 2001 (Graph 2.6, right-hand panel). By contrast, virtually all of the foreign lending to both Russia and Turkey has remained cross-border and in foreign currencies.¹⁰

Despite the similarity in the patterns of foreign lending to Russia and Turkey, there are differences between these countries from the perspective of international lenders. Russia doubled its current account surplus over the last two years and maintained its status as a net creditor to the international banking system (with the stock of net cross-border claims of BIS reporting banks at -\$22 billion in the fourth quarter of 2004). By contrast, Turkey, which has been a net debtor to BIS reporting banks since end-1996, saw its current account deficit surge over the last two years. These differences are reflected in the fact that BIS reporting banks' claims on Russia tend to be longer-term and have increased faster than those on Turkey since mid-2002.

Banks in China and Korea bring their deposits home

A net inflow to Asia-Pacific in the fourth quarter was primarily the result of deposit repatriations by several of the largest borrowers in the region. This

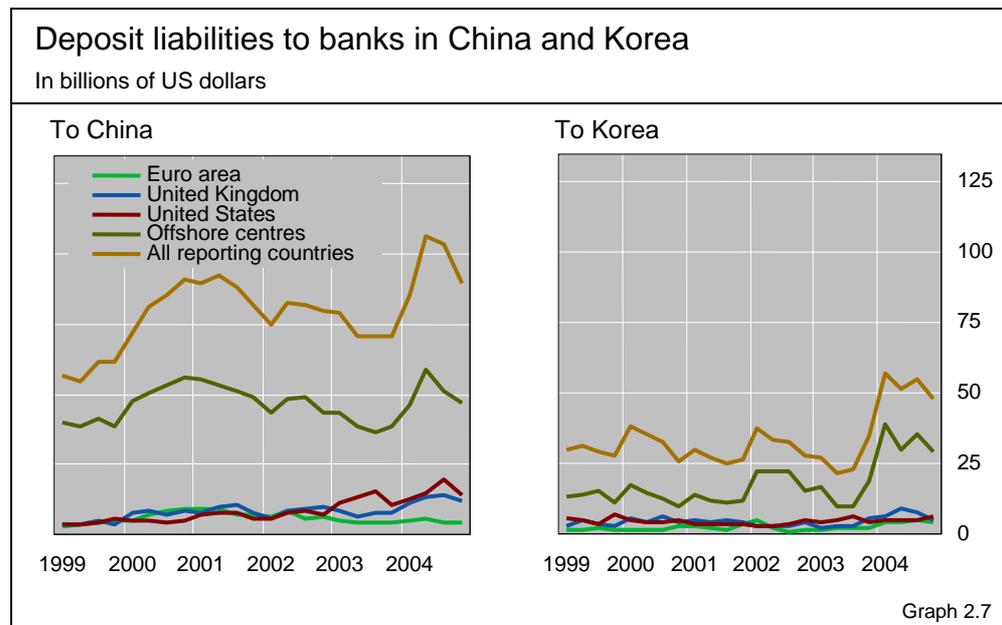
¹⁰ The principal creditors to emerging Europe (German, French, Italian and Belgian banks) have all reorganised their claims on the region in a similar way. Furthermore, banks headquartered in Germany, which currently account for 30% of foreign lending to emerging Europe, have transferred 36% of their outstanding claims on Russia and Turkey to non-bank guarantors. This contrasts with the virtual absence of such risk transfers in 1999.

inflow of funds from the international banking system occurred in spite of the overall capital outflow and current account surpluses in many countries in Asia-Pacific. On balance, BIS reporting banks' liabilities to banks in the region dropped for the first time in six quarters, by \$10 billion, as large deposit repatriations by banks in China and Korea offset increased placements abroad by banks in Malaysia, Taiwan (China)¹¹ and, to a lesser extent, India. In some cases, the change in deposit liabilities seemed to reflect central bank activity. New credit to borrowers in the region was muted. The rise in claims that did materialise (\$8 billion) primarily reflected investment in equity and debt securities, and pushed total claims on Asia-Pacific to \$404 billion, or 34% of total claims on emerging markets (from 35% in the previous quarter).

Banks in China and Korea draw down deposits in BIS reporting banks ...

The banking system in China drew down its offshore deposits the most. Chinese banks repatriated \$16 billion in deposits, primarily from BIS reporting banks in offshore centres, the United States and the United Kingdom (Graph 2.7, left-hand panel). One possible factor behind this repatriation was tighter restrictions adopted in July 2004 which limited the ability of foreign banks operating in China to borrow foreign currency offshore. As a result, banks in China may have been repatriating the funds previously deposited in banks abroad to meet demand for dollar credits in China. Deposit liabilities vis-à-vis all sectors in China fell to \$116 billion, or 25% of total liabilities vis-à-vis the region. The currency distribution of deposits repatriated by banks in China closely matched that of existing deposits. As a result, the estimated US dollar share of total deposit liabilities vis-à-vis banks in China remained at 67%, unchanged from the previous quarter, and the shares of other currencies changed little.¹²

Banks in Korea also repatriated deposits in the fourth quarter: \$7 billion from BIS reporting banks in offshore centres and an additional \$3 billion from



¹¹ Hereinafter Taiwan.

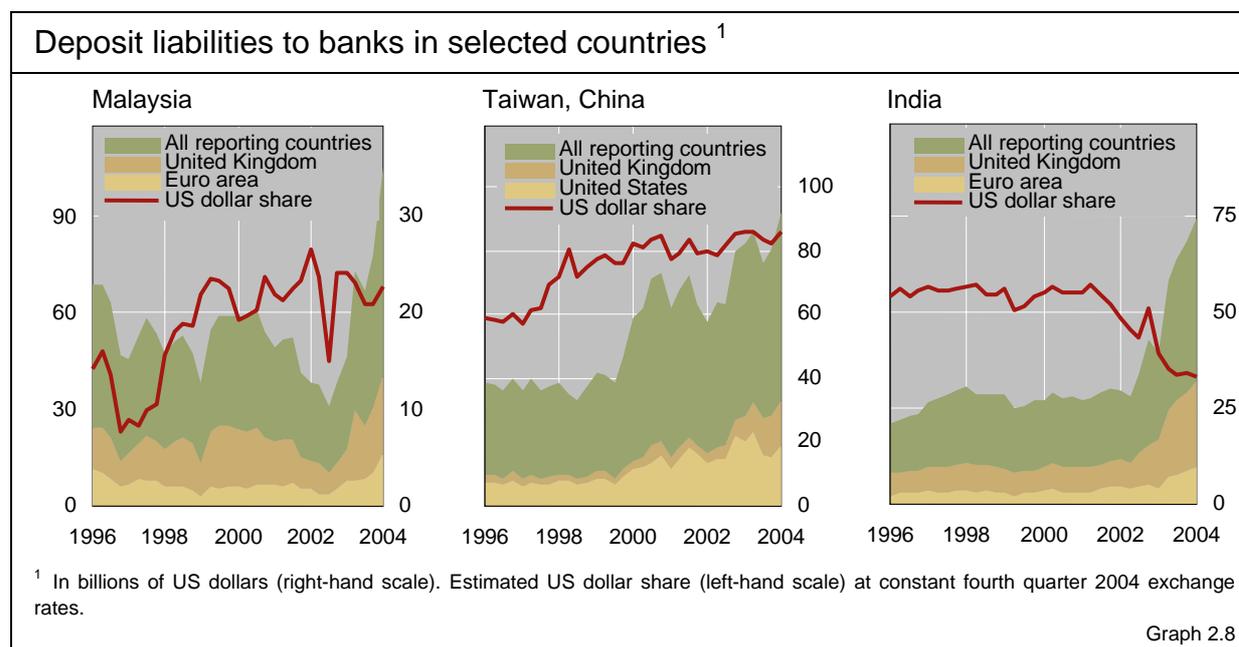
¹² See next footnote.

banks in the United Kingdom (Graph 2.7, right-hand panel). At the same time, they increased deposits in banks in the United States and Switzerland by \$1 billion and \$2 billion respectively. As a result, the estimated share of US dollar deposit liabilities in total liabilities vis-à-vis banks in Korea rose from 78% in the previous quarter to 89% in the most recent quarter.¹³ On balance, deposit liabilities of BIS reporting banks vis-à-vis the Korean banking sector fell to \$48 billion in the fourth quarter. An estimated 51% of these deposits are accounted for by Korea's foreign exchange reserves held as bank deposits abroad.¹⁴

In contrast to China and Korea, banks in Malaysia increased their deposits in BIS reporting banks. In particular, the outstanding stock of foreign exchange reserves placed in banks abroad by the Malaysian central bank grew by \$6 billion to \$15 billion. This contributed to the \$5 billion rise in BIS reporting banks' deposit liabilities vis-à-vis Malaysia's banking sector, with increased US dollar-denominated deposits placed in banks in the United Kingdom, the euro area and offshore centres (Graph 2.8, left-hand panel). As a result, the estimated share of US dollar-denominated deposit liabilities vis-à-vis the Malaysian banking sector rose from 63% in the previous quarter to 69% in the fourth quarter.¹⁵

... while banks in Malaysia, Taiwan and India place funds abroad

Elsewhere, banks in Taiwan and India also placed funds abroad. A \$6 billion rise in deposit liabilities vis-à-vis banks in Taiwan pushed total



¹³ These estimates should be interpreted with caution because as much as 51% (59%) of the deposit liabilities vis-à-vis banks in China (Korea) are placed in reporting countries that do not provide a currency breakdown. See the international banking chapter of the March 2005 *BIS Quarterly Review* for a discussion.

¹⁴ The estimate is based on the reported end-January 2005 figures for Korea's foreign exchange reserves held as bank deposits abroad (\$25 billion).

¹⁵ See next footnote.

deposit liabilities to banks in the country to \$59 billion (Graph 2.8, centre panel). This placement of deposits coincided with an increase in the US dollar value of Taiwan's total foreign exchange reserves, which rose by \$9 billion in the fourth quarter of 2004. Similarly, banks in India placed \$1.5 billion in sterling deposits in banks in the United Kingdom and the euro area, taking total deposit liabilities vis-à-vis the Indian banking sector to \$42 billion (Graph 2.8, right-hand panel). The estimated US dollar share of deposit liabilities to banks in India remained relatively stable compared to the previous two quarters, at 41%.¹⁶ This placement of deposits abroad seems to have been partially the result of central bank activity. India's foreign exchange reserves held as bank deposits abroad increased from \$32 billion in the third quarter of 2004 to \$35 billion in the fourth, or 83% of total deposit liabilities of BIS reporting banks vis-à-vis the Indian banking sector.

¹⁶ A relatively small share of deposits from banks in Malaysia and India (12% each) is placed in BIS reporting countries that do not report a currency breakdown. The corresponding share for banks in Taiwan is 32%.

International syndicated credits in the first quarter of 2005

Blaise Gadanecz

Having reached an all-time high in the fourth quarter of last year, signings of international syndicated credit facilities were relatively subdued in the first quarter of 2005. Volumes totalled \$421 billion, which nevertheless represents a significant year-on-year increase. Activity in the first quarter of each year is normally low; on a seasonally adjusted basis, lending actually grew by 6% from the previous quarter, sustained by refinancing and merger-related deals.

Financing conditions remained relatively favourable in the first quarter for borrowers from industrialised countries. While average Libor spreads on US facilities picked up slightly, average Euribor spreads on European deals fell. Average maturities continued to lengthen, while the percentage of secured facilities remained low, at 9%. Refinancing in western Europe as well as US and European merger-related deals continued to account for a significant part of total activity. However, the largest loans were European: Telecom Italia was granted a €12 billion multi-tranche facility to finance a merger; Électricité de France and Sanofi-Aventis each obtained €8 billion for refinancing and commercial paper support. Despite the profit warning and expected credit downgrade of General Motors, signings by the automobile sector were sustained (dropping sharply from the level of the fourth quarter of 2004, but displaying strong year-on-year growth).

There are signs that banks have been willing to commit increasing amounts of funds in the international market for syndicated credits. Indeed, the average amount provided per syndicate participant has increased during the past two years from \$30 million to \$50 million. At the same time, more banks have been competing for senior arranger positions – senior titles within syndicates where returns are higher (in the form of fees) than for junior participants. The ratio of senior arrangers to junior providers per loan has been on the increase, rising to an all-time high of 0.6 in the first quarter of 2005, although this may also reflect “title inflation”.

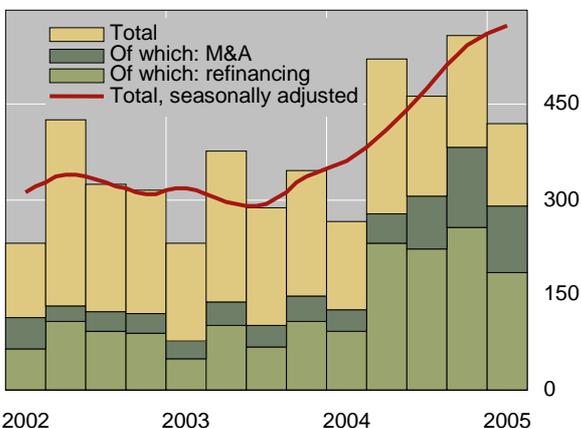
At \$29 billion, lending to emerging markets was weaker than in the previous quarter but still grew year-on-year. Activity in Asia was boosted to \$9.5 billion by Korean borrowers, especially from the banking, retail, transport and shipping sectors. Fund-raising by a South African government financial entity, as well as refinancing by gold and diamond mining firms in the country, brought lending to the Africa and Middle East region to a high of \$9 billion. A Mexican oil corporation rolled over \$4 billion, maintaining Latin American volumes at high levels.

Signings by eastern European borrowers were the lowest since the first quarter of 2003, falling to \$3.5 billion. The largest recipients were Russian telecoms firms as well as banks, which were granted facilities at slightly higher spreads than during the previous quarters. Libor spreads on eastern European loans, which had been decreasing since the beginning of 2003, rose significantly in the first quarter.

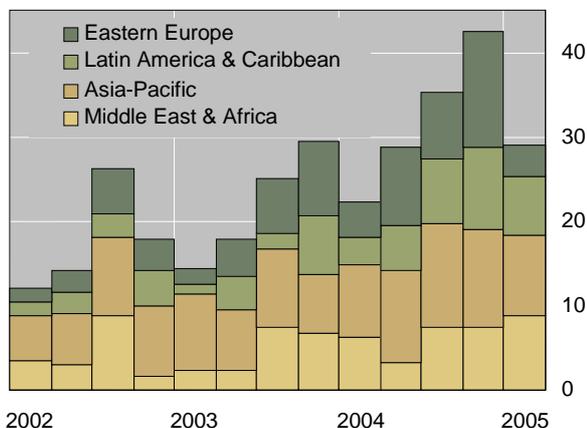
Signings of international syndicated credit facilities

In billions of US dollars

Total signings



Signings by emerging market entities



Sources: Dealogic Loanware; BIS.

3. The international debt securities market

Gross issuance of bonds and notes in the international debt securities market amounted to \$1,055 billion in the first quarter of 2005, up by 7.3% over the same quarter in the previous year (Table 3.1). Building on the pace of record issuance in 2004, borrowers continued to have easy access to international credit markets and to enjoy favourable financing conditions, as spreads remained low on a historical basis during the quarter despite widening towards the end of March. Gross issuance by euro area nationals and sovereigns was particularly strong. Global net issuance also rose, from \$426.1 billion to \$492.4 billion (Table 3.2). Whereas net issuance increased in the euro area and emerging markets, it fell in the United States and in offshore centres.

Euro area issuance rises again

Euro area issuance increases for third consecutive quarter

Gross issuance of bonds and notes in the international market by euro area entities rose for the third straight quarter, by 48.8% on a quarterly basis. Increases took place in all euro area economies except Ireland and Luxembourg. The rapid expansion in borrowing cannot be explained by seasonal or valuation effects. Gross issuance in the euro area tends to be relatively high during the first quarter of the year, yet the rise this year was particularly large (22% higher than in the first quarter of 2004). Furthermore, with the exchange rate of the euro vis-à-vis the dollar having depreciated by 4.8% during the first quarter, the increase in issuance reflects a jump in issuance in euros by euro area nationals rather than currency conversion. Total gross issuance of all debt securities (bonds and notes plus money market securities) also went up, to \$814 billion.

Net issuance also rises despite economic weakness

Net issuance of bonds and notes by euro area entities also increased rapidly in the first quarter, by 27.1%, and net issuance of all debt securities rose by 39%. These growth rates are perhaps surprising given the ongoing weakness in the euro area economy as a whole. However, the pattern of issuance across countries largely reflects the performance of the various national economies during the quarter. For example, net issuance increased most in Germany, which was experiencing strong growth, whereas a drop in net issuance in Italy and Portugal coincided with slower growth. The proceeds from new net issuance may also have been used for balance sheet

Gross issuance in the international bond and note markets							
In billions of US dollars							
	2003	2004	2004				2005
	Year	Year	Q1	Q2	Q3	Q4	Q1
Total announced issues	2,885.3	3,300.9	983.1	768.8	726.1	822.9	1,054.5
Bond issues	1,610.9	1,786.6	570.5	402.5	378.2	435.5	575.1
Note issues	1,274.4	1,514.3	412.7	366.4	347.9	387.4	479.5
Floating rate issues	962.7	1,257.3	337.4	306.4	285.2	328.2	346.9
Straight fixed rate issues	1,834.5	1,986.2	628.3	444.1	430.3	483.4	693.6
Equity-related issues ¹	88.1	57.4	17.4	18.3	10.5	11.2	14.1
US dollar	1,171.8	1,154.4	357.2	257.3	255.5	284.4	305.7
Euro	1,287.9	1,597.9	478.8	379.0	350.2	389.8	571.5
Yen	102.8	111.5	29.3	33.8	22.4	26.0	30.4
Other currencies	322.9	437.1	117.8	98.7	98.0	122.6	146.9
Developed countries	2,620.6	3,010.4	907.2	694.8	655.8	752.7	967.2
United States	739.5	771.9	249.8	167.9	169.6	184.6	216.1
Euro area	1,302.3	1,470.3	442.8	358.3	306.1	363.1	540.4
Japan	48.3	62.1	20.3	19.8	12.1	10.0	13.6
Offshore centres	31.7	41.7	7.2	7.0	13.9	13.5	11.6
Emerging markets	140.5	151.7	45.1	36.7	35.0	34.9	46.3
Financial institutions	2,280.4	2,687.3	788.5	603.5	606.5	688.9	854.5
Private	1,913.2	2,276.7	667.9	515.5	500.4	592.9	707.5
Public	367.1	410.7	120.6	88.0	106.1	96.0	147.0
Corporate issuers	269.8	271.3	61.9	72.2	62.3	75.0	58.5
Private	217.7	231.4	52.8	60.6	57.0	60.9	55.1
Public	52.1	39.9	9.0	11.5	5.3	14.0	3.4
Governments	242.6	245.2	109.1	62.9	35.9	37.3	112.0
International organisations	92.5	97.1	23.7	30.3	21.3	21.8	29.5
Completed issues	2,866.5	3,304.5	934.4	796.5	708.9	864.8	1,009.5
<i>Memo: Repayments</i>	<i>1,478.1</i>	<i>1,744.5</i>	<i>449.6</i>	<i>453.1</i>	<i>403.0</i>	<i>438.7</i>	<i>517.1</i>

¹ Convertible bonds and bonds with equity warrants.

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

Table 3.1

restructuring in some cases, as the incidence of shareholder-friendly activity began to pick up during the first quarter.

The share of net borrowing by all nationalities in euros rose in the first quarter, from 59% to 63% (Table 3.3). This mainly reflects the relatively large increase in borrowing by euro area nationalities, though some large issues in euros by nationals from other regions were also announced during the quarter, such as the Republic of Poland (see below).

Share of global net issuance in euros rises to 63%

In the past, there has typically been a positive relationship between a currency's strength and its share of international debt issuance (see the special feature on "Currency choice in international bond issuance" on page 53). For instance, all else equal, a 10% appreciation of the euro has tended to be associated with a 0.9 percentage point increase in euro issuance. Thus, in the light of the fact that the effective exchange rate of the euro has been high

Main features of net issuance in the international bond and note markets

In billions of US dollars

	2003	2004	2004				2005	Stocks at end-Mar 2005
	Year	Year	Q1	Q2	Q3	Q4	Q1	
Total net issues	1,388.4	1,560.1	484.7	343.3	305.9	426.1	492.4	13,380.1
Floating rate issues	384.3	639.5	152.4	163.5	129.7	193.9	99.5	3,646.3
Straight fixed rate issues	983.2	926.6	339.2	172.2	178.8	236.5	397.3	9,377.5
Equity-related issues	20.9	-6.1	-6.8	7.7	-2.7	-4.3	-4.4	356.2
Developed countries	1,283.2	1,432.8	447.5	311.4	276.6	397.3	456.9	11,936.1
United States	258.5	218.6	115.4	4.2	34.9	64.0	62.2	3,300.7
Euro area	733.1	781.7	215.8	205.6	139.8	220.5	280.9	5,940.7
Japan	-1.6	17.5	5.2	10.0	1.9	0.5	4.7	279.4
Offshore centres	16.3	22.2	0.4	4.4	8.5	8.9	2.5	154.5
Emerging markets	66.3	82.2	25.8	18.8	15.0	22.6	30.8	751.3
Financial institutions	1,104.0	1,303.9	385.0	275.0	278.0	365.8	389.6	9,888.0
Private	908.0	1,088.1	315.4	235.3	220.3	317.1	315.7	8,345.8
Public	196.0	215.8	69.6	39.8	57.7	48.7	73.9	1,542.2
Corporate issuers	110.3	74.7	8.9	11.6	11.3	42.9	14.3	1,559.6
Private	90.3	55.9	2.6	5.9	12.6	34.8	22.3	1,310.5
Public	20.0	18.8	6.3	5.7	-1.3	8.1	-8.1	249.1
Governments	151.5	158.7	79.9	47.9	10.8	20.1	86.3	1,394.3
International organisations	22.6	22.9	11.0	8.8	5.8	-2.7	2.1	538.1

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

Table 3.2

recently relative to its historical average, the rise in euro-denominated issuance is perhaps not surprising.

Supply feeds demand for duration

Demand for longer-maturity assets surges

The demand for long-dated securities has burgeoned in recent months. This has been driven, in part, by supervisory and regulatory actions in some countries requiring a better match in the duration of financial institutions' assets and liabilities. Pension funds, in particular, have been eager to acquire debt securities with long maturities. The heightened demand for longer-dated instruments also reflects, to some extent, a desire on the part of many investors to boost returns given the low level of yields on many default-free and credit-risky securities at shorter maturities, despite the greater risks associated with very long-term debt. Overall, this new-found demand for duration pushed long-term yields to near or below historical lows during the first quarter. As a consequence, some borrowers have taken advantage of the favourable pricing conditions and started to issue longer-dated paper.

Several long-dated issues from euro area entities ...

The number of issues with maturities of 40 years or above brought to the international market in the first quarter was a record high, although the total face value of these issues (in US dollars) was still below the amounts recorded in late 1997 and early 1998 (Graph 3.1). Many of the longer-dated issues were completed by entities from the euro area. The largest was from Agence France

Net issuance of international bonds and notes by region and currency ¹								
In billions of US dollars								
		2003	2004	2004				2005
		Year	Year	Q1	Q2	Q3	Q4	Q1
United States	US dollar	203.5	131.1	102.1	-27.0	4.9	51.1	41.0
	Euro	41.0	48.5	6.0	20.2	14.9	7.4	12.8
	Pound sterling	11.8	22.5	1.7	5.4	10.6	4.7	5.2
	Yen	1.2	4.8	1.3	1.7	1.5	0.3	-1.2
	Other	1.0	11.7	4.3	3.9	3.0	0.5	4.5
Euro area	US dollar	75.8	57.6	6.4	25.5	9.8	15.9	15.4
	Euro	627.6	656.5	188.2	157.5	115.4	195.3	235.2
	Pound sterling	13.5	32.6	6.4	12.6	8.2	5.3	12.0
	Yen	-9.5	3.1	1.7	3.8	0.6	-3.0	5.0
	Other	25.7	31.9	12.9	6.1	5.8	6.9	13.2
Others	US dollar	162.6	191.0	48.5	54.1	41.1	47.4	41.0
	Euro	116.7	218.5	65.1	43.0	62.6	47.8	62.1
	Pound sterling	60.4	79.2	22.9	19.1	8.2	29.0	30.4
	Yen	12.1	19.3	3.6	9.5	5.2	1.0	0.0
	Other	45.0	51.8	13.4	7.8	14.1	16.5	15.7
Total	US dollar	442.0	379.7	157.0	52.5	55.8	114.4	97.4
	Euro	785.2	923.5	259.4	220.8	192.9	250.5	310.1
	Pound sterling	85.8	134.2	31.1	37.1	27.0	39.0	47.6
	Yen	3.7	27.3	6.6	15.0	7.3	-1.7	3.8
	Other	71.7	95.4	30.7	17.9	22.9	23.9	33.4

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

Table 3.3

Trésor, a financing arm of the French government. With an issue size of €3 billion originally planned, the total market subscription was a far larger €19.5 billion. In the end, €6 billion (\$7.9 billion) of 50-year medium-term notes were issued on 28 February at a spread of 3 basis points over the benchmark 30-year obligations assimilables du Trésor (OAT). In fact, this was the largest single issue at any maturity in the international debt securities market during the period.

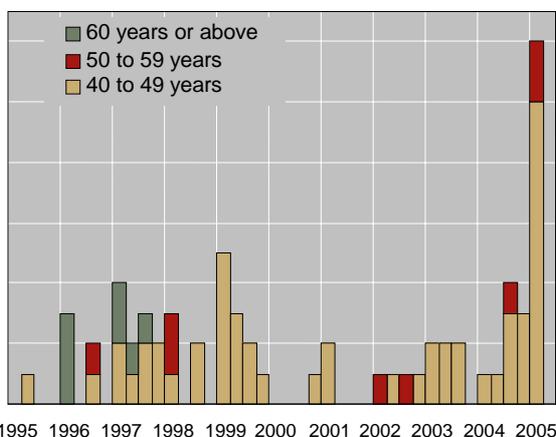
Several other large bonds with a maturity greater than 40 years were also completed during the quarter. Perhaps most notable amongst these was a 45-year Telecom Italia medium-term note with a face value of €850 million. This was priced at a spread of 106.4 basis points over the 50-year OAT. This issue was striking for two reasons. First, there have been only a few long-duration bonds issued by large corporates during the past decade in Europe or the United States, and previous issues tended to be of a much smaller size. Long-dated corporate bonds have met resistance in the past partly because of the scarcity of long-dated government paper for hedging interest rate risk. Second, Telecom Italia has a relatively low rating (Baa2 by Moody's) compared to typical issuers of very long-term debt. Since long-term credit risk can be especially difficult to assess for corporates of medium credit quality, the

... including
Telecom Italia

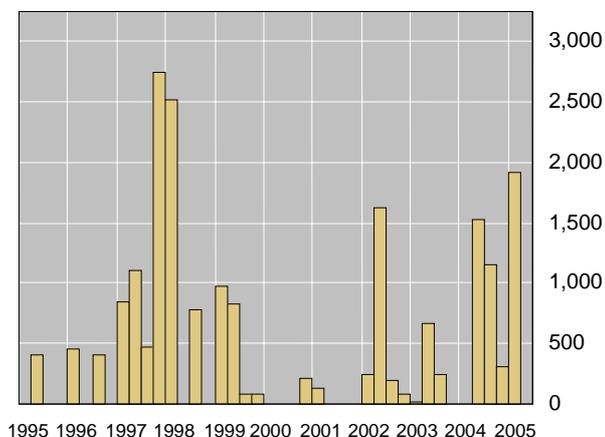
Long-maturity international bonds

Straight fixed rate, maturity of 40 years or above¹

Number of issues



Total announced issuance²



¹ Excluding asset-backed and collateralised issues. ² All maturities 40 years or above, in millions of US dollars.

Sources: Dealogic; BIS.

Graph 3.1

completion of this issue is yet further evidence of the heightened risk appetite of investors in the first quarter.

Mixed picture on US and Japanese issuance

Issuance by US financials increases sharply, but that by corporates declines

The gross amount of borrowing in the first quarter of 2005 by US entities in the international bond and note market increased on a quarterly basis; however, the level was still below the total posted during the first quarter of 2004. About 138% of the rise in gross issuance can be attributed to financial institutions. Fannie Mae and Federal Home Loan Banks continued to be amongst the largest US issuers, each with several issues of bonds and notes over \$3 billion in face value. Other financial institutions, such as Wells Fargo & Co and Goldman Sachs Group Inc, also completed large issues during the quarter.

Net issuance of bonds and notes by US entities fell by \$1.8 billion in the first quarter. However, a large rise in issuance of money market instruments by US financial institutions led to an increase in net borrowing of all international debt securities by 50% over the fourth quarter of 2004. By contrast, net issuance declined by 81% among non-financial corporations.

Issuance by Japanese nationals remains low

As with US nationals, gross issuance of bonds and notes by Japanese entities rose during the first quarter of 2005 (by 36%), but it declined on a year-over-year basis (by 33%). Net issuance of bonds and notes in the amount of \$4.7 billion during the period under review was only slightly below the \$5.2 billion posted a year earlier. Along with the rise in net issuance by Japanese nationals, the share of net issuance in yen once again became positive, but remains a negligible portion (0.8%) of the total international bond and note market. This increase in gross and net issuance cannot be attributed to revaluation effects; in fact, the yen depreciated by 4% vis-à-vis the dollar between 1 January and 31 March of this year.

As previously, banks and automotive companies were amongst the largest Japanese issuers in the international market last quarter. Notably, Resona Bank Ltd issued a €1 billion bond with a 10-year maturity. This was the first bond issued by Japan's fifth largest bank aimed at the euro investor market. Making the announcement in mid-February, the issuer was able to take advantage of the continued strong demand for BBB-rated paper in the euro market, and the bond was placed at a spread of 63 basis points over mid-swaps.

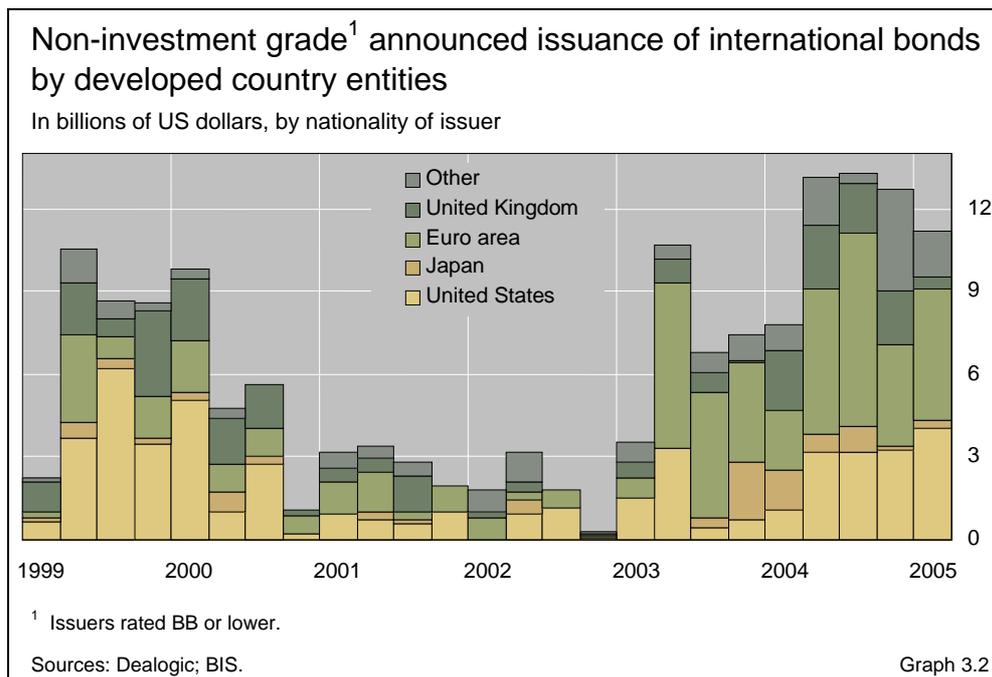
Strong risk appetite continues to drive high-yield issuance

Borrowing by high-yield entities in developed economies stayed at an elevated level during the first quarter. Financing conditions remained favourable for borrowers during January and February, as spreads on high-yield bonds fell to as low as 271 basis points and 234 basis points on the Merrill Lynch US and European high-yield indices, respectively. In March, with several negative news announcements surrounding the auto industry and a heightened risk of a downgrade of General Motors and Ford to junk status, spreads widened by about 80–90 basis points as the mood in credit markets decidedly turned for the worse (see the Overview). In the event, though, gross issuance (at \$11.2 billion) was down only slightly from the previous three quarters, and still above the level reached in any quarter between 1999 and 2003 (Graph 3.2).

Conditions remain attractive for high-yield borrowers

The largest issues brought to the market during the quarter came from firms across several sectors, including mining, forestry products, telecommunications, aerospace and textiles. Geographically, the largest amount of issuance was from entities in the euro area, totalling \$4.7 billion. This included three large issues from French firms, two of which are rated CCC+ by Standard & Poor's: Ray Acquisition SCA, an electronics outfit, issued a €600 million (\$795 million) bond, and Rhodia SA, a chemicals company,

Several large issues by French firms



issued a five-year bond for €500 million (\$650 million). The largest issue from North America was by Novelis Inc, a US metals firm in Canada, which brought a US dollar-denominated \$1.4 billion B/B1-rated bond to the market in late January. The bond had 10 years to maturity and was issued at a spread of 309 basis points over 10-year US Treasuries.

Emerging market borrowing surges amidst rising ratings

Gross issuance by emerging market economies at highest level since 1997

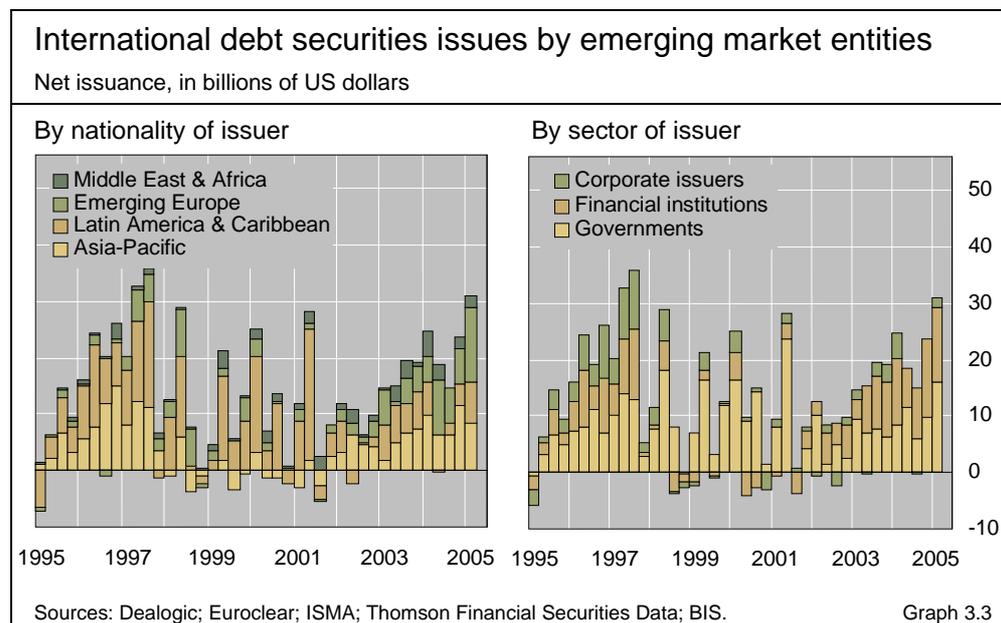
Gross issuance of bonds and notes in the international market by emerging market countries was up by 32.7% from the fourth quarter of 2004. The level of gross issuance was very high even taking into account seasonal factors, and the strong growth is particularly striking given that emerging market countries set a record for borrowing on the international market in 2004. Evidently, investors continued to have a strong appetite for emerging market debt, even though credit markets globally began to lose momentum towards the end of the quarter. A combination of improved macroeconomic fundamentals in emerging market countries broadly and low risk aversion amongst investors in emerging market debt meant that spreads on JPMorgan Chase's EMBI+ reached a historical low on 8 March. Moreover, despite widening by 54 basis points during the rest of March, spreads were still roughly equal to pre-Asian crisis levels at the end of the quarter.

Net issuance strongest by entities from emerging Europe

Net issuance of bonds and notes by emerging market countries also rose, by 36.3%, and was higher on a year-over-year basis as well. Most of the growth in net issuance was due to entities from emerging Europe and, to a lesser extent, Latin America (Graph 3.3). By contrast, net issuance declined in Asia. In a reversal from the previous quarter, net borrowing by governments of emerging market countries outpaced that by financial institutions.

Many large issues by Korean nationals

The largest Asian borrowers on the international market during the first quarter were mostly from Korea. Notably, two of the issues were denominated in euros, while two other large issues were in US dollars. Anecdotal evidence



suggests that euro-based investors have been relatively underweight on Korean debt compared to dollar-based investors. The Korea Development Bank, which has ratings of A– by Standard & Poor’s and A3 by Moody’s, issued a five-year floating rate note denominated in euros. The €500 million (\$655 million) note was placed at a spread of 30 basis points over three-month Euribor on 7 February. Korea First Mortgage No 4 Plc also issued a euro-denominated note, backed by residential mortgages, for €500 million.

The largest single issue from Asia was by the Republic of the Philippines. As market sentiment about the fiscal situation in the Philippines has wavered in recent quarters, the government has been less active in the international market. However, before receiving a two-notch rating downgrade by Moody’s in February, the government was able to complete a \$1.5 billion issue denominated in US dollars, with a maturity of 25 years, on 2 February.

Mexican and Brazilian entities were the largest net issuers from Latin America in the first quarter, with net borrowing of \$3.6 billion and \$2.6 billion, respectively. Moreover, Mexican corporations were the only non-public entities from the region with positive net issuance during the quarter. As was the case with Asia, two of the largest issues from Latin America were denominated in euros, one by a sovereign and one by a public oil company. The former, by the Republic of Venezuela, was a 10-year bond with a face value of €1 billion (\$1.33 billion) and a coupon of 7%. The latter was also a €1 billion (\$1.31 billion) medium-term note, issued by Pemex Project Funding Master Trust (and guaranteed by Petroleos Mexicanos-PEMEX). The government of Brazil issued two bonds denominated in US dollars, with face values of \$1.25 billion and \$1 billion on 4 February and 7 March, respectively. The Mexican government announced a \$1 billion 10-year dollar-denominated bond issue on 4 January at a spread of 145 basis points over 10-year US Treasuries. Soon after, Mexico’s sovereign credit rating was upgraded by two major rating agencies. On 6 January, Moody’s raised its rating of Mexico from Baa2 to Baa1, and on 31 January Standard & Poor’s boosted its rating from BBB– to BBB.

Governments of Venezuela, Mexico and Brazil are active

The governments of Poland, Turkey and Hungary were the largest issuers in emerging Europe. The Republic of Poland completed a euro-denominated medium-term note on 18 January with a face value of €3 billion. This is the largest single bond or note ever issued by the Polish government in the international market (in the past, other announcements of similar size have consisted of multiple tranches). One of the potential reasons for bringing such a large issue to the international market is an effort to fulfil the eligibility criteria for listing securities on the Euro MTS market, in which Polish issuers can participate once Poland becomes part of the euro currency union. The Republic of Turkey issued a \$2 billion bond denominated in US dollars, and the Republic of Hungary also issued a dollar-denominated bond, in the amount of \$1.5 billion. Both of these governments also announced euro-denominated issues in the amount of €1 billion each.

Poland completes a record issue of €3 billion

Along with the sovereign rating actions already mentioned above, Argentina, Chile, India, Indonesia, Russia, South Africa, Turkey and Venezuela all experienced rating upgrades by at least one major rating agency during the

Several sovereigns receive rating upgrades

first quarter, yet another signal of the positive investment environment faced by many emerging market borrowers. In particular, Russia's sovereign credit rating from Standard & Poor's crossed the investment grade threshold on 31 January, going from BB+ to BBB-. In the past, crossings of this threshold have tended to be anticipated in credit markets (see box). In the case of Russia, launch spreads had declined precipitously throughout 2004, foreshadowing the subsequent rating upgrade by Standard & Poor's.

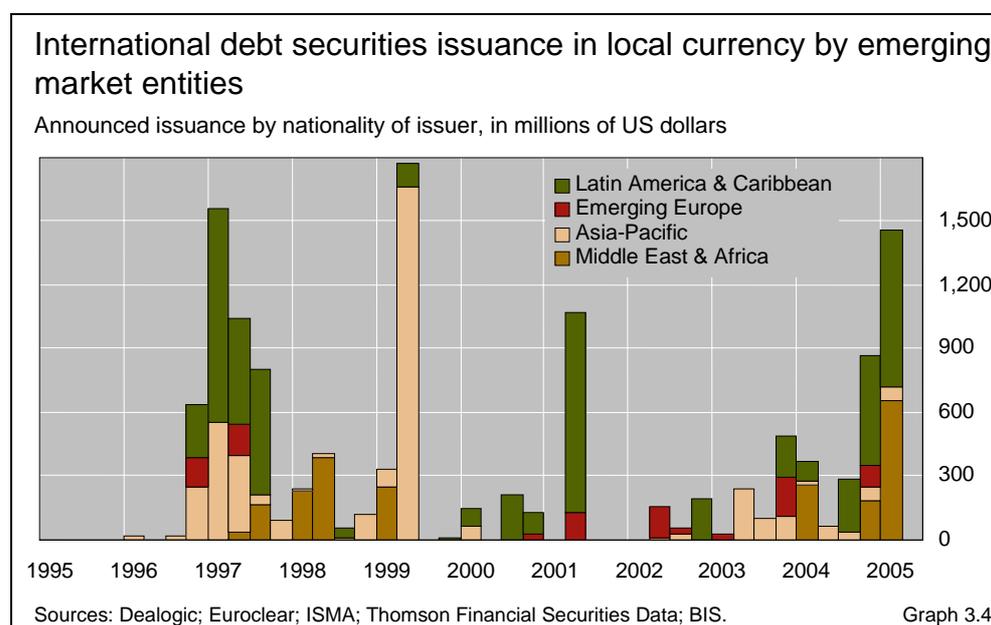
Local currency issuance by emerging markets picks up

Local currency issuance continues its upward trend

International issuance by emerging market entities in local currencies rose significantly during the first quarter, reaching the highest level (in US dollars) since the second quarter of 1999 (Graph 3.4). In fact, local currency issuance had been rising steadily since late 2003, with investors becoming more willing to buy less traditional securities as the yields on most sovereign and corporate debt fell to unusually low levels during this period.

Increases in local currency issuance were registered in the regions of Asia-Pacific, Latin America and the Middle East and Africa. The sharp rise in local currency issuance in Africa, to \$653 million from \$186.7 million in the previous quarter, can be attributed to two South African entities: Aveng Ltd, an industrial holding company, issued a convertible bond, and The Thekwini Fund 5 (Pty) Ltd issued several tranches of residential mortgage-backed securities. In Latin America, the Republic of Colombia issued two local currency bonds, where the coupon payments are to be made in US dollars. By contrast, there was no local currency issuance from emerging Europe in the international market during the period, although there has been substantial investment in the domestic bond markets by foreign investors.

Overall, the portion of local currency issuance from emerging market nationals in the international market is still quite small. Whether the recent pickup can be sustained, particularly in the face of an increase in risk aversion among global investors, remains to be seen.



The anticipation of sovereign rating migrations in bond spreads

Blaise Gadanecz

While the anticipation of future *corporate* rating migrations in current corporate spreads has been analysed in the extant literature, much less attention has been devoted to this issue from the angle of emerging markets' *sovereign* credit ratings. In addition, most of the existing literature on this topic deals with spreads on secondary, not primary, markets. In this box, we examine the relationship between emerging market sovereign bond spreads at issuance and subsequent migrations in sovereign ratings assigned by Standard & Poor's. We show that a significant relationship can be established empirically, which we interpret as evidence that emerging market sovereign rating migrations are anticipated in bond spreads. This effect can only be detected, though, when a rating migration involves crossing the investment grade threshold.

In order to assess to what extent future emerging market sovereign rating migrations are incorporated into sovereign spreads, we adapt the approach used for corporate loans by Carey and Nini (2004).^① We regress individual sovereign bond spreads in the primary market on a number of pricing factors established in the literature, plus variables that track any sovereign rating migration during the year following issuance. Because of its importance for investors, we explicitly consider the distinction between rating migrations involving a crossing of the investment grade threshold (ie the debtor country is upgraded from speculative to investment grade or vice versa) and simple rating moves not involving such a change. These two types of rating migrations are controlled for by separate dummy variables on the right-hand side. Because of differences in market reaction established in the literature,^② we look at upgrades and downgrades separately.

Sovereign bond spreads at issuance and subsequent rating migrations

Dependent variable: sovereign bond spreads (in basis points)	Effect on spread		Number of cases
	Coefficient	(standard error)	
Simple upgrade	26.1	(17.4)	136
Simple downgrade	31.9*	(16.4)	148
Upgrade from high-yield to investment grade	-141.9***	(32.0)	20
Downgrade from investment grade to high-yield	89.7**	(39.6)	25
Total number of observations			482
Adj R ²	0.59		
Adj R ² (without controls for rating migrations)	0.57		

Note: Estimates are obtained from an OLS regression, using data over the period 1993–2003. ***, ** and * stand for significance at the 1%, 5% and 10% level, respectively. In 153 cases, there was no rating change during the year that followed issuance. In addition to the dummy variables tracking subsequent sovereign rating migrations, several explanatory variables commonly used in the literature were included in the regression: bond size, maturity, guarantees, collateral, currency risk, the EMBI sovereign spread index, as well as solvency and liquidity indicators for the borrower country at the time of issuance.

Using this regression analysis framework, inferences can be made regarding the anticipation of sovereign rating migrations in spreads at issuance (see table). It appears that a subsequent rating downgrade (upgrade) involving a crossing of the investment grade threshold is systematically associated with higher (lower) spreads at issuance: 90–140 basis points. This suggests that investors incorporate credit information into prices ahead of rating changes, by demanding more (less) compensation in anticipation of higher (lower) future default risk.^③ By contrast, simple rating changes (those not involving a transition from investment to speculative grade or vice versa) seem not to be anticipated in bond spreads. The importance of crossing the investment grade threshold could be related to the changes it entails with regard to the eligibility of the debtor for inclusion into an index or a class of assets on which investors can take positions.

^① "Is the corporate loan market globally integrated? A pricing puzzle", Board of Governors of the Federal Reserve System, *International Finance Discussion Paper*, no 813, August. ^② See, for instance, M Micu, E M Remolona and P D Wooldridge, "The price impact of rating announcements: evidence from the credit default swap market", *BIS Quarterly Review*, June 2004. ^③ The results could, of course, also reflect announcements of rating changes by another rating agency (eg Moody's) around the time of debt issuance, or rating outlook changes announced by any of the agencies. However, we did not examine such possibilities.

4. Derivatives markets

In the first quarter of 2005 the turnover of exchange-traded derivatives returned to solid growth after two consecutive quarters of contraction. The combined value of trading in interest rate, stock index and currency contracts rose by 19%, to \$333 trillion. Activity was buoyant in all market segments, albeit stronger for interest rate products. In the interest rate segment, activity may have been influenced by increased uncertainty over long-term rates, as bond markets sold off in late February and early March. Trading in equity index contracts was probably boosted by a rally in major stock indices in February, after surprisingly strong corporate earnings reports and the announcement of several large mergers.

In the global over-the-counter (OTC) derivatives market, the most recent data show that positions expanded in the second half of 2004. Notional amounts outstanding were up by 12.8%, to \$248 trillion at the end of December. Gross market values rose by 43%, to \$9.1 trillion as of end-December, and by 40%, to \$2.1 trillion, after considering legally enforceable bilateral netting agreements. As a ratio to overall notional amounts, gross market values, after considering such netting agreements, rose only marginally, to 0.8%.

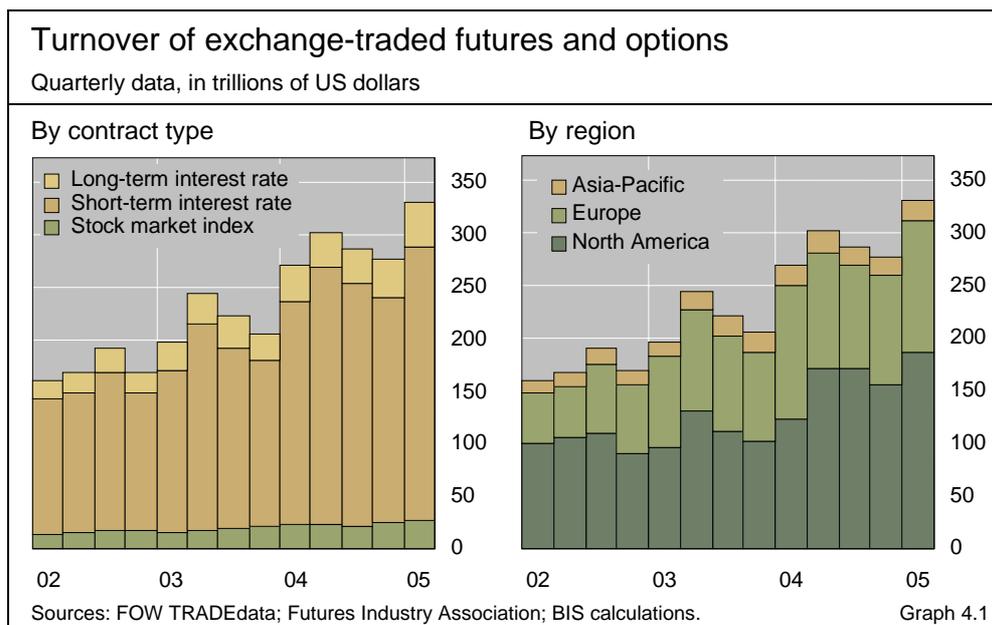
With this issue the BIS is starting to publish statistics on credit default swaps, the most dynamic component of the OTC segment.¹ As of end-December 2004 notional amounts outstanding of these instruments stood at \$6.4 trillion. According to data reported in the *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity* released on 17 March 2005, credit-related derivatives rose by 568% in the three years ending June 2004, nearly five times as rapidly as the overall OTC segment.

Buoyant activity along the yield curve

Rise in activity in short rate-related products ...

The aggregate turnover of exchange-traded fixed income contracts rose by 21% in the first quarter of 2005, to \$304 trillion. Increased activity derived from contracts on both short and long rates. Trading on money market contracts,

¹ With this issue, the BIS is also starting to publish concentration measures for OTC derivatives markets. These figures are commented on in the BIS press release *OTC derivatives market activity in the second half of 2004* (20 May 2005), available at www.bis.org.



including those on eurodollar, Euribor and euroyen rates, rose by 21% to \$262 trillion, with strong activity for both futures and options. For bond-related instruments, turnover was up by 20% to \$43 trillion (Graph 4.1).

Unlike the previous two quarters, activity in short-term contracts was strong in all regions. Trading increased by 23% in the United States, to \$159 trillion, with futures and options up by 17% and 38%, respectively (Graph 4.2). Business rose by 18% in Europe, to \$95 trillion, with activity in futures up by 13% and that in options by 41%.

The rise in business in short-term derivatives was not due to increased uncertainty over the course of monetary policy. Most investors expected that Fed tightening would continue in gradual increments over the next few months at least, as evidenced by unanimous federal funds rate target forecasts made by all participants in a Bloomberg survey. Significantly, business in federal funds products, which had fallen noticeably in the last part of 2004, shrank by an additional 1% and 14% in the first quarter of 2005 for futures and options, respectively. However, over the same period, activity in three-month eurodollar futures and options rose by 20% and 60%, respectively.

In the long-term interest rate segment, contracts expanded by 20% in the first quarter, to \$43 trillion. Business was up by 11% in North America to \$15 trillion, and by 27% in Europe to \$25 trillion (Graph 4.3). In the US market, activity might have been related to hedging needs in connection with an unexpected flattening of the curve in the early part of the period, followed by an abrupt sell-off at the long end in late February and early March. In European marketplaces, higher interest rate uncertainty may also have played a role – implied volatilities on swap rates were up 3 percentage points over the quarter, as macroeconomic news from Europe over the period was quite mixed.

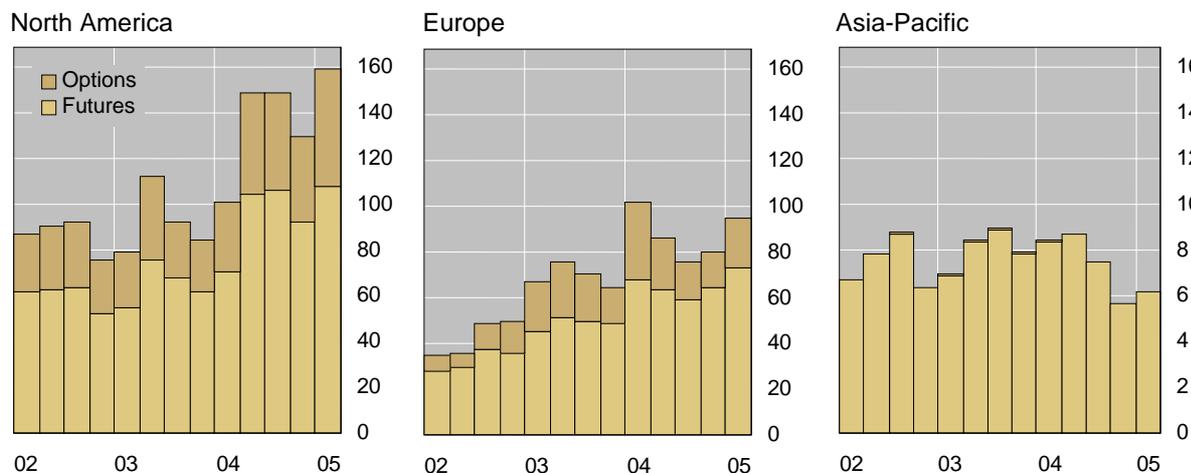
As in the fourth quarter, trading at the long end of the maturity spectrum may also have been favoured by an increasing steepness of the term structure of implied volatilities, which was particularly pronounced in the United States, due to sharply falling volatilities at the short end (Graph 4.4). The higher

... across maturities and geographical areas

Uncertain growth prospects favour European long-term contracts

Turnover of short-term interest rate contracts

Quarterly contract turnover, in trillions of US dollars



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

Graph 4.2

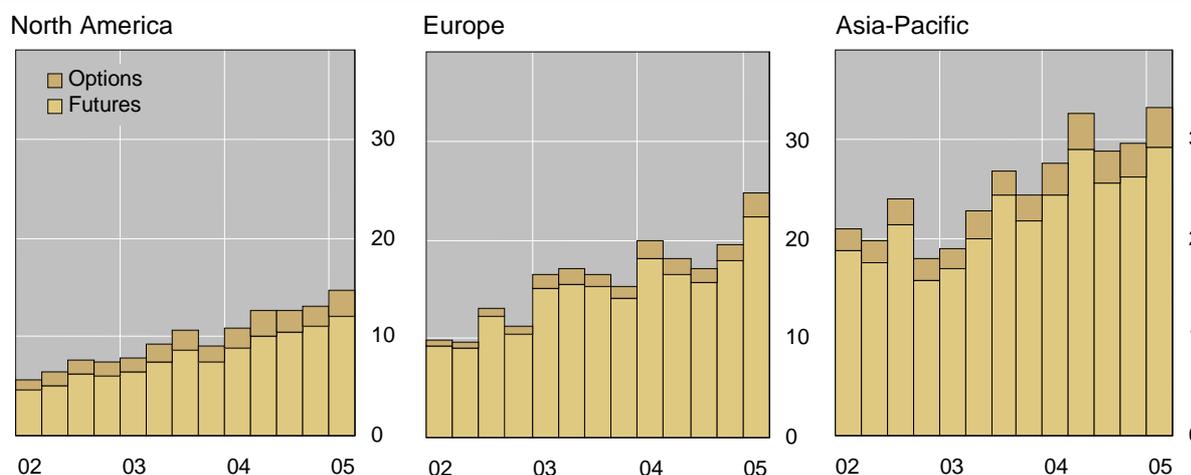
relative expected volatility of long-term rates changed the sensitivity of interest rate portfolios to both maturity changes and interest rate changes, possibly raising the need for hedging activity.

Business expands in Asia

After two quarters of contraction, business returned to growth in the Asia-Pacific region, with turnover up by 10% to \$9.5 trillion. Activity rose by 9% in short-term rate contracts and by 12% in long rate contracts. Business in the short-term segment was stronger in the Pacific region, up by 13%, than in Asia, where it grew by 2% only. Among Asian countries, activity recovered in Japan, up by 19%, after a 27% slide in the previous quarter, while it continued to fall in Singapore, down by 17%. Both short rate and long rate position-taking in Japan increased through the quarter. This development probably reflected greater uncertainty about prices and growth: Bank of Japan forecasts in January suggested a marked decline in anticipated price pressures, though the

Turnover of government bond contracts

Quarterly contract turnover, in trillions of US dollars

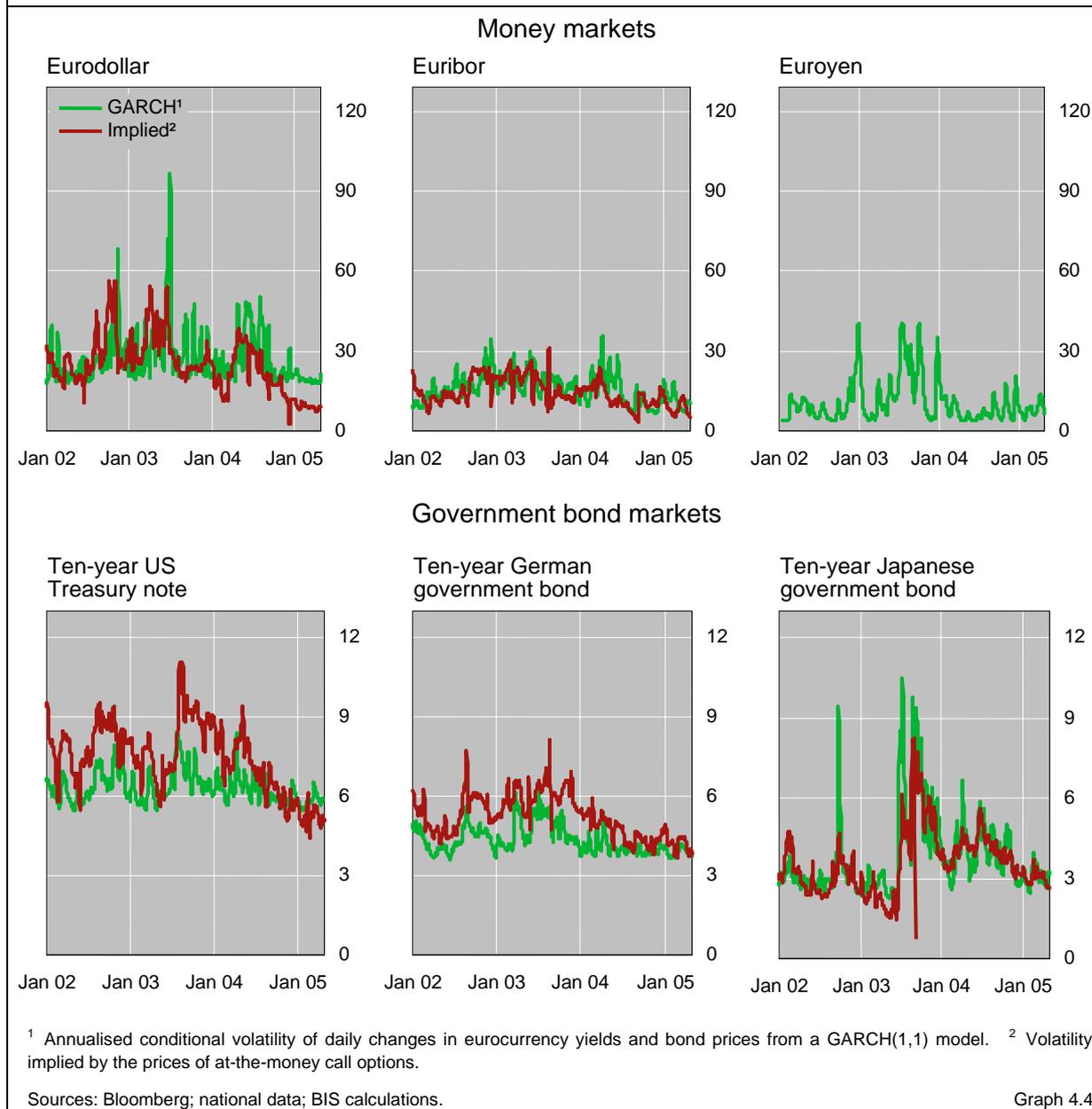


Sources: FOW TRADEdata; Futures Industry Association; BIS calculations.

Graph 4.3

Volatility of major fixed income rates

Five-day moving averages



economic outlook then brightened in February on the back of a positive surprise in machinery orders and a rising equity market.

Growth in currency contracts continues

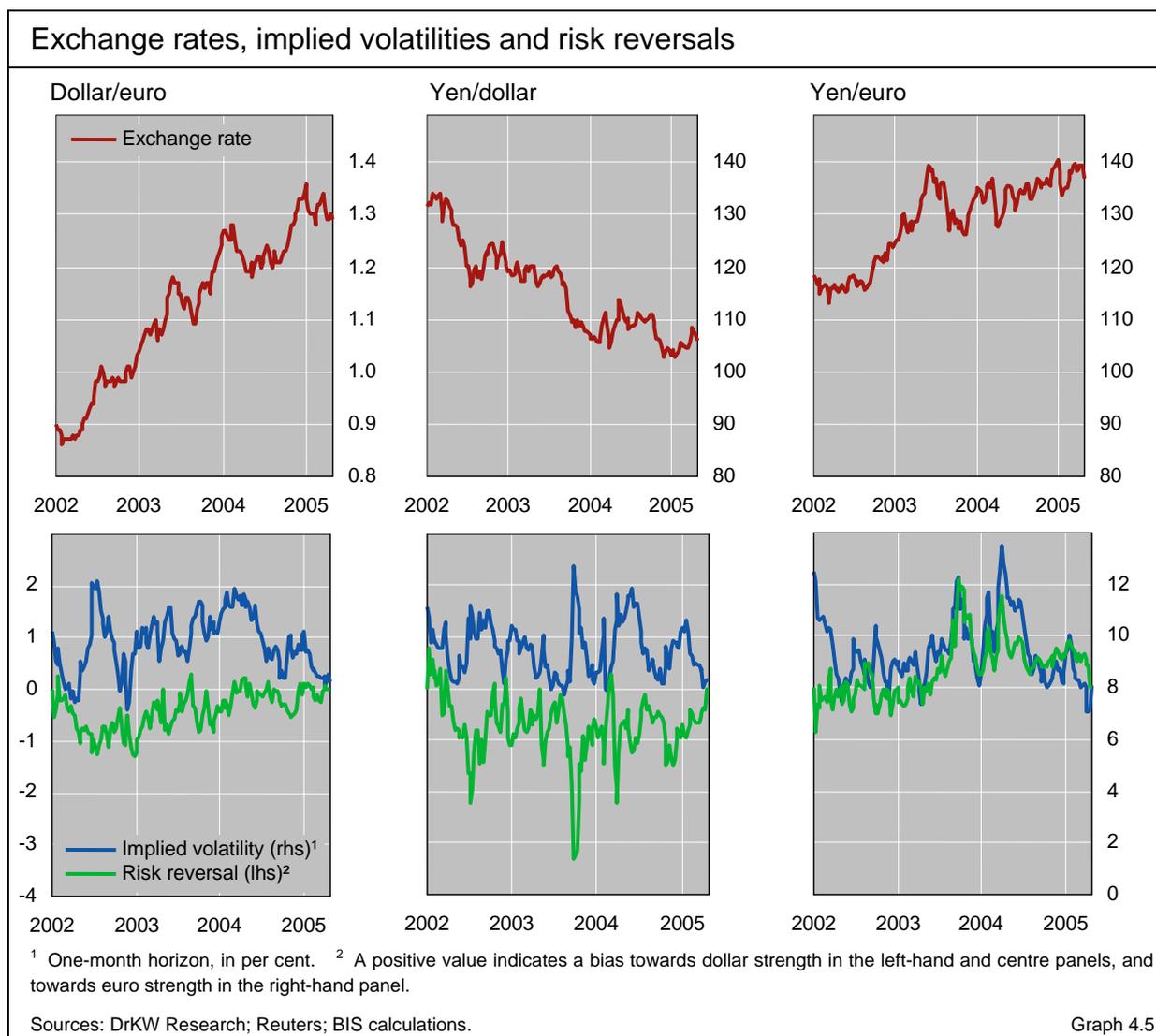
Turnover of exchange-traded currency derivatives rose by 15% from the previous quarter (to \$2.7 trillion). Business in futures contracts increased by 14% (to \$2.4 trillion), while activity in currency options surged by 25%. Higher turnover derived mainly from activity in the euro vis-à-vis the dollar, up by 19%. Among other currency pairs, turnover grew significantly for the Japanese yen vis-à-vis the dollar, up by 7%.

Trading in currency products rises ...

The increase in turnover differed across regions, although the vast majority of activity remains concentrated in US marketplaces. Business was up by 14% in the United States, to \$2.4 trillion, stagnated in Asia (\$30 billion) and fell by 3% in Europe (\$4 billion). Activity kept expanding at high rates in Brazil, with trading in futures and options on the São Paulo Mercantile and Futures Exchange (BMF) up by 32%, to \$234 billion.

... as dollar expectations shift

Increased investment and hedging activity in currency markets was not associated with uncertainty, since implied volatilities for the main currency pairs dropped significantly in the first quarter of 2005. It might instead have reflected realised and expected changes in exchange rate levels, and the need to adjust positions. After a prolonged depreciation, the dollar rose by 4.5% against the euro in the first quarter of 2005. Over the same period, risk reversal indicators derived from currency options (Graph 4.5) started to signal that economic agents had changed their expectations about future exchange rate levels, with the previously expected depreciation of the dollar versus the euro turning towards expectations of stability or slight appreciation. In particular, a large positive change in the risk reversal indicator in March was accompanied by a 34% surge in business in currency derivatives.



Activity in stock indices rises, but at a lower rate

Global turnover in stock index contracts, which had grown by 17% in the last quarter of 2004, continued to expand in the first quarter of 2005, this time by 7% (to \$26 trillion). Business was overall stronger in the United States, up by 9% (to \$11 trillion), than in Europe, which was up by a relatively weak 5% (to \$6 trillion). Business was particularly stagnant in Germany, where turnover for products related to the DAX index fell sharply. In the Asia-Pacific region, business increased by 5%, to \$9 trillion. Trading continued to expand in the Korean stock market, up by 6%, and in Japan, by 10%. Turnover rose by 13% in Australia.

Stock index turnover rises ...

... once again less rapidly in Europe ...

Options turnover was up by 8%, to \$15 trillion, while business in futures grew by 5%, to \$12 trillion. The stronger growth in the options segment came from both the US and the European markets, where activity in such instruments was up by 7% and 10%, respectively.

The increase in equity index trading in the United States and in Europe contrasts with the stability of the underlying indices, up by 0.1% and 2.4% in the first quarter, respectively. Also, it does not seem to be explained by greater uncertainty, as implied volatilities were stable at around 12% in annual terms. Higher turnover may instead have stemmed from investors turning marginally more risk-averse. Estimates of the coefficient of relative risk aversion derived from equity index options tended to rise in the first quarter of 2005, after declining through the previous year.

... as risk aversion increases

Business on individual stocks (data on which are available only in terms of number of contracts) continued to be positively related to activity in equity index-related products. The number of traded futures and options contracts written on individual stocks rose by 11% (17% and 6% in Europe and the United States, respectively).

Trading in commodities remains flat

After declining in the third quarter of 2004 and posting a modest recovery in the fourth, activity in commodity markets, which can only be measured in terms of number of contracts, remained flat in the first quarter of 2005. Business varied significantly across regions. It was up by 12% in the United States but declined by 2% in Europe and by 18% in Asia. The large fall in activity in this region derived entirely from energy- and non-precious metals-related products traded in Japan and China. Overall, turnover was negative for all types of commodity-related contracts, with the exception of agricultural derivatives, which were up by 26%.²

Overall trading in commodities remains flat

Activity was down by 1% for futures, which account for 89% of all commodity-related contracts, and up by 9% for options. Business in commodity-related options showed marked differences across types of commodities. Turnover in energy-related options was down by 5% and that in options on precious metals by 31%. In contrast, trading in options on non-

Strong activity in options on non-precious metals

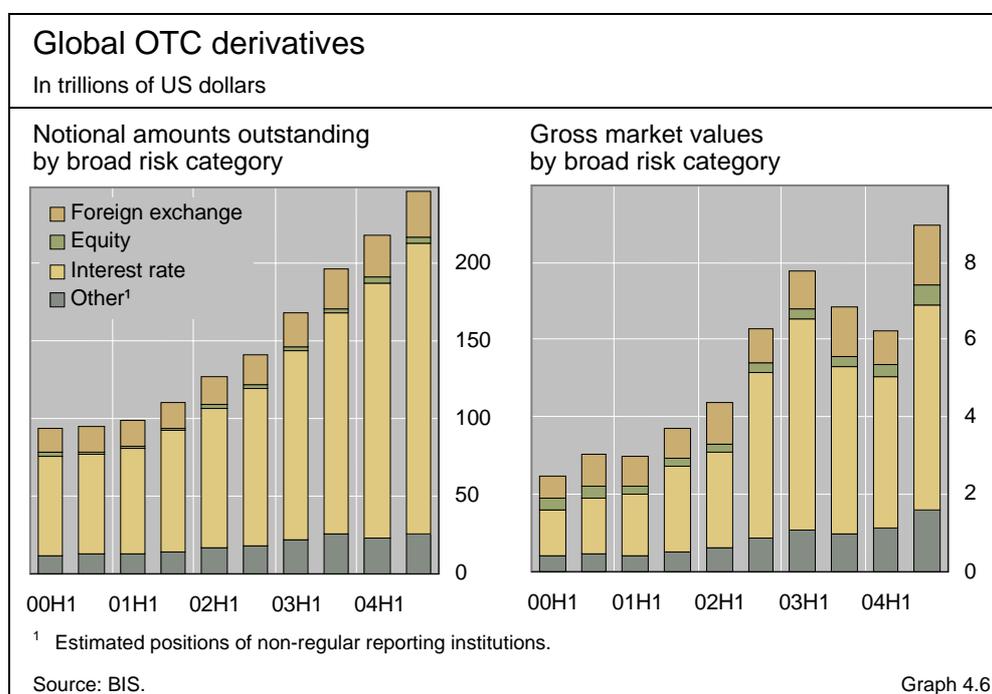
² These derivatives represent 35% of all commodity-related contracts.

precious metals rose by 21%, and in those on agricultural commodities by 32%. Persistent expectations that GDP growth would remain solid, at least in the United States, may help to explain the drop in business for options on precious metals (assets typically preferred in periods of business cycle weakness) and the rise in those on non-precious metals (commodities whose prices tend to anticipate business cycle expansions).

Robust expansion of OTC contracts

OTC activity expands in the second half of 2004

With this issue the BIS is starting to publish statistics on the market for credit default swaps (CDSs).³ The latest data on OTC derivatives, spanning the second half of 2004, show that at the end of the year notional amounts of CDSs outstanding totalled \$6.4 trillion, of which \$2.7 trillion represented contracts between reporting dealers. In aggregate, positions in the global OTC derivatives market recorded a robust expansion in the second half of 2004. Overall amounts outstanding were up by 12.8%, to \$248 trillion at the end of December (Graph 4.6 and Table 1). The growth in the latter half of the year was slightly higher than in the first six months, when positions had risen by 11.6%. After falling by 20% in the previous two surveys, gross market values increased by 43%, to \$9.1 trillion as of end-December. Even after taking account of legally enforceable bilateral netting agreements, the rate of expansion was still 40%, at \$2.1 trillion. This figure, however, represents just 0.8% of overall notional amounts.



³ The collection of CDS data started in December 2004, hence no information is available on notional amounts outstanding before this date. Also, there is no reference to such data in the Statistical Annex. A single-name CDS contract is an insurance contract covering the risk that a specified credit defaults. Following a defined credit event, the protection buyer receives a payment from the protection seller to compensate for credit losses. In return, the protection buyer pays a premium to the protection seller over the life of the contract.

The global OTC derivatives market ¹								
Amounts outstanding, in billions of US dollars								
	Notional amounts				Gross market value			
	End-Jun 2003	End-Dec 2003	End-Jun 2004	End-Dec 2004	End-Jun 2003	End-Dec 2003	End-Jun 2004	End-Dec 2004
Grand total	169,658	197,167	220,058	248,288	7,896	6,987	6,395	9,133
A. Foreign exchange contracts	22,071	24,475	26,997	29,575	996	1,301	867	1,562
Outright forwards and forex swaps	12,332	12,387	13,926	15,242	476	607	308	643
Currency swaps	5,159	6,371	7,033	8,217	419	557	442	761
Options	4,580	5,717	6,038	6,115	101	136	116	158
B. Interest rate contracts ²	121,799	141,991	164,626	187,340	5,459	4,328	3,951	5,306
FRAs	10,270	10,769	13,144	12,805	20	19	29	20
Swaps	94,583	111,209	127,570	147,366	5,004	3,918	3,562	4,793
Options	16,946	20,012	23,912	27,169	434	391	360	492
C. Equity-linked contracts	2,799	3,787	4,521	4,385	260	274	294	501
Forwards and swaps	488	601	691	759	67	57	63	81
Options	2,311	3,186	3,829	3,626	193	217	231	420
D. Commodity contracts ³	1,040	1,406	1,270	1,439	100	128	166	170
Gold	304	344	318	369	12	39	45	32
Other	736	1,062	952	1,070	88	88	121	138
Forwards and swaps	458	420	503	554	...	...	...	...
Options	279	642	449	516	...	...	...	...
E. Other derivatives ³	21,949	25,508	22,644	25,549	1,081	957	1,116	1,594
Gross credit exposure ⁴	.	.	.	.	1,750	1,969	1,478	2,076
<i>Memo: Exchange-traded contracts⁵</i>	38,203	36,740	52,802	46,592	.	.	.	.

¹ All figures are adjusted for double-counting. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers. Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. ² Single currency contracts only. ³ Adjustments for double-counting partly estimated. ⁴ Gross market values after taking into account legally enforceable bilateral netting agreements. ⁵ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Table 1

Growth in notional amounts, especially in the interest rate segment

Growth in notional amounts outstanding derived mainly from increased activity in interest rate products, up by 13.8% to \$187 trillion. Owing to the large increases in activity captured in the two most recent semiannual surveys, interest rate swaps accounted for nearly 80% of the overall OTC interest rate segment at the end of December 2004. Business was particularly buoyant for swaps, which grew by 15.5% to \$147 trillion. Notional amounts of interest rate options expanded by 13.6% (to \$27 trillion), while those of FRAs, activity in which had increased noticeably in the first half of the year, fell by 3% (to \$13 trillion).

Strong activity for swaps ...

... especially for euro- and sterling-denominated contracts

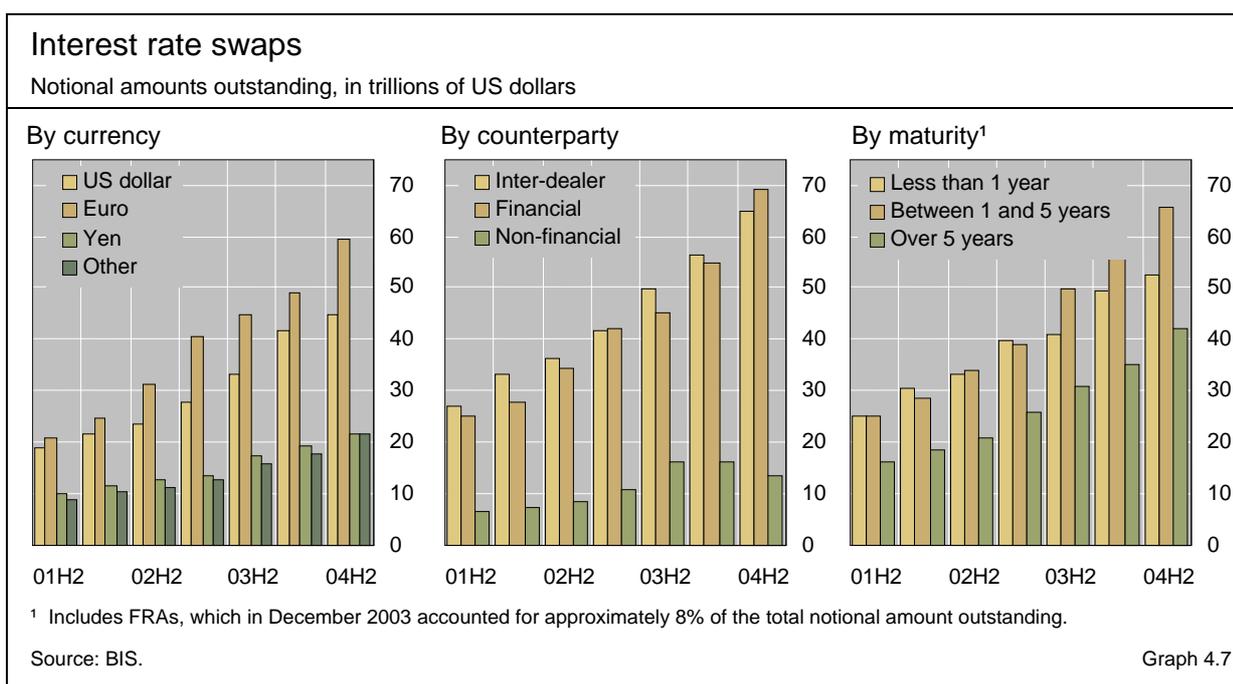
The expansion in the interest rate swap market was due mainly to euro- and sterling-denominated instruments, both up by 20% to \$59 trillion and \$12 trillion respectively. By contrast, activity in the dollar segment, previously the main source of growth of the swap market, rose by only 7.9%, to \$45 trillion, down from 25% in the first half of the year (Graph 4.7).

Growth in the notional amounts outstanding of interest rate derivatives occurred mainly among reporting dealers, up by 13%, and, as in the first half of 2004, between reporting dealers and other financial institutions, up by 23%. Position-taking by non-financial customers, mainly firms, fell by 14%. Looking at maturities, growth in notional amounts was stronger for longer-term instruments (18% for instruments over five years and 16% for those between one and five years) than for shorter-term ones (9%). This stands in contrast to the previous period, when growth in notional amounts had been strongest for short-term instruments, up by 23%.

Business in OTC foreign exchange products expanded by 9.5%, to \$30 trillion. Over 2004 as a whole, these instruments expanded by 21%, a sharp slowdown from the increase recorded in 2003, despite the persistence of the dollar's fluctuations against major currencies (its 15% fall against the euro in 2003 being followed by a further 8% drop in 2004). Notional amounts outstanding increased particularly for currency swaps, up by 16.8%, while for outright forwards and forex swaps it was equal to the average for the segment (9.5%); business was rather subdued for currency options, up by only 1.3% after posting huge growth during 2003.

Widening expected interest rate gap spurs currency swaps activity

The strong activity in currency swaps may have been boosted by a widening gap between interest rate expectations in the United States and those in the euro area. This development may have led economic agents to seek additional insurance against the larger expected differential. Activity was strongest between dealers and other financial institutions, up by 15%. Business with reporting dealers increased by 8%, down from the 25% rise recorded in



the first half of the year. Amounts outstanding with non-financial customers returned to weak growth (3%) after falling by 4% in the previous period.

Credit default swaps

At the end of 2004 the notional amounts outstanding of CDSs totalled \$6.4 trillion, nearly 50% more than the size of the market for equity index-related products but still significantly less than that of interest rate or exchange rate-related products (\$187 trillion and \$30 trillion, respectively). Despite its relatively small size, the development of the CDS market has been so far quite exceptional, compared to what has been observed for other risk categories. According to the data presented in the *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity*, the growth of credit-related derivatives in the three years ending June 2004 amounted to 568%, against 121% for all OTC products.

CDSs expand at exceptional rate

Of the \$6.4 trillion of notional amounts outstanding, \$2.7 trillion concerned contracts between reporting dealers. For both protection bought and protection sold, over 80% of the outstanding contracts between reporting dealers and non-dealers were with non-reporting financial institutions. In terms of maturity of outstanding contracts, more than 70% of the single-name contracts had a maturity between one and five years, close to the corresponding number for multi-name contracts (60%).

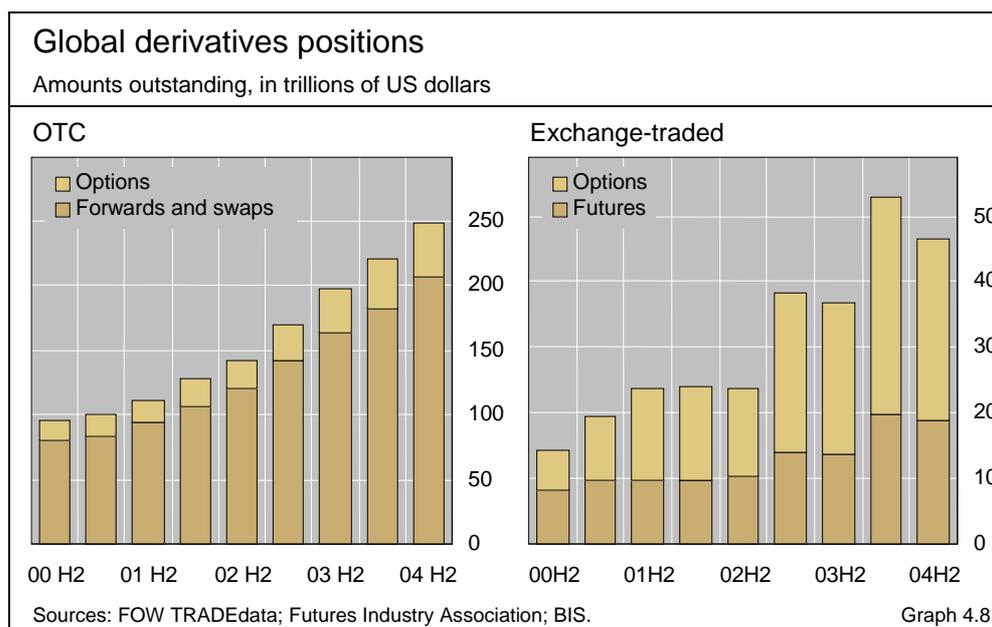
Dealers bought net protection from non-dealers amounting to \$178 billion, of which \$149 billion was with non-reporting financial institutions. Nearly two thirds of these latter contracts were multi-name. The net market value of all outstanding contracts was \$4 billion, with \$89 billion in contracts with a gross positive market value and \$93 billion in contracts with a negative market value.

Looking forward, the growth of credit derivatives could be further boosted by the recent launch of a credit derivatives fixing, relating to the iTraxx family of CDS indices. The availability of a fixing will produce a widely supported reference and settlement tool for the credit derivatives market. It will reassure investors that the prices quoted by individual traders are close to the market-wide consensus prices (much in the same way as Libor rates support the pricing of interest rate swaps), thereby enhancing transparency, and consequently volumes, of CDSs and cash-settled credit-related options.

Development of CDS market likely to be boosted by credit derivatives fixing

Sizeable increase in gross market values

Gross market values, which had been declining for two consecutive reporting periods, jumped significantly, by 43%, in the second half of 2004, to \$9 trillion (Graph 4.6). Interest rate contracts, which represent the largest OTC segment, were up by 34%, to \$5.3 trillion. The increase was quite small for dollar-related products, only 3%, to \$1.5 trillion, but amounted to 65% and 26% for euro- and sterling-related products, to \$2.9 trillion and \$237 billion respectively. The surge in gross market values was particularly strong for foreign exchange products, 80%, to \$1.6 trillion, and for equity-related products, 70%, to \$0.5 trillion. Compared to interest rate products, both segments are, however,



smaller components of the overall derivatives market. Across all risk categories, the ratio of gross market values to notional amounts outstanding went up from 2.9% as of end-June 2004 to 3.7% as of year-end. Taking account of legally enforceable bilateral netting agreements does not bring down the expansion in gross market values. Nevertheless, gross market values – thus calculated – increased only marginally (from 0.7% to 0.8%) as a ratio to overall notional amounts.

Growth in OTC markets was not matched on exchanges

The 12.8% rise in business in OTC markets in the second half of 2004 coincided with a drop in activity, of 11.8%, on the exchanges.⁴ The gap in the development of notional amounts outstanding between the two markets has become particularly sizeable since mid-2003 (Graph 4.8). Between end-June 2003 and end-December 2004, amounts outstanding grew by 46% in OTC markets, against 22% in exchanges. By contrast, over the previous 18-month period, both segments had grown by approximately 55%.

⁴ When comparing activity in the exchange-traded and OTC segments, it is important to recall that notional amounts outstanding in the OTC market should tend to grow faster, since hedging or trading in this segment generally involves the writing of new contracts, which leads to a natural build-up of notional amounts outstanding.

Currency choice in international bond issuance¹

Aggregate issuance of international bonds is found to be significantly higher in strong currencies than in weak ones. The mix of currencies is also found to be influenced by interest rate differentials, with greater issuance in higher-yielding currencies, and by the amount of home country issuance. Taken together, the results suggest that both the investor's and the issuer's preferences determine currency choice in international bond issuance.

JEL classification: G110, G150, G320.

The international debt securities market² brings together borrowers and lenders with diverse risk profiles and risk appetites. This special feature investigates the determinants of the currency denomination of international debt issuance. Specifically, it examines the share of aggregate issuance of international bonds and notes that is denominated in selected currencies, and estimates the impact on these currency shares of a number of plausible factors. The international market is an attractive one for studying currency choice issues, because issuers are likely to be well known outside their national boundaries, and investors are likely to be comparatively well informed. As a result, asymmetric information regarding credit quality will be relatively low.

The key finding is that there is more issuance in a given currency when it 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. These findings hold even when controlling for demand for investable funds in that currency, as proxied by the growth of investment, or the level of home country issuance. The preferences of investors appear to play just as important a role as those of issuers in determining the terms and conditions of international bond issues.

¹ I am grateful to Claudio Borio, Frank Packer, Bob McCauley, Jacob Gyntelberg and Már Gudmundsson for comments, and to Jhuvesh Sobrun for outstanding research assistance. They are not responsible for my errors. The views expressed in this article are those of the author alone and do not necessarily reflect those of the BIS.

² "International debt securities" are debt securities that are either issued outside the borrower's home market (in any currency), issued in the domestic market in foreign currency, or issued in the domestic market but targeted at foreign investors. See BIS (2003) for detailed discussion.

The first section discusses some of the potential determinants of the currency mix of international bond issuance and reviews prior research on the subject. The second then presents broad trends in observed currency shares, and examines the explanatory power of a simple statistical model that relates these shares to exchange rate levels, interest rate differentials and other factors. A concluding section summarises the results and suggests interpretations.

Factors influencing the currency of denomination of bond issues

Two sets of factors are likely to enter into the choice of currency for a bond issue: those relating to risk management, and those relating to borrowing costs.

Regarding risk management, a borrower would ideally want to match the currency of its interest and principal payments to that of the net cash inflows it expects to receive from operations during the life of the bond, while an investor would ideally want to match asset returns to current and prospective expenses. Kedia and Mozumdar (2003) find that US firms that issue foreign currency debt also tend to have significant foreign income, as well as characteristics suggesting that exchange rate hedging improves their ability to exploit growth opportunities. Keloharju and Niskanen (2001) obtain similar results for Finnish firms. Researchers at the ECB (2005) find a strong positive relationship at the firm level between having subsidiaries in a currency area and bond issuance in that currency. As financial derivatives have become more widely available in recent years, these considerations might be thought to have become less important, since mismatches between asset and liability flows can often be reduced or eliminated through the use of an appropriate derivative structure. But derivatives-based hedging strategies are sometimes costly for long-term assets.³

Currency choices are influenced by risk management by issuers ...

Considerably less research has been done on the extent to which and the reasons why investors in mature economies take positions in currencies outside their own. Theoretically, the standard approach tends to favour full hedging; for example, Solnik (1974) concluded that it is optimal to diversify equity risk internationally while fully hedging exchange rate risk. Other authors, however, have suggested that unhedged or partially hedged foreign currency investments would be desirable insofar as they hedge against equity market risks (Froot (1993)) or movements in real interest rates (Campbell et al (2003)).

... and investors ...

With regard to borrowing costs, some of these reflect institutional factors, the cost of which is shared between issuers and investors. The market for bonds denominated in a certain currency might be subject to withholding taxes or regulatory burdens, or might be too thin to provide the level of liquidity demanded by active investors. Very large issuers may want to diversify their

... as well as borrowing costs related to institutional factors

³ The global outstanding notional amount of currency swaps, which allow a stream of interest payments in one currency to be exchanged for payments in another, increased from \$1.9 trillion in June 1998 to \$7.0 trillion in June 2004. Studies of the determinants of foreign currency derivatives usage include Géczy et al (1997), Allayannis and Ofek (2001), Hagelin (2003) and Huffman and Makar (2004).

funding sources to assure themselves steady market access. When these considerations are relevant, borrowers will issue in the cash market where institutional costs are lowest and use the swap market to adopt their preferred currency exposure (Kim and Stulz (1988)). For borrowers from emerging economies, the thinness of markets for home currency debt is a well recognised problem. In this case, swap markets also tend to be underdeveloped, so issuers are often forced to take mismatched currency exposures as a price of market access. See Goldstein and Turner (2004) for further discussion.

If investors and issuers have identical expectations regarding the future path of exchange and interest rates, and similar levels of tolerance for the risk embodied in unhedged currency exposures, then hedging considerations and institutional borrowing costs such as these should be decisive. The quantity of bonds issued in a given currency will be determined solely by the capital needs of issuers, the portfolio allocation needs of investors and institutional characteristics of specific markets, and not by interest rate differentials or by prospective exchange rate trends.

However, even if borrowers and lenders are primarily concerned with hedging risk, there might be an interest rate differential wide enough, or an exchange rate level sufficiently out of tune with expectations, to override risk management considerations and institutional borrowing costs.⁴ There are three principal reasons why market participants might allow prevailing interest rate or exchange rate conditions to influence their debt denomination decisions.

First, issuers and investors may differ about whether expected exchange rate movements will fully counteract interest rate differentials across currencies. Although standard economic theory teaches that expected exchange rate movements should perfectly counteract interest rate differentials, a relationship known as uncovered interest parity (UIP), the empirical evidence for this relationship is weak. Instead, the evidence suggests that investing in high-yielding currencies should be a profitable strategy for investors and issuing in low-yielding currencies should be profitable for borrowers. Alternatively, participants could focus on evidence that exchange rates tend to follow trends and to overshoot their equilibrium levels. The observed relationship between yield differentials and currency patterns on the one hand, and bond currency denomination shares on the other, might then signify whether the preferences of either borrowers or investors are dominant in currency denomination choices.⁵

Other factors include violations of uncovered interest parity ...

⁴ Allayannis et al (2003) find that interest differentials play a significant role in foreign currency debt issuance by East Asian corporations, alongside hedging-related factors such as the degree to which they have foreign earnings. ECB (2005) obtains a similar result for a sample of global debt issuers.

⁵ See Froot and Thaler (1990) and Chinn and Meredith (2005) for further discussion of the evidence for UIP. Johnson (1988) finds that, for the case of Canada, differences in interest rates are likely to assume greater importance when the exchange rate is expected to be fixed. See Mohl (1984) for an early study of the salience of investor preferences in international bond currency choices.

Second, even if exchange rate levels do not reliably forecast their future movements, they could be associated with differences in the risk characteristics of exchange rates. A weak currency could be perceived as incorporating a large risk of a substantial further weakening, while a strong one might be seen as offering a greater possibility of a substantial further strengthening. Risk-averse investors would then prefer strong currencies even if the absolute returns they are expected to offer are no greater than for weak ones.⁶ If borrowers are relatively less risk-averse than investors, then the borrowers may be able to reduce their borrowing costs by accommodating the risk protection demands of investors.

... differences in risk aversion ...

A third potential reason is that interest rate differentials might not be fully reflected in prices for foreign exchange derivatives such as forwards and swaps. Observers of the international bond market often stress the ability of issuers to take advantage of temporary anomalies in the prevailing configuration of bond yields, currency swap rates and forward exchange rates (see, for example, Grabbe (1996), pp 314–15). While the no-arbitrage relationship among these variables, known as covered interest parity (CIP), generally holds at short horizons, the lack of liquidity or depth in certain markets could allow anomalies to persist long enough for well placed borrowers to take advantage of them. It is worth noting that, while violations of UIP could plausibly result from differences in expectations or risk sensitivities across market participants, violations of CIP, which is a riskless arbitrage relationship, require the existence of an institutional barrier that prevents or delays the rectification of a market anomaly.⁷

... and breakdowns of cross-market arbitrage

Modelling strategy and results

Currency shares and exchange rate levels

The bulk of international bond issuance is concentrated in a small number of currencies, particularly the US dollar, euro, Japanese yen and pound sterling (Table 1). The currency shares are even more concentrated than economic activity in the respective issuing countries. For example, in 2004 the United States accounted for 29% of global GDP (at market exchange rates), but the US dollar was used in 35% of international bond issuance. This reflects the status of those currencies as means of payment and stores of value outside their home countries. Issuers from a given country tend to issue primarily, but not exclusively, in their home currency (Table 1, columns 2–4). Currency

⁶ The pricing of risk reversals, derivative positions that comprise a put and call position on a currency with strike prices that are equally out of the money, offers evidence that markets perceive risk in this way. See Dunis and Lequeux (2001) and Pagès (1996) for discussions of the information content of risk reversals.

⁷ Clinton (1988) shows that deviations of CIP at short horizons tend to be small and within the range that would be explained by transaction costs. However, Fletcher and Taylor (1996) find that deviations from CIP at long horizons in excess of transaction costs are neither rare nor non-trivial.

Currency shares in international bond and note issuance				
Share in total announced issuance over the period indicated				
	All issuers	US issuers	Euro area issuers	Japanese issuers
1993 Q3–1998 Q4				
US dollar	0.443	0.772	0.256	0.299
Japanese yen	0.140	0.046	0.111	0.526
Deutsche mark	0.099	0.041	0.183	0.035
Pound sterling	0.073	0.043	0.038	0.023
Swiss franc	0.036	0.021	0.046	0.081
Canadian dollar	0.011	0.006	0.010	0.004
Australian dollar	0.013	0.006	0.006	0.005
1999 Q1–2004 Q4				
US dollar	0.428	0.822	0.147	0.253
Japanese yen	0.046	0.025	0.033	0.605
Euro	0.410	0.106	0.737	0.096
Pound sterling	0.067	0.030	0.039	0.012
Swiss franc	0.014	0.007	0.019	0.011
Canadian dollar	0.007	0.001	0.002	0.004
Australian dollar	0.008	0.004	0.006	0.003
Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS calculations. Table 1				

shares tend to be similar across the main categories of issuers, such as governments, financial institutions and non-financial corporations.

A casual look at historical patterns in debt issuance and exchange rates suggests that the share of international debt issuance denominated in a given currency has tended to be broadly related to the strength of that currency (Graph 1).⁸ The link between the exchange rate level and the currency share appears to be strongest for the US dollar, the Deutsche mark and the euro. For the other currencies displayed in Graph 1, while exchange rate and currency share trends broadly coincided for much of the period from 1993 to 2002, the appreciation of these currencies against the dollar from 2002 onwards has tended not to be accompanied by an increased share in international bond issuance.

A model of international bond currency shares

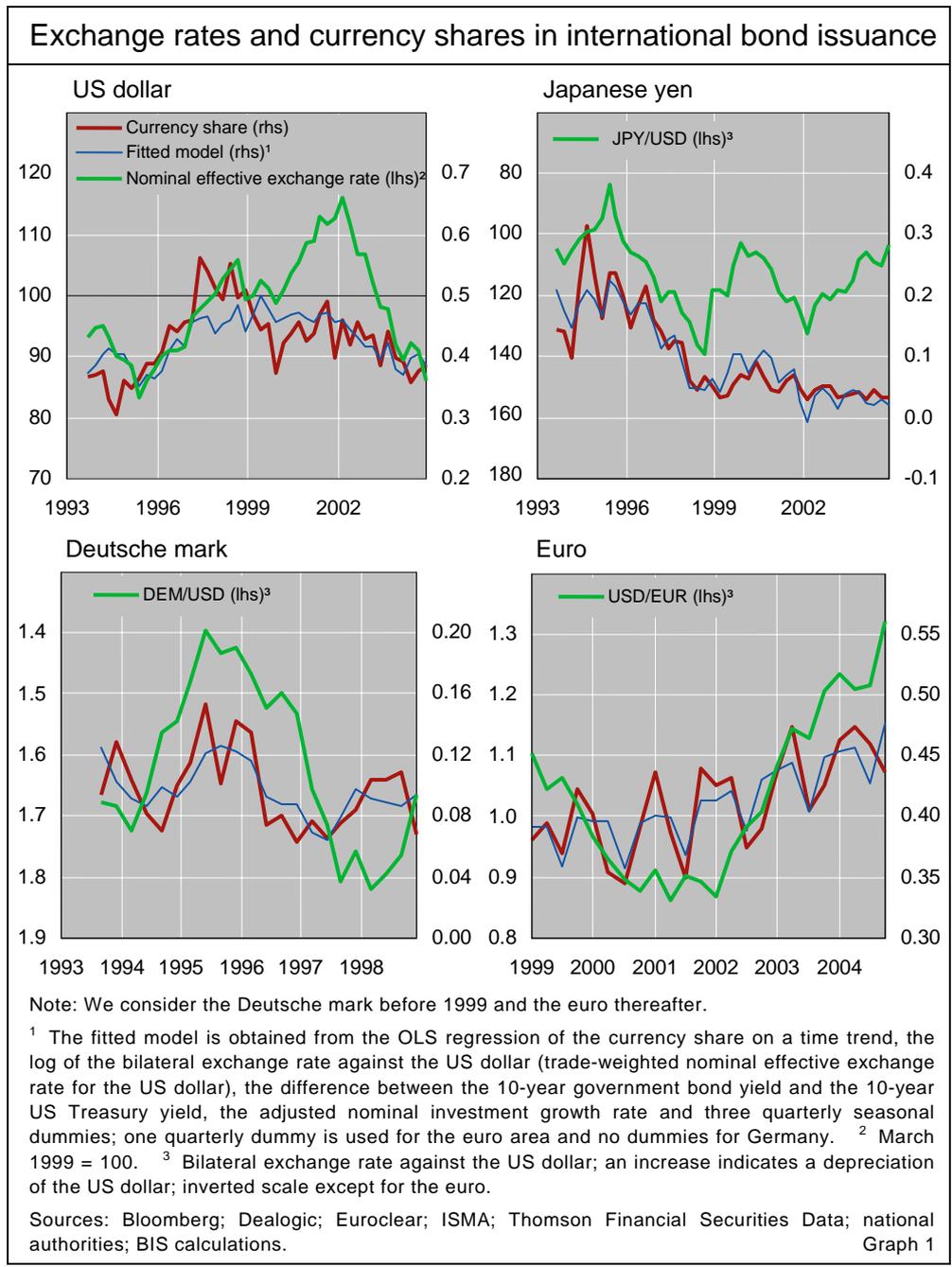
To gain a fuller understanding of the relationship between bond currency shares and market conditions, a simple statistical model is estimated for eight major currencies incorporating several of the factors discussed so far. The model regresses the quarterly share of announced international bond and note

Currency shares tend to track exchange rate levels

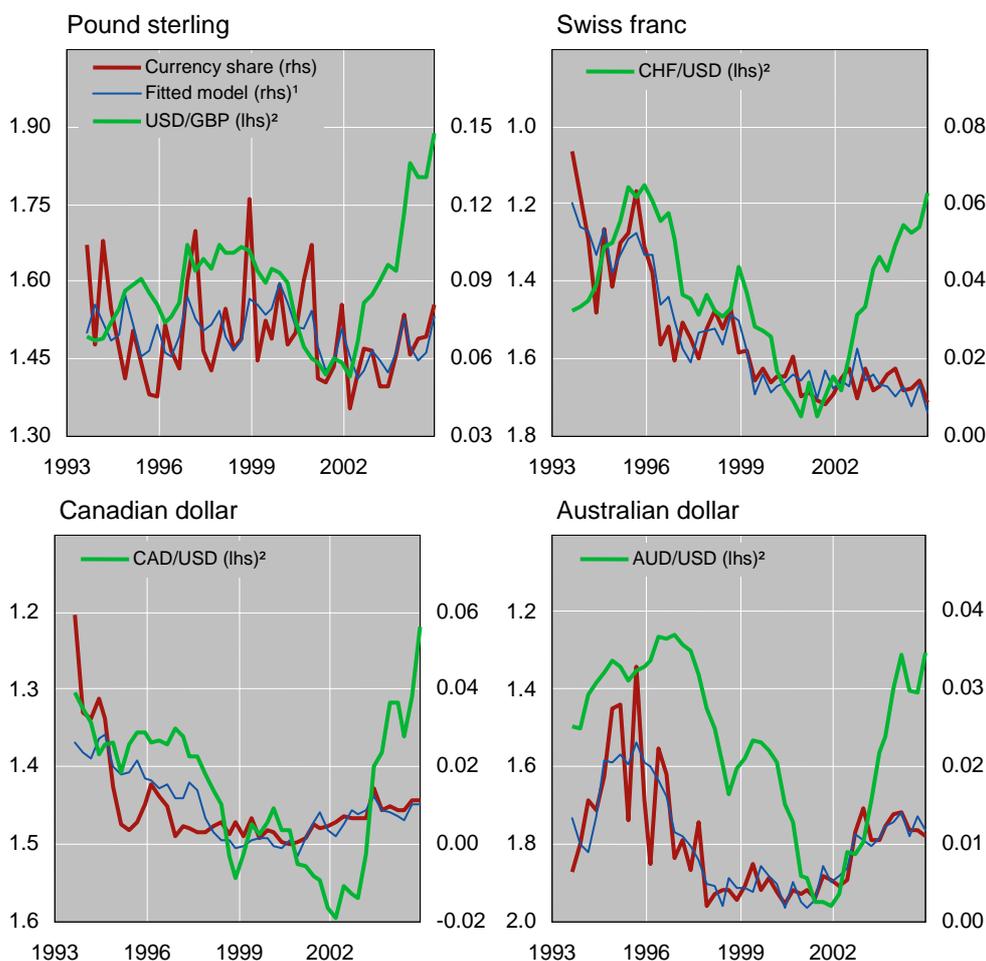
⁸ Throughout the analysis that follows, quarterly currency shares convert local currency amounts into dollars using the average level of the relevant exchange rate over the whole sample period. If the quarterly level of exchange rates were used, a stronger exchange rate would automatically be associated with a larger currency share even if local currency amounts were unchanged.

issuance denominated in each currency on the following variables (quarterly averages are used except where specified):

- The log of the exchange rate against the US dollar. For the United States, the nominal effective (trade-weighted) exchange rate is used.
- The difference between the 10-year US Treasury yield and a comparable 10-year government bond yield for the home country. For the United States, the difference between the US Treasury yield and the 10-year German bund yield is used.
- The difference between quarterly nominal investment growth in the home country and a GDP-weighted average of investment growth rates for the countries in the study. This term is intended to capture the use of bonds



Exchange rates and currency shares in international bond issuance (cont)



¹ The fitted model is obtained from the OLS regression of the currency share on a time trend, the log of the bilateral exchange rate against the US dollar, the difference between the 10-year government bond yield and the 10-year US Treasury yield, the adjusted nominal investment growth rate and three quarterly seasonal dummies. ² Bilateral exchange rate against the US dollar; an increase indicates a depreciation of the US dollar; inverted scale except for the pound sterling.

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

Graph 1 (cont)

denominated in a given currency to hedge the future cash flows in that currency arising from real assets.

- The share of a country's nationals in total debt issuance. This variable offers an alternative means by which to capture the demand by issuers for instruments with which to hedge future cash flows in the stated currency.⁹
- A time-trend term. This should capture longer-term developments in currency shares, resulting from such trends as the changing investor base for international bonds and the greater international use of the euro.

⁹ Because the country share can also reflect the demand for a country's bonds from international investors based on exchange rate and interest rate effects, we use the residual from a first-stage regression of the national share variable on the other explanatory variables. This allows us to isolate the impact of issuers' demands for home currency funding.

- Quarterly dummy variables. Some currency shares display seasonal patterns, reflecting uneven funding flows at different times of the year.

The model is estimated using data from the third quarter of 1993 (the quarter from which the BIS international debt securities data can be considered to offer full market coverage) to the fourth quarter of 2004. For the Deutsche mark, the estimation covers 1993 Q3–1998 Q4, while the estimation for the euro covers 1999 Q1–2004 Q4. For each currency, two regressions are run: one specification with nominal investment as the explanatory variable capturing issuer demand, the other with the modified home country issuance variable.

The fitted currency shares resulting from the model match the data fairly well, with adjusted *R*-squared statistics exceeding 40% for seven of the eight currencies in the second specification (Table 2; Graph 1, blue lines). For the Japanese yen, Australian dollar and Swiss franc, the adjusted *R*-squared exceeds 70%. It appears that, whatever their interpretation, the identified variables go a long way towards explaining currency denomination decisions in the international bond market. The one currency share for which the model appears to perform comparatively poorly is the pound sterling.

For five of the eight currencies, the exchange rate level has a strong and statistically significant impact in both specifications (Table 2, column 1). The results confirm the impression transmitted by the graphs that a stronger currency tends to be associated with a rise in that currency's use as a vehicle for international bond issuance. For example, the model predicts that a 10% appreciation of the yen should lead to a 2.2 percentage point increase in the yen's share of international bond issuance if other variables are unchanged. This is relative to an average yen currency share of 9.9% during 1993 Q3–2004 Q4. As will be discussed further below, this effect seems to be associated with the (log) level of the exchange rate, rather than with its recent trend.

For an overlapping set of five currencies, increased international bond issuance tends to be associated with relatively higher interest rates (Table 2, column 2). The estimation results suggest that, for these currencies, an increase in the local bond yield relative to the United States is associated with an increase in the use of the respective currency in international bond issuance, and that higher US Treasury yields relative to bunds lead to greater US dollar-denominated issuance. The pound sterling is the one currency for which lower relative interest rates are associated with greater issuance, though this is statistically significant in only one of the two specifications.

Of the two proxy measures for issuer demand, the modified home country issuance variable appears to provide the better predictive power. The impact of nominal investment growth on bond issuance is positive for five of the eight currencies, but it is statistically significant for only three of them (Table 2, column 3).¹⁰ By contrast, the home country issuance variable is statistically significant in seven out of eight specifications. Despite the development of currency swap markets that might be expected to dilute the impact of issuer demand on final currency of issuance, it would appear that borrowers'

Issuance is higher in currencies which are relatively strong ...

... high-yielding ...

... and linked to increased home country issuance

¹⁰ Similar results were found when other variables (such as the share of nominal investment expenditure) were used to measure investment-related demand for funding.

Factors influencing international bond currency shares					
	Log exchange rate	Interest rate differential	Investment growth	Home country issuance	Adjusted R^2
US dollar ¹	0.27**	0.052**	-0.002		0.33
	0.31**	0.049**		0.408**	0.41
Deutsche mark	0.00	-0.047**	0.001		0.30
	0.07	-0.048**		0.629**	0.67
Euro	-0.09	0.002	0.003		0.56
	-0.01	0.012		0.464	0.61
Japanese yen	-0.22**	0.004	0.005**		0.80
	-0.26**	0.004		0.927**	0.78
Pound sterling	-0.05	0.007	-0.001		0.11
	-0.06	0.009**		0.329*	0.16
Australian dollar	-0.01*	-0.006**	0.000		0.66
	-0.01**	-0.006**		0.225**	0.70
Canadian dollar	-0.06**	-0.009**	0.001**		0.45
	-0.05**	-0.007**		0.329**	0.49
Swiss franc	-0.03**	-0.011**	0.001*		0.85
	-0.02**	-0.012**		0.225*	0.85

Note: Coefficients from a regression of the share of quarterly announced international bond issuance in the listed currency on a constant; the log of the exchange rate; the difference between the US 10-year Treasury yield and a comparable government bond yield in that currency; the difference between quarterly nominal investment growth in that country and GDP-weighted average quarterly nominal investment growth for the countries studied in the first line for each currency (in the second line, residuals of shares of announced international bond issuance in the listed currency by issuers from that country (nationality basis)); a time trend; and seasonal dummies. All regressions are estimated over 1993 Q3–2004 Q4 except in the case of the Deutsche mark (1993 Q3–1998 Q4) and the euro (1999 Q1–2004 Q4). ** and * indicate significance at the 95% and 90% confidence levels respectively. Quarterly currency shares are computed using average exchange rates over 1993 Q3–2004 Q4. Complete results are available from the author.

¹ For the United States, the interest rate differential is the difference between 10-year US Treasury and 10-year German bund yields, and the exchange rate is the nominal trade-weighted effective exchange rate. Table 2

preference for matching the currency denomination of their assets and liabilities plays an important role in their choice of currencies as funding vehicles in the international bond market.

Exchange rate levels and exchange rate trends

Exchange rate levels have more explanatory power than trends

Perhaps surprisingly, exchange rate levels tend to have a stronger and more consistent impact on currency denomination decisions than do exchange rate trends (Table 3). The difference between the current quarter's average exchange rate and its average over the previous four quarters has a significant impact on the currency share of bond issuance for only three of the eight currencies (Table 3, column 1). In all three cases, issuance is greater in a currency that has appreciated relative to its levels of the previous year. When this variable is included alongside the log level of the exchange rate, its statistical significance falls further, although the performance of the log exchange rate suffers as well (Table 3, columns 3 and 4).¹¹

¹¹ Similar results are obtained when other variables representing recent exchange rate movements are used. For example, the quarter-on-quarter change in the exchange rate does

Alternative models of the influence of exchange rates on international bond currency shares					
	Model using exchange rate trends		Model using exchange rate levels and exchange rate trends		
	Trend in log exchange rate (see note)	Adjusted R^2	Log exchange rate	Trend in log exchange rate	Adjusted R^2
US dollar ¹	0.102	0.26	0.558**	-0.390*	0.37
Deutsche mark	0.056	0.31	-0.043	0.087	0.28
Euro	-0.054	0.33	-0.135	0.107	0.32
Japanese yen	-0.309**	0.80	-0.131*	-0.184*	0.81
Pound sterling	-0.081	0.14	0.012	-0.093	0.11
Australian dollar	-0.007	0.64	-0.023*	0.016	0.66
Canadian dollar	-0.092**	0.51	0.013	-0.106**	0.50
Swiss franc	-0.053**	0.86	-0.009	-0.042	0.85

Note: Regression models are identical to those presented in Table 2, except that an exchange rate trend term is included instead of the log exchange rate in the regressions in columns 1 and 2, and in addition to the log exchange rate in the regressions in columns 3–5. In both sets of regressions, the exchange rate trend term is $\ln(e_t) - (1/4)(\ln(e_{t-1}) + \ln(e_{t-2}) + \ln(e_{t-3}) + \ln(e_{t-4}))$. ** and * indicate significance at the 95% and 90% confidence levels respectively. Complete results are available from the author.

¹ For the United States, the interest rate differential is the difference between 10-year US Treasury and 10-year German bund yields, and the exchange rate is the nominal trade-weighted effective exchange rate.

Table 3

These results suggest that, to the extent that the exchange rate has an impact on decisions about the currency of denomination of international bond issues, this impact depends on the currency's strength relative to its long-run average rather than more recent values. This can be seen from the relatively better performance of the econometric specifications presented in Table 2, where the coefficient on the log exchange rate in effect measures the impact of the exchange rate's level relative to its average level over the entire sample period.

Currency denomination choices by nationality

The strength of the home country issuance variable suggests that nationality is an important factor underlying the currency composition of international bond issuance. To explore this issue further, it may also be useful to examine currency shares for bond issuance by issuers from a single nationality. In particular, we can ask whether the choice of alternative currencies by borrowers of a given nationality is influenced by exchange rates and interest rates to the same degree that these factors influence currency shares observed in the aggregate, while acknowledging that we are looking at only part of the picture.

Looking only at US and German issuers, it appears that the exchange rate effects documented earlier do not appear to be driven by home country issuers (Table 4, columns 1 and 4). Before 1999, while an appreciation of the Deutsche

Exchange rate effects are weaker for home country issuers ...

not have a statistically significant impact on the currency share for any of the eight currencies studied. Detailed results are available from the author.

mark caused more Deutsche mark-denominated issuance by US issuers, it caused *less* Deutsche mark issuance by issuers from Germany. After 1999, the exchange rate between the dollar and euro had no significant impact on currency denomination decisions by either group. Regarding the decision to use the US dollar as a denomination currency, US issuers were not significantly influenced by the euro/dollar exchange rate, while German issuers responded to a stronger dollar by increasing dollar-denominated issuance. This suggests that the tendency of a stronger dollar to attract dollar-denominated issuance, documented in Table 2, primarily reflects behaviour by non-US borrowers. For other currencies, the impact of currency strength on bond denomination by US and German issuers broadly matches that estimated for the full set of issuers, though statistical significance levels are lower.

... though interest rate differentials still play a role

The impact of interest rates on issuance, by contrast, does seem to result at least in part from the behaviour of home country issuers (Table 4, columns 2 and 5). An increase in the difference between US Treasury and bund yields

Factors influencing international bond currency shares: results by nationality of issuer							
	US issuers			German issuers			Sample period
	Log exchange rate	Interest rate differential	Adj R^2	Log exchange rate	Interest rate differential	Adj R^2	
US dollar ¹	-0.052	0.060**	0.59	-0.220*	0.076**	0.22	1993–2004
Deutsche mark ²	-0.241**	0.010	0.22	-2.258*	0.225**	0.33	1993–1998
Euro ³	0.120	0.032	0.10	0.264	-0.473**	0.43	1999–2004
Japanese yen	-0.050	-0.025**	0.51	-0.064	0.043**	0.40	1993–2004
Pound sterling	-0.089	0.004	0.03	0.147*	0.004	0.19	1993–2004
Australian dollar	-0.018**	-0.000	0.11	0.044**	-0.010**	0.49	1993–2004
Canadian dollar	-0.048	-0.009**	0.43	0.025	-0.012*	0.38	1993–2004
Swiss franc	-0.060**	-0.000	0.62	0.176	0.030**	0.59	1993–2004

Note: Except as noted, coefficients under “US issuers” are from a regression of the share of quarterly announced international bond issuance in the listed currency by US issuers on a constant; the log of the exchange rate (in currency units per US dollar); the difference between the US 10-year Treasury yield and a 10-year government bond yield in that currency; the difference between quarterly nominal investment growth in that country and GDP-weighted average quarterly nominal investment growth for the countries studied; a time trend; and seasonal dummies. Coefficients under “German issuers” are from the same regression, with currency units per euro instead of the US dollar and the German bund yield instead of the US Treasury yield. Pre-1999 euro rates are constructed based on the 1999 conversion ratios. ** and * indicate significance at the 95% and 90% confidence levels respectively. Complete results are available from the author.

¹ The “US dollar” regression under “US issuers” uses the log EUR/USD rate and the difference between the US and German government bond yields. ² The “Deutsche mark” regression under “German issuers” uses the log USD/DEM rate and the difference between the German and US government bond yields. ³ The “Euro” regression under “German issuers” uses the log USD/EUR rate and the difference between the German and US government bond yields. Table 4

leads to more dollar-based borrowing by US issuers and less Deutsche mark- or euro-based borrowing by German issuers. As with the exchange rate, results for other currencies broadly match those for the full set of issuers.

These findings confirm those of Kedia and Mozumdar (2003) and others, to the effect that issuers generally prefer to match the currency denomination of their bonds to that of assets and cash flows. The preference of issuers for their home currency does not seem to be strongly affected by whether that currency is strong or weak. Where issuers have already decided to venture outside their home currency, however, exchange rates and interest rates have a greater impact. As suggested by ECB (2005), issuers seem to follow a two-stage approach to the denomination decision: first, whether to borrow in domestic or foreign currency; and second, if foreign currency is preferred, which foreign currency to use.

Concluding remarks

The share of international bond issuance denominated in a given currency tends to be greater for strong currencies, for those boasting relatively high long-term bond yields, and for those where home country demand for funding is high. The impact of home country funding demand confirms the results of previous research on the importance of risk management motives to decisions about the currency denomination choices of international bond issuers. The exchange rate and interest rate effects seem to result primarily from changes in currency denomination choices on the part of borrowers which are not issuing in their home currency. These results suggest that, while risk management motives on the part of issuers and investors play an important role in currency denomination decisions, other factors are relevant as well.

Strong exchange rates and high yields may be taken by investors as a signal that investment returns in those currencies are likely to be higher in the near future. Investors might implicitly hold the belief that interest rate differentials do not, or do not fully, reflect future exchange rate changes, in other words that UIP is systematically violated. Borrowers might be willing to concede these increased returns (which correspond to increased borrowing costs for them) either because they do not share these beliefs, or because they are able to use derivatives to pass the associated exchange rate exposures to other counterparties who do not share these beliefs.

An explanation based on market imperfections would focus on ways in which borrowers are able to take advantage of certain markets to which investors do not have access. For example, it could be the case that CIP is systematically violated in such a way that the all-in cost of issuing in a high-yielding currency and swapping into a low-yielding one is frequently lower than that of issuing directly in the low-yielding currency to begin with, and that there are market imperfections preventing this anomaly from being arbitrated away smoothly.

To choose among these and other explanations, one would need a fuller model that takes account of alternative financial instruments, including domestic bonds and bank loans, and incorporates more rigorous behavioural

models of both investors and issuers. One would also require more conclusive empirical evidence on anomalies and imperfections in international long-term debt markets, including the typical degree and direction of deviations from UIP and CIP.

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Structured finance: complexity, risk and the use of ratings¹

This article reviews the principal features of structured finance instruments. Key to understanding the risk properties of these products is the evaluation of the risks associated with their contractual structure, in addition to the modelling of the credit risk of the underlying asset pools. It is argued that structured finance ratings, though useful, have intrinsic limitations in fully gauging the risk of these products, even as their complexity creates incentives to rely more heavily on ratings than for other rated securities. Market participants and public authorities need to take account of this in their assessments of structured finance instruments and their markets.

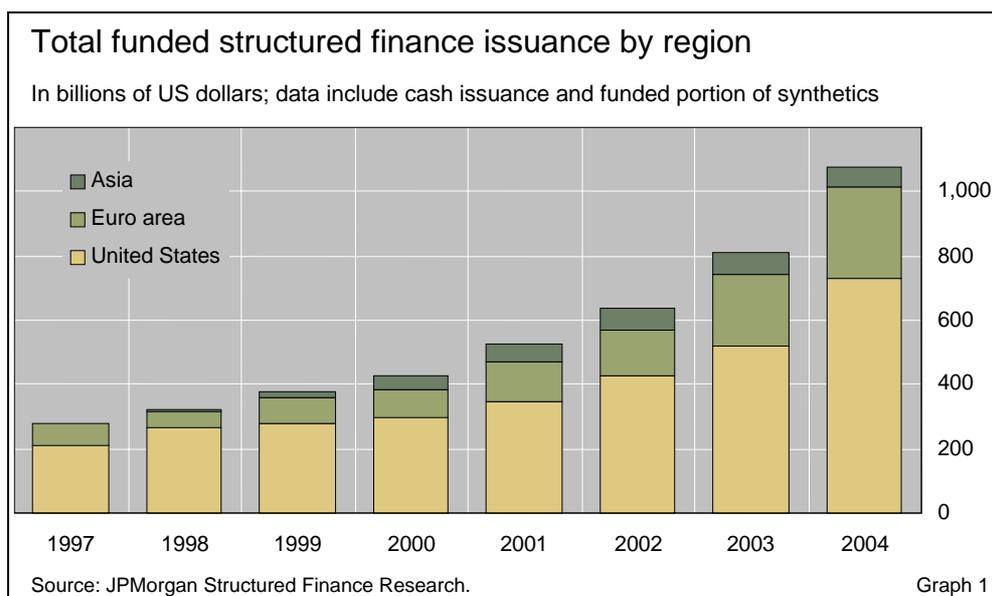
JEL classification: G100, G200.

Structured finance involves the pooling of assets and the subsequent sale to investors of tranching claims on the cash flows backed by these pools. It has become an increasingly important tool for credit risk transfer. Issuance volumes have grown rapidly over recent years (see Graph 1), paralleling technical advances in credit risk modelling.

Like other forms of credit risk transfer – eg credit default swaps (CDSs) or pass-through securitisations – structured finance instruments can be used to shift credit risk across financial institutions and sectors. Yet, a key difference between structured finance and other risk transfer products is that, via the tranching of claims, structured instruments also transform risk by generating exposures to different “slices” of the underlying asset pool's loss distribution. As a result of this “slicing” and the contractual structures needed to achieve it, tranche risk-return characteristics may be particularly difficult to assess.

Ratings, which are based on the first moment of a security's loss distribution, have intrinsic limitations in fully gauging the risk of tranching securities. While this observation holds in principle for any security, it will be argued below that the tails of these loss distributions are likely to be more

¹ The views expressed in this article, which will also appear in a forthcoming issue of the National Bank of Belgium's *Financial Stability Report*, are those of the authors and do not necessarily reflect those of the BIS or the National Bank of Belgium; any errors and omissions are the authors'.



pronounced for structured products.² As a result, subordinated structured finance tranches in particular can be expected to be riskier than portfolios of like-rated bonds in that investors in the former are more heavily exposed to extreme loss events. Yet, the complexity of structured finance transactions may lead to situations where investors tend to rely more heavily on ratings than for other types of rated securities. On this basis, the transformation of risk involved in structured finance gives rise to a number of questions with important potential implications. One such question is whether tranching instruments might result in unanticipated concentrations of risk in institutions' portfolios.

For various reasons, some of which are discussed below, structured finance products may be more effective than other financial instruments at addressing problems of adverse selection and segmentation in financial markets. This has made these products attractive for a variety of market participants. Financial intermediaries' motivations for issuing structured finance instruments include access to new sources of funding, reduction of economic or regulatory capital, and arbitrage opportunities. Investor interest has been stimulated by portfolio diversification and the expectation of attractive risk-return profiles in an environment of low interest rates.

Recognising the potential of structured finance for risk transformation, the Committee on the Global Financial System (CGFS), which monitors financial market functioning for the central bank Governors of the G10 countries, established a working group to explore these instruments.³ This article highlights some of the group's principal findings in the context of the "complexity" and "riskiness" of tranching products. Rating agencies and their

² It should be noted that ratings are not intended to be comprehensive measures of risk. This means that the stated limitations relate to their use, not to ratings as such.

³ The working group on the role of ratings in structured finance was chaired by Peter Praet of the National Bank of Belgium. Its report, CGFS (2005), and a number of background papers authored by working group members are available online at www.bis.org. See also CGFS (2003).

evaluation approaches are important aspects of this discussion. Other aspects, such as potential conflicts of interest related to issuer fee-based ratings, are briefly mentioned below and covered in more detail in CGFS (2005).

The remainder of this article is organised as follows. The next section briefly discusses the economics of structured finance markets. This is followed by sections focusing on the complexity of structured finance instruments and their risk-return characteristics. The last section identifies some implications for policymakers, researchers and market participants.

What is structured finance?

Structured finance involves the pooling of assets ...

Structured finance instruments can be defined through three distinct characteristics: (1) *pooling of assets* (either cash-based or synthetically created); (2) *delinking* of the credit risk of the collateral asset pool from the credit risk of the originator, usually through the transfer of the underlying assets to a finite-lived, standalone special purpose vehicle (SPV); and (3) *tranching of liabilities* that are backed by the asset pool. While the first two characteristics are also present with classical pass-through securitisations, the tranching of liabilities sets structured finance products apart.⁴

... backed by tranching liabilities with different risk-return profiles

A key aspect of the tranching process is the ability to create one or more classes of securities whose rating is higher than the average rating of the underlying collateral asset pool or to generate rated securities from a pool of unrated assets. This is accomplished through the use of credit support specified within the transaction structure to create securities with different risk-return profiles. The priority ordering of payments offers one example of credit support: the equity/first-loss tranche absorbs initial losses up to the level where it is depleted, followed by mezzanine tranches which absorb some additional losses, again followed by more senior tranches. The credit support resulting from the priority ordering means that the most senior claims are expected to be insulated – except in particularly adverse circumstances – from the default risk of the asset pool through the absorption of losses by subordinated claims.

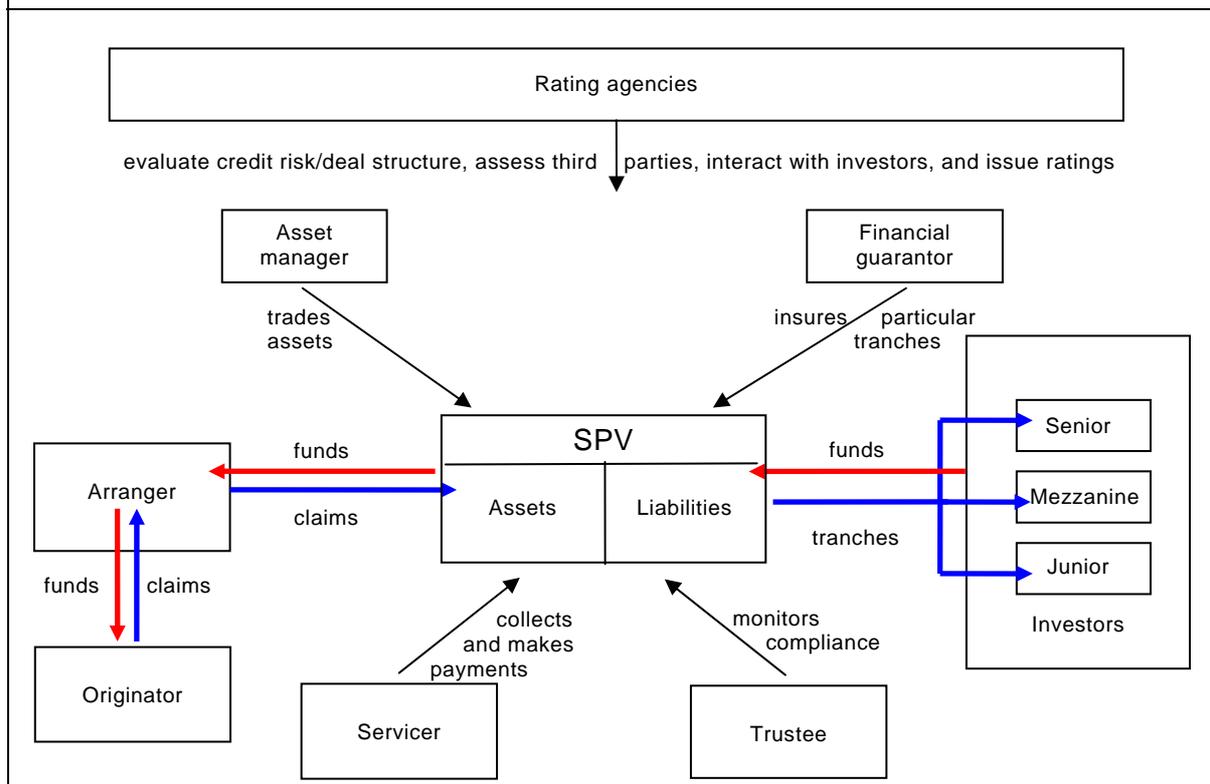
Value creation is based on market imperfections ...

Each of the three key characteristics of structured finance contributes to “value creation” and to the attractiveness of structured finance markets for a variety of market participants. (Figure 1 illustrates the range of participants involved in a generic structured finance transaction.) In this context, delinking confers benefits similar to those of secured credit, with the additional feature that the income streams from the delinked assets will tend to be more predictable than those of the ongoing firm. An important question relating to the pooling and tranching characteristics of structured finance is under what circumstances the tranching of liabilities, which is costly, can create value above and beyond that of pooling only (eg through “pass-through”

⁴ In the remainder of this article, the term “traditional ABS” will be used for structured finance securities backed by large homogeneous asset pools, such as credit card and auto loans. This contrasts with CDOs, themselves part of the ABS universe, which are backed by smaller pools of more heterogeneous assets, including assets such as bonds sourced in secondary markets and “unconventional” assets, such as tranches of other ABSs and CDOs.

Structured finance: key market participants

Stylised overview of the “players” involved in (funded) structured finance transactions and of their roles



Source: CGFS (2005).

Figure 1

securitisation). Answers to this question relate to the nature of imperfections in financial markets. For example, the presence of adverse selection and/or market segmentation can lead to situations where tranching adds value. When the originating institution has more information about the potential cash flows from the asset pool than do outside investors, or when one group of investors has more information or ability to value the assets than others, it may be optimal to issue a senior tranche (ie debt), which is at least partially insulated from default and purchased by lesser informed investors, and a junior tranche (ie equity), to be acquired by more informed investors or retained by the originating institution.⁵ Indeed, banks typically hold the equity tranches of the collateralised loan obligations they issue. Market information also suggests that the more junior tranches of structured products are often bought by specialist credit investors, while the senior tranches appear to be more attractive for a broader, less specialised investor community.

... such as asymmetric information ...

Similarly, segmented financial markets – due, for example, to the existence of investors with ratings-based investment mandates – may make it

... and market segmentation

⁵ Gorton and Pennacchi (1990) show in a general context that it may be optimal for firms facing informed and uninformed investors to issue both debt and equity. For a review of literature relating more specifically to asymmetric information and market segmentation in structured finance markets, see Mitchell (2004). Ashcraft (2004) and Amato and Remolona (2003) present illustrations of value creation via arbitrage CDOs.

attractive for structured finance arrangers to create new assets with desired loss characteristics for particular investor classes. Investors benefit, as structuring helps to “complete” otherwise incomplete financial markets, for example by enabling investors constrained to invest in highly rated securities to gain exposure to asset classes, such as leveraged loans, whose performance across the business cycle may differ from that of other eligible assets.

Contractual structures ...

Whereas tranching claims may help to overcome certain market imperfections, it also introduces problems related to governance and to the question of who, if anyone, should take responsibility for restructuring the portfolio if some of the underlying assets become non-performing. As is discussed in the next section, equity tranche holders may have an incentive to increase risk and return, whereas senior tranche holders have an incentive to minimise defaults in the asset portfolio. In addition, if third-party asset managers are required to hold the equity tranche of a transaction in order to control problems of moral hazard, then their incentives will be in conflict with the senior investor classes. Indeed, much of the contractual structure of tranching products amounts to an exercise in “complete contracting”, detailing the rights and responsibilities of the asset manager, note holders and other third parties involved in the transaction. In practice, these provisions – which take the place of discretionary control rights granted to equity investors in ordinary, long-lived firms – have evolved substantially over time, often in response to poor transaction performance due to unanticipated, opportunistic behaviour by certain participants.

The complexity of structured finance

Sources of complexity

... add a layer of analytical complexity ...

Pooling and tranching, while being key sources of value in structured finance, are also the main factors behind what might be called the “complexity” of these instruments. As far as pooling is concerned, evaluation of risk and return of a structured finance security necessitates modelling the loss distribution of the underlying asset pool, which may be complicated when the pool consists of a small number of heterogeneous assets. However, as tranching adds an extra layer of analytical complexity, the evaluation of a structured finance instrument (in other words, a tranche) cannot be confined to analysing asset pool loss. It is also necessary to model the distribution of cash flows from the asset pool to the tranches; that is, to evaluate the deal’s specific structural features. These features, defined via covenants, may entail sets of rules for the allocation of principal and interest payments received from the collateral pool and for the redirection of these cash flows in the case of stress situations, in addition to specifying the rights and duties of various third parties involved in the transaction.⁶

⁶ One might argue that evaluation of subordinated debt and related assets is similarly complex, given various covenants and differences across national bankruptcy laws. We argue that evaluation of structured finance instruments entails all of that complexity, plus additional

Consequently, structured finance instruments give rise to “non-default” risks – ie risks that are unrelated to defaults in the collateral pool, but which nevertheless affect the credit risk of issued tranches.⁷ One source of non-default risk is the conflicts of interest among tranche holders. For example, senior note holders are promised interest during the life of the transaction and a principal payment at maturity. Equity holders have no promised principal payment; therefore, they have an interest in see(k)ing high up-front payouts before defaults begin to deplete their tranche holdings. By implication, to the extent that equity investors can influence initial portfolio selection, they may be willing to sacrifice credit quality in exchange for enhanced yield payments, eg by including credits with wide spreads for given rating levels.

... involving default and non-default risks ...

To try to control such conflicts, CDOs and other tranching products rely extensively on structural provisions based on loss triggers and threshold levels (eg overcollateralisation and interest rate coverage tests). These tests, when “failed”, divert cash flow to protect senior note holders. In this context, preservation of “excess spread”, which represents the difference between the income earned on the collateral assets in a given period and the contracted payments to the tranching liabilities, has become a key structural feature. As a result, the excess spread now tends to be held in a reserve fund rather than being distributed to equity tranche investors immediately. This serves to make payouts more back-loaded, cushioning the performance of senior notes.

Performance of third parties constitutes another source of non-default risk.⁸ Servicer performance, in particular, is of fundamental interest for traditional ABS instruments – especially for structures containing assets from jurisdictions or market segments with a relatively small number of third-party servicers, where replacement servicers may be hard to find. The importance of servicer performance for the robustness of structured finance transactions, including possible interactions with legal and default risks, has been highlighted by the losses experienced on certain transactions in the US manufactured housing ABS markets in the late 1990s.⁹

... such as those arising from third-party involvement

Structured finance ratings

Given the complexities described above, structured finance has, from the beginning, been largely a “rated” market. Issuers of structured instruments

Structured finance is a rated market ...

layers, due to the pooled nature of the underlying assets and the elaborate, often non-standardised contractual structures.

⁷ See, for example, Cousseran et al (2004) for a comprehensive description of these issues.

⁸ The underperformance of certain early CDO structures has at least partially been blamed on the actions of asset pool managers. The recent legal dispute over CDO structures named “Corvus” and “Nerva” involving HSH Nordbank and Barclays Capital, which was settled out of court in February, may be a case in point. HSH Nordbank sued Barclays Capital because of losses incurred in these CDO structures, which Barclays managed and in which the asset manager had included some tranches from other, poorly performing Barclays CDOs.

⁹ A decline in underwriting standards, combined with the servicers’ delay of foreclosures, which allowed delinquencies to build, ultimately resulted in higher than anticipated loss severities. In the wake of the economic downturn starting in 2000, pool deterioration became increasingly apparent, triggering substantial downgrades. See CGFS (2005), Appendix 5, for more detailed coverage.

were keen to obtain ratings according to scales that were identical to those for bonds, so that investors would feel comfortable purchasing the new products. Investors, in turn, had an interest in delegating part of the assessment of these instruments to third parties.

The rating agencies, in their traditional role as “delegated monitors” of the riskiness of debt instruments, emerged as a natural source for such services. The complexity of structured finance instruments in all likelihood heightened the importance of this role.¹⁰ Interestingly, structured finance ratings are now among the largest and fastest-growing business segments for the three leading credit rating agencies, and a principal revenue source. This has given rise to a number of concerns, including questions about potential conflicts of interest based on issuer-paid fees.¹¹

While much of the expertise involved in rating traditional debt carries over to structured finance, the special features of structured products lead to differences in the nature of the agencies’ rating methodologies. Importantly, structured finance tranches are usually tailored by arrangers with target ratings in mind. This, in turn, requires the rating agencies to take part in the deal’s structuring process, with deal origination implicitly involving obtaining structuring opinions from the rating agencies.

In practice, arrangers will routinely use the agencies’ publicly available models to prestructure deals and subsequently engage in an iterative dialogue with the agencies to finalise their structures. This process and the confined, contractual nature of a structured finance transaction allows arrangers to adapt the profile of a tranche in response to pre-rating feedback, which implies that the process of rating these instruments has a pronounced “ex ante” nature. This contrasts with traditional “ex post” ratings, for which targeted ratings levels and pre-rating feedback play less of a role, owing to the limited ability of issuers to adjust their credit characteristics in response to such information.

... and instruments are structured in accordance with rating agency models

The risks of structured finance

Analysing pool default risk

Ratings, as indicators of the default risk embedded in debt instruments, are based on expected loss (EL) or probabilities of default (PDs).¹² The estimate of

Asset pool analysis relies on estimated loss distributions ...

¹⁰ Indeed, work by Ammer and Clinton (2004) on pricing patterns for US ABSs suggests that reliance on ratings as a source of credit information seems to be somewhat higher in structured finance than in traditional bond markets. Specifically, ABS downgrades are found to have a stronger impact on prices than do downgrades for corporate bonds, with downgrades to speculative grade standing out in particular.

¹¹ Moody’s annual report for 2003 documents that structured finance, at \$460 million, accounted for more than 40% of its ratings revenues. Although separate public accounts for Fitch Ratings and Standard & Poor’s are unavailable, the annual reports of their respective parent companies suggest that structured finance is of comparable importance for them too.

¹² Ratings issued by Standard & Poor’s and Fitch are based on PDs, whereas Moody’s ratings are based on EL. These differences have a historical component – in order to enhance comparability between bond and structured finance ratings, each agency elected to base its structured finance ratings on the same measure used for its bond ratings.

EL or PD for a structured finance tranche will critically depend on the size (ie “thickness”) and position of that tranche in the loss distribution of the underlying asset pool. To obtain this assessment, as highlighted above, an estimate of the asset pool’s loss distribution (the result of *credit risk modelling*) has to be combined with information about the structural specifics of the deal and its tranches (the result of *structural analysis*).

The main factors driving the loss distribution of any portfolio and, hence, the three main inputs into each agency’s structured finance rating methodology are estimates of: *probabilities of default* of the individual obligors in the pool; *recovery rates*; and *default (time) correlations* among the obligors within the pool. The choice of the approach used in conjunction with these inputs to model losses will depend on collateral pool specifics, such as the number and homogeneity of assets, obligor classes, and historical performance. In this regard, a key differentiation can be made between the approaches used to rate traditional ABS instruments and those applied to CDOs.

... which are based on assumptions about default probabilities and recovery rates ...

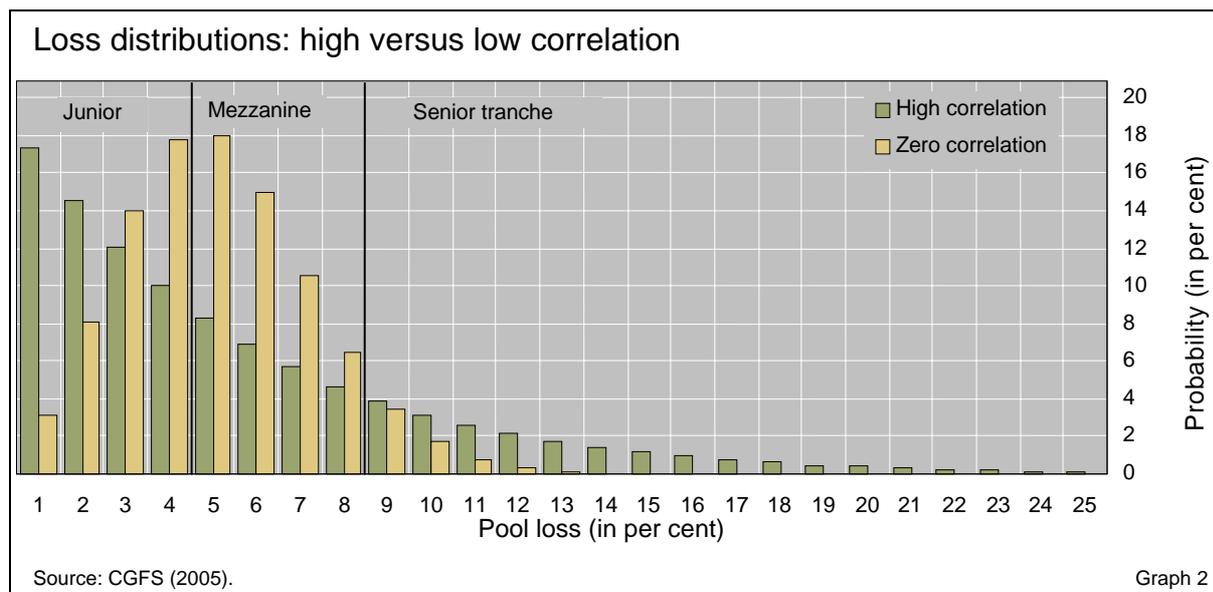
Traditional ABS portfolios are usually made up of large, well diversified, homogeneous pools of assets (eg residential mortgages or credit card receivables), with no significant individual exposures relative to overall pool size. Thus, idiosyncratic risk is much less important for ABSs than for instruments with less diversified and more heterogeneous collateral pools. As a result, ABSs are typically rated by use of so-called “actuarial approaches”, which rely on the assumption that each originator’s unique underwriting policy gives rise to characteristic loss and recovery patterns that are reasonably stable over time. Loss and dispersion measures can then be reliably inferred from the loss histories of static pools of assets originated by the same lender.

CDOs, on the other hand, are “lumpy” (ie less granular than traditional ABSs) and generally contain, or are referenced to, relatively small numbers of non-homogeneous assets. Consequently, both idiosyncratic and systematic risks are important for pool performance, and methods used for calculating loss distributions for traditional ABS portfolios are inappropriate for CDOs.

One of the key issues affecting the assessment of the loss distribution for CDO portfolios is the estimation of default correlations among the obligors. When correlation is close to zero, a typical CDO’s loss distribution will have a skewed bell shape that is best approximated by the binomial distribution. At higher correlation levels, however, the shape of the loss distribution changes, as probability mass is moved into the tails (see Graph 2). For a given level of expected loss, higher correlation among obligors in the pool thus leads to loss distributions such that the senior tranches bear greater risk and the most junior tranche benefits, as outcomes will be more dispersed.

... as well as default correlations

Estimates of tranche risk and return, therefore, are quite sensitive to assumptions regarding the default correlation of obligors in the underlying pool. Consequently, estimates of tranche EL and PD – ie ratings – may differ across rating agencies due to differences in methodologies and/or assumptions. This, in turn, gives rise to “model risk”, ie the risk that the specific model used to size the credit enhancement for a given tranche and rating may inaccurately reflect



the “true” risk of the tranche. Investors, finally, need to understand the model risk they are taking in order to demand appropriate risk-adjusted returns.¹³

Ratings and tranche risk properties

Ratings are based on expected loss or probability of default ...

A related question is whether ratings, to the extent that they accurately reflect EL or PD, are a good guide to the risk properties of tranced instruments. For instance, depending on their position in the seniority structure, tranches of structured finance instruments can be more leveraged than the portfolio of underlying assets: ie the more subordinated a given tranche and the “thinner” that tranche, the greater the probability that the holder of the tranche will lose a significant portion of its investment.

... but not “risk” more generally

As explained in the box on page 76, the variety of possible risk profiles generated through tranching can lead to substantial differences, in terms of unexpected loss and the timing of losses, among tranches as well as between tranches and ordinary bond portfolios. Importantly, these differences apply even when the two instruments have the same EL or PD. As a result, tranced products can have risk properties that differ substantially from those of equally rated bond portfolio exposures. An important implication is that, due to the joint effects of pooling and tranching, ratings of structured finance products can be expected to provide only an incomplete description of their riskiness relative to traditional instruments. In particular, as “tail events” tend to be more likely than for like-rated traditional instruments, undue reliance on the part of structured finance investors on ratings can thus lead to unintended exposures to unexpected loss.

¹³ See Fender and Kiff (2004) for a comparison of the rating agencies’ approaches for CDO modelling and a description of the key role played by default correlation in understanding model risk; Amato and Gyntelberg (2005) show how the price sensitivities of tranced instruments depend on default correlations.

Ratings and the risk properties of structured finance products^①

Ratings are assessments of *expected loss (EL)* or *probability of default (PD)* and thus reflect an actuarial notion of credit risk that depends only on the first moment of the distribution of possible outcomes. Holding EL constant, however, an investment will tend to be riskier if its loss distribution is more dispersed. Risk profiles of financial instruments are, therefore, more fully described when estimates of EL or PD are combined with information on the *ex ante uncertainty of losses* as reflected, for example, in the variance and higher moments of the loss distribution. Ex ante credit loss uncertainty, in turn, has come to be commonly referred to as *unexpected loss (UL)*. With regard to structured finance, two considerations merit mention in this context:

1. Risk comparisons among structured finance tranches

Due to the additivity of EL, the process of tranching will distribute the EL of the underlying portfolio across the various classes of securities issued against the pool. The equity tranche, although typically the smallest tranche in terms of notional size, will end up bearing much of the pool's EL. In contrast, the senior tranche, being highly rated, will bear only a small portion of the EL, despite laying claim to most of the structure's principal. Tranche UL will exhibit similar patterns across tranches: measured against tranche notionals, the UL of a tranche will tend to be higher for more junior tranches. The risk profile of a structured finance tranche, in fact, depends largely on two factors: its *seniority* (as determined by the lower boundary of the tranche) and its *thickness* (ie the distance between the upper and lower tranche boundaries; see Graph 2). The lower the seniority, the lower the level of loss protection and the higher the risk of a given tranche. The narrower the tranche, the more the loss distribution will tend to differ from the distribution for the entire portfolio in that it is likely to be more bimodal and, thus, riskier.

2. Risk comparisons with like-rated assets

Another aspect of structured finance is that tranching can lead to risk profiles that are substantially different from those of ordinary bond portfolios with the same (weighted average) rating. One factor behind this observation is the possibility of zero tranche recoveries for subordinated tranches. As a result, if defaults are severe enough, investors in all but the most senior tranches may lose the entire value of their investment even in the case of non-zero recoveries. The narrower the tranche, the riskier it will be, as it takes fewer defaults for the tranche to be wiped out once its lower loss boundary has been breached. Subordinated tranches, therefore, have a wider distribution of outcomes than like-rated bond portfolios and will thus need to pay a higher spread than traditional debt instruments to compensate for the added risk.

^① See CGFS (2005), Gibson (2004) and Meli and Rappoport (2003).

Structured finance and bond ratings differ not only in the conceptual dimensions highlighted above, but also in terms of the empirically observed rating stability over time. Given the pooled nature of structured finance products, and resulting diversification, they might be expected to – and indeed do – exhibit greater average ratings stability. Empirical studies suggest, in particular, that the volatility of structured finance ratings is significantly lower than for corporate bonds, although the average number of notches per structured finance rating change appears to be higher – perhaps reflecting their higher inherent leverage described earlier. The likelihood of a rating change, therefore, is smaller in structured finance, while the magnitude of the change, when it occurs, is larger. At the same time, the results for structured finance products taken as a whole mask significant differences across different types of

structured instruments, and particular asset classes seem to exhibit a markedly higher rate of downgrades than bonds.¹⁴

Some implications

While structured finance instruments can contribute to market completion and a better dispersion of credit risk, they also give rise to a number of questions with potential financial stability implications. One of these is whether adding structured instruments to an institution's portfolio might lead to unanticipated risk concentrations. A closely associated question is whether ratings-related investment mandates and similar constraints are effective in defining maximum levels of risk when structured finance is an eligible asset class.

Undue reliance on ratings ...

The discussion above suggests that tranching securities pose unique challenges to the application of ratings-based constraints in that a greater likelihood of "tail events" is not captured by ratings ranking expected loss or probability of default. Transaction-specific documentation makes the task of assessing the riskiness of tranching instruments even more difficult, which in turn may increase investors' reliance on ratings for "due diligence" purposes. And, even when asset managers do fully understand the risks they are taking, they may still be tempted to employ structured securities to increase portfolio risk to levels that are higher than was intended by those who designed their investment mandates. By implication, market participants and supervisors should not rely exclusively on ratings when setting risk limits for credit portfolios.¹⁵

... and model risk ...

Model risk is another important concern, being tightly linked to the complexity of structured products and to the sensitivity of tranche risk to differing assumptions embodied in estimates of the asset pool loss distribution.¹⁶ Importantly, any effect of misspecified model inputs, such as default correlation, may be magnified by governance issues, as equity tranche holders favour asset pools composed of obligors with high default correlations, at the expense of senior note holders.

In addition, it should be noted that model risk is a feature also of the pricing models used by deal arrangers and other market participants. As these models have to date been largely untested by a truly major stress event, even

¹⁴ One such example is CDOs, for which Moody's reports a downgrade-to-upgrade ratio of 19.0 for 1991–2002, as compared with long-term ratios of 1.2 for all structured finance products and 2.3 for corporate bonds. According to market sources, this record was primarily driven by an extraordinarily high rate of defaults and downgrades for bonds included in CDO pools and by shared concentrations in particular obligors. See also Violi (2004).

¹⁵ The new regulatory capital requirements for banks' holdings of securitisations, as specified in the new Basel II framework, may be seen as a reflection of these considerations. They not only take account of the rating assigned to a tranche, but also explicitly incorporate factors such as the level of subordination of the tranche and the granularity of the underlying asset pool. For more detail on the different approaches for computing regulatory capital for securitisations, see CGFS (2005), Box 6.

¹⁶ Note that model risk is also present in bond ratings. However, given the less quantitative nature of the bond rating process, model risk is arguably more pronounced and its sources more easily identifiable in structured finance ratings.

the most sophisticated market participants may thus need to be careful when trading structured instruments, given the resulting scope for mispriced or mismanaged exposures. A related point is that adding tranching products to existing exposures in a portfolio raises issues regarding the management of correlations on the portfolio level – particularly for “correlation-intensive” instruments, such as CDOs based on tranches of other CDOs.

Fortunately, these issues appear to be reasonably well understood by many, if not most, market participants. Market surveys suggest that investors do not rely exclusively on ratings for their structured finance investment decisions; rather, they tend to see ratings as only one element of a broader process of risk management. In addition, those investors who lack the capacity to analyse complex structured finance instruments, such as CDOs, claim to avoid using them (see CGFS (2005) and ECB (2004)). However, to the extent that structured finance markets are broadening to include less sophisticated institutions and retail investors, the risk of unanticipated losses is real.

... pose the risk of unanticipated losses

The rapid evolution of structured finance markets implies that new structures and asset classes are continually being introduced. As a result, unfamiliar structures create new opportunities for unanticipated behaviour by note holders or third parties, while the scarcity of data on the historical performance of new asset classes generates additional model risk. Given the issues highlighted in this article and the fact that the structured finance market remains largely untested, policymakers and market participants alike have an interest in following closely the developments in these markets and in attempting to understand the core challenges faced.

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Opening markets through a regional bond fund: lessons from ABF2¹

In creating a regional bond fund, central banks in East Asia and the Pacific worked to reduce impediments in eight local markets. Moreover, they built into the fund's structure an incentive mechanism for reducing impediments further.

JEL classification: E440, G150, G160, G180, O160.

Since the Asian crisis of 1997, local currency bond markets in the region have expanded rapidly; even so, they are still seen as not achieving their potential to intermediate between domestic savers and borrowers. Capital flows since the crisis show that Asians have been investing largely in low-yielding foreign assets and foreigners in higher-yielding assets in the region. While some of these flows are consistent with portfolio diversification, the broad pattern suggests that a sizeable part of financial intermediation is being carried out abroad. To bring such intermediation home, Asian policymakers perceive a need for deeper and more liquid local bond markets.

This perception has spawned a number of regional cooperative efforts at market reform. In this special feature, we assess one such undertaking – an unusual one in that it involved the creation of an actual bond fund, with financial contributions from the parties concerned. The regional group involved is the Executives' Meeting of East Asia and Pacific (EMEAP) central banks.² The fund they have created is called the Asian Bond Fund 2 (ABF2). We argue that because the group set up an actual fund, its reform efforts enjoyed significant advantages from “learning by doing”.

In what follows, we first provide an overview of the recent development of local currency bond markets in East Asia and describe the main impediments in those markets. We then explain the structure and features of ABF2 in the

¹ We thank Claudio Borio, Norman Chan, Guy Debelle, Már Gudmundsson, Robert McCauley, Frank Packer, Sakkapopp Panyanukul, Ramona Santiago, Atsushi Takeuchi, Philip Wooldridge and Sunny Yung for helpful discussions. The views expressed are those of the authors and do not necessarily reflect those of the BIS.

² The 11 EMEAP central banks and monetary authorities are the Reserve Bank of Australia, People's Bank of China, Hong Kong Monetary Authority, Bank Indonesia, Bank of Japan, Bank of Korea, Bank Negara Malaysia, Reserve Bank of New Zealand, Bangko Sentral ng Pilipinas, Monetary Authority of Singapore and Bank of Thailand.

context of various regional initiatives for bond market development. Finally, we comment on the role of the ABF2 exercise in the reform of bond market regulation, providing examples of market impediments that have been reduced in the process of creating the fund and describing the mechanism put in place to provide incentives for reducing impediments further.

Local currency bond markets in East Asia

In the wake of the Asian crisis of 1997, there was concern at first that the lack of well developed local currency markets was forcing Asians to borrow in foreign currencies, thus making their economies more vulnerable to a speculative currency attack. Since then, however, governments in the region have accumulated so much in foreign exchange reserves that the risk of another currency crisis has ceased to be an immediate concern. Of greater interest to policymakers in the region has been the concern that their stockpiles of official reserves may be a sign of inefficient domestic intermediation, since such reserves seem to have been earning much less than what they pay when borrowing abroad.

Currency crisis no longer the issue ...

McCauley (2003) documents that the broad pattern of gross capital flows since the Asian crisis has indeed been one of Asians investing in low-yielding foreign assets and foreigners investing in higher-yielding assets in the domestic markets of the region. In other words, Asian savings are being sent abroad only to return in the form of foreign investment. Financial intermediation is being carried out in the more developed financial markets of Europe and North America. In principle, the importance of local information should lead to such intermediation being done at home. If local currency bond markets in Asia functioned as intended, Asian policymakers now seem to be asking, could they not keep such intermediation at home and in the process save their economies some of the borrowing costs?

The Asian crisis did have economic consequences that themselves added impetus to the development of local currency bond markets in the region. As economies contracted, governments in the region found themselves faced with budget deficits. Huge amounts of funds were needed for large-scale bank restructuring. And this time, the governments in the region made an effort to eschew borrowing abroad, instead borrowing locally in local currencies. As a result, the total amount of domestic debt outstanding in East Asia excluding Japan has risen nearly threefold since 1998 (Graph 1).³ Hence, to the extent that the sheer amount of debt helps in market development, the Asian crisis has contributed to the development of local currency bond markets in the region.

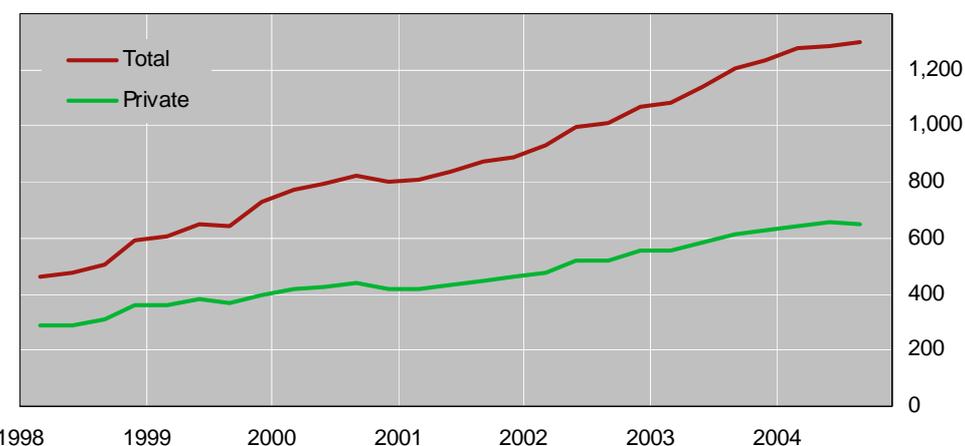
... although it has played a role

Other factors, however, seem to continue to hold back these local markets. While the strength of issuance has been beneficial to the primary markets, the secondary markets still suffer from a lack of liquidity. A number of market impediments, both cross-border and local, remain. Takeuchi (2004)

³ For a review of bond market development since the 1997 crisis, see CGFS (1999), McCauley and Remolona (2000), Jiang and McCauley (2004), Battellino (2004) and Sheng (2005).

Domestic debt securities outstanding in East Asia¹

In billions of US dollars



¹ Includes the bond markets of the eight EMEAP members China, Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand.

Source: BIS.

Graph 1

provides a survey of cross-border impediments in Asia. While most of these cross-border impediments are well known in the literature on capital controls, local impediments have been relatively less well appreciated and thus received insufficient attention.

Cross-border
impediments ...

Capital controls typically include a ban on investments by foreigners or on repatriation of principal or income on these investments, restrictions on currency conversion and other prohibitions and regulatory hurdles for both issuers and investors. There is evidence that such controls still bind in Asia. Ma and McCauley (2004), for example, show that there is still not sufficient arbitrage to equalise onshore and offshore yields in various Asian money markets.

... as well as local
ones

Local market impediments may take the forms of taxes, insufficient market development and an inadequate clearing and settlement infrastructure. Withholding taxes and taxes on financial transactions remain a major cost to non-resident investors in some of the local markets. Within EMEAP, some jurisdictions exempt only non-resident investors, and some only for certain instruments. Insufficient market development, such as the lack of a broad and diversified bond investor base, issuers and products, is not conducive to liquidity. For deep and liquid markets in Asia, Jiang and McCauley (2004) identify as essential such factors as market size, the diversity of the investor base and the availability of hedging instruments. Inadequate custody, clearing and settlement facilities also hamper bond market development. In most Asian bond markets, it is still rather cumbersome and sometimes impossible to clear and settle cross-border bond transactions.

Regional cooperation and the ABF2 project

East Asia has seen several initiatives in regional cooperation to develop domestic bond markets. The focus of the various regional initiatives has been to open up domestic markets to foreign portfolio investment by removing both

local and cross-border impediments. Among these initiatives, only the ABF2 effort involves actually setting up funds to invest in the local currency markets. We argue in this section that this unusual approach leads regulators to encounter impediments in such an operational manner as to make it an effective mechanism for regulatory reform. In principle, private investors could have also lobbied for reforms as they set up investment funds. However, market reform is a public good in the sense that the benefits are enjoyed by many investors. Individually, investors would be unwilling to bear the costs of lobbying fully for such reforms, because they would not be able to keep the benefits to themselves.

Initiatives in Asian regional cooperation

At least three major government-sponsored regional organisations in Asia are pursuing initiatives to promote financial development in the region (Battellino (2004)). Under the banner of the Asia-Pacific Economic Cooperation (APEC) forum,⁴ one initiative is focusing on the development of securitisation and credit guarantees. Within the Association of South East Asian Nations Plus Three (ASEAN+3) framework,⁵ six working groups have been set up to address a broad range of issues related to local bond markets in Asia. The third organisation consists of the EMEAP central banks, which have been behind the setting-up of the Asian bond funds (ABFs).

Three regional organisations ...

The initiatives of these three regional organisations tend to complement each other. For example, under ASEAN+3, the Asian Bond Market Initiative has helped secure approval from three countries to allow multilateral development institutions to issue bonds in their local currencies. The Asian Development Bank (ADB), International Finance Corporation (IFC) and World Bank have already taken advantage of this by each issuing bonds denominated in Malaysian ringgit.⁶ The ADB has also issued in Thai baht and plans to issue in Philippine pesos and Chinese renminbi. Hence, these actions are adding to the supply of paper in the local bond markets while the ABF2 exercise is adding to the demand for this paper.

... complementary initiatives ...

The ABF exercises are the first initiatives in which a regional organisation has contributed financial resources to setting up actual bond funds in Asia. In June 2003, the EMEAP central banks launched the first fund, the Asian Bond Fund 1 (ABF1), pooling \$1 billion in international reserves from the 11 central banks and investing in US dollar-denominated bonds issued by sovereigns and

... and two bond funds

⁴ APEC has 21 member economies: Australia, Brunei Darussalam, Canada, Chile, China, Hong Kong SAR, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Taiwan (China), Thailand, the United States and Vietnam.

⁵ The members of ASEAN are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. The "+3" are China, Japan and Korea.

⁶ There have been three issues of supranational local currency bonds in Malaysia since late 2004: MYR 400 million by the ADB, MYR 500 million by the IFC and MYR 760 million by the World Bank. The ADB issue in Thailand in 2005 amounted to THB 4 billion.

quasi-sovereign borrowers in eight of the EMEAP economies.⁷ It was the first regional pooling of international reserves in Asia. The EMEAP central banks have now launched the second fund, the Asian Bond Fund 2 (ABF2), which will invest \$2 billion of EMEAP central bank reserves in local currency denominated sovereign and quasi-sovereign issues in the same eight EMEAP markets.⁸

Concerted "learning by doing": the ABF2 exercise

As mentioned, the ABF2 initiative differs from the others in that it involves the actual creation of local currency bond funds. The earlier ABF1 had limited itself to dollar-denominated issues that are mostly traded in more developed international bond markets. Nonetheless, that first fund was important because it afforded the EMEAP central banks an opportunity to work together to build trust so as to foster cooperation and to further develop financial markets in the region.

Nine individual funds ...

ABF2 is actually nine separate funds: a Pan-Asian Bond Index Fund (PAIF) and eight single-market funds (Figure 1). The PAIF is a single-index bond fund investing in sovereign and quasi-sovereign domestic currency denominated bonds issued in the eight EMEAP markets. The PAIF will be quoted in US dollars on an unhedged basis (see the box on page 87). The eight single-market funds will each invest in the respective local currency bond market. Each of the nine funds will replicate a bond index provided by a third party, the International Index Company (IIC), which has been a major participant in developing the highly successful credit default swap (CDS) indices in Europe and North America.⁹ Private sector fund managers have been designated to individually manage the PAIF and the single-market funds. The mandate of each fund manager is then to try to replicate the relevant index and manage the fund passively.

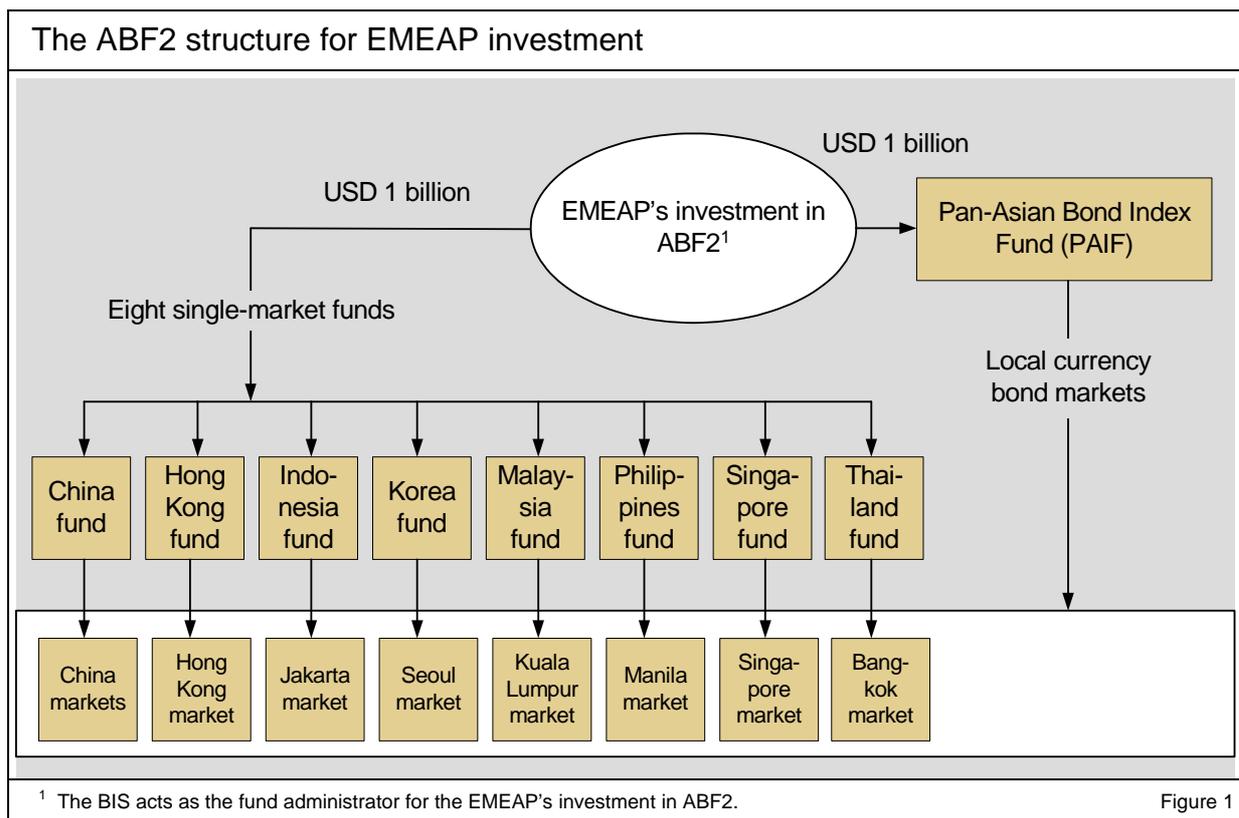
... in two phases

ABF2 is proceeding in two phases. In Phase 1, investments in both the PAIF and the single-market funds are confined to the international reserves of the 11 EMEAP central banks, with a total sum of \$2 billion. The EMEAP has just announced the formal launch of Phase 1 of ABF2. In Phase 2, the PAIF and the eight single-market funds are to be gradually opened up to other institutional and retail investors, both within and outside the EMEAP region. The pace and timing of the opening of these nine bond funds could vary across jurisdictions. While the PAIF is expected to become open to the public around the end of June 2005, some of the single-market funds could take somewhat longer. Undertaking the project in phases has allowed the central banks to identify market impediments in stages and deal with them on a realistic schedule.

⁷ The three EMEAP countries in which the ABFs will not invest are Australia, Japan and New Zealand.

⁸ The BIS acts as manager for ABF1 and as administrator for ABF2.

⁹ CDS indices are now the most actively traded instruments in credit markets. The main CDS index for Europe is DJ iTraxx and for North America DJ CDX. Both are the result of a merger between two competing families, Trac-x and iBoxx. See Amato and Gyntelberg (2005).



The advantage of creating actual funds in the process of trying to reform markets is that an important element of “learning by doing” is introduced. Conversations with the key individuals involved suggest that in setting up ABF2 the EMEAP central banks encountered myriad market impediments, many of them seemingly small but each one critical to the operation of the funds. Even when these officials had been aware of the impediments before the exercise, they found some of them to be more significant than initially thought. By undertaking the initiative as a group, the EMEAP central banks improved their understanding of specific impediments in their local bond markets and ways to overcome them. Seeing that the authorities in neighbouring jurisdictions had already instituted certain market reforms would encourage the relevant authorities to “fast-track” their own initiatives. Often the central bank officials worked with their counterparts at the finance ministry or securities regulator to deal with the impediments.

“Learning by doing”

Recognising that their job is far from complete, the central banks have also agreed on an incentive mechanism for further reducing market impediments. In particular, the scheme for allocating the portfolio to the various local markets will take account of market impediments: the portfolio weight in ABF2 for an individual market rises as cross-border and local market impediments there are removed.

Designing a liquid Pan-Asian Bond Index Fund

Pierre Cardon

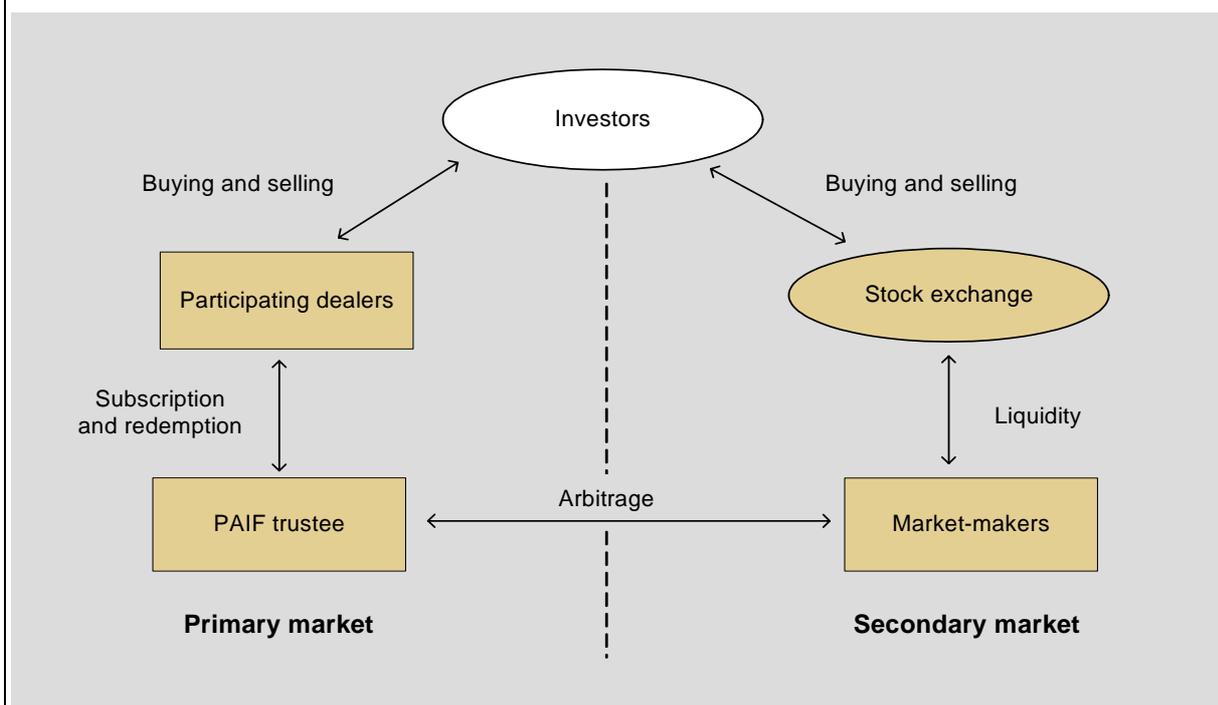
The Pan-Asian Bond Index Fund (PAIF) was designed to allow institutional and retail investors to gain access to Asia's local bond markets in a simple, transparent and cost-effective manner. The main challenge was to ensure that investors benefit from the lower costs resulting from the economies of scale obtained by passively tracking a regional index. The specific index will be the iBoxx Pan Asia Index, which is constructed to be transparent and to cover the eight local Asian bond markets. The index will be quoted in US dollars on an unhedged basis.

The fund's regional scope meant that there was no natural domicile for it in any of the EMEAP jurisdictions. Tax, legal, operational and marketing considerations suggest that a Singapore unit trust initially listed on the Hong Kong Stock Exchange would offer the best option for all investors. This unique combination of domicile and listing is still pending approval by the relevant authorities.

The fund will be open-ended as well as exchange-listed. These features allow a passively managed fund to trade at well determined prices even in relatively illiquid local bond markets. Here investors will be able to trade the PAIF in two ways. First, as shown in the figure below, investors could go to fund trustees through dealers to buy or redeem units at that day's closing net asset value, thus engaging in a transaction in the "primary market". Second, they could buy or sell units on the stock exchange, thus trading in the "secondary market". As has been the case with other funds previously launched in the region, there will be some restrictions on trading PAIF units in the primary market so as to concentrate liquidity in the secondary market. Nonetheless, the primary market will continue to provide an important means for arbitrage to ensure that secondary market prices stay in line with the fund's net asset value.

In the primary market, the PAIF will follow the "participating dealer model". This model limits daily subscriptions and redemptions only to dealers who have signed an agreement with the fund manager. To help the manager deal with cash inflows and outflows, the participating dealers may only transact a minimum size. For cash transactions, there will be a limit on the total daily volumes; and the manager will charge a dilution fee. There will, however, be no such limit and dilution fee if transactions are in exchange of a basket of bonds. These transactions are known as "in-kind" subscriptions or redemptions. Engaging in such transactions will be at the discretion of the fund

Two ways to trade the PAIF



manager. The “in-kind” facility makes the PAIF similar to an exchange-traded fund (ETF), the main difference being that in-kind dealing is more formalised with an ETF.

In the secondary market, the fund manager will appoint market-makers to provide liquidity in the trading of units on the stock exchange. The market-makers will be expected to maintain tight bid and offer quotes on the exchange and to seize arbitrage opportunities by closely monitoring the fund’s net asset value and comparing it with the prices on the exchange. To help them provide liquidity, the market-makers will have priority in the primary market for trades up to a specified limit per day, and they will be able to borrow fund units from institutional investors.

The opening of the PAIF to the public may take place around the end of June 2005. Before listing the fund on the exchange, a unit trust will be set up by the EMEAP central banks with an “in-kind” transfer of the equivalent of around \$1 billion in local currency bonds, which will have been purchased during Phase 1 of ABF2. The fund will then be enlarged through private placements by institutional investors, participating dealers and market-makers. It will then be listed to allow all other investors to acquire the units on the secondary market. This strategy is expected to keep costs low and avoid the volatility usually associated with a sale-driven initial public offering. From then on, listings on other EMEAP stock exchanges will be considered depending on demand from local investors and on whether local regulatory rules permit it.

Once listed, the PAIF will be the first low-cost, passively managed investment fund invested in the eight EMEAP local bond markets. It is the first foreign fund that has been granted direct access to China’s interbank bond market. These features should make the PAIF especially attractive to pension fund and retirement accounts seeking opportunities for diversification and favourable long-term returns.

Impediments already reduced

For such relatively small sums, the ABF2 initiative has apparently been unusually effective in promoting the reform of local bond markets.¹⁰ Because of the other initiatives that are also under way, it is always difficult to attribute regulatory changes to the ABF2 effort alone. Nonetheless, many of the participants feel that the effort has made a significant difference. In this section, we can provide only a few illustrative examples of reductions in impediments. A more comprehensive review will form the subject of future work.

The most apparent area for reform has been in capital controls. Malaysia, for example, has announced measures to liberalise its foreign exchange market so that it has now essentially restored the regime that was in place before it imposed capital controls during the Asian crisis. The Malaysian authorities have lifted all restrictions on non-resident hedging activities. Companies controlled by non-residents now enjoy full access to onshore ringgit credit facilities. Residents without domestic ringgit borrowing can freely invest abroad. Finally, the Malaysians have permitted multilateral agencies to issue local currency bonds in the domestic market and allowed these non-resident issuers to hedge exchange risks with onshore banks. China’s active participation in ABF2 also bodes well for the country’s willingness to simplify its still extensive regulations on cross-border portfolio investment and to lower hurdles for the still fragmented domestic bond markets regulated by multiple

Relaxing capital controls

¹⁰ In this respect, the small sums involved help in that they avoid the problem of a passive investor’s taking away from the market too much of the available volume of tradable instruments.

authorities. In fact, the PAIF is the first foreign institutional investor that has been given direct access to the Chinese interbank bond market.¹¹

Withholding taxes and other taxes are another area of reform. Thailand has already granted non-resident investors withholding tax exemption for income from investing in baht-denominated government bonds and, in most cases, government-guaranteed bonds in the domestic market. Malaysia has also announced the exemption of non-resident investors from the withholding tax on the interest income received from investment in ringgit-denominated debt securities onshore. So far, five of the eight EMEAP member markets have offered exemption from the withholding tax to non-residents investing in local currency sovereign or quasi-sovereign issues. In the Philippines, the documentary stamp duty will be removed with the introduction of the Philippine single-market fund.

Spanning national jurisdictions

One unexpected area of reform has been the legal accommodation of national jurisdictions so that a fund domiciled in one jurisdiction may be sold in another. The PAIF, for example, is to be domiciled in Singapore to take advantage of a host of factors including bilateral tax agreements between Singapore and the other EMEAP members. However, it will be initially listed in Hong Kong in part to take advantage of the high degree of liquidity and depth in that market. This combination is the first ever in Asia, entailing a significant learning effort on the part of each regulatory authority.¹² To make this possible, the participating central banks and the regulatory authorities concerned needed to cooperate in reconciling divergent regulatory frameworks. Direct participation in local currency bond markets by the EMEAP central banks has thus helped them further identify, understand the details and gauge the importance of market impediments and appreciate more the diversity of each other's regulatory frameworks. This appreciation should in turn set the stage for further streamlining of market regulation in the region.

Incentives to further reduce impediments

The central banks involved in ABF2 have devised a mechanism to provide incentives to further reduce impediments in their own local bond markets. These incentives are built into the determination of the market weights in the portfolio of the PAIF and the single-market funds.

Determining the market weights

Weights for portfolio allocation ...

The portfolio allocations of the PAIF and the EMEAP investment in the eight single-market funds will be determined in large part by market weights that take account of various factors. There are specifically four such factors: the size of

¹¹ Previously, qualified foreign institutional investors were allowed to directly invest in bonds and stocks traded on the smaller Shanghai Stock Exchange and Shenzhen Stock Exchange.

¹² In the future, the PAIF may be listed in another market in the region, and some of the eight single-market funds could be managed in jurisdictions other than those where they are registered and listed.

the local market, the turnover ratio in that market, the sovereign credit rating¹³ and a market openness factor. Starting from an equal allocation for each local market, the allocation will be adjusted to take account of these four factors. The allocation for a given market will be adjusted upwards if the adjustment factors score better than the averages for the eight markets. In the adjustment, market size, turnover ratio and credit rating will each carry a 20% weight. The greatest part of the adjustment will be determined by the market openness factor, which will be assigned a 40% weight.

The market openness factor

IIC, the company generally responsible for the bond market indices to be replicated by the nine ABF2 funds, has constructed a “qualitative factor that gauges the relative openness of the eight markets” (IIC (2005a)). In so doing, IIC consulted with a “number of international and domestic market participants through its Asian Index Committee and Asian Oversight Committee, as a means to help ensure the credibility and market acceptance of the indices” (EMEAP (2005)). Any assessment of market openness might be expected to take account of such considerations as the absence of capital controls, the level of withholding taxes, the availability of hedging instruments, the facilities for real-time gross settlement and the ability to clear local bonds internationally. The higher the market openness factor assigned for a given market, the more the portfolio allocation is adjusted in favour of that market. The country weights, and thus the market openness factor, will be reviewed every September. As impediments are removed, the changes can be expected to be reflected in a rebalancing of the regional portfolio.

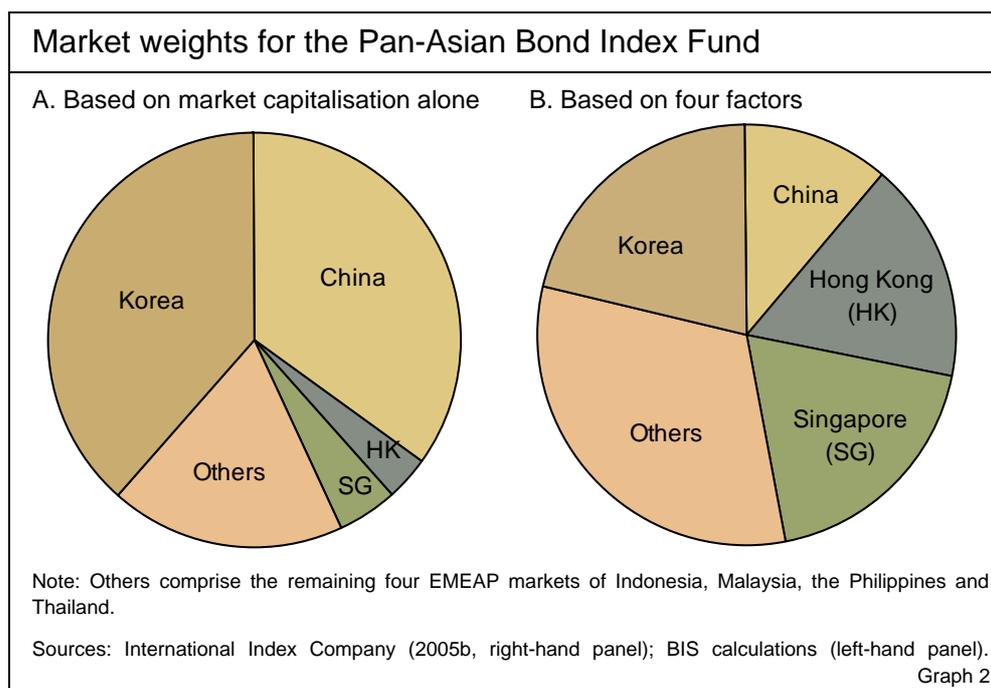
... take account of
market openness

An illustration

Graph 2 shows the effects of such weight adjustments. It compares the weights based on raw market capitalisation data and the adjusted weights in the PAIF portfolio at the time of launch. The allocation after adjustments differs considerably from the weights on the basis of raw market capitalisation data. The allocations in the PAIF to China and Korea fall noticeably below their capitalisation-based weights, while the remaining six markets gain. In particular, the Hong Kong and Singapore allocations rise more than fourfold.

There are at least two ways in which the ABF2 indices will help the development of Asian local currency bond markets. First, they provide a dynamic mechanism to encourage the eight EMEAP members to continue their efforts at market liberalisation. Market openness is the single most important adjustment factor in the allocation weights, and these will be reviewed annually. Second, the transparency, replicability and credibility of these market indices will provide the kinds of benchmarks that have proven useful elsewhere for the development of markets in corporate bonds.

¹³ Local currency long-term debt ratings of the three international rating agencies (Fitch, Moody's and Standard & Poor's) are applied.



Conclusion

The ABF2 initiative is a regional cooperative effort aimed at fostering local currency bond markets in Asia. It differs from other such efforts in that it involved actually setting up bond funds. Hence, it contained an important element of “learning by doing”, which enabled EMEAP to identify in detail significant market impediments that had not been well appreciated before. The process has already helped ease various market impediments, both cross-border and local. The exercise also provides incentives to further reduce market impediments.

An important test for the exercise will be whether it sets the stage for the development of local currency markets in corporate bonds. Already, ABF2 is bringing new instruments to the local markets. As a listed open-ended index fund, the PAIF is a relatively low-cost, low-denomination and transparent fund, which would be potentially appealing to a broad spectrum of institutional and retail investors. Thus, the PAIF may help broaden both the investment menu and investor base. Five of the eight single-market funds are expected to be exchange-listed, and another market will join their ranks soon. For instance, the Hong Kong Fund and Singapore Fund may be structured as exchange-traded bond funds (ETFs). China is also expecting its own single-market fund to be an ETF in the second phase of ABF2. Both Thailand and Malaysia are actively working on their own ETF regulations. The introduction of these funds along with a set of transparent and replicable benchmark indices for Asian local currency bond markets may facilitate the development of other fixed income and derivative products, including corporate bonds and credit default swaps.

Corporate bonds
the next stage?

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

For most of 2004, the endorsement of the new capital adequacy framework (Basel II) and issues related to its implementation were the dominant themes. The first quarter of 2005, however, was characterised by more diverse releases by the various Basel-based committees and the Financial Stability Forum. The formal establishment in February 2005 of the Public Interest Oversight Board (PIOB) – a result of multilateral efforts in the oversight of international accountancy standard setting – represents a special highlight of the period under review. Table 1 provides a selective overview of the most recent initiatives.

Basel Committee on Banking Supervision

BCBS publishes study focusing on empirical methods to validate internal rating systems ...

In January, the Basel Committee on Banking Supervision (BCBS) provided an update on one of the greatest challenges of implementing the new capital adequacy framework, the need to validate the systems used to generate the parameters that serve as inputs to the internal ratings-based (IRB) approach to credit risk. This work is carried out under the aegis of the Committee's Accord Implementation Group (AIG) and focuses on the essential role that internal ratings and default and loss estimates play in the credit approval, risk management, internal capital allocation and corporate governance functions of banks using the IRB approach. Recognising that validation is a fundamental aspect of this approach, the AIG has established a subgroup to examine a range of issues related to validation. In this context, the BCBS in February issued a working paper on key aspects of the validation process. Entitled *Studies on the validation of internal rating systems*, the paper presents the work of the Validation Working Group, a subgroup of the Committee's Research Task Force (RTF). The paper concentrates on the validation of the three key risk components in the regulatory capital calculation: probability of default (PD), loss-given-default (LGD) and exposure at default (EAD).

... and announces plans to undertake QIS 5

In March, as part of another follow-up to Basel II, the Committee announced plans to undertake the fifth Quantitative Impact Study

(QIS 5)¹ between October and December 2005 in order to ensure that the review of the calibration of the revised framework, scheduled to take place in spring 2006, is based on the most recent, high-quality data. In addition, QIS 5 will help to evaluate the impact of the Committee's new proposals for the recognition of the effect that both a borrower and a guarantor must default on the same obligation for a loss to be incurred (double default) and trading book-related issues, which were released in a paper for public comment in April.² Entitled *The application of Basel II to trading activities and the treatment of double default effects*, the paper proposes capital requirements that are intended to improve the sensitivity of the capital rules to the underlying economic risks associated with such exposures in a Basel II-compatible fashion. The paper addresses the treatment of the following five issues in particular: (i) counterparty credit risk for over-the-counter (OTC) derivatives and repos; (ii) the double default effect for covered exposures; (iii) the short-term maturity adjustment for trading book-related items under the IRB approach; (iv) improvements to the current trading book regime; and (v) the design of a specific capital treatment for unsettled and failed transactions.

Also in April, the BCBS issued a high-level paper entitled *Compliance and the compliance function in banks*. The paper aims to provide basic guidance for banks based on the views of banking supervisors on compliance. Relying on a single framework of principles, the paper illustrates how compliance with the laws, rules and standards that govern banking activities helps to maintain a bank's reputation vis-à-vis its shareholders, customers, employees and the markets.

BCBS paper on compliance function provides guidance

Committee on the Global Financial System

In February, the Committee on the Global Financial System (CGFS) announced that – under its auspices – the ECB, in cooperation with the Bank of Japan and the Board of Governors of the Federal Reserve System, would host a conference on risk measurement and systemic risk. Scheduled to take place in early November 2005, this fourth in a series of *Joint central bank research conferences on risk measurement and systemic risk* will focus on questions relating to sources of financial contagion and its relation to other forms of systemic risk, macro stress testing, the financial stability implications of credit risk transfers (CRT) and recent advances in risk measurement.³

CGFS announces joint central bank conference on risk measurement

¹ The main purpose of the QIS to date has been to gather information with which to assess whether the Committee has met its goals with regard to the revised framework.

² A summary of responses received on a survey of banks' and investment firms' trading books that provides background material was also published in April (see Basel Committee on Banking Supervision, *Trading book survey: a summary of responses*, 2005).

³ A detailed conference outline and more information on the call for papers are available at www.bis.org/cgfs/cgfsconf2005.htm.

Main recent initiatives by Basel-based committees and other bodies			
Body	Initiative	Thematic focus	Release date
BCBS	<i>Studies on the validation of internal rating systems</i>	<ul style="list-style-type: none"> Importance of validation of systems used to generate the parameters for IRB approach Empirical validation methods with regard to probability of default (PD), loss-given-default (LGD) and exposure at default (EAD) 	February 2005
	Schedule for QIS 5	<ul style="list-style-type: none"> Key input for review of calibration of Basel II Evaluation of impact of new proposals (trading book-related issues and double default) 	March 2005
	<i>The application of Basel II to trading activities and the treatment of double default effects</i>	<ul style="list-style-type: none"> Consultation paper for public comments prepared by joint BCBS-IOSCO working group Outline of proposals for capital requirements dealing with trading book-related issues and double default 	April 2005
	<i>Compliance and the compliance function in banks</i>	<ul style="list-style-type: none"> Basic guidance for banks Single framework incorporating sound practice guidance for design, implementation and operation of compliance function 	
CGFS	Fourth joint central bank research conference on risk measurement and systemic risk	<ul style="list-style-type: none"> Conference announcement and call for papers Financial contagion, macro stress testing, financial stability implications of credit risk transfers, advances in risk measurement techniques 	February 2005
CPSS	<i>Statistics on payment and settlement systems in selected countries – Figures for 2003</i> (final version)	<ul style="list-style-type: none"> Annual release of country-specific and comparative tables 	March 2005
Joint Forum ¹	Update on initiatives to combat money laundering and the financing of terrorism	<ul style="list-style-type: none"> Update on activities by BCBS, IAIS and IOSCO 	January 2005
	Outsourcing guidance to the financial sector (final version)	<ul style="list-style-type: none"> Guiding principles, current trends Regulatory developments, key risks 	February 2005
	Report on credit risk transfer (CRT) (final version)	<ul style="list-style-type: none"> Degree of risk transfer achieved by instruments/transactions Agents' understanding of risks involved Concentration risk due to CRT 	March 2005

FSF	Establishment of PIOB	<ul style="list-style-type: none"> • Joint initiative by BCBS, FSF, IAIS, IOSCO and World Bank • To oversee public interest activities of the International Federation of Accountants (IFAC) 	February 2005
	Thirteenth meeting and progress report	<ul style="list-style-type: none"> • Financial system vulnerabilities • Transfer of risk to the household sector • Issues relating to prior concerns • New process to promote improvements in offshore financial centres 	March 2005
<p>¹ The Joint Forum was established in 1996 under the aegis of the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS).</p> <p>Sources: www.bis.org; www.fsforum.org.</p>			

Table 1

Committee on Payment and Settlement Systems

In March, the Committee on Payment and Settlement Systems (CPSS) released the final version of its annual publication of statistics on payment and settlement systems in the 13 member countries.⁴ The report contains detailed tables on various aspects of payment and securities settlement systems for each individual country as well as a number of cross-country comparative tables.

CPSS releases annual statistics on payment and settlement systems

Joint Forum

In January, the Joint Forum published an update on the various initiatives taken by the respective sectors (banking supervisors, insurance supervisors and securities commissions) to combat money laundering and the financing of terrorism. This note had been prepared for the November 2004 meeting of the Joint Forum. It was intended as an overview of developments since the June 2003 report, entitled *Initiatives by the BCBS, IAIS and IOSCO to combat money laundering and the financing of terrorism*.

Joint Forum issues update on various initiatives ...

In February and March, the Joint Forum released the final versions of two separate reports for which the consultative documents had been circulated during the latter half of 2004.⁵ The first report, entitled *Outsourcing in financial services*, recognises the global trend whereby internationally active businesses providing financial services are increasingly relying on third parties to perform activities they would have previously undertaken themselves. The report examines the growth and other stylised facts of outsourcing and outlines the

... releases final report on outsourcing in financial services ...

⁴ See Committee on Payment and Settlement Systems, *Statistics on payment and settlement systems in selected countries – Figures for 2003, 2005*. The preliminary version, published in October 2004, included some data for 2003 that were provisional.

⁵ The consultative document *Outsourcing in financial services* was issued in August 2004 and the one entitled *Credit risk transfer* in October 2004 (see this chapter of the December 2004 *BIS Quarterly Review*).

potential associated risks to individual firms in particular and the financial sector in general. It also presents a set of best practice principles for entities engaged in outsourcing activities, providing a minimum benchmark against which to gauge individual outsourcing efforts. The Joint Forum developed these principles in conjunction with the International Organization of Securities Commissions (IOSCO), which is producing a specific set of principles for the securities industry. The Joint Forum and the International Association of Insurance Supervisors (IAIS) will consider whether additional guidance on outsourcing for the banking and insurance sectors is necessary.

... and also issues final report on credit risk transfer

The second report, entitled *Credit risk transfer*, was prepared by the Joint Forum's Working Group on Risk Assessment and Capital in response to a request by the Financial Stability Forum (FSF). The report focuses on three issues highlighted by the FSF: whether instruments and transactions accomplish a clean transfer of risk, the degree to which market participants understand the risks involved, and whether credit risk transfer activities are leading to undue concentrations of credit risk. It concludes that credit derivatives have achieved a relatively good risk transfer record to date. Market players seem to be largely aware of the risks concerned, and the concentrations of credit risk pose no immediate threat to financial stability.

Financial Stability Forum

Public Interest Oversight Board established to oversee IFAC

In February, the Financial Stability Forum (FSF) together with IOSCO, the BCBS, the IAIS and the World Bank announced the formal establishment of the Public Interest Oversight Board (PIOB). The PIOB will oversee the International Federation of Accountants' (IFAC) standard-setting activities relating to auditing and assurance practices and member body compliance programmes. The establishment of the PIOB is the result of a collaborative effort by the international financial regulatory community to ensure that the auditing standards set by IFAC and its committees are in line with public interest. As such, this new body will strengthen international auditing standards through informed oversight and by enhancing the transparency and consultative processes involved in these activities.

In March, the FSF held its 13th meeting in Tokyo. The issues discussed included: risks and vulnerabilities in the international financial system; the transfer of risk to the household sector; offshore financial centres; financial reporting and audit-related matters; international standards, codes and best practices; and reinsurance.

FSF reviews risks to financial stability ...

With regard to *vulnerabilities in the international financial system*, the FSF noted that the near-term outlook for global growth and inflation, and the current balance sheet strength of financial institutions, provided a positive backdrop for financial stability. However, members identified a number of risks with the potential to cause strains in financial systems, including: the current level of global funding and market liquidity and the associated low levels of risk premia and long-term interest rates; the process of unwinding global current account imbalances; the continued tightness of commodity markets; and possible spillovers to other economies from future capital account or economic

developments in China. Members also discussed the continued rapid growth of the hedge fund sector and the systemic importance of hedge funds' counterparty relationships.

FSF members thought that major banks and securities firms seemed well placed to manage any potential changes in the economic and financial environment. Nonetheless, members encouraged market participants to monitor and manage evolving risks closely, including through stress-testing of exposures to more adverse scenarios.

On the *transfer of risk to the household sector*, the FSF noted the growing extent of such risk transfer and discussed the changes in financial tools and risk exposures under way on both the asset and liability sides of household balance sheets. Members highlighted the need to foster the financial education of households and ensure that risks were well managed.

On *offshore financial centres (OFCs)*, the FSF agreed on a new process, based on objective criteria and due process, to promote further improvements, notably in the areas of cross-border cooperation and information exchange and adequacy of supervisory resources. At the same time, members agreed that the list of OFCs issued by the FSF in 2000 had served its purpose and was no longer operative. The new process includes initiatives by Forum members at both international and national levels and steps by the FSF itself. The FSF will establish a group to review reports by IOSCO, the IMF and other bodies on the status of their efforts and the results that have been achieved. Drawing on the advice of this group, the FSF will consider follow-up actions as necessary, either to recognise improvements or to highlight non-cooperation with ongoing assessment processes. Unless other considerations call for acceleration of the process, the FSF will in two years' time review the adequacy of these initiatives in addressing the current concerns of its members.

... agrees to improve cross-border information exchange on offshore financial centres ...

With regard to *financial reporting and audit-related matters*, the FSF welcomed the establishment in February 2005 of the Public Interest Oversight Board (PIOB). It also noted progress towards international convergence in accounting standards and encouraged a positive outcome in connection with the finalisation of IAS 39 and other important conceptual accounting issues.

On *international standards, codes and best practices*, the FSF discussed a report by an IOSCO Chairmen's Task Force on IOSCO's response to recent high-profile incidents of securities fraud and market abuse. The FSF agreed to review progress at its next meeting and also issues with respect to implementation of standards and codes more generally. As input to that discussion, in April the FSF Secretariat, with the IMF and World Bank, convened a meeting of standard setters, assessors, and others involved with standards and codes to refine the issues that could usefully be addressed. The IMF's and World Bank's own forthcoming review of standards and codes will also provide input to the FSF discussion.

... discusses a report on international standards and best practices ...

On *reinsurance*, the FSF welcomed publication by the IAIS in December 2004 of the first global reinsurance market report. The report highlighted the improving overall financial strength of the industry during 2003. Members encouraged the IAIS to further develop data collection and analysis of the structure and resilience of the sector.

... and welcomes IAIS report on reinsurance

Members also discussed *work in other areas*, including: a Joint Forum group examining financial institutions' risk management practices concerning liquidity risk; another Joint Forum group seeking to develop high-level principles on business continuity for financial authorities and market participants; and a task force co-chaired by the CPSS and World Bank to establish general principles on international remittances.