

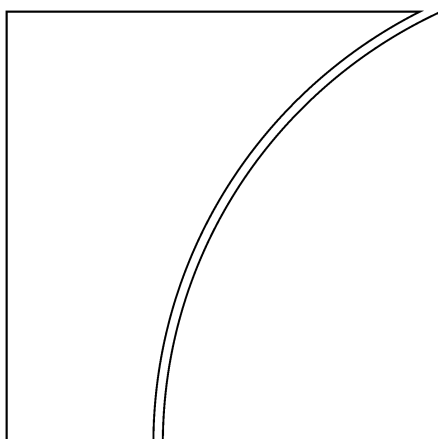


BANK FOR INTERNATIONAL SETTLEMENTS

BIS Quarterly Review

September 2003

**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: a sell-off in global bond markets

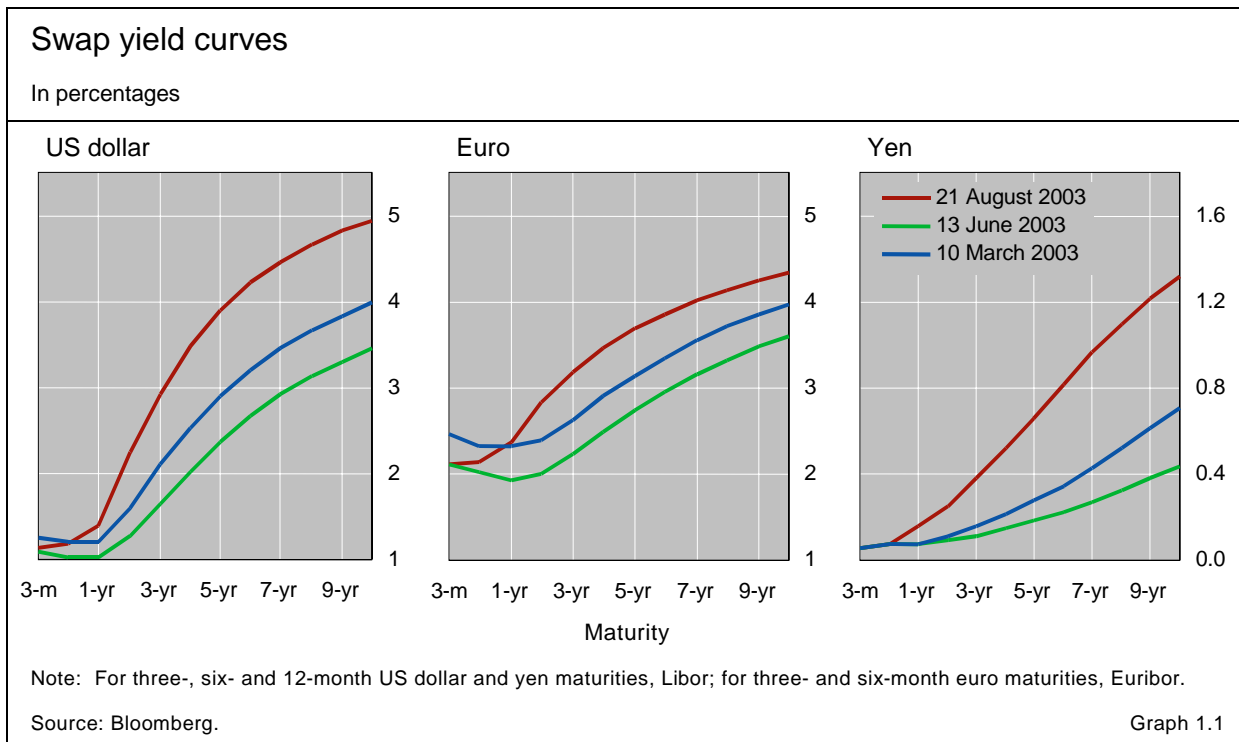
In late June and July, global bond markets suffered their largest sell-off since 1994. US dollar, yen and euro yields all increased sharply – dollar yields by as much as 140 basis points. The rise in part reflected upward revisions in bond investors' expectations about global growth prospects. An additional factor behind the rise appears to have been a change in bond investors' assessment of the likelihood of unconventional policy measures by the US Federal Reserve.

In the US dollar market, the backup in yields was exacerbated by the hedging activities of holders of mortgage-backed securities (MBSs). As yields rose, the flow of mortgage refinancing started to dry up, and investors found themselves holding MBS portfolios with durations exceeding their targets. To return to their duration targets, many investors turned to the interest rate swap market, where their demand for the fixed payment side of the contracts contributed to a doubling of swap spreads.

Spillovers to credit and equity markets were for the most part limited. Although high-yield and emerging market spreads widened as the search for yield abated, volatility in government bond and swap markets did not trigger a general sell-off in credit markets. The picture was similar in equity markets. In fact, the Tokyo equity market rallied as bond yields rose. Valuations for banks and most other financial institutions kept pace with changes in broad market indices, suggesting that equity investors were not concerned about the impact of higher yields on these institutions' balance sheets.

Unusual dynamics behind the rise in yields

While investors' increased optimism about global economic growth played an important role in recent increases in yields, unusual factors also contributed at various stages. These factors included auction results, risk management mechanisms, hedging of mortgage positions and views about "unconventional measures" of monetary policy. As a result, from a low of 3.11% on 13 June, 10-year US Treasury yields jumped above 4.40% by the end of July. Over the same period, 10-year Japanese government bond (JGB) yields rose by 50 basis points to 0.93%, and German bund yields by 70 basis points to 4.19%.



The rise was most pronounced at longer maturities, leading to a sharp steepening of yield curves (Graph 1.1).

Long-term yields had not risen so sharply in such a short period since 1994. Then, over the eight weeks beginning in early February 1994, 10-year US Treasury yields surged by approximately 130 basis points, bund yields by 80 basis points and JGB yields by 35 basis points. The move was precipitated by a shift in the stance of US monetary policy, with the Federal Reserve raising its target rate by 25 basis points after a long period of low or declining rates. Although for the most part the global financial system adjusted smoothly to higher yields in 1994, some strains did emerge. The Orange County municipal investment pool, with \$7 billion in investments, failed in December 1994, and the Mexican crisis broke out later that month. In contrast to 1994, the most recent upturn in yields was not accompanied by a shift towards a more restrictive policy stance. The central banks of all the major economies continued to pursue an accommodative monetary policy.

The bond market sell-off ...

... is not triggered by tighter monetary policy

The most recent rise in yields occurred over at least four distinct phases. During the first phase, from 13 to 24 June, the Japanese market sold off most sharply. The second phase lasted from 25 June to 14 July and saw all of the major markets sell off. The third phase, from 15 July to early August, saw dollar yields continue to rise. In the final phase, from early August to the end of the month, Japanese yields again moved up.

In the first phase, a mix of technical factors and macroeconomic news triggered a substantial rise in yen yields beginning in mid-June. A poorly received auction of 20-year JGBs on 17 June reportedly led to profit-taking by Japanese banks and selling by hedge funds. The sell-off during this first phase culminated in a 16 basis point rise in the yield on 10-year JGBs on 19 June to 0.69% (Graph 1.2). The resulting higher volatility caused those investors

Yen yields are the first to bottom

relying heavily on quantitative risk management techniques, such as value-at-risk models, to breach limits and unwind their positions. This unwinding exacerbated price dynamics in the JGB market. Such volatility was expected to persist; the implied volatility of JGB futures increased by a factor of one half in the first phase, while it rose much more gently in the euro and dollar markets.

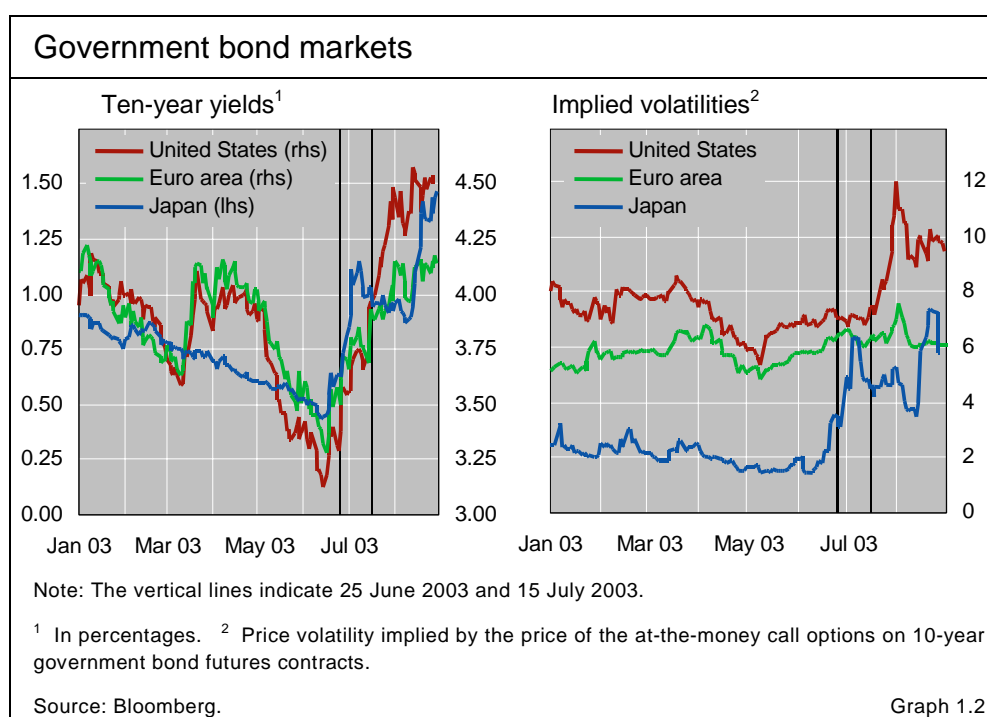
Interestingly, foreign rather than domestic macroeconomic news appears to have influenced the moves in JGB yields during this phase. Better than expected US macroeconomic data during the week of 16–20 June, in particular the Empire State Manufacturing Survey and the consumer inflation report, were cited as factors contributing to the rise in Japanese yields. US data also put upward pressure on dollar yields during this period.

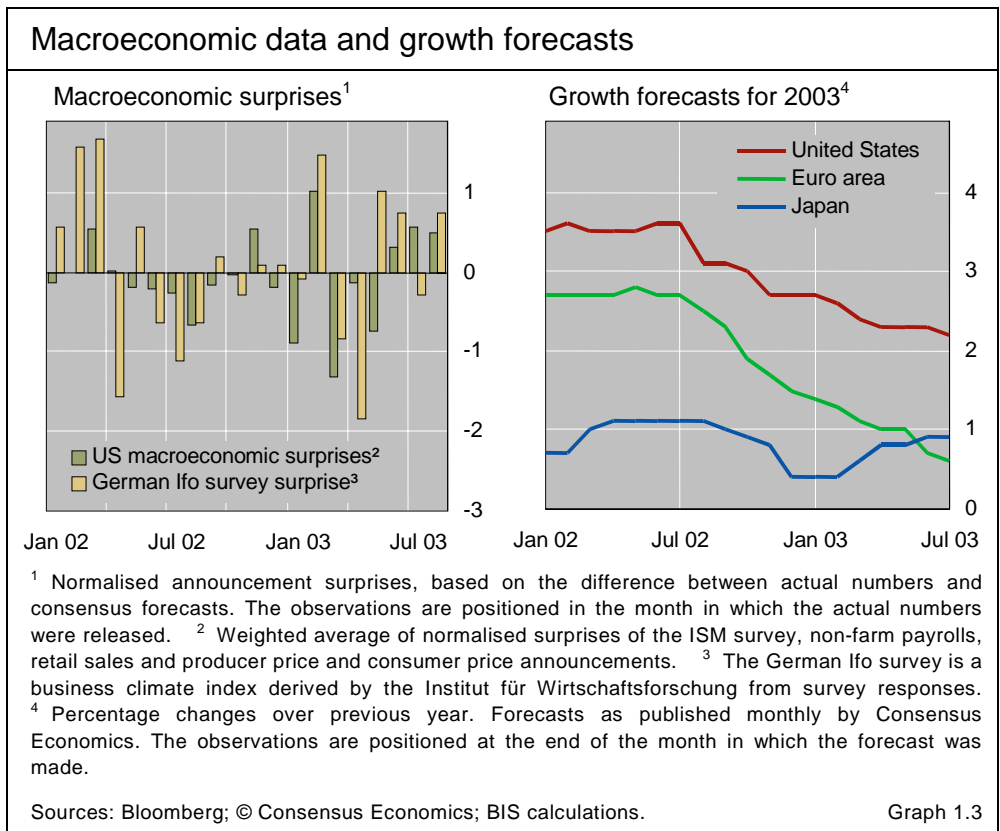
In the second phase, the US Federal Reserve’s decision on 25 June to cut its target rate by 25 basis points rather than the anticipated 50 basis points triggered a further increase in yields. The decision was interpreted by market participants as signalling that the Fed was unlikely to implement unconventional policy measures in the near future. In particular, it changed perceptions about the likelihood of Fed purchases of US Treasury securities to hold long-term rates down, the possibility of which had buoyed the US Treasury market after the Fed’s policy meeting in May. Yields on 10-year Treasury securities rose by 30 basis points over the two days following the rate cut. Euro and yen yields followed with a few days’ lag.

Market participants’ response to the Fed’s decision was amplified by developments in Japan. Sales of US Treasuries and other foreign securities by Japanese banks exceeded purchases by an outsized \$25 billion in July. In addition, the size and suddenness of the rise in yields and volatility in the yen market are likely to have sensitised investors to the possibility of such a move in other major markets.

“Unconventional measures” appear less likely

Feedback from the yen market





Though better than expected growth was frequently cited as a reason for the upturn in global yields, macroeconomic releases were not unambiguously positive for either the United States or Europe. Indeed, economists' growth forecasts for 2003 were not revised upwards during June and July (Graph 1.3). The mixed economic data suggest that the fixed income markets in the United States responded asymmetrically to US economic news, shrugging off negative reports. For instance, on 29 July yields rose despite much weaker than expected consumer confidence numbers. In any event, the economic readings seemed to exert less influence on yields than concerns about Federal Reserve actions and mortgage hedging (see below).

Economic data not a major surprise ...

Only in Japan were the economic indicators clearly bullish. The climb in yen yields gained considerable momentum after the announcement of a better than expected *Tankan* survey on 1 July. They rose again following a poorly subscribed 10-year bond auction on 3 July. Intraday volatility was most extreme in the JGB market on 4 July, when the 10-year yield hit 1.4% during the day before falling back to close at 1.05%.

... with the exception of Japan

Policy changes by the Japanese authorities appear to have played a major role in restoring stability to the yen market in the second phase. In the days following 4 July, the Ministry of Finance announced a series of measures intended to reduce volatility in the JGB market, including the introduction of pre-auction trading and repurchases of five-year JGBs. In addition, observers highlighted the decision by the Bank of Japan in May to switch from mark to market to amortised cost in accounting for its own holdings of JGBs, which was viewed as a signal of the Bank's willingness to increase the pace of its outright purchases of JGBs if necessary. This contributed to the stabilisation of the yen

Temporary stabilisation of the yen market

Renewed selling of
Treasuries in mid-
July ...

market, and the correlation between daily percentage changes in JGB yields and bund and Treasury yields weakened considerably after 15 July.

Bond markets entered a third phase of selling following the Federal Reserve Chairman's semiannual monetary policy report to Congress on 15 July. The report and subsequent testimony were interpreted by market participants as confirmation that the Fed was less likely to implement unconventional policy actions than they had previously thought. The report judged that situations requiring unconventional actions were unlikely to arise, noting both that monetary policy could be eased further through conventional tools if necessary, and that signs of a recovery were emerging. Dollar yields rose immediately following this report, with 10-year US Treasury yields moving up by 20 basis points on 15 July and by a further 55 basis points by the end of month. Moreover, the implied volatility of Treasury futures soared during the last two weeks of July. Market factors unique to the United States, in particular mortgage hedging activity, contributed importantly to this phase of the sell-off (see below).

Euro yields continued to track US yields during this third phase, although not as closely as during the second phase. Bund yields rose by 30 basis points during the last two weeks of July, to 3.97%. The implied volatility of bund futures also increased, albeit by much less than that of Treasury futures.

... and a mid-
August surge in
JGB yields

The yen market was seemingly unaffected by events in the dollar market during the third phase. However, the sell-off in Japan resumed in August. In this fourth phase of the sell-off, 10-year JGB yields surged by more than 55 basis points in the three weeks to the end of August, to 1.47%. This followed better than expected economic data, in particular a robust GDP growth figure for the second quarter and a strong machinery orders report. Another factor was the widely observed reallocation of funds by overseas hedge funds and other investors from bonds into stocks on the back of renewed gains in Japanese shares. Policymakers appeared to acquiesce to the rise in rates that resulted from an improving economic outlook.

Mortgage hedging unsettles the swap market

The feedback
effects of mortgage
hedging ...

The size and structure of the mortgage securities market distinguish fixed income markets in the United States from markets elsewhere. While volatility in US fixed income markets remained more or less stable following the initial jump in yields, mortgage hedging contributed to a change in market dynamics following the renewed rise on 15 July. The surge in long-term yields abruptly lengthened the duration of US mortgage-backed securities (MBSs), which in turn intensified efforts by holders of such securities to adjust their interest rate hedges (see the box on page 6). The duration of Lehman's mortgage index lengthened from 0.5 years in mid-June to 1.8 years in mid-July and to over three years by early August. It added 0.4 years on 15 July alone. Efforts to hedge this duration extension appear to have had broader and deeper feedback effects on US financial markets than during past episodes of rising yields. This is probably due to the increase in size, both in absolute and relative terms, of the market for MBSs.

Impact of mortgage securities hedging on US financial markets

One of the characteristics of contemporary financial markets is that risk management systems aimed at reducing the volatility of the earnings or capital of individual institutions can at times increase the volatility of financial markets overall. An example prominent in the recent fixed income market sell-off was hedging related to mortgage-backed securities (MBSs). Although also a factor during the sell-off in 1994,^① such hedging activity appears to have had a deeper and broader impact in 2003 than during past periods of volatility.

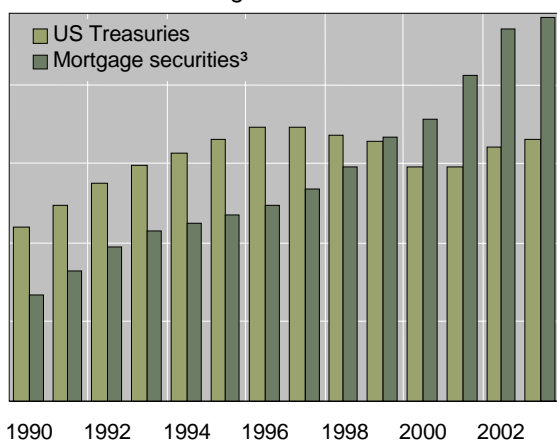
How can securitised mortgage markets increase market volatility? Owing to the prepayment risk embedded in MBSs originated in the United States – the risk that homeowners will refinance their mortgages before the stated maturity – movements in interest rates often result in significant changes in the average life, or more precisely the option-adjusted duration, of an MBS. For example, when interest rates rise, fewer homeowners will opt to refinance their mortgages, leading to an increase in the duration of MBSs. MBS investors typically manage their exposure to interest rate moves by hedging their holdings with Treasury securities, swaps or related derivatives. Continuing with the previous example, investors might hedge against an increase in interest rates by shorting Treasuries in the cash market, selling Treasury bond futures, contracting to pay the fixed leg of a swap, or buying an option granting the right to pay fixed in a swap. Changes in the duration of MBSs, therefore, can exacerbate price movements in these other markets.

The potential impact of hedging activity by MBS holders on other segments of fixed income markets has increased in recent years because of changes in the structure of mortgage and related markets. First, the sheer size of mortgage markets is a source of vulnerability. The US MBS market has doubled in size since 1995 and is now the largest fixed income market in the world: at end-March 2003, the outstanding stock of MBSs totalled \$4.9 trillion, compared to \$3.3 trillion in outstanding Treasury securities (see graph below). A sudden rebalancing by MBS holders could strain the capacity of dealers to make markets.

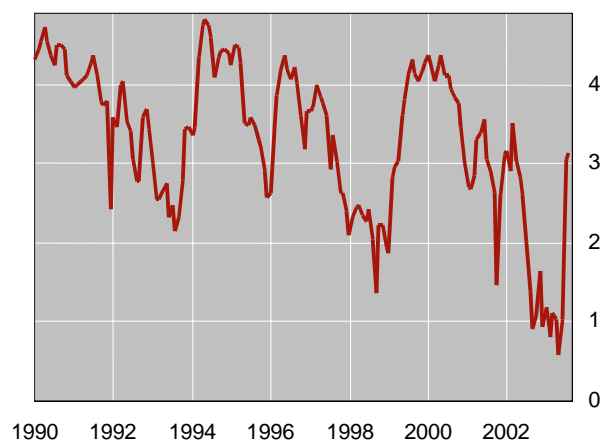
Second, the large number of refinancings since 2000 has concentrated holdings in MBSs paying similar coupons. Among the MBSs included in Lehman Brothers' US fixed rate MBS index, 70% have a coupon of between 5.5 and 6.5%. Such concentration has meant that the sensitivity of MBSs to changes in market interest rates has been similar across a large number of MBS portfolios, thereby increasing the likelihood of a sudden and common rebalancing in the event of a change in interest rates.

Third, in some ancillary markets, such as the swap market, the concentration of OTC hedging activity in a small number of dealers seems to have made these markets more vulnerable to a loss of liquidity. At times of high volatility, it is enough for one or two of these dealers to breach their risk limits and cut back on their market-making activity for the whole market to lose liquidity. Indeed, this is apparently what happened on 1 August, when the lack of liquidity caused US dollar swap spreads to spike.

Amounts outstanding¹



Duration²



¹ In trillions of US dollars. ² Modified adjusted duration of Lehman Brothers' US fixed-rate MBS index; end-month.

³ Agency and private-label MBS, plus collateralised mortgage obligations.

Sources: Bond Market Association; Lehman Brothers.

^① See, for example, J Fernald, F Keane and P Mosser, "Mortgage security hedging and the yield curve", *Federal Reserve Bank of New York Quarterly Review*, Summer-Fall 1994.

... contribute to a spike in dollar swap spreads

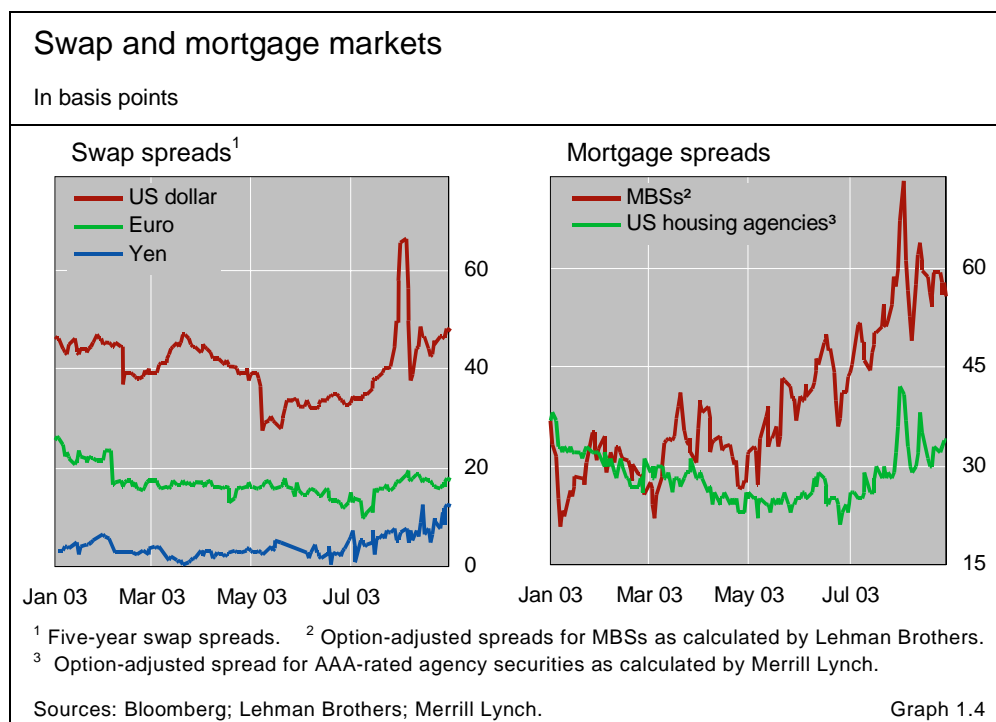
As a result of this hedging activity, spreads widened and volatility increased. The 10-year US Treasury yield jumped from 3.72% in mid-July to 4.41% at the end of July, owing in part to short sales of Treasuries by holders of MBSs seeking to reduce the duration of their portfolios. Similar trades caused dollar swap spreads to double in the last half of July, to 65 basis points (Graph 1.4). Indeed, swap markets tended to become one-sided: sell orders elicited lower prices, and lower prices in turn elicited more sell orders. Selling pressure also led to a 30 basis point increase in MBS spreads during July, to a peak of 74 basis points on 4 August.

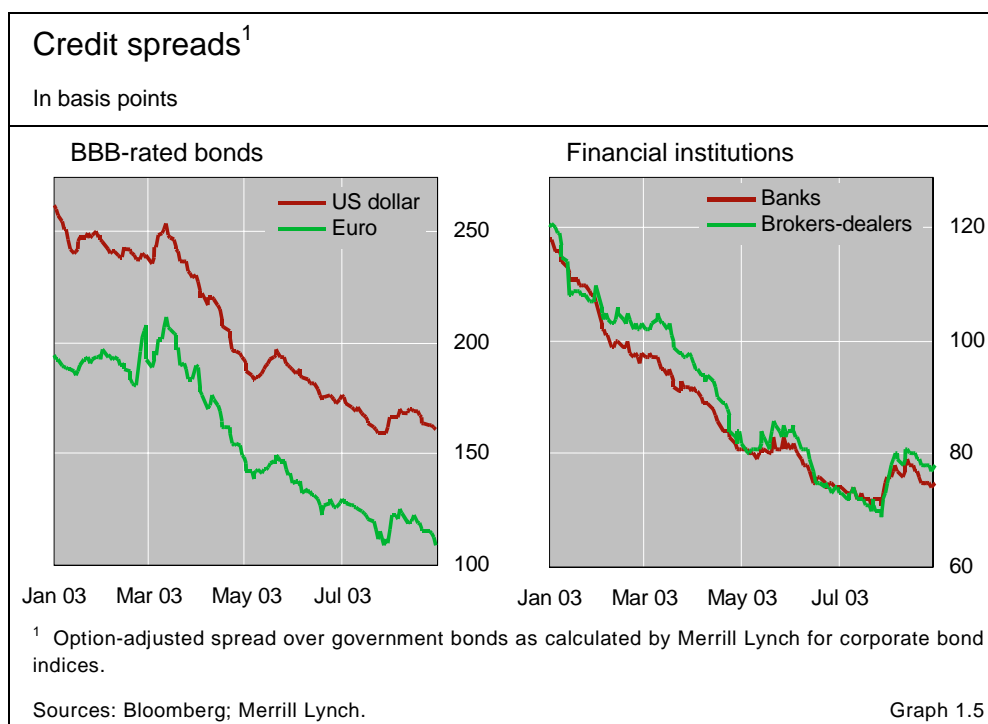
Mortgage-related markets were especially volatile in the last few days of July and the first few days of August. The widening of swap spreads had caused a number of swap dealers to breach their market risk limits, and they subsequently scaled back their activities. Given the dominance of the swap market by a few dealers, this quickly caused liquidity conditions to deteriorate. The loss of liquidity in the swap market made it more difficult to hedge MBSs, leading holders to sell, and as a result MBS spreads widened still further.

Unusually, auctions of US Treasury securities also added to volatility in early August. Announcements of auction results typically do not greatly affect yields in the Treasury market. Yet on 5 August 10-year Treasury yields rose by 10 basis points following a poorly subscribed three-year note auction. Subsequent auctions were better subscribed, pushing yields down again.

Modest impact on credit spreads

Another notable development was that credit spreads were only modestly affected by developments in the swap and mortgage markets. On some past occasions of extreme market volatility, in particular the LTCM crisis of 1998, credit spreads against Treasuries had tended to widen by at least as much as swap spreads. Spreads between corporate bonds and Treasury yields





did widen towards the end of July, indicative of some adjustment of corporate spreads to swap spreads, but the movement was limited (Graph 1.5). When measured against swaps, credit spreads actually narrowed. Credit default swaps remained more or less unchanged.

Investment grade spreads were supported by signs of an improvement in credit quality. In the second quarter of 2003, corporate earnings continued to recover, defaults declined and the ratio of credit rating upgrades to downgrades rose to its highest level since 1999. As a result, the long rally in credit markets that had begun in October 2002 continued through to the end of July. Having already fallen by 110 basis points between mid-October and early May, spreads between BBB-rated US corporate debt and US Treasuries fell by a further 25 basis points between early May and late July, to 160 basis points.

The relative lack of movement in the credit markets testifies to the technical nature of the widening of swap spreads in late July. Corporate bond investors appear to have recognised that the phenomenon was driven largely by mortgage hedging and did not reflect an increase in overall credit risk. Whereas past episodes of swap widening, such as the LTCM crisis, were accompanied by a change in perceptions of risk, spreads on default swaps on large financial institutions were virtually unchanged this time around.

One exception was the US housing agencies, Fannie Mae and Freddie Mac, which saw borrowing costs increase sharply in June and July. The housing agencies are by far the largest players in the US mortgage securities market. The revelation of accounting irregularities and assumed weaknesses in corporate governance at Freddie Mac had earlier sensitised investors and dealers to possible shortcomings in risk management at the two agencies. The suddenness and magnitude of the duration extension heightened these concerns. In late July, spreads between AAA-rated agency securities and US Treasuries jumped by 10 basis points to 40 basis points.

Swap and mortgage markets stabilise in August

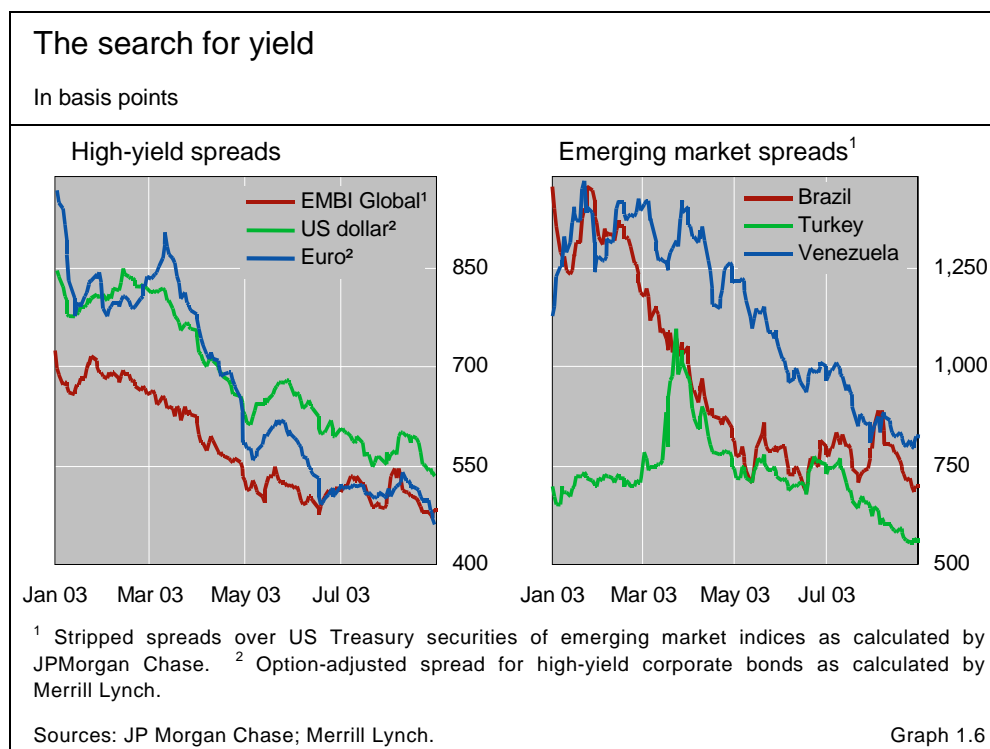
The relative calm of credit markets helped swap and mortgage markets settle down in early August. Credit derivatives traders in particular took advantage of arbitrage opportunities created by the widening of spreads on interest rate swaps. A popular strategy in the credit derivatives market is to buy a bond and buy protection on the same name, earning the difference between the bond spread and the default swap spread (which is frequently narrower than the bond spread). Some participants hedge the interest rate risk associated with the bond purchase by paying fixed on an interest rate swap. When the spread between corporate bonds and interest rate swaps narrowed in late July, traders following this strategy took profits, selling bonds and unwinding swaps. This helped to re-establish a two-way interest rate swap market. In early August, swap, MBS and agency spreads all fell from their peaks, albeit to levels that were higher than a month earlier. The implied volatility of Treasury securities also fell.

The search for yield abates

Although there was no general sell-off in credit markets, investors' earlier search for yield abated. After nine months of inflows, investors withdrew money from US high-yield mutual funds in late July and early August. Indeed, according to AMG Data Services, the first week of August saw the largest ever outflow from high-yield mutual funds.

High-yield debt spreads widen ...

At the same time, a surge in issuance helped dampen the expectations of corporate deleveraging that had underpinned the narrowing of credit spreads in earlier months. Issuance by lower-rated corporations increased, as they sought to take advantage of low borrowing rates. The result was upward pressure on



high-yield debt spreads (Graph 1.6). In addition, announcements of investment grade bond issues also rose markedly during the period. One major instance in late June was a large package of issues by General Motors and its financing subsidiaries, reportedly to fill a pension plan shortfall (see “The international debt securities market” on page 27).

Investors also shifted out of emerging market debt. In fact, financing conditions for emerging market borrowers began to deteriorate around mid-June, more than one month before those in the high-yield corporate market. The EMBI Global index reached a record low of 476 basis points on 17 June and subsequently sold off as Treasury yields rose. Brazil was the most adversely affected. The country’s sovereign spread widened by approximately 200 basis points between mid-June and early August, and the real depreciated by 6% against the US dollar to BRL 3.07. Even investment grade emerging markets, such as Mexico and South Africa, experienced wider spreads.

... as do emerging market debt spreads ...

Positive economic and political news helped to narrow emerging market spreads somewhat in early August. In late July, Standard & Poor’s had upgraded the credit ratings of Turkey and Venezuela by one notch, to B and B– respectively. The Brazilian government secured legislative approval in early August for reforms to the public sector employees’ pension plan. In the Philippines, which had seen spreads jump by 50 basis points in late July following a revolt by some members of the armed forces, spreads also recovered as the government moved quickly to maintain order.

The rise in borrowing costs – through both wider spreads and higher yields – is not expected to create serious difficulties for emerging markets. Many borrowers had prefunded earlier in the year in expectation of a rise in yields. Net issuance of international debt securities by emerging market borrowers over the first six months of 2003 was almost 30% higher than during the same period a year ago (see “The international debt securities market” on page 27). Furthermore, emerging market borrowers are increasingly turning to local bond markets to meet their financing requirements (see the special feature “Changing links between mature and emerging financial markets” on page 45).

... though serious funding difficulties are unlikely

Indeed, the abatement of the search for yield might not be an unwelcome development in some countries. Inflows of short-term capital had put upward pressure on a number of emerging market currencies, which in turn threatened to weaken export growth. Some emerging markets responded by expanding capital controls on inflows, or removing them on outflows. In particular, Argentina imposed controls on short-term capital inflows in May. China relaxed controls on outflows in June, followed by Thailand in July.

Bank stocks keep pace with equity markets

The sell-off in bond markets had little direct impact on equity markets. Equity markets in the United States and Europe had rallied in April and May on expectations of a recovery in economic growth. To the extent that the rise in yields reflected similar expectations, bond investors seemed only to be catching up with the optimism of equity investors.

Equity markets retain earlier gains ...

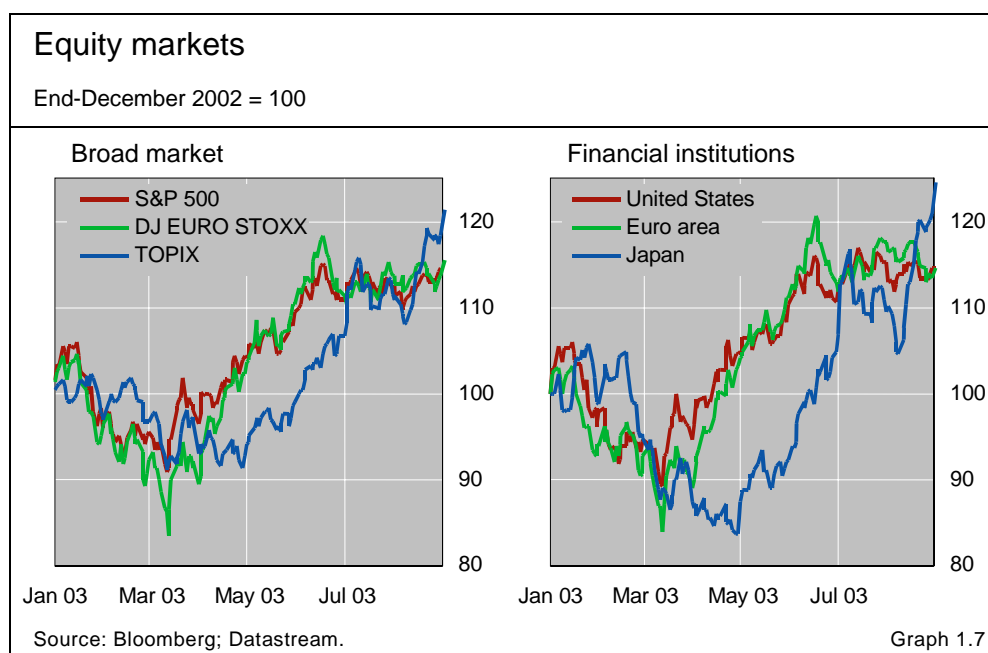
... as financial sector shares shrug off the backup in rates

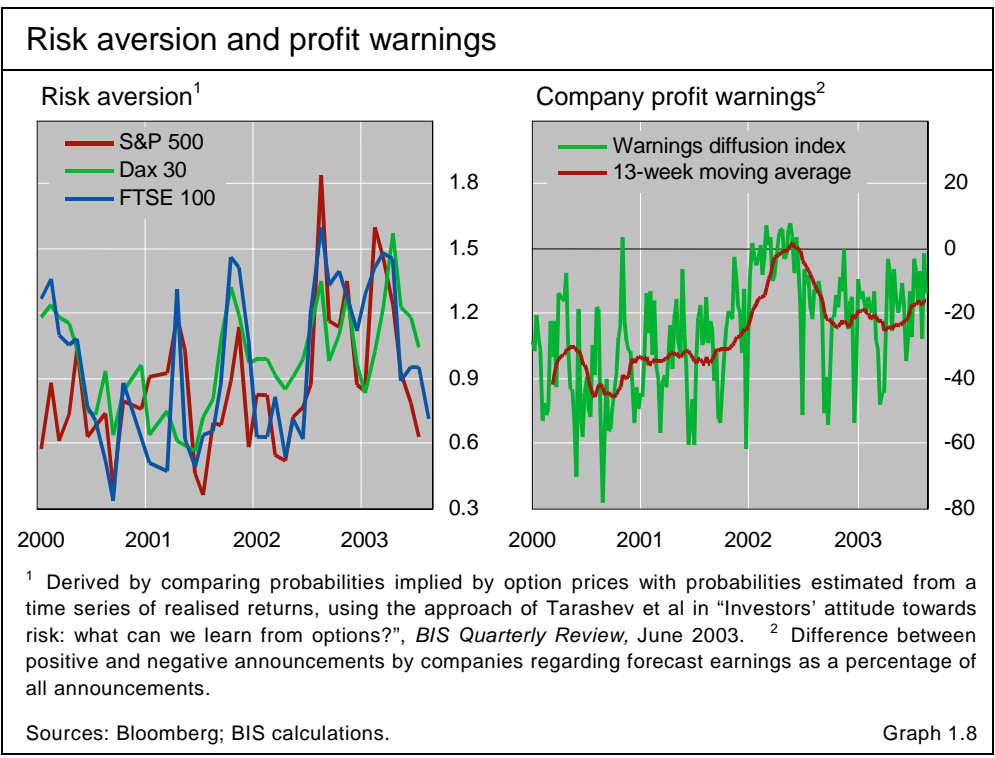
It was notable that the financial sector kept pace with the overall equity market despite the backup in long-term interest rates. Valuations for Fannie Mae and Freddie Mac were marked down in early June, following the revelation of corporate governance improprieties, and again in the second half of July, owing to the volatility in mortgage markets. However, share prices for most other US and European financial institutions were largely unchanged, suggesting that market participants were not concerned about the vulnerability of the balance sheets of these institutions.

The rally in US and European equity markets stalled in July even as estimates of the effective risk aversion of investors continued to decline (Graph 1.7). Such risk aversion seemed to lag rather than lead significant market movements. Earnings that generally came in better than expected also failed to sustain the market rally. Investors increasingly appeared to discount analysts' forecasts of a further acceleration in earnings growth in the latter half of the year and to give greater credence to firms' warnings about future profits (Graph 1.8). One such announcement was US retailer Costco's forecast on 5 August of a drop in earnings, which drove the market down in consequence.

Asian markets outperform ...

Most Asian markets outperformed US and European markets between May and August. In Japan, surprisingly positive economic news contributed to a nearly 20% increase in the TOPIX between the end of May and the end of August. Large upward moves followed the release of the *Tankan* on 4 July and of the GDP report for the second quarter on 12 August. Investment in the Japanese equity market came to be viewed as a global reflation play, and as such attracted significant foreign inflows. Marked downward moves in Japanese indices during the period tended to be associated with weak earnings announcements by technology firms in the United States, a testament to the fact that Japan's market ultimately remained dependent on the strength of the prospective US recovery.





Japanese banks outperformed the market over this period. Investors apparently perceived that any losses on banks' bond holdings arising from the backup in yields would be more than offset by gains on their equity holdings and a decline in loan delinquencies. Companies in financial difficulty also outperformed the market. The public recapitalisation announced in May for Japan's fifth largest banking group, Resona, under relatively lenient terms for existing shareholders was viewed as a signal that weaker borrowers would be protected from bankruptcy by government support for the banking system.

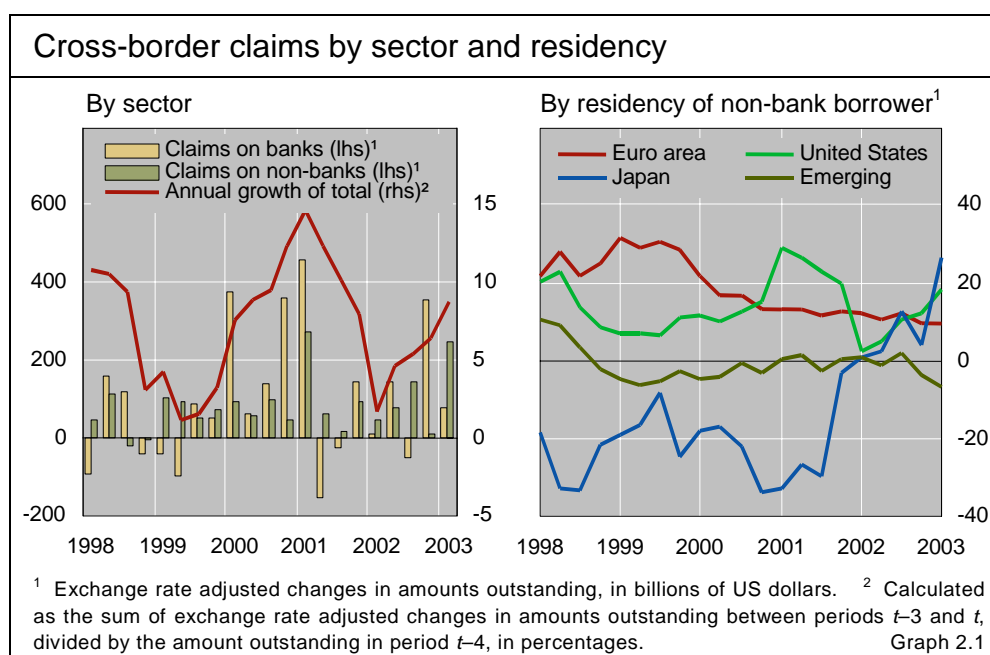
... as do Japanese banks

Other Asian markets, which had significantly underperformed US and European markets earlier in the year, made up for lost ground starting in May. The Thai, Indian and Taiwanese stock exchanges all rose by more than 30% in local currency terms between early May and late August. Fears about SARS, which had weighed heavily on sentiment earlier in the year, receded as the number of reported cases fell. Markets were also supported by the continued strength of exports from the region.

2. The international banking market

Lending to non-bank borrowers drove claim flows in the international banking market in the first quarter of 2003, largely in the form of repo activity, intragroup lending and lending to governments. Extending a trend evident since mid-2002, and reflecting subdued economic growth, banks in many developed countries shifted their consolidated loan portfolios away from non-bank private sector borrowers. In addition, many banking systems continued to reduce claims on borrowers in the lower-rated developing countries, as evidenced by gradual improvements in the average credit ratings of their consolidated emerging market portfolios.

Emerging markets saw an inflow of funds driven by robust lending to banks, although regional differences remained apparent. The net outflow from Latin America continued, reflecting deposit movements and contractions in claims on non-banks in Mexico, Brazil and Argentina. This was more than offset by net inflows to the Asia-Pacific region, mainly the result of increased claims on the Chinese banking sector. Countries in emerging Europe, particularly those in accession negotiations with the European Union, were again recipients of additional bank lending.



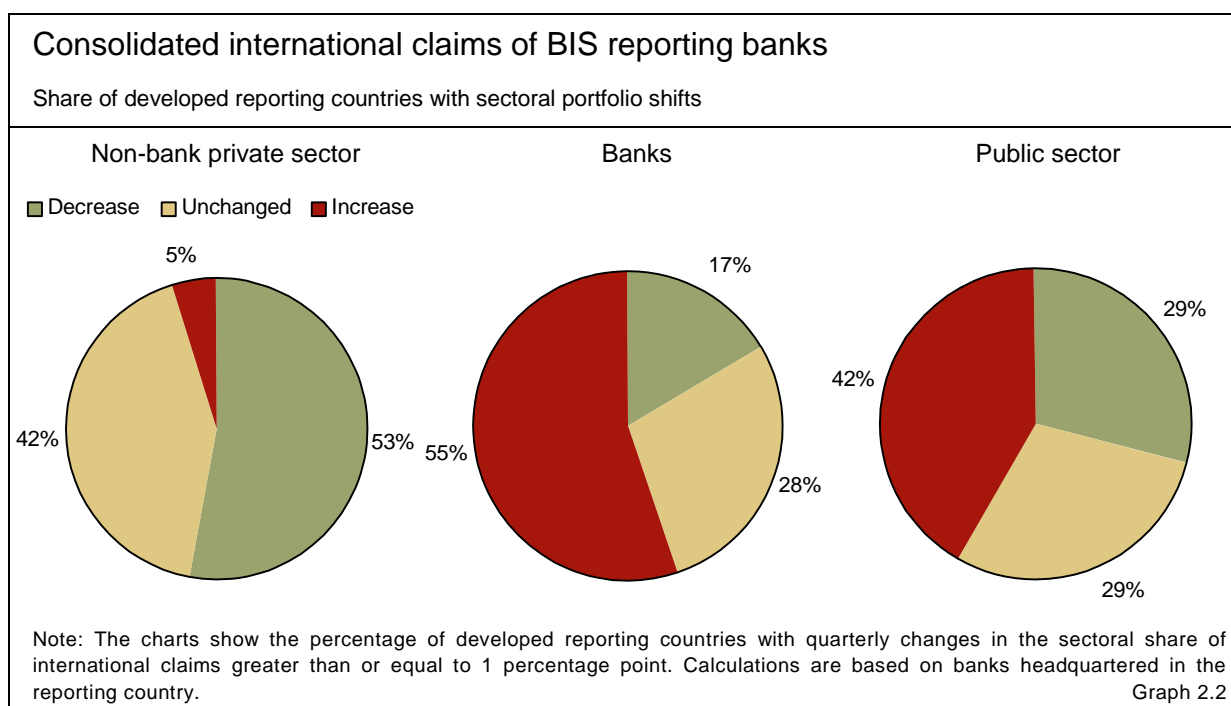
Non-bank claims reflect repo activity and lending to governments

Lending to non-bank borrowers dominated movements in the first quarter of 2003, accounting for two thirds of the growth in claims of BIS reporting banks. Much of this resulted from increases in repo activity and claims on the public sector. In seasonally unadjusted terms, the outstanding stock of total cross-border claims rose by \$341.4 billion, to \$14 trillion (Table 2.1), boosting the year-over-year growth in claims to 9% from 6% in the last quarter of 2002 (Graph 2.1).

Following a large expansion in interbank lending in the previous quarter, lending to other sectors picked up in the first quarter of 2003. For every dollar that had passed between banks in the fourth quarter of 2002, 66 cents flowed to non-bank customers in the first quarter of 2003. Such patterns of alternating growth have been characteristic of the sectoral distribution of claim flows throughout the period covered by the BIS statistics; a periodic swelling in the interbank market often leads to increases in lending to corporate and other borrowers in later periods. As shown in Table 2.1, this pattern was evident on a quarterly basis throughout 2002.

While growth in claims on the non-bank private sector can indicate a pickup in corporate lending, the rise in the first quarter of 2003 was largely explained by greater repo activity, as banks financed securities firms, and lending to governments. Roughly 43% of the total growth in claims on corporate and other non-bank borrowers was accounted for by banks in the United Kingdom, whose claims on this sector rose by \$99 billion, their largest increase in the period covered by the BIS statistics. Sixty per cent of these claims, or \$59 billion, flowed to non-bank borrowers in the United States, largely the result of increased loans to affiliated securities houses and the realisation of short positions. An additional \$18 billion reflected intragroup lending with counterparties in Japan and purchases of Japanese government securities.

Parked funds flow out of the interbank market ...



Cross-border claims of BIS reporting banks

Exchange rate adjusted changes in amounts outstanding, in billions of US dollars¹

	2001	2002	2002				2003	Stocks at end-March 2003
	Year	Year	Q1	Q2	Q3	Q4	Q1	
Total claims	859.4	740.8	57.3	225.9	94.3	363.4	341.4	13,991.6
By instrument								
Loans and deposits	612.2	500.3	-0.6	83.6	3.0	414.3	259.0	10,505.2
Securities ²	247.2	240.5	57.9	142.3	91.3	-50.9	82.4	3,486.4
By currency								
US dollar	422.7	320.9	49.5	183.7	-114.4	201.9	93.5	5,771.7
Euro	439.6	463.0	44.3	98.5	201.1	119.1	231.7	4,867.2
Yen	-65.5	-40.0	-81.4	5.4	14.0	22.0	-16.7	720.7
Other currencies ³	62.5	-2.9	44.8	-61.7	-6.4	20.4	32.9	2,632.0
By sector of borrower								
Banks	417.3	459.9	9.5	146.4	-49.3	353.4	108.2	9,108.9
Non-banks	442.1	280.9	47.8	79.5	143.6	10.0	233.3	4,882.6
By residency of non-bank borrower								
Advanced economies	384.8	283.9	44.6	46.6	129.5	63.3	164.4	3,746.1
Euro area	139.0	115.9	51.5	8.4	48.6	7.4	52.2	1,655.9
Japan	-3.7	4.1	-2.3	6.3	-0.4	0.5	21.8	145.8
United States	183.4	136.0	-17.3	40.1	55.5	57.6	32.2	1,307.6
Offshore centres	55.0	17.9	-7.7	36.9	16.8	-28.1	78.4	564.7
Emerging economies	2.5	-17.4	9.3	-4.9	2.4	-24.3	-7.7	508.7
Unallocated ⁴	-0.1	-3.5	1.5	0.8	-5.0	-0.9	-2.3	63.1
<i>Memo: Local claims⁵</i>	76.4	38.6	69.8	-40.3	-26.5	35.6	184.8	1,941.9

¹ Not adjusted for seasonal effects. ² Mainly debt securities. Other assets account for less than 5% of total claims outstanding. ³ Including unallocated currencies. ⁴ Including claims on international organisations. ⁵ Foreign currency claims on residents of the country in which the reporting bank is domiciled. Table 2.1

... reflecting increased repo and intragroup activity

Banks in the United States were also active in the first quarter of 2003. Overall, their claims rose by \$65.6 billion, the largest expansion since the fourth quarter of 2001. Growth in claims on the non-bank private sector drove the increase, and largely stemmed from a rise in repo activity with broker-dealers in offshore centres and in the United Kingdom. Excluding these claims, lending to corporate and other non-bank borrowers by banks in the United States actually declined for the second consecutive quarter, this time by \$14.3 billion. This was partially the result of a \$5 billion reduction in credit to euro area borrowers, particularly in Germany and Spain.

More restrained lending to corporations seems to have mirrored the depressed global economic conditions and rallying bond markets in the first quarter of 2003.¹ Excluding loans granted by banks in the United States and the United Kingdom, loans to non-bank borrowers rose by \$7.2 billion, less than the \$25 billion and \$46 billion increases in the third and fourth quarters of 2002 respectively. In addition, the BIS consolidated statistics, which net out

¹ See the Overview in the June 2003 issue of the *BIS Quarterly Review*.

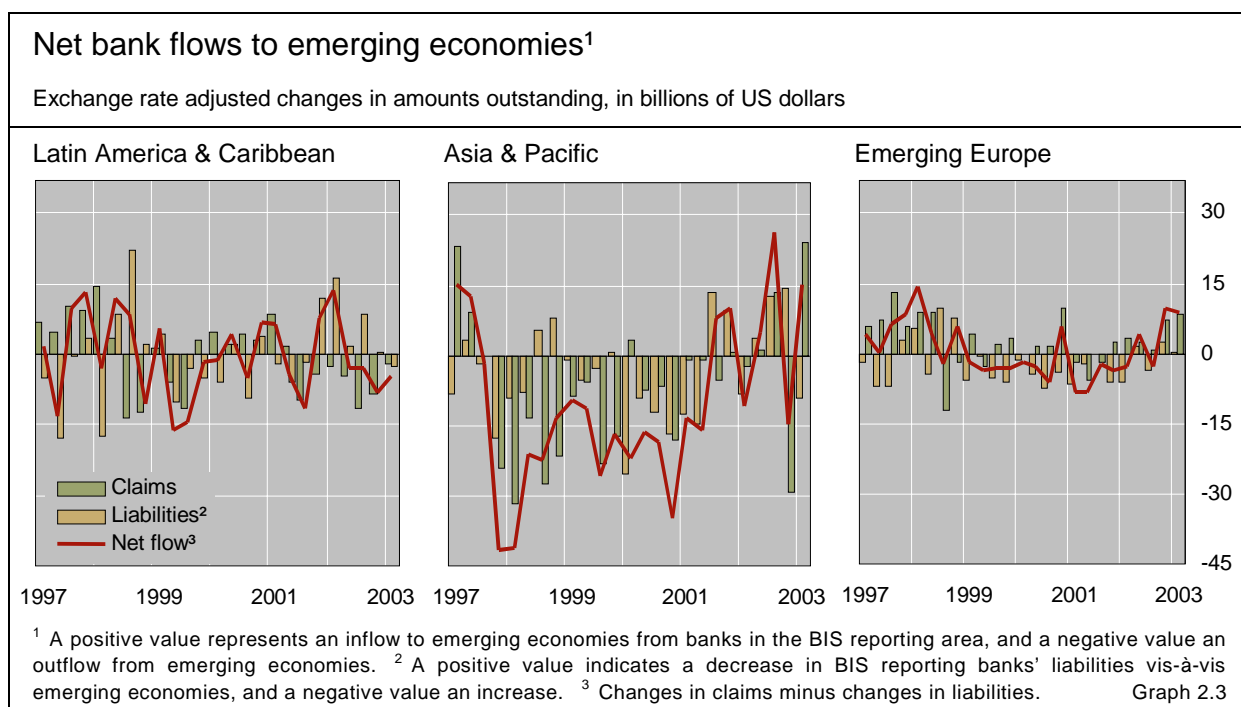
inter-office positions, indicate that reporting area banks shifted away from corporate lending in the first quarter of 2003. Reporting area banks' consolidated international claims on the non-bank private sector stood at \$3.8 trillion, or 40% of total consolidated international claims. Ten out of the 19 developed reporting countries experienced portfolio shifts away from claims on corporate and other non-bank private sector borrowers in the first quarter, while only Italian banks channelled assets towards these borrowers (Graph 2.2).

The shift away from lending to the corporate sector was most pronounced among European banks. Their contractual claims on the non-bank private sector totalled \$2.8 trillion, or 47% of their total consolidated international claims (down from 48% the previous quarter). The claims of Belgian and Portuguese banks on non-bank corporate borrowers in developed Europe fell, as did Swedish banks' claims on this sector in the United States. In other European countries, increases in claims on corporate borrowers were overshadowed by even larger increases in claims on the banking and public sectors: Austrian, Danish, Finnish, UK and Swiss banks all reduced their share of loans to the non-bank private sector. German banks' claims on this sector remained relatively stable, at 50% of their total consolidated international claims, while those of French banks fell to 54%, down from 56% a year earlier.

European banks channel funds to the banking and public sectors

Net inflow into emerging markets masks regional differences

The net flow of funds into emerging markets from banks in the BIS reporting area was positive in the first quarter of 2003, although regional differences were apparent (Graph 2.3). Total claims on emerging markets rose by \$29 billion, the largest expansion since the first quarter of 1997. However, this reflected unusually large increases in claims on the Chinese banking sector.



Claims on emerging Europe rose for the sixth consecutive quarter, while claims on Latin America continued to fall. As discussed in the next section, the riskiness of reporting area banks' asset portfolios has fallen in recent years as they have shifted out of claims on emerging markets. These claims remained below 7% of total claims for a second consecutive quarter, down from an average of 8% in 2001 and 9% in 2000.

Outflow from Latin America continues

Rate of contraction in claims on Latin America stabilises ...

While the rate of contraction in claims on borrowers in Latin America appeared to stabilise in the first quarter of 2003, claims on the region sank below 30% of total claims on emerging markets for the first time since 1999. Total claims fell to \$272 billion, leaving the year-over-year rate of contraction in claims at 9.5%, unchanged from the preceding quarter. This contributed to a net outflow of funds for the fourth consecutive quarter, this time by \$4.6 billion. Following two quarters of decline, claims on banks rose by \$1.9 billion, the largest increase for this sector since the first quarter of 2001. However, claims on corporations and other non-bank entities fell by \$3.9 billion, pushing the year-over-year rate of contraction in claims on this sector to 8% from 5% in the previous two quarters. In addition, syndicated loan signings by borrowers in Latin America shrank to a historical low of \$2.5 billion in the first quarter of 2003, or 15% of total signings by borrowers in emerging markets (down from an average of 33% since 1999).

... despite net outflows from Mexico, Brazil and Argentina

The net outflow from Mexico was the largest in the region, at nearly \$4 billion, and was driven by increased deposits in reporting area banks. Banks in Mexico deposited \$2.3 billion in funds, primarily in banks in offshore centres. At the same time, a \$1.2 billion reduction in claims on Mexican non-bank borrowers was partially offset by an expansion in claims on banks in Mexico, leaving total claims on Mexican borrowers down slightly from the previous quarter.

The \$2.2 billion net outflow from Brazil also resulted from a relatively large increase in deposits abroad. Banks in Brazil deposited \$3.6 billion with reporting area banks, mainly in the United States and United Kingdom. Following three consecutive contractions, claims on Brazil rose by \$1.4 billion, as new credit to the Brazilian banking sector more than offset a reduction in claims on non-banks.

Unlike in Mexico and Brazil, the fifth consecutive quarter of net outflows from Argentina resulted from reduced lending to both bank and non-bank borrowers. Claims on banks and non-banks contracted by \$0.7 billion and \$1.1 billion respectively, pushing total claims on Argentina down to \$29.6 billion, or 64% of their second quarter 2001 level. Banks in many reporting countries cut back their short-term claims on Argentina, with banks in the United States again reducing exposure the most.

In the midst of economic turmoil in the first quarter of 2003, Venezuela experienced its largest net inflow since the third quarter of 2001. Venezuelan banks repatriated deposits, primarily from banks in the United States, driving a \$2 billion net inflow. A relatively large \$0.9 billion contraction in claims on the

Cross-border bank flows to emerging economies									
Exchange rate adjusted changes in amounts outstanding, in billions of US dollars									
	Banks' position ¹	2001	2002	2002				2003	Stocks at end-March 2003
		Year	Year	Q1	Q2	Q3	Q4	Q1	
Total ²	Claims	-27.0	-37.6	-0.8	1.1	-0.3	-37.6	28.7	930.9
	Liabilities	20.3	-46.4	-10.4	-6.4	-18.4	-11.2	8.6	1,122.6
Argentina	Claims	-5.8	-11.8	-4.3	-0.8	-4.5	-2.3	-1.9	29.6
	Liabilities	-16.7	-0.1	-1.0	0.5	0.3	0.2	0.5	25.9
Brazil	Claims	0.9	-11.3	1.0	-2.4	-3.5	-6.4	1.4	89.4
	Liabilities	0.4	-8.0	1.4	-3.8	-1.4	-4.2	3.6	44.6
Chile	Claims	0.2	0.5	-0.3	-0.5	-0.1	1.3	-0.1	19.9
	Liabilities	-1.0	-1.1	0.2	-0.8	-0.8	0.3	-1.2	15.2
China	Claims	-3.5	-12.4	-7.3	1.0	4.1	-10.2	15.9	60.4
	Liabilities	-6.5	-3.6	-7.1	6.4	-1.0	-1.9	1.2	94.5
Indonesia	Claims	-5.4	-6.0	-1.3	-2.1	-1.3	-1.2	-1.1	30.4
	Liabilities	1.1	-2.4	-1.4	-0.3	-0.2	-0.5	0.4	12.4
Korea	Claims	-0.2	8.2	6.4	1.8	6.5	-6.4	2.1	76.6
	Liabilities	1.7	0.5	11.4	-5.6	-0.4	-4.8	-0.9	30.4
Mexico	Claims	2.0	3.1	3.3	1.7	-1.9	-0.1	-0.6	64.2
	Liabilities	8.8	-11.4	-14.1	1.3	-0.3	1.7	3.4	58.1
Russia	Claims	1.3	3.6	1.4	0.8	-1.1	2.4	1.2	36.6
	Liabilities	5.2	9.6	3.6	0.0	4.0	2.0	5.7	45.1
Saudi Arabia	Claims	-2.4	-5.4	0.0	0.5	-1.8	-4.2	1.0	20.5
	Liabilities	-9.7	-2.1	-5.4	-0.1	1.4	2.0	5.8	57.2
South Africa	Claims	-0.4	-0.4	-1.5	0.2	-0.6	1.5	-0.3	18.3
	Liabilities	2.1	2.7	0.3	1.3	-0.4	1.4	0.6	21.7
Thailand	Claims	-3.5	-5.0	-2.2	-0.5	-0.5	-1.8	-0.4	18.7
	Liabilities	1.3	-4.6	-0.7	-1.3	-1.4	-1.2	2.5	13.9
Turkey	Claims	-12.0	-2.8	0.9	-1.5	-2.1	-0.1	1.5	38.2
	Liabilities	-2.1	0.0	1.6	-1.9	-0.2	0.5	-4.0	15.9
<i>Memo:</i>									
EU accession countries ³	Claims	6.3	10.1	1.4	1.9	3.4	3.3	5.3	98.8
	Liabilities	9.9	-6.4	-0.2	0.5	-1.3	-5.4	-2.2	60.6
OPEC members	Claims	-13.7	-10.1	3.4	-0.6	-4.4	-8.5	-0.2	126.2
	Liabilities	-2.9	-9.2	-6.2	-3.1	-1.2	1.3	-5.1	245.3

¹ External on-balance sheet positions of banks in the BIS reporting area. Liabilities mainly comprise deposits. An increase in claims represents an inflow into 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 Countries in accession negotiations with the European Union (excluding Turkey), ie Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia. Table 2.2

Venezuelan non-bank sector was largely offset by increased lending to the country's banking sector. As a result, total claims on Venezuelan borrowers stood at \$15 billion, or 6% of total claims on the region (up from 5% a year earlier).

Net flows to Asia-Pacific region through repos with the US

Flows into the Asia-Pacific region returned to positive territory in the first quarter of 2003, despite contractions in claims on corporate and other non-bank borrowers. Relatively large increases in claims on a few countries led to a

\$15 billion net inflow, the second largest since the first quarter of 1997. This largely reflected a \$27 billion expansion in claims on the region's banking sectors, primarily in China, Taiwan (China) and Korea. As a result, the share of claims on the Asia-Pacific region in total claims on emerging markets rose to 31% in the first quarter, closer to the 32.5% average share since early 1999, and surpassed claims on Latin America as the largest emerging market exposure of reporting area banks.

Repo activity with banks in China drives claims

The net inflow to the region was primarily attributable to activity vis-à-vis China. Claims on China rose by \$16 billion, three quarters of which flowed to the Chinese banking sector from banks in the United States and United Kingdom. Much of this stemmed from a resumption of repo activity with banks in the United States after a slowdown in the fourth quarter of 2002, partially the result of banks in China funding an increase in foreign currency lending in the first quarter of 2003 through the repo market rather than through the interbank market.

Claims on Taiwanese banks also increased in the first quarter, although this was largely offset by reductions in claims on corporate and other borrowers and by growth in residents' deposits with reporting area banks. Total claims on the Taiwanese banking sector rose by \$6.5 billion, the largest increase in the period covered by the BIS statistics. This was mainly the result of a resumption of inter-office activity and repo agreements by banks in the United States, which had waned in the fourth quarter of 2002. In addition, a reclassification of loans from banks in the United States contributed to the rise in claims on the Taiwanese banking sector, and to the \$1.9 billion drop in claims on non-bank borrowers.

Banks in the United States were mainly responsible for the net inflow into banks in Korea. Claims on the Korean banking sector rose by \$5.6 billion, while credit to non-bank borrowers contracted by \$3.6 billion, both partially reflecting a reclassification of loans by banks in the United States. Excluding claims from these banks, credit to corporate and other non-bank customers remained stable from the previous quarter, while \$1.4 billion in additional funds flowed into the banking sector.

Net inflow to emerging European economies continues

The emerging European economies experienced a second consecutive net inflow in the first quarter of 2003, nearly as large as in the previous quarter. This resulted from an increase in claims, two thirds of which flowed to countries in EU accession negotiations, although movements in deposits by certain countries played a role as well. Claims on the region rose by \$8.4 billion, as reporting area banks extended credit to both the banking (\$5.2 billion) and non-bank sectors (\$3.3 billion).

Banks send funds into virtually all EU accession countries

Claims on all but one of the EU accession countries (Latvia) rose in the first quarter of 2003, with claims on Hungary, Poland and Cyprus expanding the most. Reflecting increased loans from banks in the Netherlands, Austria and Germany, claims on Hungary rose by \$1.4 billion. In addition, banks in Hungary repatriated \$1.3 billion in deposits from European banks, contributing to a \$2.7 billion net inflow, the largest for Hungary in the BIS reporting period.

Elsewhere in the emerging European region, growth in US dollar and euro deposits led to a large outflow from Russia. Banks in Russia deposited a total of \$5.5 billion with banks in the United States, Germany, France and other euro area countries, the largest deposit movement for Russia since the BIS statistics were introduced. Although partially offset by \$1.7 billion in loans from banks in Germany to Russian non-bank borrowers, this increase in deposits contributed to a \$4.5 billion net outflow from the country.

Country risk edges lower with reduced emerging market exposure

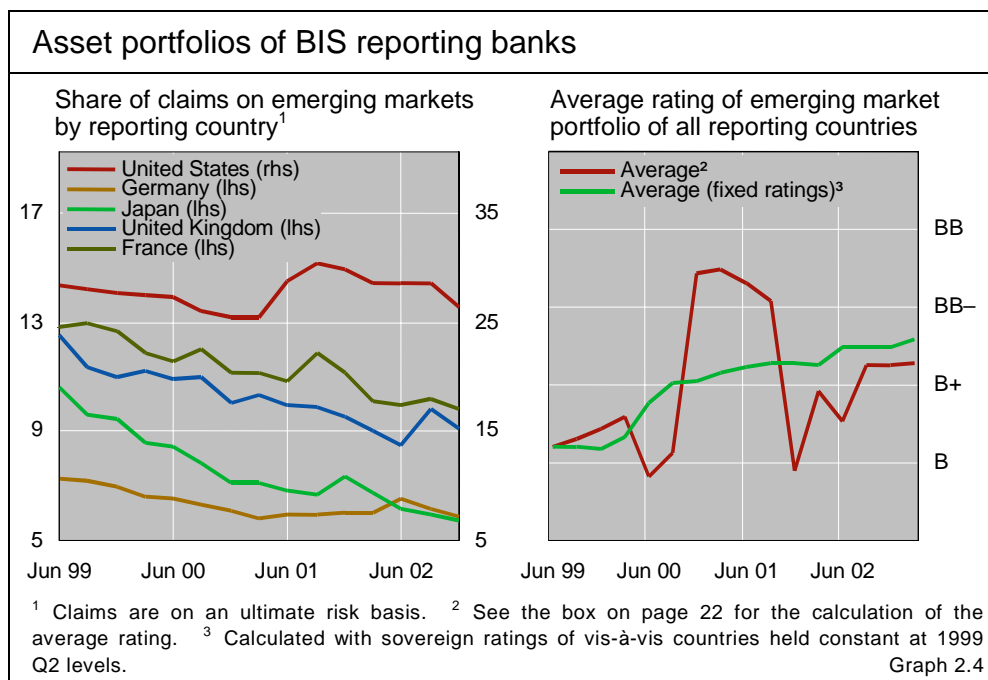
Consistent with the shift towards safer assets described in recent issues of the *BIS Quarterly Review*, the country risk inherent in the exposures of reporting area banks seems to have declined for many of the major banking systems. This decline is the result of reduced exposure to emerging market borrowers, as well as reduced exposure to riskier countries *within* emerging markets.

For present purposes, country risk is represented by sovereign ratings, which measure the potential loss on assets held in a foreign country, typically an emerging market, due to a deterioration in political or economic conditions in that country. Since a potential default by an emerging market government is often the source of financial market turbulence, a weighted average of sovereign bond ratings of all emerging market borrowers of a particular reporting country is a rough, but illustrative, statistic for tracking the country risk of a particular banking system (see the box on page 22).

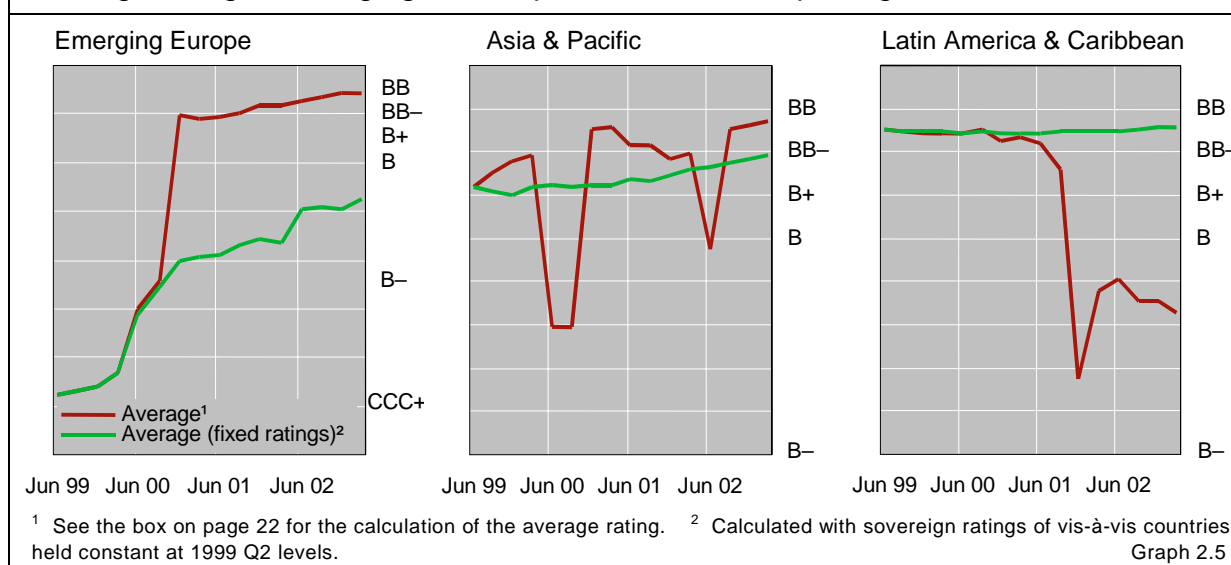
Banks shift out of emerging markets

Country risk seems to have fallen consistently in recent years, in part as a consequence of reduced exposure to emerging markets. The share of ultimate risk claims flowing to emerging markets, which typically have higher country

Country risk falls with reduced exposure to emerging markets



Average rating of emerging market portfolios of BIS reporting banks



risk than developed countries, declined from 12% in the second quarter of 1999 to 9% in the first quarter of 2003. The share of ultimate risk claims on emerging Europe remained stable over this period, while that of claims on all other emerging market regions fell. Ultimate risk claims on Latin American borrowers rose from 4% of total ultimate risk claims in the second quarter of 1999 to 5% throughout 2001, and subsequently contracted to 3% by the first quarter of 2003. Similarly, the share for Asia-Pacific borrowers fell from 4% to under 3% over the same period.

The movement out of emerging markets, and the corresponding improvement in the average rating of ultimate risk claim portfolios, have been relatively widespread across the major banking systems (Graph 2.4, left-hand panel). US banks' ultimate risk claims declined from 30% of their total ultimate risk claims on emerging markets in late 2001 to 26% in the first quarter of 2003, with claims on Latin American borrowers falling the most. Japanese banks have halved their exposure to emerging markets over the last five years, with the share of ultimate risk claims on emerging market borrowers falling from 12% in 1999 to 6% in the first quarter of 2003. Cutbacks in exposures to emerging markets by UK, German and French banks have contributed to an improvement in the average rating for these banking systems as well.

Reduced exposure to riskier countries within emerging markets

In addition to reducing exposure to emerging markets overall, banks have also increasingly channelled funds to less risky countries *within* emerging markets, as evidenced by the improved average rating of their emerging market portfolios. Quarterly movements in the average ratings are largely the result of changes in the sovereign rating of borrowing countries rather than dramatic swings in emerging market exposures (Graph 2.4, right-hand panel). However, holding individual borrowing country ratings constant at their mid-1999 level, shifts in exposures led to an improvement in the average rating of the total

Average sovereign ratings: calculation and discussion

Regulators and policymakers have become increasingly interested in gauging the vulnerability of a country's banking sector to macroeconomic developments, both domestic and foreign. While this vulnerability encompasses many factors, one important factor is the country risk associated with foreign exposures. Broadly speaking, country risk is a measure of the potential losses on assets held in foreign countries, typically emerging markets, due to a deterioration in political or economic conditions in these countries. As a first approximation, an average measure of the credit quality of borrowing countries in which a reporting country holds assets may be useful in tracking the evolution of country risk for individual banking systems. For present purposes, we take the sovereign rating assigned by a credit rating agency as our measure of country risk for individual borrowing countries.

Calculation

Our measure of country risk for each reporting country, or its "average rating", is based on the reporting country's emerging market exposure only, and is a simple weighted average of the sovereign ratings of all emerging market borrowing countries. Since the likelihood of default increases non-linearly as a country's sovereign rating worsens, we use as weights the default probabilities associated with each letter rating to better capture the exponentially increasing probability of loss. Thus, the average rating for reporting country i , AR_i , is a weighted average of the default probabilities associated with the foreign currency sovereign bond ratings of all emerging market vis-à-vis countries to which the reporting country is exposed.^① Formally, the AR_i for lending country i in any given period is calculated as:

$$AR_i = \sum_j \omega_{ij} * PD_j$$
$$\omega_{ij} = \frac{c_{ij}}{\sum_j c_{ij}}$$

where j indexes the emerging market vis-à-vis countries of reporting country i , ω_{ij} is the share of claims on vis-à-vis country j in reporting country i 's total claims, PD_j is the default probability associated with the sovereign rating for vis-à-vis country j , and c_{ij} is the exposure of reporting country i to vis-à-vis country j . The exposure of each reporting country is measured as its consolidated foreign claims on an ultimate risk basis on each borrowing country. Foreign claims include both international and local currency claims, and are adjusted for inward and outward risk transfers based on the ultimate guarantor of the claim.

The sovereign rating of each borrowing country is based on that given by Standard & Poor's. For each letter rating, which can vary by country and through time, we assign a default probability, which is assumed constant through time. These default probabilities are based on the empirical experience for corporate defaults, which tend to be more frequent than sovereign defaults (see Packer, "Mind the gap: domestic versus foreign currency sovereign ratings", in this issue of the *BIS Quarterly Review*).^② In using these probabilities for weighting purposes, we assume that rating agencies impose some consistency in the way they rate different types of borrowers. Once the average probability of default is calculated, we then express it in terms of the closest corresponding rating.

Uses and pitfalls

The estimated average rating for a reporting country is most appropriately used to assess changes in credit quality over time. Among other things, differences in the credit quality between claims on the public and private sectors, in the composition of the portfolio and in the overall rate of collateralisation of cross-border claims can cloud the interpretation of the estimated average rating at a point in time. However, to the extent that these evolve slowly over time, the *time series*

^① The calculation procedure is loosely based on a similar exercise discussed in the June 2000 issue of the *Financial Stability Review*. ^② The default probability is set to unity if the country is in a state of default.

properties of the estimated average rating for any single reporting country can still be a useful tool in tracking broad changes in the risk of foreign exposure, the focus in the main text.

Data limitations require that numerous assumptions be made in calculating the average rating. For example, only 13% of the total international claims of domestically owned banks in the BIS reporting countries are on the public sector. Yet, credible indices of the health of the banking and corporate sectors for many vis-à-vis countries are not readily available. While differences in credit quality across sectors are surely relevant, the index calculated here relies solely on sovereign ratings, and may bias the estimated average rating.

Further complicating the calculation, the BIS consolidated data do not track potentially important exposures of reporting country banking systems. While the consolidated ultimate risk claims do take into account the ultimate guarantor of each claim, the scope of this analysis is limited to the on-balance sheet exposures of banks. Off-balance sheet items, an important portion of banks' total assets, are not captured in the BIS statistics. The extent to which these items balance, or are used as a hedge against, known risks in cross-border exposures will further bias the estimated average rating.

Finally, the coverage across countries of sovereign ratings is not complete, making it impossible to assign a default probability to a portion of the claims of reporting area banks. Not all countries have a sovereign rating, either because these countries do not have outstanding government bonds or because the rating agencies have not rated their sovereign debt. That said, the increase over the last decade in the number of countries that have a sovereign rating means this problem is less severe than it once was. In each quarter since mid-1999, an average of only 4% of all claims of all BIS reporting countries have been on countries that do not have a sovereign foreign currency rating provided by Standard & Poor's.

emerging market portfolio of reporting country banks, from near B in the second quarter of 1999 to better than a B+ rating in the first quarter of 2003.

Country risk of
emerging Europe
portfolio declines ...

While banks channelled funds away from risky countries in all emerging market regions, the improvement in the rating of the emerging Europe portfolio of reporting banks has been the most striking (Graph 2.5). Ultimate risk claims on emerging European economies have increased as a share of total ultimate risk claims on emerging markets, from 17% in mid-1999 to 23% in the first quarter of 2003. But over this same period, the average rating (with country ratings held at their mid-1999 level) improved from CCC+ to near a B rating, reflecting primarily a cutback in claims on Russia and an increase in claims on Poland. Ultimate risk claims on Russia, whose default in 1998 led to an average rating of CCC between mid-1999 and the first quarter of 2003, dropped from 26% of total claims on the region to 11% over this period. At the same time, the share of claims flowing to Poland, which had an average rating near BBB+, increased from 12% of total claims on the region to 24 over this same period.

... as does that of
the Asia-Pacific
portfolio

Although less dramatic, the average rating of reporting area banks' Asia-Pacific portfolio has improved as well. Holding sovereign ratings constant at their mid-1999 level, the average rating of this portfolio edged closer to a BB–rating, an improvement of roughly one notch. This largely resulted from decreased exposure to Indonesia, which had on average a CCC rating between mid-1999 and the first quarter of 2003, and increased exposure to Malaysia, with an average rating better than BBB.

International syndicated credits in the second quarter of 2003

Blaise Gadanezc

Following three consecutive quarterly declines, activity in the international syndicated loan market picked up in the second quarter of 2003, with signings totalling \$371 billion compared with \$234 billion in the first quarter. Nevertheless, this in fact represented a slight decrease on a seasonally adjusted basis. Signings in the second quarter of each year have traditionally been strong, averaging \$384 billion between 1999 and 2002.

Lending to US borrowers fell year over year, particularly to borrowers in the investment grade market segment. The 32% overall slowdown for all rating types stemmed from favourable financing conditions in corporate bond markets, as well as fewer backup lines being granted for commercial paper issuance purposes than a year ago. Noteworthy was the sharp drop, to 8%, in the share of deals explicitly identified as collateralised in total lending to US borrowers, consistent with the slowdown in US long-term credit downgrades. The ratio of explicit collateralisation was down from an average of 21% in previous quarters since the beginning of 1999 and a peak of 36% in the first quarter of 2003.

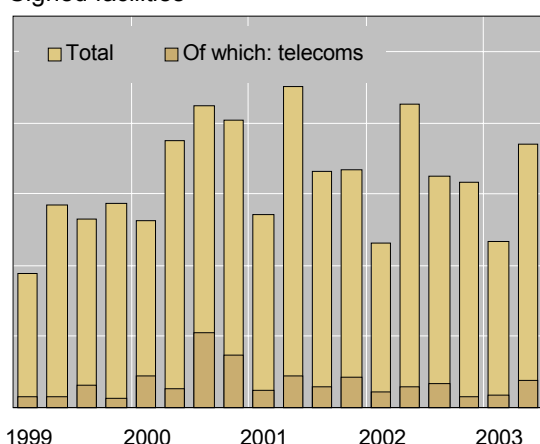
Conversely, signings for European borrowers expanded year on year. The 39% jump resulted from large refinancings by vehicle manufacturers (DaimlerChrysler rolled over \$13 billion) and telecoms firms (such as Telecom Italia/Olivetti and Vodafone),^① suggesting a return of investor confidence to that sector. At nearly \$40 billion, the total volume of signings for telecoms firms worldwide was the highest since the end of 2001. This sector was recently revived by increased liquidity in the secondary market, where trading of this type of debt has become popular and indeed dominated activity according to reports from practitioners.

Signings for emerging market borrowers expanded slightly over the year, totalling \$18 billion for all regions. Lending to Latin America, which had hit a historical low during the previous quarter, rebounded, supported by a \$2 billion sovereign facility granted to the Mexican government to finance a Brady bond buyback programme.^② In Asia, Korean and Taiwanese borrowers, mainly from the electronics, banking and petrochemical industries, were the most active, with borrowers from each country arranging signings totalling \$1.8 billion. The South African Reserve Bank signed a \$1 billion facility to retire a previous credit line.

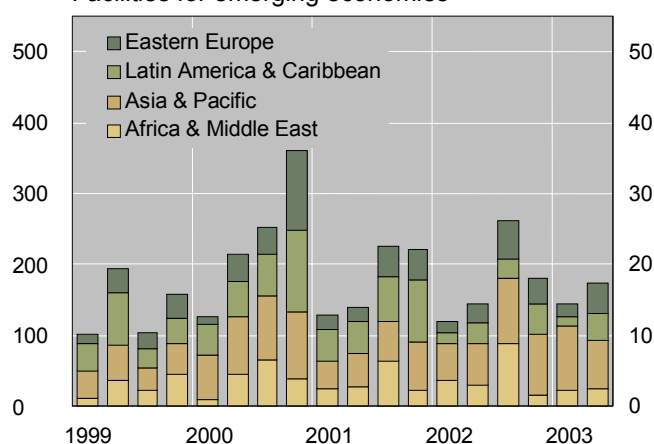
Activity in the international syndicated credit market

In billions of US dollars

Signed facilities



Facilities for emerging economies



Sources: Dealogic Loanware; BIS.

^① Both firms' facilities, initially worth €15.5 billion and \$10.4 billion respectively, were subsequently reduced during the third quarter. ^② See "The international debt securities market" on page 27.

The Argentine default in 2001 drove down the average rating of reporting area banks' Latin American portfolio. However, with country ratings held constant at their mid-1999 level, the average rating of this portfolio changed little over this period, hovering near BB-. This reflects the fact that two of the largest borrowers in the region, Argentina and Mexico, had similar country ratings at the time. The deterioration in the average rating of this portfolio in mid-2001 resulted from the series of downgrades of Argentina which had started in March 2001. The subsequent improvement in the average rating from the first quarter of 2002, as banks reduced exposure to Argentina, was partially offset by a one-notch downgrade of Brazil to B+ in July 2002. While the share of ultimate risk claims on Argentina fell from 21% of total claims on the region in mid-1999 to 8% in the first quarter of 2003, that of claims on Mexico, which had on average a rating of BB+, rose from 20% to 45% over this same period.

3. The international debt securities market

The second quarter of 2003 witnessed continued strength in fund-raising through the international debt securities market. Aggregate net issuance was \$346 billion (Table 3.1), essentially unchanged from the previous quarter. This

Main features of net issuance in international debt securities markets								
In billions of US dollars								
	2001	2002	2002			2003		Stocks at end-Jun 2003
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Total net issues	1,346.9	1,010.5	340.5	179.3	182.2	355.1	345.6	10,266.2
Money market instruments ¹	-78.9	2.3	8.3	11.8	-10.0	55.4	3.4	518.7
<i>Commercial paper</i>	26.9	23.7	1.8	19.3	-3.0	46.8	13.1	367.9
Bonds and notes ¹	1,425.8	1,008.2	332.2	167.5	192.2	299.8	342.2	9,747.5
<i>Floating rate issues</i>	390.8	198.9	74.1	25.3	39.6	-41.7	-27.6	2,215.3
<i>Straight fixed rate issues</i>	995.8	799.2	245.6	145.2	155.2	341.1	369.3	7,210.6
<i>Equity-related issues</i>	39.1	10.1	12.5	-3.0	-2.6	0.3	0.5	321.6
Developed countries	1,259.9	946.3	325.6	164.4	171.8	330.4	314.4	9,091.0
<i>United States</i>	596.7	337.2	115.7	35.6	48.5	61.3	30.6	2,865.1
<i>Euro area</i>	550.9	471.1	153.5	91.0	98.1	212.8	206.5	4,256.7
<i>Japan</i>	-10.1	-23.5	3.2	-6.2	-10.2	-4.0	-2.7	249.1
Offshore centres	28.2	8.3	0.3	-1.1	4.7	2.3	4.3	119.1
Developing countries	42.6	35.0	7.8	6.9	8.7	13.2	11.7	577.4
Financial institutions	1,037.5	834.6	277.3	151.6	168.7	273.1	246.2	7,396.9
<i>Private</i>	955.1	714.2	240.7	115.8	141.0	203.2	176.7	6,262.5
<i>Public</i>	82.4	120.4	36.6	35.8	27.7	69.9	69.5	1,134.3
Corporate issuers	207.6	55.8	40.7	0.9	2.1	16.4	31.2	1,358.1
<i>Private</i>	171.3	53.8	40.5	-1.6	-3.4	10.6	30.3	1,123.5
<i>Public</i>	36.3	2.0	0.3	2.5	5.5	5.8	0.9	234.6
Governments	85.5	99.2	15.7	17.6	14.5	56.5	52.9	1,032.5
International organisations	16.3	20.9	6.8	9.1	-3.0	9.1	15.3	478.7
<i>Memo: Domestic CP²</i>	-125.8	-104.8	-70.6	5.1	27.2	-0.6	-18.0	1,923.5
<i>Of which: US</i>	-144.6	-91.4	-56.5	0.2	23.8	-15.7	-41.9	1,312.5

¹ Excluding notes issued by non-residents in the domestic market. ² Data for the second quarter of 2003 are partly estimated.

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

Table 3.1

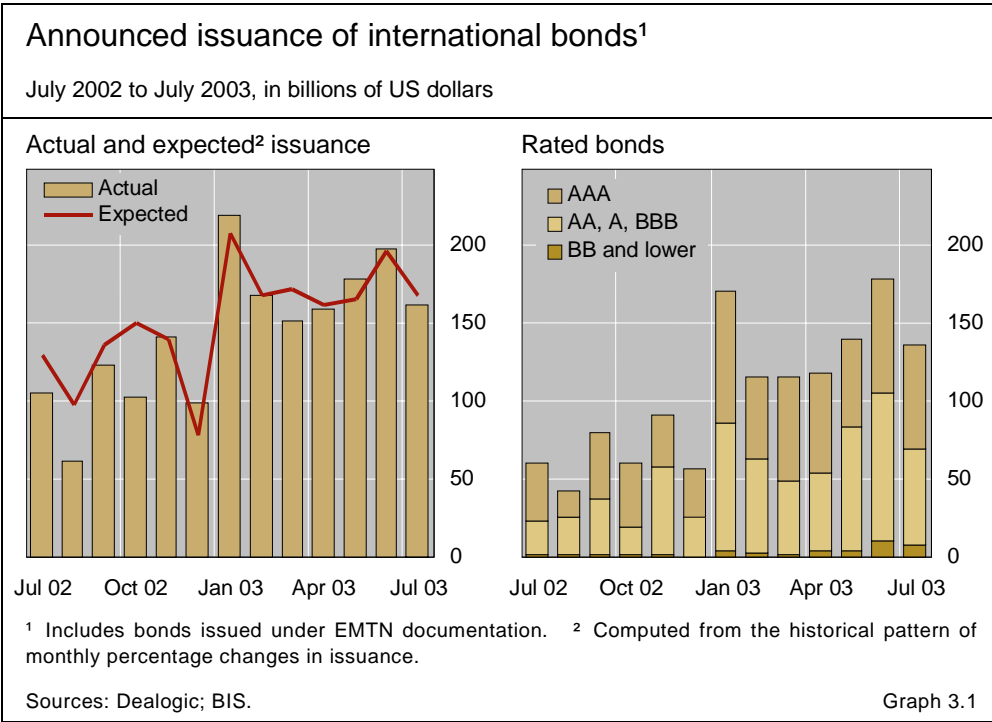
brought net issuance for the first half of the year to \$701 billion, an 8% increase over the figure for the first six months of 2002 and a substantial rise over the weak activity of the intervening period. The search by investors for higher yields, prevalent during most of the second quarter of 2003, led to greater demand for credit products. This demand was met with ample new supply from euro area borrowers, making up for a sharp fall in net issuance by US entities. Borrowers also continued to take advantage of historically low long-term interest rates to lengthen the maturity of their debt. Net issuance would have been even higher during the second quarter had it not been for record repayments. The quarter saw defaults and early repayments on callable and convertible debt that totalled \$19 billion.

The greater demand for credit products created a favourable environment for lower-rated issues. Emerging market borrowers in particular continued to benefit from receptive international capital markets during most of the second quarter. Their fund-raising through the international debt securities market remained fairly robust, as spreads on high-yielding sovereign debt fell to levels last seen in the late 1990s. The quarter also saw a sharp pickup in speculative grade issuance by developed country entities.

Borrowers shift to longer-term debt as geopolitical risks wane and investors seek higher yields

The waxing and waning of recent geopolitical risks had a discernible impact on the international debt securities market, but gross issuance over the quarter nevertheless hit a record high. Associated with the outbreak of war in Iraq was a lower than expected rate of gross issuance in the international bond market (Graph 3.1). Gross issuance usually increases slightly between February and

Gross issuance at an all-time high



Gross issuance in the international bond and note markets

In billions of US dollars

	2001	2002	2002			2003	
	Year	Year	Q2	Q3	Q4	Q1	Q2
Total announced issues	2,305.3	2,100.6	569.1	434.9	490.4	757.6	784.2
Bond issues	1,348.8	1,165.2	313.9	210.2	266.2	435.0	454.5
Note issues	956.5	935.5	255.3	224.8	224.3	322.6	329.7
Floating rate issues	642.9	603.2	160.2	144.1	157.0	123.1	140.4
Straight fixed rate issues	1,590.2	1,454.7	388.9	285.9	325.2	616.5	627.4
Equity-related issues ¹	72.2	42.8	20.0	5.0	8.2	18.0	16.4
US dollar	1,131.3	985.9	256.5	200.4	218.9	332.1	286.5
Euro	841.4	806.7	229.3	163.9	184.9	330.4	388.6
Yen	125.2	88.3	25.9	21.6	24.5	23.3	26.1
Other currencies	207.4	219.7	57.5	49.0	62.2	71.8	83.0
Financial institutions	1,708.2	1,632.0	429.3	352.7	401.3	582.3	594.9
<i>Private</i>	1,471.3	1,375.9	361.9	293.4	329.0	464.7	464.2
<i>Public</i>	236.8	256.0	67.4	59.3	72.3	117.6	130.7
Corporate issuers	348.2	211.5	74.5	34.0	40.2	55.0	78.6
<i>Of which: telecoms</i>	135.6	45.9	16.1	7.8	10.1	23.0	6.6
<i>Private</i>	287.2	186.6	70.9	28.4	31.1	39.6	71.3
<i>Public</i>	61.0	24.9	3.6	5.6	9.0	15.5	7.3
Governments	174.2	172.9	44.9	28.3	31.1	81.6	80.1
International organisations	74.8	84.3	20.5	20.0	17.9	38.7	30.7
Completed issues	2,305.1	2,101.2	576.2	441.6	495.6	716.7	724.8
<i>Memo: Repayments</i>	879.3	1,093.1	244.0	274.1	303.4	417.0	382.6

¹ Convertible bonds and bonds with equity warrants.

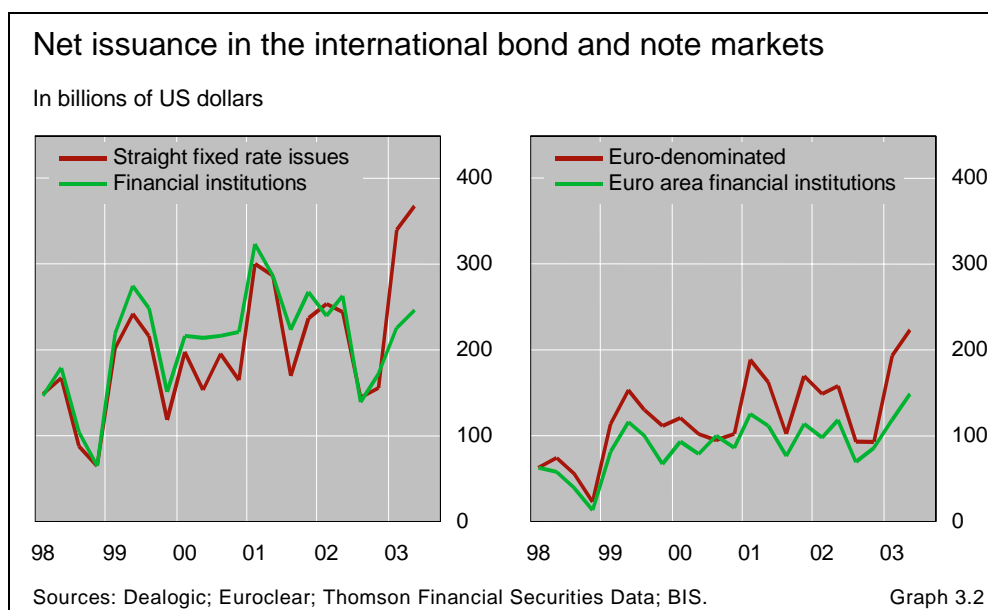
Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS.

Table 3.2

March but in 2003 it actually fell during that period, although, at \$151 billion, announced issuance was only \$21 billion below that implied by the seasonal pattern of monthly changes. Moreover, the rapid military victory permitted a quick return to expected rates of issuance in April, and the earlier shortfall was partly made up by greater than expected issuance in May. For the second quarter as a whole, gross announced issuance of bonds and notes was \$784 billion (Table 3.2), a further increase over the record level set in the previous quarter.

An important factor underlying these developments was the continuation of global investors' search for yield. There was a large decline in net short-term fund-raising in the international debt securities market, consistent with the view that borrowers were taking advantage of historically low long-term interest rates to lengthen the maturity of their debt. Net issuance of money market instruments contracted to \$3 billion from \$55 billion in the previous quarter. This was the result of a sharp fall in net issuance of international commercial paper (CP) from an unusually high level in the first quarter. Net domestic CP

Borrowers lengthen
debt maturity



issuance also fell, from $-\$1$ billion to $-\$18$ billion, although a marked drop in net CP issuance by US companies was partly offset by a rise in net issuance by Japanese businesses.

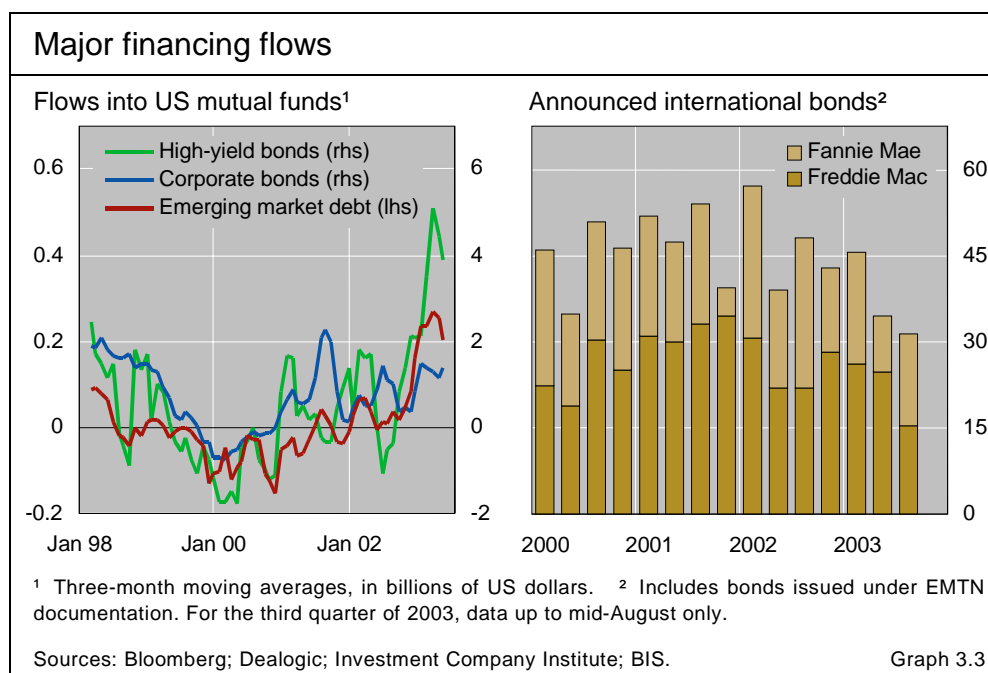
The decline in net issuance of money market instruments was partly offset by increased net borrowing in the form of longer-term, fixed rate securities. Net issuance of straight fixed rate bonds and notes rose by \$28 billion in the second quarter to \$369 billion (Graph 3.2), an all-time high. This rate of net issuance is substantially greater than one might have expected, given the historically fairly tight relationship between net issuance of straight fixed rate securities and net issuance by financial institutions. In contrast, net issuance of floating rate bonds and notes remained negative for the second quarter in a row. This occurred despite a 14% rise in announcements of floating rate bonds and notes to \$140 billion in the second quarter of 2003, as a high rate of repayments in this instrument category kept the net issuance figure negative.

Record fixed rate issuance

Developing country borrowers gain from strong investor demand

Emerging markets were among the biggest beneficiaries of the global search for yield that characterised most of the second quarter of 2003. Flows into US mutual funds specialising in emerging market debt were large (Graph 3.3), and spreads on high-yield sovereign debt fell to levels last seen in the late 1990s. Emerging market borrowers responded to these favourable issuance conditions and continued to tap the international debt securities market for new funds. Their net issuance during the second quarter was \$12 billion, about the same as in the first quarter, but substantially above levels seen in 2002. A \$3 billion increase in net issuance by borrowers in developing Asia and the Pacific was more than offset by a \$6 billion fall in net issuance by borrowers in developing Europe. Net issuance by Latin American borrowers was steady at \$5 billion. The two largest emerging market issues during the second quarter were a €1.25 billion 10-year bond floated by the Republic of South Africa and a \$1.5 billion US dollar issue by Mexico.

Emerging markets benefit from the hunt for yield ...



In Latin America, a decline in net borrowing by Chilean and Peruvian entities in the second quarter of 2003 was more than offset by a \$3 billion increase in net issuance by Brazilian borrowers. Mexico's net borrowing also rose, by 30% to \$3 billion. This was accomplished through \$4.4 billion in new announcements. In addition, during May and July, Mexico conducted two Brady bond buyback operations, one for \$3.8 billion of US dollar-denominated bonds and another for \$1.2 billion of European currency denominated bonds. The funds used in these buybacks stemmed from both accumulated liquidity from earlier financial operations of the federal government and a \$2 billion syndicated loan (see "International syndicated credits in the second quarter of 2003" on page 25). This action resulted in Mexico becoming the first sovereign borrower to completely liquidate its outstanding stock of Brady bonds.

It was Korean and Chinese borrowers that were responsible for most of the rise in net borrowing for the Asia-Pacific region. In the case of China, net issuance rose to \$0.6 billion in the second quarter of 2003 from -\$1.0 billion in the previous quarter, while Korea's net issuance increased to \$1.9 billion from \$0.8 billion. On the other hand, net issuance by Thai entities remained at essentially zero for the third quarter in a row. There was nevertheless a significant development concerning Thai borrowing: in the second quarter, the Kingdom of Thailand issued \$300 million of US dollar bonds, the first dollar issues by the central government since April 1997.

Lower-rated issues find receptive market

... as do other lower-rated borrowers

Lower-rated borrowers from developed countries also took advantage of the search for yield and the resulting decline in credit spreads. Gross issuance of speculative grade international bonds from developed country entities increased by more than 150% to \$8.8 billion in the second quarter. Combined with \$9.6 billion in speculative grade announcements from emerging market

entities, this raised aggregate speculative grade gross issuance to \$18.4 billion, up from \$7.8 billion in the previous quarter. This occurred despite a sharp fall in gross issuance by telecoms operators, from \$23 billion to \$7 billion. Speculative grade issuance continued to rise throughout the second quarter, reaching \$10.5 billion in June, the highest level since March 2000.

There was also a marked expansion in investment grade issuance in the international bond market throughout the course of the second quarter of 2003. After remaining fairly constant during February, March and April, announcements of bonds rated BBB and higher increased by \$21 billion in May and by an additional \$32 billion in June. This greater investment grade issuance was not associated with larger fund-raising by Fannie Mae and Freddie Mac, the US housing agencies. Their combined gross issuance in the international bond market, as reported by Dealogic, fell by 24% to \$35 billion. However, preliminary data suggest that the decline will be reversed in the third quarter, as announcements during July and the first half of August already amounted to \$31 billion. Thus, the surprise management shake-up at Freddie Mac announced on 9 June does not appear to have affected the ability of the housing agencies to raise funds in the international market; although secondary market spreads on agency debt did widen briefly after 9 June, they fell back again later in the month. The largest new international bond issue by Freddie Mac following the announcement was a \$2.5 billion 10-year note that closed on 12 June and was priced at a spread of 68 basis points over the 10-year US Treasury yield.

Emerging market spreads began to rise in the second half of June, indicating some abatement in the search for yield (see the Overview). There followed a 65% decline in speculative grade issuance by emerging market entities between June and July. The heaviest emerging market speculative grade borrower in July was Brazil, with \$1.3 billion of gross issuance. In contrast, speculative grade issuance by developed country entities rose by 14% between June and July. The biggest developed country speculative grade borrower in July was Vivendi Universal, responsible for \$1.5 billion in gross issuance over two deals, the larger of which was a five-year note priced at a spread of 380 basis points. At \$7.2 billion, total speculative grade announcements, although down from the June figure, remained fairly robust in July. Total announced issuance of international bonds fell by 18% in July to \$162 billion, a slightly greater decline than the seasonal monthly pattern in issuance would have led one to predict.

Euro-denominated issuance reaches all-time high

Net issuance of euro-denominated bonds and notes in the international market reached a record high in the second quarter of 2003, rising by 15% to \$223 billion. In percentage terms, however, the increase was substantially less than that posted between the fourth quarter of 2002 and the first quarter of this year, when net issuance of these securities more than doubled. The rise reflected greater borrowing by both financial and non-financial entities from the

Investment grade
issuance rises

Speculative grade
issuance falls in
July

Euro-denominated
issuance increases
further

Net issuance of international debt securities by region and currency¹

In billions of US dollars

Region/currency		2001	2002	2002			2003	
		Year	Year	Q2	Q3	Q4	Q1	Q2
North America	US dollar	524.8	303.9	93.3	35.7	49.3	40.4	28.5
	Euro	65.1	40.0	14.7	7.3	-0.4	15.9	4.9
	Yen	19.0	-7.2	1.0	-1.5	-2.5	0.0	-1.7
	Other currencies	7.2	12.5	6.0	-0.8	3.8	3.5	7.6
Europe	US dollar	42.7	62.6	36.8	4.2	15.4	38.2	29.1
	Euro	521.5	463.7	133.0	101.5	93.8	203.9	213.3
	Yen	-2.5	-26.2	-4.7	-6.5	-2.7	-4.4	-3.2
	Other currencies	73.7	85.7	28.4	25.8	14.6	27.1	26.4
Others	US dollar	83.9	53.6	16.8	5.3	8.1	18.7	17.8
	Euro	10.5	18.2	8.1	5.4	-0.3	6.6	13.2
	Yen	0.1	-10.3	6.7	-0.5	-3.7	-1.8	1.8
	Other currencies	0.8	14.0	0.5	3.4	6.8	7.0	7.8
Total	US dollar	651.5	420.1	146.8	45.3	72.8	97.3	75.3
	Euro	597.1	521.9	155.8	114.2	93.1	226.4	231.4
	Yen	16.6	-43.7	3.0	-8.4	-8.9	-6.1	-3.0
	Other currencies	81.7	112.3	35.0	28.3	25.2	37.6	41.9

¹ Based on the nationality of the borrower.

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

Table 3.3

euro area. The largest non-financial corporate issuer in the second quarter was Volkswagen International, which borrowed €4 billion through the flotation of two euronotes. Siemens also floated a large issue in the second quarter, a €2.5 billion contingent convertible bond.¹ Euro area financial institutions were responsible for even larger flotations. The Kreditanstalt für Wiederaufbau, for instance, borrowed €5 billion with a single issue while DEPFA ACS Bank raised €3.5 billion, also with a single issue.

Higher net issuance of euro-denominated bonds and notes helped to push total net issuance of euro-denominated debt securities in the international market to \$231 billion, an all-time high (Table 3.3). A decline in net issuance of these securities by North American entities was partly offset by increased euro-denominated issuance from borrowers outside the United States and the euro area, which doubled to \$13.2 billion. The largest borrower in this category was the European Investment Bank, which floated a €5 billion 10-year bond. This was also the largest issue in the second quarter by an international organisation.

¹ A contingent convertible bond is a security similar to a traditional convertible bond with a strike price that is the cost of the stock when the bond converts into stock. However, in the case of a contingent convertible bond, there is another price higher than the strike price that the company's stock must reach before the conversion can be made.

Pension fund gap financed in international securities market

A significant development during the second quarter of 2003 was the placement on 26 June of a very substantial debt package by General Motors Corporation. Reportedly, the company intended to use most of the proceeds to fill a large shortfall in its pension plan which was partly to blame for its recent rating downgrades. The package was made up of \$8.2 billion in issuance by the parent company and an additional \$5.5 billion in gross issuance by its financing subsidiaries. This debt package even surpassed the unusually large fund-raising operation conducted by WorldCom in May 2001, comprising \$11.9 billion in bond offerings on a single day. To the extent that General Motors earns a higher tax-free return on its pension assets than the after-tax cost of the new debt, the deal will strengthen the firm's balance sheet. The largest of the issues, a \$3 billion 30-year bond, was priced at a spread of 400 basis points over a comparable US Treasury.

Borrowing to fill the pension gap ...

The \$8.2 billion of the General Motors debt package issued by the parent company helped to push net private US non-financial corporate issuance during the second quarter to \$4.3 billion, up from \$0.6 billion in the previous quarter. However, there was no accompanying increase in borrowing by US financial institutions, whose net issuance fell 58% to \$26 billion during the second quarter and was the main reason for the decline over the same period in overall net issuance by US entities. Issuance by non-US corporate entities rose significantly more than that of US entities in the aggregate. Net private corporate issuance by euro area countries, for example, grew from \$6.5 billion to \$24.3 billion, mostly due to greater borrowing by French entities, whose net issuance rose from -\$2.9 billion to \$12.1 billion.

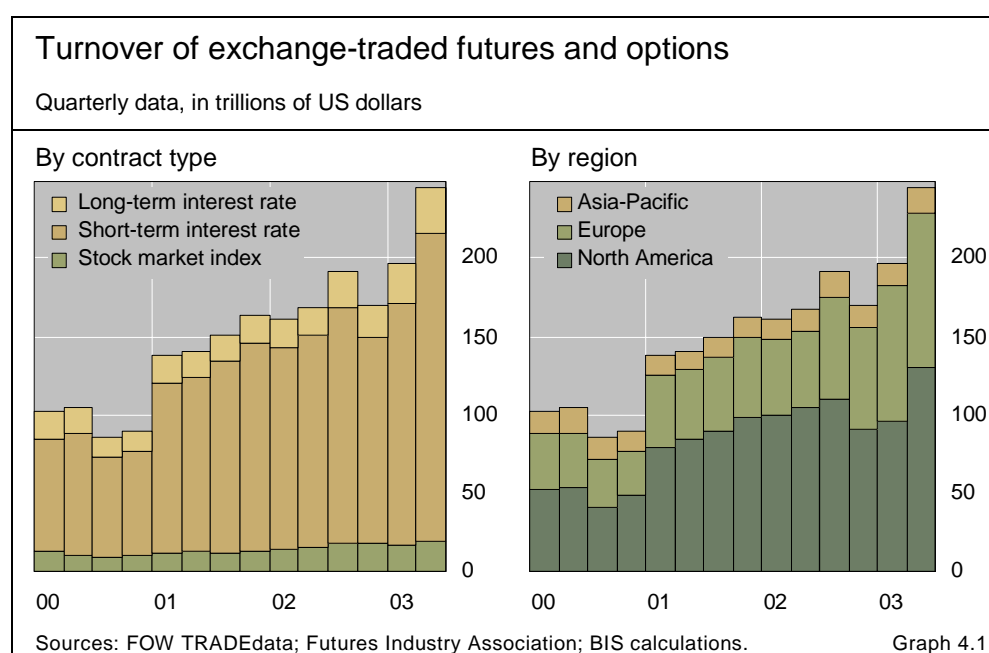
... supports US non-financial corporate issuance

4. Derivatives markets

The aggregate turnover of exchange-traded financial derivatives contracts monitored by the BIS grew further in the second quarter of 2003. The combined value of trading in interest rate, stock index and currency contracts reached \$246 trillion, a 24% rise (Graph 4.1). Trading was buoyant across all major market risk groups, but activity was particularly brisk in interest rate contracts.

Much of the increase in fixed income business occurred on US exchanges and seemed to result from hedging activity related to future monetary policy actions and from duration readjustments by large intermediaries active in the US mortgage market. The backup in yields in the global bond market from late June had only a limited impact on overall market activity in July, with a notable increase in the trading of US government bond contracts but a decline in the turnover of fixed income instruments elsewhere.

Trading in stock index contracts returned to expansion in the second quarter from a slight contraction in the previous period. At the same time, turnover in the comparatively small currency segment showed signs of revival following a long period of decline. Exchanges continued to introduce a variety of new contracts, largely on stock market indices (see the box on page 42).



Hedging boosts activity in fixed income contracts

Aggregate trading in exchange-traded interest rate contracts, the largest of the broad market risk categories, continued to grow strongly in the second quarter of 2003. The volume of transactions expanded by 25% to \$226.2 trillion, compared with an increase of 18% in the first quarter. Contracts on short-term interest rates, including eurodollar, Euribor and euroyen, accounted for much of the absolute increase in business, with turnover rising by 28% to \$197.8 trillion. Business in longer-term instruments, including 10-year US Treasury notes, 10-year German government bonds and 10-year Japanese government bonds, rose at a weaker pace, with turnover up by 9% to \$28.4 trillion.

Short-term interest rate contracts drive the increase ...

The most notable feature of activity in fixed income products in the second quarter was a sharp increase in turnover in North America, where trading expanded by 39% to \$121.5 trillion. Of this total, business in short-term interest rate contracts grew by 42% to \$112.5 trillion, while that in longer-term instruments rose by 17% to \$9 trillion. Trading of short-term interest rate products on the Chicago Board of Trade (CBOT) rose by an unprecedented amount (by 148% to \$22.3 trillion), while such activity on the Chicago Mercantile Exchange (CME) expanded at a robust pace (by 28% to \$88.2 trillion).

... which takes place largely in North America ...

The notably strong increase in activity in short-term products on US exchanges during the second quarter reflected two main underlying factors. First, market participants appear to have misinterpreted a change in the way the Federal Open Market Committee (FOMC) expressed its assessment of economic conditions on 6 May. While the FOMC's decision to keep its target for the federal funds rate unchanged was largely expected, the publication of separate risk assessments for economic growth and inflation represented a significant break from the traditional practice of a single assessment of the balance of risks. In its statement, the FOMC distinguished between an economic climate for which risks seemed to be balanced and a trend in prices for which deflation was a greater risk than inflation. Markets seemed uncertain about how to interpret this new risk assessment framework, and, in particular, what it would mean for future FOMC actions. In their attempt to hedge against this new source of uncertainty, market participants increased their recourse to short-term interest rate contracts.

... as market participants react to a new policy announcement

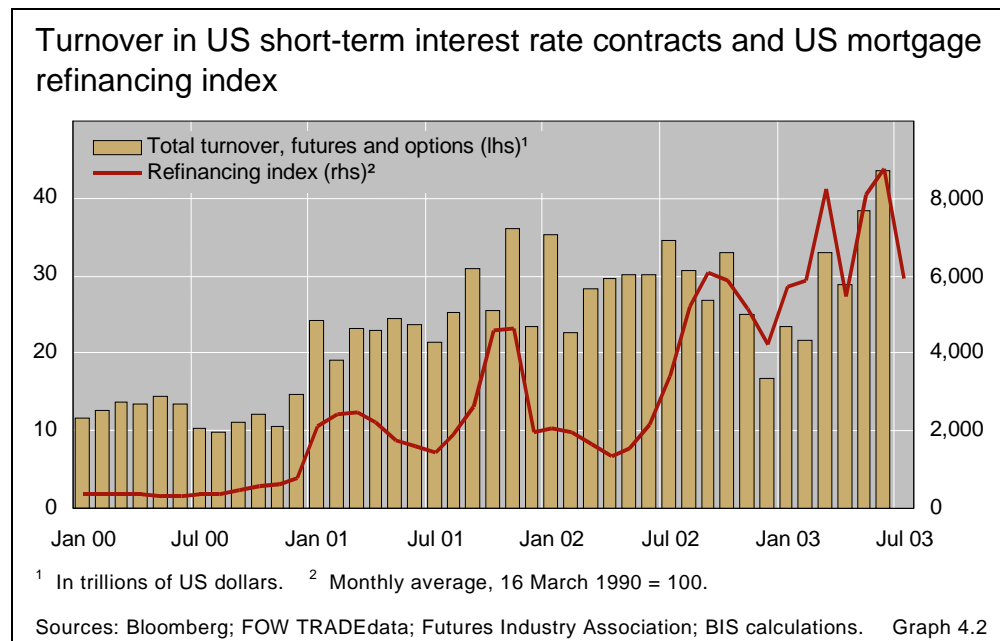
The 30-day US federal funds rate futures and options traded on the CBOT were particularly favoured by market participants. Trading in such contracts expanded at an unusually rapid pace, leading to a significant gain in their share of the US market for short-term instruments. Activity in such contracts amounted to 20% of the turnover in US money market contracts in the second quarter compared with 12% in the previous quarter and an average of 9% for 2002 as a whole. The rapid expansion of short-term contracts represents a new development for the CBOT, an exchange that has traditionally tended to dominate trading in longer-term instruments such as US government bond contracts. Federal funds futures have been traded on the CBOT since late 1988 but their use has accelerated sharply since the beginning of 2001, when the FOMC embarked on a vigorous round of reductions in the federal funds

Fed funds contracts gain market share

rate. The development of a liquid market in these futures encouraged the exchange to introduce options on them in early 2003, contracts that have found ready investor acceptance. Since federal funds contracts are directly tied to the federal funds rate, they are well suited for trading on US monetary policy actions.¹ The CME's well established eurodollar contracts have also been used extensively to trade on US policy rates. However, these contracts are tied to Libor, which means that their usefulness as trading instruments depends on the extent to which Libor tracks the federal funds rate. Trading on policy rates through eurodollar futures would involve greater basis risk than trading through federal funds futures.

Trading in fixed income contracts was also boosted by the hedging of mortgage-backed securities (MBSs). With US mortgage refinancing reaching a new record at the end of the second quarter, a large number of MBSs were subject to early repayment, leading to a further shortening in the average duration of MBS portfolios.² In order to minimise mismatches in the duration of their assets and liabilities, holders of MBSs were reported to have sought to lengthen the duration of their assets by various means, including purchasing government bonds and newly issued MBSs, taking long positions in government bond futures and contracting to receive fixed rates in interest rate swaps. While the taking of long positions in government bonds and related futures led to a direct increase in cash market and exchange-traded turnover,

The hedging of MBSs also boosts activity



¹ See R S Gürkaynak, B Sack and E Swanson, "Market-based measures of monetary policy expectations", FEDS paper 2002-40, Federal Reserve Board, August 2002. The authors found that the federal funds futures rate dominates all other market interest rates for predicting changes in the federal funds rate over horizons extending to several months.

² Investors in MBSs face significant prepayment risk since the holders of the underlying mortgages can refinance their mortgages on more favourable terms when long-term interest rates decline. See the box on page 6 for a discussion of the impact of MBS hedging on financial markets.

the taking of receiver positions in the swap market had a second-round impact on the turnover of short-term interest rate futures. Short-term futures, particularly the eurodollar contracts traded on the CME, are highly liquid and therefore commonly used by intermediaries in the hedging of swaps since a series of futures contracts extending over a number of delivery cycles can be used to create an exposure that is similar to that of an interest rate swap. Such an interpretation seems to be corroborated by Graph 4.2, which shows a degree of co-movement between the pace of US mortgage refinancing and turnover in US short-term interest rate contracts.

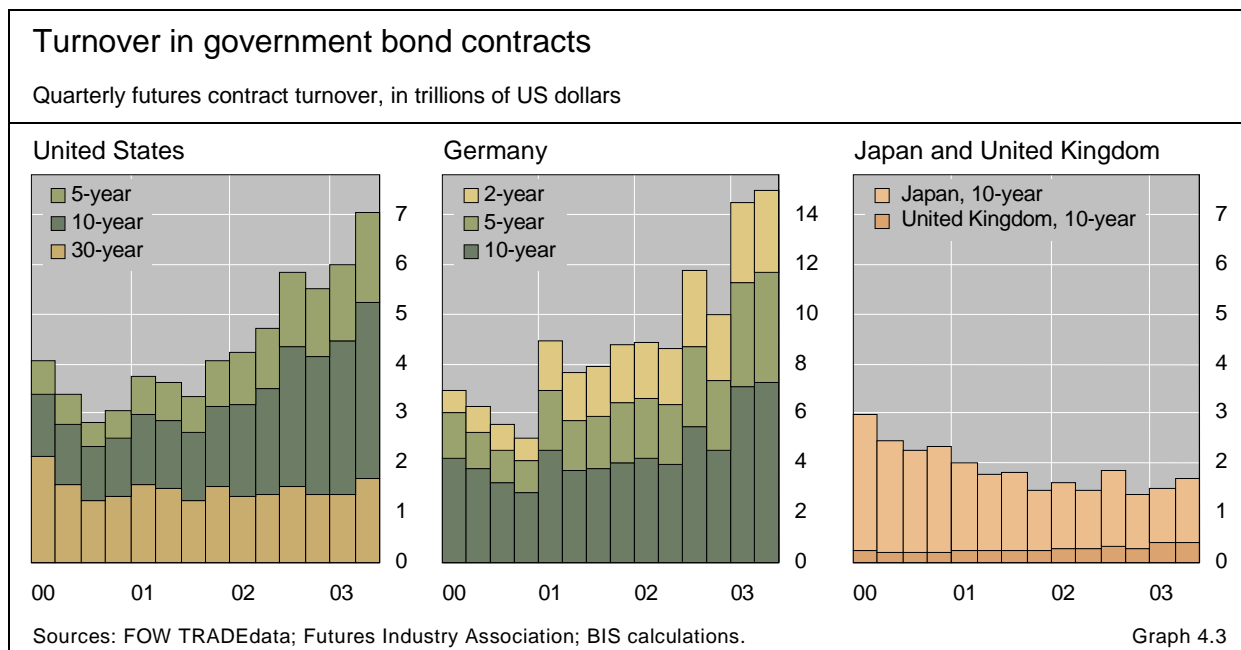
While aggregate trading in US short-term interest rate instruments rose sharply in May, it was even more buoyant in June, with activity in federal funds and eurodollar contracts reaching a maximum on 26 June. Financial markets appear to have been disappointed on 25 June by the size of the Federal Reserve's cut in policy rates and its apparent downplaying of possible recourse to unconventional monetary policy measures (see the discussion in the Overview).

The rally in US fixed income markets until mid-June also generated a significant volume of transactions involving US government bond contracts, with robust activity across the maturity spectrum (Graph 4.3). Total turnover in 10-year Treasury note futures and options, the most actively traded US government bond contracts, rose by 13%, while that in 30-year Treasury bond contracts, which were for a long time the CBOT's flagship instruments, increased by 26%. Trading in Treasury bond contracts had largely been stagnant in the wake of the US Treasury's announcement in October 2001 that it would halt sales of 30-year bonds. The recent surge in activity in that contract may have reflected the wide range of opinions concerning prospects for the evolution of the price level in the United States, given that such prospects would have a particularly significant impact on the price of long-dated assets. Speculation concerning a resumption in the issuance of 30-year Treasuries

Growing liquidity of US federal funds contracts

Robust activity in US bond contracts ...

... particularly in the long bond contracts



may also have played a role. Trading in US government bond contracts was especially buoyant in May, reaching very high levels on 28 and 29 May, when a disappointing report on durable goods orders took the shine off an earlier rally in equity markets and prompted traders to take positions in fixed income markets.

Fixed income contracts rise in Singapore and Australia

Trading in interest rate products in the Asia-Pacific region rose by 21% to \$10.7 trillion. Transactions in interest rate contracts in Singapore, the largest Asian market for such products, rose by 25% to \$5.9 trillion. Much of the rise reflected buoyant activity in eurodollar contracts. Business on Australian exchanges extended an upward trend observed since the beginning of 2001, with trading rising by 22% to \$2.5 trillion. This sharp increase seems to have been related to the hedging of new issuance in the corporate bond market. The first two quarters of the year saw unprecedented offshore issuance of Australian dollar-denominated bonds on the back of strong overseas demand. This encouraged many non-residents to issue Australian dollar debt that was swapped back into their own currency. As a result, swap spreads moved in a way that made it very attractive for Australian borrowers, particularly financial institutions, to issue foreign currency debt and swap it back into Australian dollars. This increase in swap-related issuance led to a parallel increase in exchange-traded activity as intermediaries hedged their risk exposures through short-term interest rate and government bond futures.³

Mixed pattern of activity in Japan

The pattern of activity in interest rate contracts observed on Japanese exchanges was mixed. The aggregate volume of transactions rose by 15% to \$2 trillion, with short-term contracts declining further to \$0.4 trillion and government bond contracts jumping by 25% to \$1.6 trillion. Business in government bond futures and options rose particularly abruptly in the second half of June as market participants rushed to hedge their positions or reduce their exposure to long-term fixed income assets in the wake of a disappointing auction of 20-year government bonds on 17 June (see the Overview for an analysis of developments in Japan).

Relatively modest expansion in Europe

Business in interest rate products in Europe increased at a modest pace relative to that in North America and the Asia-Pacific region. Turnover rose by 11% to \$93.3 trillion, with money market contracts expanding by 13% to \$76.2 trillion and government bond contracts up by 3% to \$17.1 trillion.⁴ Business in both short-term interest rate and bond contracts was especially buoyant in June. Trading in both types of contract reached a maximum on 5 June, the day the ECB released its monetary policy announcement. The 50 basis point cut in the ECB's refinancing rate, combined with comments by its President suggesting that further easing was likely if growth failed to accelerate, appear to have sparked a rally in euro area fixed income markets and feverish activity in related contracts.

³ For a more detailed discussion, see "Statement on monetary policy", *Reserve Bank of Australia Bulletin*, May 2003, pp 37–46, at www.rba.gov.au.

⁴ It should be noted that about half of this increase in dollar terms resulted from an appreciation of the euro relative to the dollar between the first and second quarters.

Exchange-traded markets return to life

Following a long period of stagnation, exchange-traded markets have experienced a remarkable recovery since 2001. Whereas turnover in the exchange-traded financial contracts monitored by the BIS averaged about \$360 trillion in the second half of the 1990s, average activity in the first two years of the new millennium rose by nearly 80% to \$644 trillion. Much of that higher turnover resulted from an unprecedented increase in the trading of short-term interest rate contracts to an average of \$512 trillion in 2001 and 2002. Activity in government bond contracts also increased substantially, even if by less in absolute amounts.

This recovery can be attributed to a number of factors, some of which appear to have been cyclical and others of a longer-term nature. The main cyclical factor seems to have been monetary easing since early 2001. Long-term factors include a possible shift away from the OTC market due to concerns about counterparty credit risk and the introduction of new hedge accounting rules. While more extensive research would be required in order to quantify the relative contribution of the various factors, this box offers a preliminary discussion of the most likely recent sources of market growth.

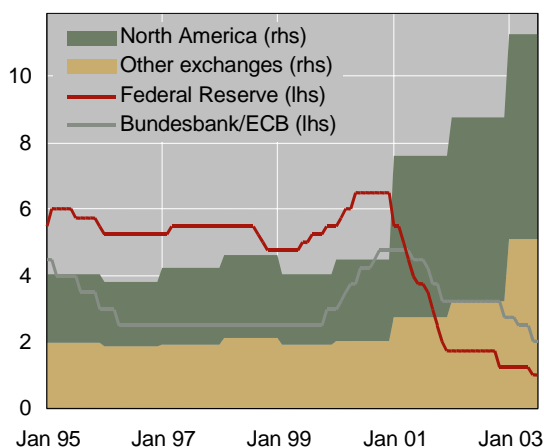
Impact of market movements

A number of empirical studies have found evidence of a positive relationship between daily or intraday volatility and turnover in exchange-traded markets.^① Recent work conducted at the BIS on monthly data shows that some of the increase in trading activity in a few US contracts was related to market volatility but that this relationship was weak and inconsistent over time.^② These results seem to apply to global trading as well. The graph below shows that the long-term evolution of global turnover in fixed income products has not been systematically related to indicators of financial market volatility. A tentative explanation is that the various trading motives may often have had offsetting impacts on aggregate turnover. A higher volume of hedging transactions could have

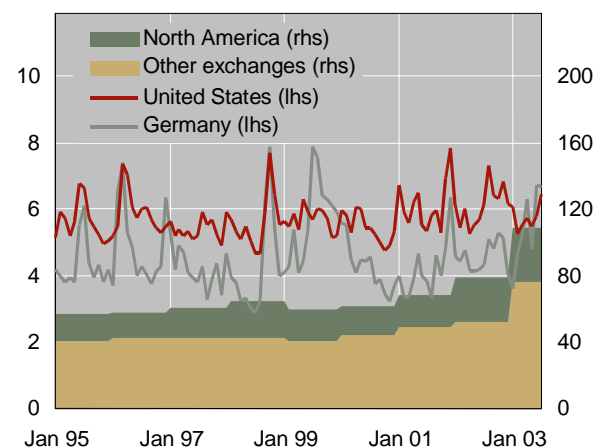
Turnover in interest rate derivatives and conditions in major fixed income markets

By region, in trillions of US dollars (rhs) and percentages (lhs)

Policy rates and turnover of short-term interest rate derivatives



Bond yield volatility¹ and turnover of long-term interest rate derivatives



Note: For 2003, turnover data for the first half-year at an annual rate.

¹ Annualised conditional variance of daily changes in 10-year government bond yields from a GARCH(1,1) model.

Sources: Bloomberg; national data; BIS calculations.

^① For an early survey see J M Karpoff, "The relationship between price changes and trading volume: a survey", *Journal of Financial and Quantitative Economics*, vol 22, no 1, 1987, pp 109–26. ^② See S Jeanneau and M Micu, "Volatility and derivatives turnover: a tenuous relationship", *BIS Quarterly Review*, March 2003, pp 57–65.

been offset by reduced speculative transactions in periods of heightened market turbulence.^③

Of course, one trading motive may at times dominate the others. This appears to have been the case in 2001 when the US Federal Reserve embarked on a round of monetary policy easing. The decline in US policy rates did not result in markedly higher volatility in US fixed income markets but it was nevertheless associated with an unprecedented expansion in the trading of US interest rate contracts. Much of that increase seems to have been fuelled by a surge in mechanically determined hedging transactions. Financial institutions, in particular, actively use fixed income derivatives to adjust gaps in the duration of their assets and liabilities as the level of interest rates changes. Such “immunisation” strategies create an unambiguously positive link between transactions and market movements.

This general relationship has been amplified in recent years by a more intensive use of derivatives contracts by a few very large market participants, such as US government-sponsored mortgage lenders. Such lenders have retained a growing share of new MBSs in their own investment portfolios, and the need to hedge the prepayment risk of those securities has led them to make greater use of derivatives contracts (see the box on page 6). This has been particularly evident since 2001. The downtrend in mortgage rates has prompted homeowners to refinance their mortgages and forced mortgage lenders to make increasingly frequent adjustments to the duration of their portfolios of MBSs.

It should be noted, however, that policy easing has not been the only factor in the recent expansion of exchange-traded markets since trading continued to be buoyant even when US policy rates remained stable, as in much of 2002. The steady rise in business observed in recent years may therefore have resulted from longer-term factors.

Concerns about counterparty credit risk

Some of the increase in exchange-traded activity may have resulted from growing concerns about counterparty credit risk. The large number of mergers and acquisitions in the financial services sector over the past decade has led to an increase in the concentration of financial markets. Such consolidation has made it more difficult for intermediaries to diversify the counterparty credit risk attached to derivatives transactions in the OTC market. Moreover, the credit quality of the major market-makers in derivatives markets has declined over the years. For example, in 1994 the largest dealer in the global interest rate swap market was rated AAA/Aaa but by 2002 its rating had declined to the lower edge of AA/Aa. Participants in the over-the-counter (OTC) market have taken various measures to mitigate counterparty risk, including daily settlement, the posting of collateral and bilateral netting. Some may also have sought to reduce counterparty credit risk and associated capital charges by stepping up their use of exchange-traded contracts.^④

Accounting changes

The introduction by the US Financial Accounting Standards Board (FASB) of new rules on derivatives and hedge accounting for all publicly traded US companies as from the fiscal year ending on 15 June 2000 and the forthcoming introduction of related rules by the International Accounting Standards Board (IASB) were reported to have had an impact on derivatives markets, with a possible shift away from OTC transactions to exchange-traded ones. FASB Statement no 133 requires US companies to record derivatives on their balance sheets as assets and liabilities that will be measured at fair value. Companies have to record in their income statement or under “Other comprehensive income” any changes in the value of such instruments designated as hedges that do not closely offset changes in the value of the underlying assets. This was reported to have prompted corporate treasuries to re-examine their use of complex derivatives transactions for fear that they would fail the hedge effectiveness test. Corporate treasurers are apparently moving to more focused hedging strategies involving the use of simpler instruments, such as exchange-traded derivatives contracts.

^③ Market movements or increases in volatility may have had a long-lasting but indirect effect on trading to the extent that they contributed to a greater awareness of the need for adequate risk management programmes. Such greater awareness has been confirmed by recent market surveys, which have highlighted the growing sophistication of corporate risk management. See, for example, the results of a survey conducted by the International Swaps and Derivatives Association in March and April 2003 at www.isda.org. ^④ The exchange’s clearing house helps to ensure the financial integrity of contracts by operating a system of daily revaluation accompanied by the calling of margin to reflect changes in the net obligations of market participants. This substantially reduces credit risk.

Stock index contracts return to expansion

Trading in stock index futures and options returned to expansion in the second quarter of 2003 after a slight contraction in the previous quarter. Aggregate turnover rose by 11% to \$18.6 trillion. As was the case with fixed income contracts, the growth in activity was higher in the Asia-Pacific region, up 20% to \$6.3 trillion, and in North America, up 9% to \$8.3 trillion, than in Europe, where business expanded by only 2% to \$3.9 trillion.

Stock index business rises in Korea and the United States

The increase of activity in Asia was again largely attributable to buoyant trading in options on the Korea Stock Exchange's KOSPI 200 index, particularly in April. The revelation of accounting irregularities at one of the country's largest conglomerates shook financial markets in March and April, leading to a bout of call writing on the index.⁵ Much of the expansion in stock index contracts in North America took place on the CME. The exchange has been able to capitalise on strong retail demand for its small, electronically traded "e-mini" contracts. Indeed, the e-mini S&P 500 futures have become its most actively traded equity contracts in value terms, exceeding business in the established S&P 500 futures for the fourth consecutive quarter.⁶ Aggregate trading in the major US stock index contracts was strongest on 12 June, when the release of mixed economic indicators exacerbated the dispersion of beliefs about the direction of the US economy.

Buoyancy of small equity contracts

Tentative revival of currency contracts

Exchange-traded currency contracts, which account for less than 1% of overall turnover in financial instruments, grew by 18% to \$1.1 trillion in the second

Exchanges focus on the development of equity-related contracts

Exchanges introduced 127 new derivatives contracts in the second quarter of 2003: 80 stock index contracts, 22 single equity contracts, 15 agricultural contracts, eight interest rate contracts, one currency contract and one energy contract. Most of the new stock index contracts were on exchange-traded funds (ETFs).^① ETFs have expanded rapidly in recent years, particularly in Europe, with exchanges seeing them as a promising area for the development of new contracts. Within the area of traditional stock index contracts, mention can be made of Euronext's attempt to enter the market for pan-European stock indices by introducing futures and options on the new FTSEurofirst 80 and 100 stock indices. So far, the market for such products has been dominated by Eurex's EURO STOXX 50 contracts. In a move to further strengthen its position in such contracts, Eurex sought to attract liquidity from the OTC market by offering long-dated EURO STOXX 50 options.

^① ETFs are exchange-traded securities (or index funds) that are backed by an underlying basket of securities held in trust. They can be bought and sold at intraday prices throughout the trading day, in contrast to conventional mutual funds, which are generally purchased or redeemed only at end-of-day prices.

⁵ See the box on recent developments in Korea's financial sector on page 10 of the June 2003 issue of the *BIS Quarterly Review*.

⁶ It should be noted that the dollar value statistics produced by the BIS are limited to transactions in equity index contracts. Value data are not available for futures and options on single equities. The number of such contracts grew more rapidly than stock index contracts for much of the 1990s but since 2001 stock index contracts have returned in force.

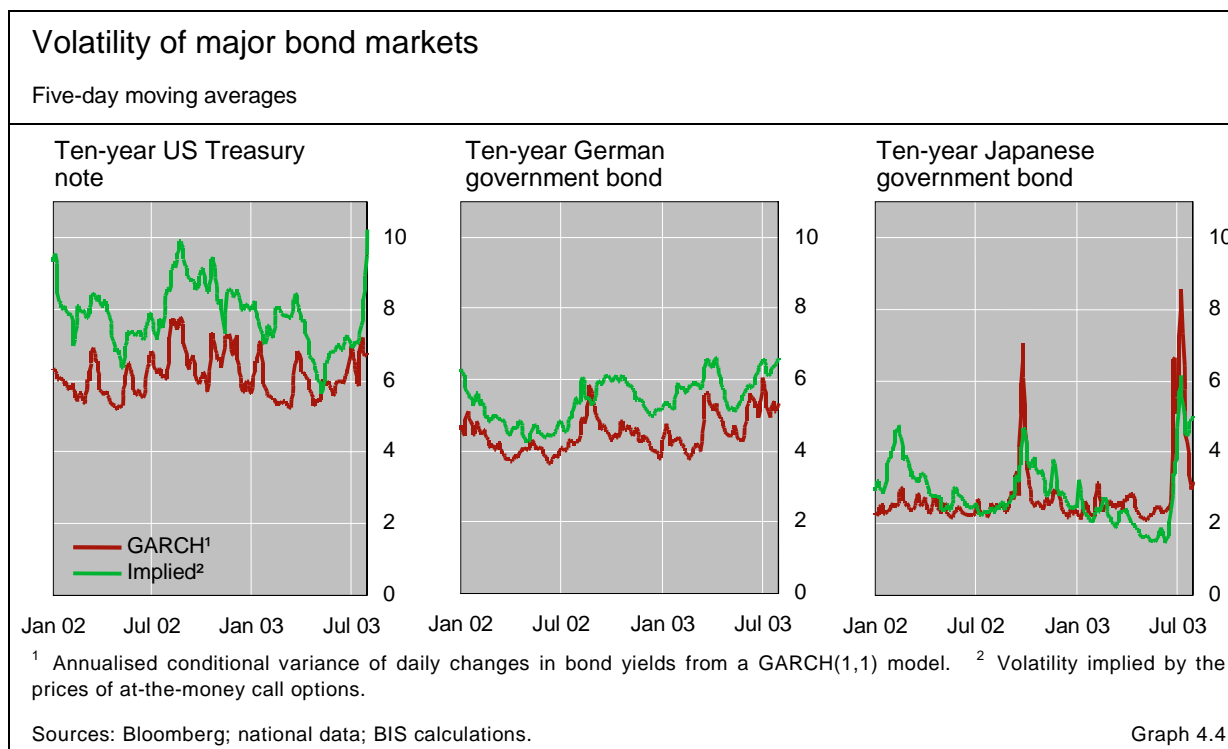
Larger pool of traders in dollar/euro contracts

quarter of 2003. Such contracts appear to have been recovering in recent quarters from a long period of decline. This recovery stems largely from a significant increase in the turnover of dollar/euro futures on the CME, the largest marketplace in the world for exchange-traded currency contracts. Trading in the CME's major European "legacy" contracts (dollar/Deutsche mark and dollar/French franc) had declined sharply ahead of the introduction of the euro at the beginning of 1999. Although the new dollar/euro contract has since replaced legacy contracts, its turnover is only now beginning to match the volumes achieved by them in the early to mid-1990s. Market participants have noted that the introduction by the CME of round-the-clock electronic trading for its currency contracts in April 2001, combined with the US dollar's recent swings against the euro, have helped enlarge the pool of traders in such contracts. Electronic trading may enable exchanges to compete more effectively with the much larger OTC market for currency instruments.

Marginal decline in global trading in July

Preliminary data on the global turnover of financial contracts monitored by the BIS for the month of July show that the number of units traded declined by 4% compared with June, to 468.9 million contracts.⁷ A 15% drop in the global volume of interest rate contracts (to 171.4 million) more than offset a 4% increase in the turnover of stock index contracts (to 291.4 million). The sharp spike in yields in the global bond market from late June had only a limited

Rise in bond yields fuels activity in US bond contracts



⁷ Statistics on the dollar value of transactions monitored by the BIS were not available at the time of writing.

impact on aggregate fixed income business in July. There was a notable increase in the trading of US government bond contracts but a decline in the turnover of US short-term rate contracts and a drop in fixed income instruments elsewhere. The rise in the turnover of US government bond contracts can probably be explained by the specific dynamics of US fixed income markets. In particular, the growing size, in both absolute and relative terms, of the MBS market has been associated with a more active use of hedging instruments. The increase in US mortgage lending rates in July led to a precipitous drop in the pace of US mortgage refinancing (Graph 4.2), confronting holders of US MBSs with a significant extension in the duration of their portfolios. This forced them to make quick adjustments to their risk exposures through derivatives contracts, leading to a pronounced increase in market volatility (Graph 4.4).

Changing links between mature and emerging financial markets¹

Emerging and mature financial markets are more integrated today than at any time since the First World War. Net capital flows to emerging markets have yet to return to the levels of the mid-1990s and remain significantly below those reached a century ago. However, cross-border flows provide an incomplete picture of the breadth and depth of links between mature and emerging financial markets. The range of foreigners investing in emerging markets has broadened in recent years. Local operations of foreign financial institutions are playing an increasingly important, in some cases even dominant, role in the financial systems of many emerging markets. At the same time, emerging market residents are increasingly involved in foreign financial systems, both as issuers and as investors. This special feature discusses these developments and identifies several issues for public policy arising from greater integration.

Capital flows and market integration

Capital flows to emerging markets are still below their 1990s peak ...

Net private capital flows to emerging markets as a group remain far below the peak reached in the mid-1990s. They amounted to \$44 billion in 2002, compared to an average of \$94 billion a year in 1995–96. Flows to Latin America are at their lowest level in a decade. Flows to Asia are gradually recovering from the sharp decline after the Asian crisis; in 2002, new lending by foreign banks exceeded repayments for the first time in five years. Flows to central and eastern Europe have held up better than those to other regions, supported by the process of accession to the European Union (Graph 1). Flows to emerging markets are expected to increase in 2003, but not substantially so.

... but financial links have continued to strengthen

While the recent weakness in the *volume* of capital flows has had an adverse impact on the macroeconomic performance of a number of emerging markets, changes in the *character* of capital flows – or in financial intermediation more generally – are likely to be more significant over the longer term. Even as capital flows slowed in the late 1990s, links between mature and emerging financial markets continued to evolve and actually

¹ The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS.

strengthen. Indeed, by some measures, mature and emerging financial markets are more integrated today than during the mid-1990s.

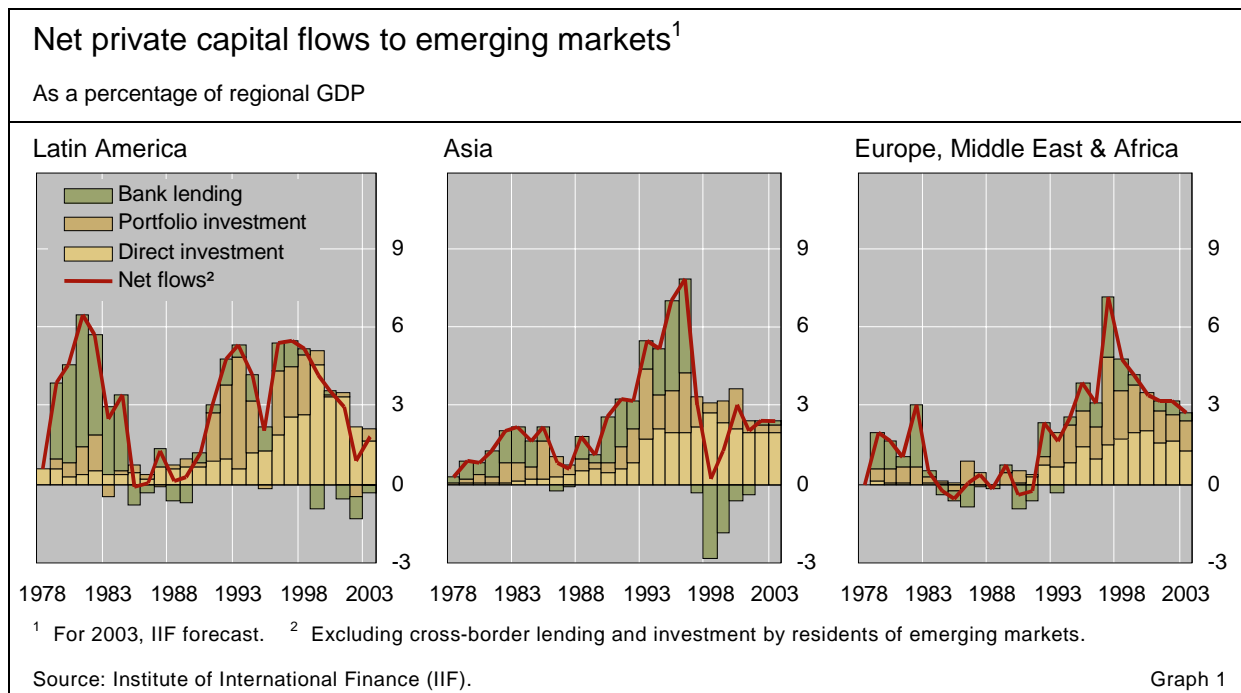
One indicator of the growing degree of integration is the close co-movement of securities prices in mature and emerging markets in recent years. The correlation between changes in emerging market bond spreads and changes in US high-yield bond spreads is significantly higher today than a decade ago despite important differences in the fundamentals underlying the two asset classes (Graph 2). The correlation between emerging market equities and the S&P 500 Index of US stocks has also risen. These higher correlations suggest that price movements are increasingly explained by global factors common to mature and emerging markets; the importance of idiosyncratic local factors is diminishing.

Closer co-movement of asset prices ...

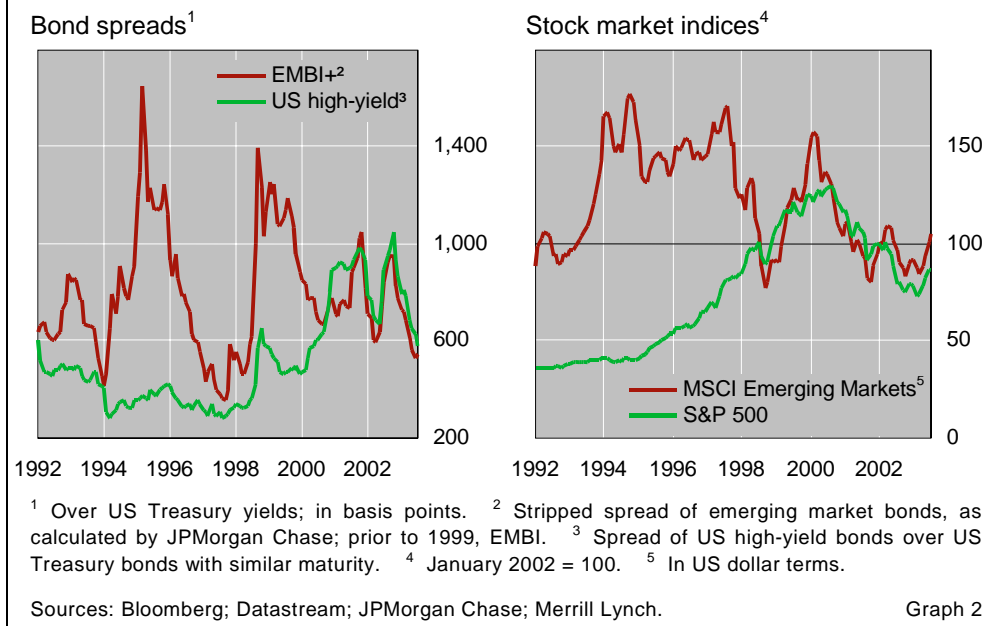
Various econometric studies confirm the growing importance of common factors in explaining the volatility of emerging equity and bond prices. Bekaert and Harvey (1997) demonstrate that global factors explain a larger proportion of equity volatility in emerging markets which have liberalised. Bekaert et al (2003) conclude that emerging market equity returns were more highly correlated with world equity returns during the 1990s than during the 1980s. McGuire and Schrijvers (forthcoming) find that one third of all variation in emerging market bond spreads over the 1997–2003 period can be ascribed to a single common factor.

... reflects increasing importance of common factors

This process of integration was set in train in the mid-1980s, when many emerging (and mature) markets began to liberalise their financial systems, open their capital accounts and implement other market-oriented reforms. In general, the period from the mid-1980s to the mid-1990s was characterised by the removal of many government restrictions on financial market activities. Progress in removing capital controls subsequently slowed, and in fact a number of countries expanded controls on institutional investors in the late



Co-movement of mature and emerging market securities



1990s (IMF (2003a)). Nevertheless, links between mature and emerging markets deepened as investors and issuers took full advantage of the opportunities that had been made available earlier.

Diversification of the investor base

One way in which links between mature and emerging markets have strengthened is through changes in the investor base. A broad range of participants from mature economies are now active in emerging financial markets. Whereas in the 1970s foreign banks were the dominant source of private capital inflows to emerging markets, starting in the early 1990s equity and bond investors became an important source. In fact, for emerging markets as a group, cross-border portfolio investment has exceeded bank lending in eight of the last 10 years.

Furthermore, the range of investors purchasing emerging market securities has broadened. Specialised investors such as hedge funds and mutual funds focusing on emerging markets accounted for the bulk of portfolio inflows in the early to mid-1990s. In more recent years, investors who traditionally invested in highly rated debt issued in mature markets have increased their presence. In particular, pension funds, insurance companies and other institutional investors have added emerging market assets to their portfolios. According to JPMorgan, trading activity by such investors increased from 9% of total turnover in emerging market debt instruments in 1998 to 32% in 2002 (World Bank (2003)). By contrast, the market share of hedge funds fell from 30% to 10%.

Innovations in fixed income indices, against which institutional investors often benchmark their performance, underline the diversification into emerging market assets. Investment banks introduced a number of global bond indices in

Growing presence
of institutional
investors

the late 1990s covering not only debt issued in mature markets but also emerging market bonds. For example, emerging market debt accounts for approximately 2% of Lehman Brothers' Global Aggregate Index, introduced in 1999 to capture the universe of investment grade debt. Furthermore, dedicated emerging market indices were refined in various ways to meet the demands of institutional investors. For instance, JPMorgan's Emerging Market Bond Index Global Diversified – introduced in 1999 – limits the weighting given to larger debtors. There now even exist indices comprised of bonds denominated in emerging market currencies, designed to help institutional investors diversify into local markets, as well as separate credit ratings for such bonds.²

The changing character of banks

The growing diversification of the investor base for emerging market assets was accompanied by a radical change in the nature of commercial banks' involvement in emerging markets. Internationally active banks turned their focus from cross-border lending to local business and capital market activities.

Changing forms of banks' activities ...

Beginning in the mid-1990s, US and European banks greatly expanded their locally funded operations in emerging markets. Through mergers and acquisitions of local banks, locally funded claims increased fourfold in US dollar terms between 1995 and 2002, to \$544 billion (Graph 3).³ Foreign banks invested most heavily in Latin America, followed by central and eastern Europe. They also expanded their local business in emerging Asia, although not as dramatically as in other regions. The growth of local claims greatly outpaced that of cross-border claims, and as a result local claims rose from 14% of foreign banks' total claims on emerging markets in 1995 to 40% by the end of 2002.

... lead to strong growth of locally funded claims

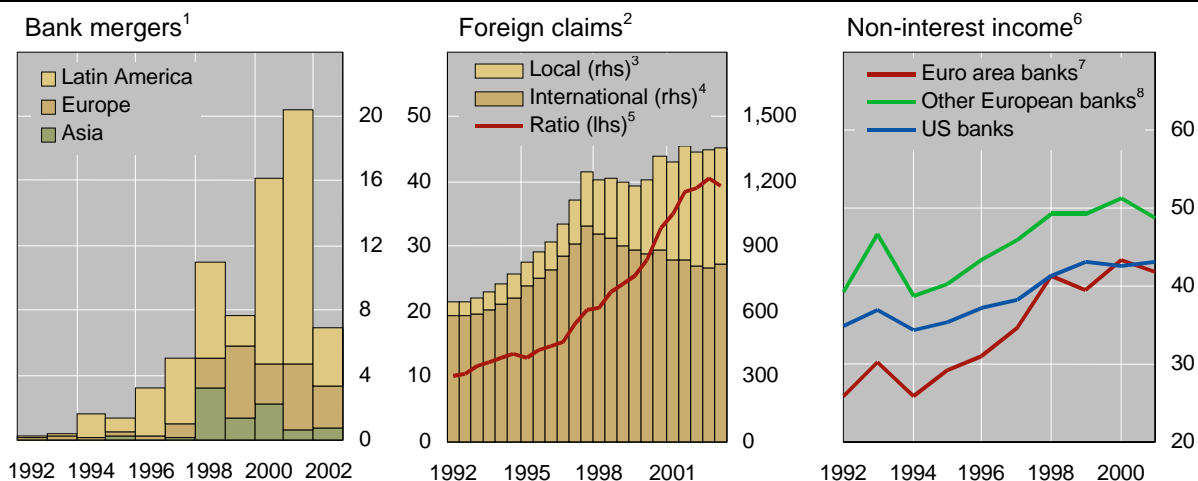
The shift from cross-border to local banking in part reflects a broader strategic shift from interest-earning to fee-based business lines. US and European banks now generate more than 40% of their global revenues from non-interest activities, such as market-making, bond and equity underwriting and asset management. The development of these business lines tends to contribute to the balanced growth of local assets and liabilities, for example as banks fund their inventory of securities with repurchase agreements (McCauley et al (2002)). Even banks' lending activities are beginning to resemble capital market activities. Commercial loans are often syndicated and sold, generating arrangement and trading fees for the syndicate participants, while mortgage and consumer loans might be securitised and sold.

Increasing role of fee-based business

² Packer (also in this *Quarterly Review*) contrasts credit ratings on foreign and domestic currency sovereign debt.

³ Local claims increased tenfold between 1995 and 2002 when measured in constant (end-2002) US dollars, ie after adjusting for the depreciation of local currencies against the US dollar.

Changing character of international banks



¹ By residency of purchased bank; in billions of US dollars. ² In billions of US dollars; semiannual data. ³ Claims booked by the foreign offices of banks in the BIS reporting area vis-à-vis residents of the country in which the foreign office is located and denominated in the local currency of the borrower. ⁴ BIS reporting banks' cross-border claims in all currencies plus their foreign offices' local claims in foreign currencies. ⁵ Local claims as a percentage of local plus international claims. ⁶ As a percentage of total gross income. ⁷ Excluding Belgium and Greece. ⁸ Norway, Sweden, Switzerland and the United Kingdom.

Sources: OECD; Bloomberg; Thomson Financial Securities Data; BIS.

Graph 3

Banks' activities support the development of local financial markets

Such changes in banks' strategies have supported the development of local financial markets. Emerging financial markets, especially bond and derivatives markets, have expanded significantly in recent years. Indeed, local currency bond issuance by East Asian and Latin American corporations now exceeds international issuance and accounts for a rising proportion of total corporate funding (Fernandez and Klassen (2003), IMF (2003b)). Attracted by the apparent opportunities for growth, foreign banks have invested considerable capital and expertise in local securities and derivatives markets. They participate as primary dealers in some local government bond markets, as pension fund managers in other markets, and as swap dealers in still others.

The events in Argentina in 2001–02 raised questions about whether foreign banks would revisit their strategy towards emerging markets. The signals to date are mixed. Cross-border mergers with and acquisitions of Latin American banks fell sharply in 2002, and several foreign banks sold or scaled back their local operations. In some cases this reflected banks' heightened concerns about political risk and their exposure to countries experiencing difficulties. In others it reflected the parent bank's need to rebuild its balance sheet. Part of the decline in cross-border takeovers also stemmed from the fact that in several countries, most notably Mexico, the banking system was by that time largely foreign-owned.

Global presence of emerging market residents

Links between mature and emerging markets have been further strengthened by the growing presence of emerging market residents in mature markets. Investors from emerging markets have channelled significant amounts into

mature financial markets in recent years. These flows have arisen in large part from current account surpluses but also from changes in portfolio management. At the same time, a growing number of issuers from emerging markets have gained access to the greater depth and liquidity offered by international markets.

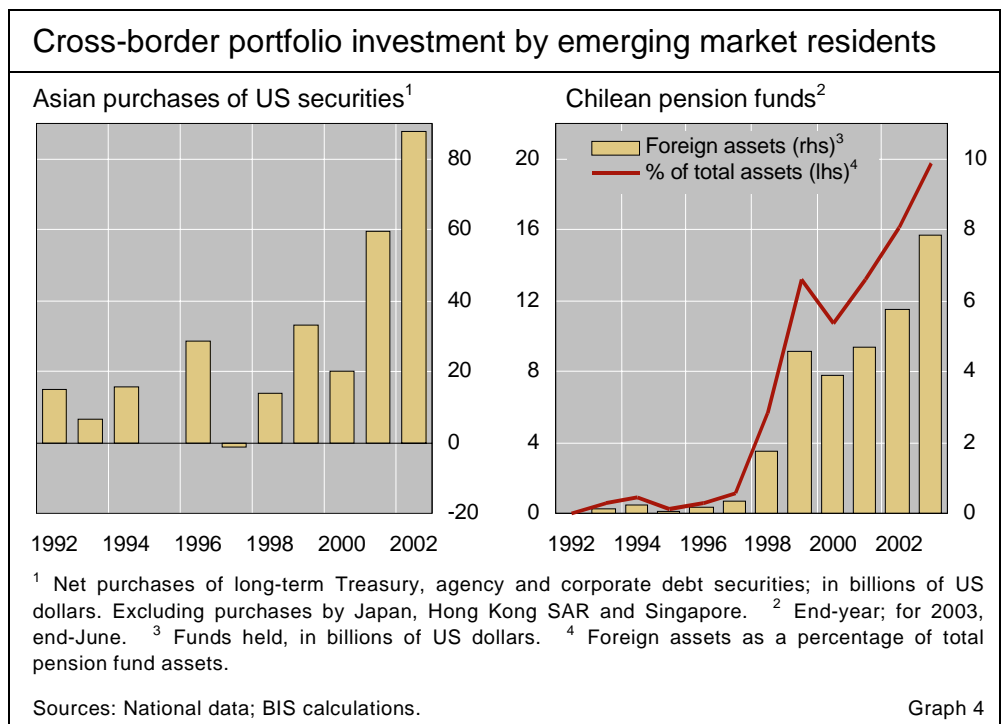
The oil-exporting countries of the Middle East have long been active foreign investors, and residents of other emerging markets are increasingly becoming so. The central banks of Asia are the most notable example. The foreign exchange holdings of Asian central banks, excluding the Bank of Japan, increased by more than \$360 billion, or approximately 80%, between 1998 and 2002. The majority of these funds were invested in US securities (McCauley (2003)). Indeed, net purchases of US securities by residents of non-Japan Asia accounted for 13% of total foreign purchases of US securities over this period, funding a large part of the US current account deficit (Graph 4).

Emerging market residents are becoming more active foreign investors

Other residents of emerging markets are starting to increase their holdings of mature market assets as well. Even countries that are net importers of capital are beginning to export capital so as to benefit from greater diversification. Chile has gradually increased the maximum limit on foreign assets held by local pension funds from 3% in 1992 to 25% today, and Chilean pension funds' foreign holdings rose from zero to \$8 billion over this period. Similarly, in the near future Mexico is expected to amend its regulations to allow local pension funds to invest up to 20% of their assets abroad.

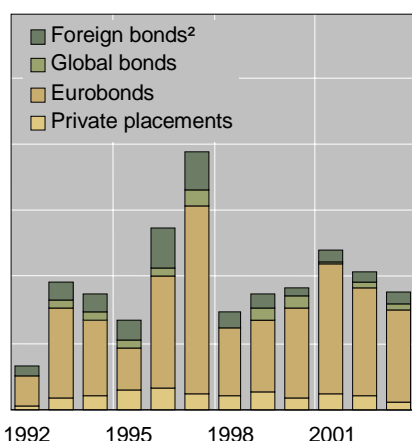
As well as becoming more important foreign investors, emerging market residents are becoming important issuers in mature markets. In the past, emerging market residents seeking to raise funds abroad mainly tapped unregulated markets, such as the eurobond market, or lightly regulated

Firms are tapping regulated international markets

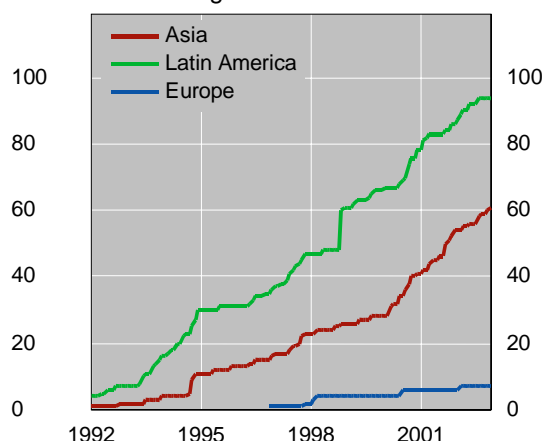


Emerging market firms in international markets

International bond issuance¹



Cross-listings³



¹ Gross issuance from emerging markets by non-government borrowers; in billions of US dollars. Data for 2003 refer to January–June. ² For example yankee, samurai and bulldog bonds. ³ Number of ADRs and GDRs listed on the New York Stock Exchange by nationality of listed firms.

Sources: Dealogic; Euroclear; ISMA; JPMorgan Chase, Thomson Financial Securities Data; national authorities; BIS. Graph 5

markets, such as the global bond market (Graph 5).⁴ Since the mid-1990s, they have become more active in regulated public securities markets. In particular, a growing number of Latin American, East Asian and central European companies have elected to cross-list their shares on an international stock exchange. For example, the number of Latin American companies with shares listed on both their local exchange and the New York Stock Exchange tripled between 1995 and 2002, from 31 to 94. Foreign companies accessing US public markets must meet the same reporting, accounting and corporate governance standards as listed US companies – standards which are stricter than those in many emerging markets.

New links, new challenges

The growing integration of mature and emerging financial markets brings both benefits and challenges.⁵ The diversification of the investor base for emerging market assets, the changing character of banks and the growing penetration of mature markets by emerging market issuers increase the pool of capital available for investment, widen the range of financial services provided and in general improve the saving and investment process. At the same time, they

⁴ Most global bonds issued by emerging market residents are placed under Rule 144A of the US Securities and Exchange Commission (SEC). Rule 144A allows large US financial institutions to sell previously acquired private placements without having to register the securities with the SEC or hold the securities for two years.

⁵ The number of academic studies and official reports examining these benefits and challenges has increased considerably since the Asian crisis. See Rajan and Zingales (2003), FSF (2000) and White (2000).

present a new challenge for public policy: how can one ensure the proper functioning of increasingly integrated financial markets?

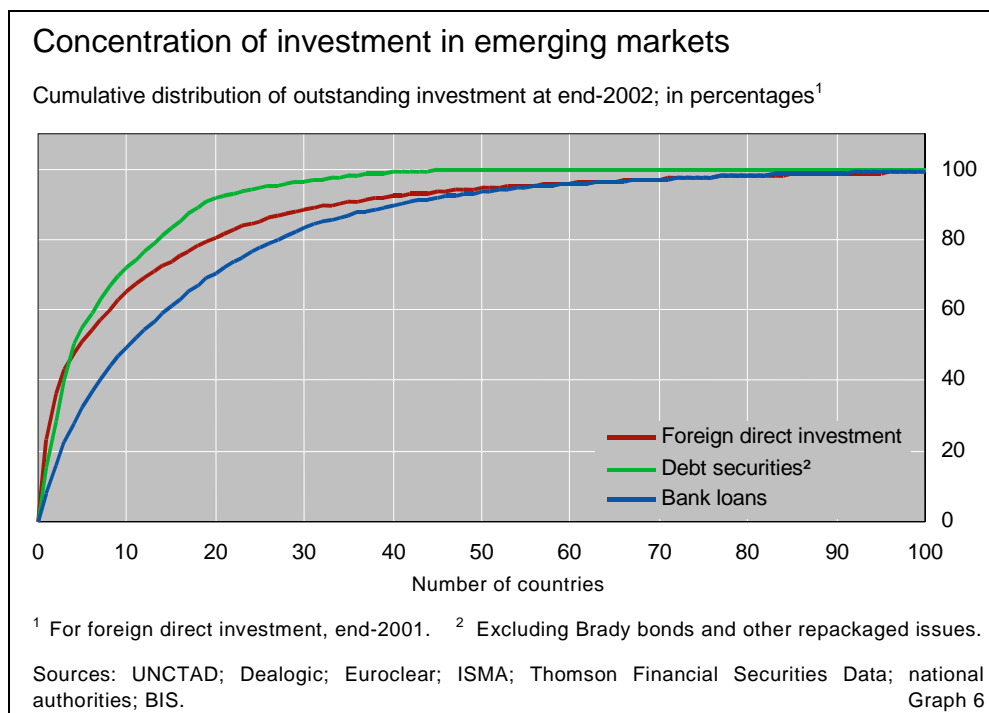
One issue is market tiering. Greater price discrimination is to be expected as market integration facilitates the measurement and especially management of risks. The benefits of greater integration thus seem likely to go predominantly to well managed economies perceived to have good growth prospects. Riskier countries may find themselves increasingly marginalised in the international financial system and suffer from disproportionately high risk premia.

Integration could lead to more tiering in international markets ...

Tiering is already evident in foreign direct investment, which is concentrated in a relatively small number of countries (Graph 6). To the extent that the Argentine crisis increased awareness of political risk, it raises questions about the ability of less stable countries to attract foreign direct investment in highly regulated sectors such as banking and energy. Portfolio investment is even more concentrated. Many institutional investors are restricted by mandate from holding debt securities rated below investment grade. Lower-rated borrowers also face considerable difficulties in accessing derivatives markets, where concerns about counterparty credit risks loom large. This tends to limit the risk management tools available to such borrowers.

Declining cross-border bank lending may add to tiering. Banks have historically had more diversified portfolios than other investors, mitigating their exposures to high-risk countries through the use of collateral and restrictive loan covenants. Therefore, as banks refocus their activities and institutional investors come to play a larger role, lower-rated countries may face more difficult financing conditions even as higher-rated countries enjoy more favourable ones.

A second related issue is coping with financial cycles. While integration facilitates the pricing and management of risks, it does not necessarily



... increase the scope for financial cycles ...

eliminate booms and busts in financing flows and asset prices. On the contrary, financial liberalisation tends to increase the scope for such cycles. Experience suggests that investors tend to underestimate risks during booms and overestimate them during busts (Borio et al (2001)). For example, during booms investors frequently underestimate the likelihood of high-loss, low-probability events such as defaults.

Better pricing and management of currency and liquidity risks are key to strengthening the resilience of emerging markets to financial cycles. Currency and maturity mismatches on balance sheets leave borrowers vulnerable to changes in investors' appetite for risk. One way in which policymakers can promote better pricing and management of currency exposures is by allowing greater exchange rate flexibility. Liquidity risks can be reduced by managing foreign currency reserves in line with potential short-term foreign currency liabilities. In emerging markets with weak financial systems, there may also be a case for maintaining some constraints on capital inflows. The development of local securities markets, with issues denominated in domestic currencies, can also be of great help in eliminating mismatches.

This leads to the third issue raised by greater integration: the potential trade-offs associated with managing and trading exposures in domestic versus international markets. Access to the greater liquidity typically available in international markets allows emerging market residents to reduce their funding costs and to manage savings in line with individual preferences. However, to take full advantage of these financing opportunities, access to well functioning derivatives markets is required to manage the resulting foreign currency exposures. This in turn requires systems to manage counterparty credit risks, especially in over-the-counter markets where a handful of dealers dominate. In addition, a sound infrastructure for cross-border trading and settlement becomes more important as a means to limit operational risks. Proper collateral and netting agreements can also assist in this regard.

... and reduce liquidity in domestic markets

One negative consequence of the migration of financing activity abroad may be a reduction in the capacity of domestic financial systems to price and trade financial risks, or in the incentives to develop markets to do so. Liquidity tends to concentrate in specific financial instruments and markets. Each foreign investor who stops trading on emerging equity markets and invests instead in ADRs subtracts liquidity from the local exchange and adds it to New York, raising the incentive for other market participants to do the same. As a consequence, liquidity in domestic financial markets tends to decline and funding costs increase for those firms that do not have direct access to international funding (Claessens et al (2002)).

Promotion of competitive and open markets is a challenge for public policy

Against this background, the challenge for public policy is to support the development of financial structures that combine access to a broad range of financial services with the efficient pricing and management of risks. The promotion of greater competition in domestic financial markets – among issuers, investors and intermediaries – can make an important contribution in this respect. So too can the international integration of these markets, for instance through the adoption of internationally agreed legal and regulatory standards and further relaxation of capital controls.

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Mind the gap: domestic versus foreign currency sovereign ratings¹

Over the past decade, it has become common practice for rating agencies to assign a domestic currency rating to the debt of sovereign nationals in addition to a foreign currency one. Often the domestic rating is higher, reflecting the presumed greater ability and willingness of sovereigns to service debt denominated in their own currency. However, the gap between the two ratings is neither omnipresent nor uniform.

These rating differences are likely to have increasingly important implications for the development of global capital markets. Many governments have embraced the goal of developing local currency bond markets as an alternative to inflows of foreign capital,² and differential rating policies for foreign and domestic currency debt are likely to reinforce this policy intention through their effect on investor acceptance and market pricing. Rating differences may also be relevant in the light of the expanding use of ratings for regulatory purposes.

This feature begins by reviewing the development of the two types of sovereign ratings. Local currency bond ratings tend to be of newer vintage, in line with the more recent emergence of local currency bond markets. We then examine the frequency and size of the markup of local over foreign currency ratings. Our investigation reveals not only differences among borrowers, but also surprising differences across the agencies themselves, suggestive of greater disagreement among the agencies over the risk assessment of domestic currency denominated obligations.

The growth of domestic and foreign currency ratings

Sovereign ratings are a rapidly growing area within the rating agency business. In 1985, only 17 countries had obtained credit agency bond ratings to borrow in

¹ The views expressed in this article are those of the author and do not necessarily reflect those of the BIS.

² For instance, although the newly created Asian Bond Fund is initially investing in dollar-denominated debt, East Asian central banks will study whether to extend its investment mandate to local currency denominated bonds. See EMEAP (2003).

international capital markets.³ Most of these countries were rated AAA; less financially strong countries relied on bank finance or privately placed bonds (Tables 1 and 2). However, over the past 15–20 years, countries at the lower end of the credit quality spectrum have relied increasingly on bond markets. The issuance of new ratings has been particularly marked over the last decade.

The demand for sovereign ratings grows ...

Initially, most of the new sovereign ratings applied to foreign currency debt, as sovereigns apparently felt little need to obtain a rating for domestic currency obligations. However, an increasing percentage of sovereigns now have domestic currency ratings as well, a likely reflection of efforts to increase the investor base for domestic currency bonds.⁴ Within the past eight years, 47 new sovereigns have received foreign currency ratings (45% of all rated sovereigns), as compared to 72 new sovereigns with domestic currency ratings (more than two thirds of all rated sovereigns). The expansion of domestic currency ratings has proceeded rapidly enough that the catch-up is now complete, with the number of sovereigns obtaining domestic currency ratings virtually equal to those receiving foreign currency ratings.

... particularly for domestic currency ratings ...

The growth in demand for domestic currency ratings demonstrates striking parallels with the earlier development in foreign currency ratings, in that lower-quality credits have gradually been brought into the ratings fold. While initially the demand for domestic currency ratings came from borrowers mostly rated AAA, there has been a steady expansion of the market towards lower-quality borrowers; since 2001, the median rating assigned has been below investment grade at BB (Table 2).

... as lower-quality borrowers are brought into the fold

Domestic and foreign currency sovereign ratings		
	New foreign currency ratings	New domestic currency ratings
	Number of sovereigns	
Pre-1985	17	0
1986–90	22	3
1991–95	19	31
1996–2000	36	60
2001–03	11	12
Total	105	106

Notes: Sovereigns are deemed to have a rating if one of the three major agencies has a rating outstanding. The United States did not receive a foreign currency rating until 1992.

Sources: Fitch Investors Service; Moody's Investors Service; Standard & Poor's. Table 1

³ The rating agencies also had an active sovereign rating franchise in the 1920s, and Moody's had rated around 50 sovereigns by 1929. However, international bond markets were much less active during the Great Depression, and virtually disappeared after the Second World War.

⁴ Another reason given for the greater demand for local currency ratings is an increase in structured transactions that separate out the risk elements unique to foreign currency debt, such as convertibility and transfer risk.

Credit quality of newly assigned sovereign ratings		
	New foreign currency ratings	New domestic currency ratings
	Median rating	
Pre-1985	AAA	...
1986–90	A+	AAA
1991–95	BB+	AA–/A+
1996–2000	BB	BBB
2001–03	BBB	BB

Note: Sovereigns are deemed to have a rating if one of the three major agencies has a rating outstanding.

Sources: Fitch Investors Service; Moody's Investors Service; Standard & Poor's. Table 2

For the most part, regulations that key off agency ratings make little distinction between foreign as opposed to domestic currency rated claims. Those exceptions that do exist favour domestic currency ratings and/or domestic currency claims. For instance, under the standardised approach of the New Basel Capital Accord, in the case of foreign currency exposures to multilateral development banks whose convertibility and transfer risk are “considered to be effectively mitigated by national supervisory authorities”, the domestic currency rating may be used for risk weighting purposes instead of the foreign currency rating.⁵

The rating gap

A gap exists between domestic currency and foreign currency ratings ...

Rating agencies often give higher ratings to the domestic currency obligations of sovereign states than to their foreign currency ones. The difference is usually justified in terms of the sovereign's ability to tax and appropriate domestic currency assets, which is often assumed to be greater than in the case of foreign currency assets. In addition, while the sovereign must generate foreign exchange to repay foreign currency debts, it can print money to meet domestic currency obligations (see, for example, Fitch Investors Service (2003)).

... though constraints on monetary policy can limit the gap

Following this logic, constraints on the sovereign's ability to print domestic currency would tend to reduce the justification for a rating gap. Prime examples would be sovereigns that use the currencies of foreign countries, such as Panama and El Salvador. The countries of the euro area are also special cases; here the delegation of monetary policy to the ECB has greatly diminished the distinctions drawn between local and foreign currency debt.⁶ More generally, the frequent existence of significant political costs

⁵ See Basel Committee (2003). In addition, the Accord gives national authorities the general discretion to apply even lower risk weights to banks' exposures to sovereign or central bank domestic currency obligations (provided they are funded in the local currency), which is not the case with foreign currency obligations.

⁶ Though there was a difference of approach over whether foreign currency ratings should be upgraded or domestic currency ratings downgraded, the major rating agencies eliminated or

associated with high levels of inflation should limit the applicability of the “printing press” argument for high domestic currency ratings.

Another possible exception would be if foreign currency issuance is small relative to the total debt outstanding of a sovereign. After all, one of the underlying principles of sovereign debt analysis is that sovereign risk always depends on the willingness as well as the ability to pay. Given a small enough burden, the sovereign might conceivably make an extra effort to avoid default on foreign currency obligations. It is likely that the relatively small size of international bonds of emerging market countries in the early 1980s explains why the default experience on bonds at that time was rather limited, despite a range of bank loan restructuring programmes.

The gap by rating distribution

Another factor influencing the size of the gap is a purely technical one: there is no rating higher than AAA (Aaa) in the rating agencies’ symbology. The additional credit standing that a foreign currency AAA credit might gain by being denominated in domestic currency is unobservable. In addition, countries that are AA+ can only be raised by one notch, and so forth. The gap should thus become more pronounced and more frequently observed as the foreign currency rating drifts downwards from AAA and AA, which is in fact what we generally see (Table 3).

On the other hand, it appears that the gap peaks in the mid-grade rating category of BBB. For instance, according to Standard & Poor’s ratings, for this rating category three quarters of all rated sovereigns have domestic currency obligations that are rated two notches or more higher than the foreign currency ones. By contrast, the relative advantage of domestic currency obligations is

The gap tends to be highest in the BBB category

Domestic vs foreign currency rating gaps by rating (S&P)			
Foreign currency rating	No difference	Domestic currency debt rated higher by exactly one notch	Domestic currency debt rated higher by more than one notch
		Number of sovereigns	
AAA	17	0	0
AA	8	2	0
A	4	5	8
BBB	0	3	9
BB	3	8	6
B	9	4	3

Note: Ratings indicate the broad letter grade category, eg AA stands for credits rated AA+, AA and AA-.

Source: Standard & Poor’s. Table 3

narrowed outstanding domestic/foreign currency rating gaps for euro area countries ahead of and during the transition to the euro (for further discussion, see McCauley and White (1997)).

much smaller for countries that are below the investment grade cutoff than for countries above. The hump-shaped pattern in notching is evident in the distribution of rating gaps among the other agencies as well.

Why the sovereign rating gap should have this second particular feature is not immediately obvious. If the differences were in any way related to demand from issuers to achieve an investment grade rating for domestic obligations, we would expect to see greater gaps at the BB (foreign currency) rating level, but this is not the case. For its part, Standard & Poor's posits that low-rated countries face risks, such as high degrees of social and political stress, that would also impair their ability to keep servicing domestic obligations in circumstances where foreign currency debts were allowed to default (Standard & Poor's (2002)).

Sovereign defaults on rated debt

The track record of defaults on rated debt is limited

In the best of all possible worlds, we could rely on default statistics to check whether the domestic rated debt that is often presumed to be safer has in fact been so in the past. However, because the number of sovereign ratings only

Rated bond defaults by sovereigns				
	Foreign currency	Domestic currency	Total amount ¹	Comment
	Year of default (prior rating)			
Argentina	2001 (Caa3)	2001 (Caa3)	\$82.3 billion	Simultaneous default
Ecuador	1999 (B3)	1999 (B3)	\$6.6 billion	Foreign currency default one month prior to domestic
Moldova	2001 (B3) 2002 (Caa1)	.	\$145 million	Only foreign currency debt rated
Pakistan	1998 (Caa1)	.	\$750 million	Only foreign currency debt rated
Peru	2000 (Ba3)	.	\$4.9 billion	Defaulted only on foreign currency debt
Russia	1998 (B1)	1998 (B2)	\$73.4 billion	Domestic currency default one week prior to foreign
Ukraine	1998 (B3) 2000 (Caa1)	.	\$1.4 billion \$1.1 billion	Only foreign currency debt rated
Uruguay	2003 (B3)	.		Only foreign currency debt rated
Venezuela	.	1998 (B3)	\$270 million	Defaulted only on domestic currency debt

¹ The total amount sums defaulted local and foreign currency debt using the exchange rate at or around the time of default.

Source: Moody's Investors Service (2003a). Table 4

took off in the late 1980s, and because there are a limited number of sovereigns more generally, the track record for defaults on rated debt is quite slim. Since 1985, Moody's Investors Service counts only nine sovereigns that have defaulted on rated bonds, and all of these were from 1998 or later (Table 4). Of these, only five had *both* foreign and domestic currency rated debt at the time of default.

The limited sample indicates no uniform relationship between the denomination of debt and the likelihood of default.⁷ In one case (Peru), the sovereign only defaulted on foreign currency debt, while in another (Ecuador), default occurred first on foreign currency debt and only later on domestic debt. But Venezuela defaulted only on domestic currency debt, while Russia defaulted on its domestic currency debt before its foreign currency debt. In the case of the largest sovereign default to date, Argentina, the defaults were simultaneous.

Foreign currency debt has not always been the first to default

Differences among the rating agencies

There are surprisingly sharp differences among the rating agencies with respect to the frequency and degree to which domestic obligations are given favourable ratings. In particular, Moody's tends to notch up its domestic currency rating much less frequently than the other agencies; for instance, it gives a higher domestic currency rating on only 28% of its rated universe of sovereigns, compared with well over 50% for both S&P and Fitch (Table 5).

The rating agencies differ with respect to the frequency and degree of notching

Domestic vs foreign currency rating gaps			
Differential	Moody's	S&P	Fitch
	Number of sovereigns		
4 notches	–	2	–
3 notches	7	11	3
2 notches	8	14	20
1 notch	11	22	20
No difference	61	43	29
– 1 notch	2	–	1
– 2 notches	1	–	–
– 3 notches	0	–	–
– 4 notches	1	–	–
Total	91	92	73

Sources: Fitch Investors Service; Moody's Investors Service; Standard & Poor's. Table 5

⁷ The sample has been constructed based on Moody's definition of default and ratings. As the definition for default on sovereign debt and the number of assigned ratings can differ among the major rating agencies, the sample and related comments would not necessarily be identical to that based on other agency ratings and default records.

Mean sovereign rating differences among agencies			
	Moody's/S&P	Moody's/Fitch	S&P/Fitch
Foreign currency rating (A)	0.34	0.31	-0.01
Domestic currency rating (B)	-0.34	-0.33	0.04
(A) – (B)	-0.68	-0.64	0.05

Note: A positive number in the first two rows indicates that the first rating agency rates higher.
Sources: Fitch Investors Service; Moody's Investors Service; Standard & Poor's. Table 6

Moody's also assigns a higher foreign currency rating than domestic currency rating in four cases,⁸ with a relatively small proportion of outstanding foreign currency debt relative to foreign exchange reserves always cited as a reason (Moody's (2003b,c)).

The end result of these differences is that domestic currency ratings of S&P and Fitch are each around two thirds of a notch higher on average than they would be if the gaps between foreign and domestic currency ratings were identical to those assigned by Moody's (Table 6).⁹ Needless to say, were the 15 or so countries with AAA foreign currency ratings removed from the sample, the mean differences would be even greater.

The disagreement over the appropriate domestic currency rating may also apply to the agencies' ranking of risks. As agencies argue that ratings should be interpreted as measures of the relative risk of default, the rank-order correlation coefficient is arguably a more precise measure of agency consensus. In Table 7, we document consistently lower rank-order correlation coefficients among the rating agencies' domestic currency ratings than among their foreign currency ratings. Though the small sample size limits the strength

There also appears to be disagreement over the ordering of domestic currency risks

Inter-agency correlations of domestic and foreign currency ratings		
	Foreign currency rating	Domestic currency rating
Moody's/S&P	0.958	0.937
Moody's/Fitch	0.951	0.926
S&P/Fitch	0.986	0.937

Note: Spearman rank-order correlations were calculated only for sovereigns with foreign currency ratings lower than AAA (Aaa).
Sources: Fitch Investors Service; Moody's Investors Service; Standard & Poor's. Table 7

⁸ The four countries are India, Lebanon (one notch), Turkey (two notches) and Japan (four notches). By contrast, Standard & Poor's does not assign a higher foreign currency rating to any sovereign, while Fitch assigns a higher foreign currency rating only in the case of Japan.

⁹ For the purpose of the calculations of Tables 6 and 7, the ratings have been transformed as follows: AAA (Aaa) = 1, AA+ (Aa1) = 2, B- (B3) = 16.

of the statistical inference, the evidence is suggestive of greater disagreement among the agencies over the ordering of domestic currency ratings.¹⁰

Conclusion and implications

Local currency ratings, a relatively new development, will take on increasing importance as local currency bond markets grow. In fact, many policymakers believe that domestic currency bond markets can provide insurance against the volatile flows of foreign currency based investors, and thus should be developed further (BIS (2001), IMF (2003)). A number of regional initiatives seek to build on such a consensus.

Rating agency policies often treat domestic currency obligations relatively favourably owing to the fact that the sovereign can generally tax domestic subjects to meet domestic currency obligations or, even more fundamentally, print money. This favourable treatment may serve to encourage the development of local bond markets, both by increasing market acceptance of domestic currency credits and by lowering regulatory capital charges to the extent they are determined by ratings.

However, as this note has documented, the gaps between foreign and domestic currency ratings are far from uniform among the major rating agencies, leading frequently to striking disagreements. One rating agency tends to place less weight on whether obligations are in domestic currency, and in fact occasionally rates foreign currency credits higher. Meanwhile, the evidence is suggestive of less agreement among the major agencies over the ordering of the risks of domestic currency obligations.

Given the evolution of global capital markets and the relative paucity of sovereign default history, diversity in rating policies is to some extent natural and even welcome. However, the differences may also be indicative of an added degree of uncertainty concerning the appropriate distinction to be made between domestic and foreign currency obligations. Further research using market data may shed light on the degree to which investors price this uncertainty.

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¹⁰ The p-value for the z-statistic for testing the null hypothesis of no difference in rank-order correlations is less than 0.01 for the S&P/Fitch pair, but 0.116 for the Moody's/S&P pair and 0.156 for the Moody's/Fitch pair.

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Reaching for yield: selected issues for reserve managers¹

Managers of official foreign exchange reserves have been facing historically low yields on highly rated government securities, the instruments to which they have traditionally devoted the bulk of their investment portfolios. In mid-August 2003, after eight weeks of rising long-term interest rates, the yield on the two-year US Treasury note still stood at 1.86%, down from a peak of nearly 17% in 1981. It is true that much of the decline since 2001 had been the result of cuts in monetary policy rates, which had served to shift down whole yield curves. Nevertheless, even adjusting for the monetary policy cycle, yields in the major currencies have tended to be substantially lower in recent years compared to those in the previous decade. In these conditions, reserve managers have found themselves seeking instruments with higher yields in an effort to maintain the investment returns to which they had become accustomed.

In considering higher-yielding alternative instruments, reserve managers must ask two basic questions. First, do higher yields actually lead to higher returns?² Second, to the extent that higher expected returns are a compensation for taking on greater risk, what is the nature of the risk entailed? In this special feature, we focus on a few selected cases for which these questions seem particularly interesting. These cases involve three alternative portfolios that offer higher yields, namely a longer-duration portfolio, a corporate bond portfolio and a portfolio of higher-yielding currencies. We discuss the issue of increased risk-taking with respect to durations and corporate bonds. In the case of durations, we ask the specific question of whether the present low-yield environment implies a new trade-off between duration and volatility. In the case of corporate bonds, we focus on the challenge of managing a portfolio in which risk is characterised by low probabilities of heavy losses. We finally examine the question of yield and return with respect to currencies. Specifically, do higher yields offered by

¹ The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS or the Netherlands Bank.

² Yields differ from returns, because the latter include capital gains or losses, which will depend on duration. For the relationship between yield and return, see footnote 5 below. In the case of foreign currencies, returns may also differ from yields because of exchange rate changes.

instruments in certain currencies tend to be offset by movements in exchange rates?

In the discussions below, we limit ourselves to issues of strategic investment over the medium to long term. Hence, we conduct our analysis in terms of averages of returns and measures of risk over extended periods of time. This focus allows us to avoid the tactical question of timing, ie the issue of when precisely reserve managers should undertake a change in positions. Timing depends on when yields or spreads may be expected to rise or fall, and this is an issue on which we offer no guidance. Our focus on investment strategy also means saying nothing about issues of liquidity. While central banks often hold liquid reserves for intervention purposes, the reach for yield really pertains to the investment part of the portfolio.

Duration and volatility: have lower yields changed the trade-off?

For default-free debt securities without the possibility of prepayment, risk is represented primarily by duration. A change in the level of interest rates would affect the market value of longer-duration securities more than that of shorter securities. One possible implication of a low-yield environment is a thinner yield cushion against capital losses. If interest rate volatility has remained the same, then a reserve manager who wishes to avoid negative returns would set a shorter duration target. But is it true that volatility is invariant to the level of yields? From a technical standpoint, the zero lower bound on nominal interest rates should naturally lead to lower volatility.³ From an economic point of view, an environment of low interest rates may simply be an environment of low inflation. Since lower levels of inflation tend to be associated with reduced variability of inflation, this may lead to lower interest rate volatility. Low interest rates may also reflect a more transparent monetary policy reaction function, which may also serve to dampen volatility.⁴

The zero lower bound should lead to lower volatility

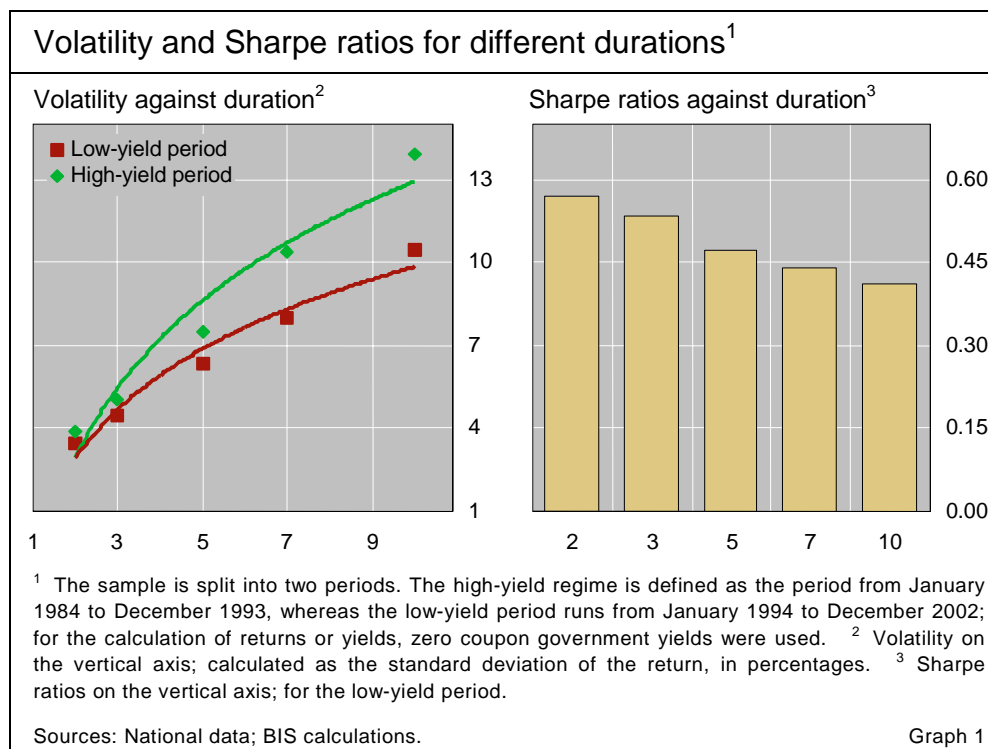
Indeed, there is evidence that as yields have declined so have the volatilities of returns.⁵ In the left-hand panel of Graph 1, we compare for one-year investment horizons average volatilities between two periods, a high-

Volatilities are lower across the yield curve ...

³ This is one reason why models of interest rate movements incorporate the so-called “square-root process”, in which volatility is specified to be proportional to the square root of the level of interest rates. In this case, an interest rate close to zero would imply a volatility close to zero. See, for example, Cox et al (1985) and Gong and Remolona (1997).

⁴ Indeed, Ait-Sahalia (1996) provides evidence that such volatility depends on both the monetary regime and, within a regime, on how far the interest rate is from its mean. There is also strong evidence for mean reversion in interest rates within a regime, suggesting that when interest rates are close to the trough in a period of monetary easing, the distribution of interest rate changes is likely to be skewed to reflect the likelihood of a reversal in the policy stance. Moreover, Borio and McCauley (1996) document that bond yield volatility depends asymmetrically on the direction of price changes, where rising yields lead to higher volatility.

⁵ Note that the concept of volatility relevant to investors is the volatility of *returns*, not the volatility of percentage changes in yields. The relationship of return to yield is well approximated by $r_{t+1} = y_{t+1} + D_t(y_t - y_{t+1})$, where r_{t+1} is the return at the end of the holding period, y_{t+1} and y_t are the yields at the end and beginning of the holding period respectively and D_t is the duration. The relationship is exact for zero coupon bonds.



yield period from January 1984 to December 1993 and a low-yield period from January 1994 to December 2002. As we would expect, the graph shows that in both periods longer duration is associated with higher volatility. More importantly, the graph shows consistently lower volatilities across the duration spectrum during the low-yield period. On average, volatility in recent years is about three quarters of the average volatility in 1984–93. Assuming this volatility pattern continues to hold, a reserve manager with a given volatility target – or equivalently, a given value-at-risk standard – would now be able to extend duration without taking on more risk.

Another way to decide on duration is to consider the trade-off between risk and return in deviating from a benchmark portfolio. This trade-off may be measured by the Sharpe ratio, which consists of the excess return achieved by deviating from the benchmark divided by the volatility of this excess return. To illustrate the problem, we consider a benchmark portfolio of three-month US Treasury securities and calculate Sharpe ratios for a shift into longer durations. We calculate excess returns by taking the average of realised monthly excess returns from January 1994 to December 2002 resulting from adding different durations to the benchmark portfolio.⁶ We consider the addition of two-, three-, five-, seven- and 10-year durations. Note that if similar calculations are done with other benchmarks, the Sharpe ratios may change. As shown in the right-hand panel of Graph 1, the calculated Sharpe ratios range from about 0.40 to 0.60, with the shorter durations providing the higher ratios.

... but Sharpe ratios are better for shorter durations

⁶ This is an *ex post* calculation of excess returns. In theory, the Sharpe ratio is about *expected* excess returns, and the calculation assumes that these returns can be measured by past experience. See, for example, Sharpe (1966).

Hence, while volatility seems to be lower in general, one gets less “bang for the buck” as one goes further out in duration. In the above analysis, the desirability of extending duration would depend on whether the reserve manager focuses on meeting a volatility target or on maximising a measure of the trade-off between risk and return. These two decision rules give different answers in the data set investigated here.

Credit risk and skewness: the challenge of diversification

Another way to increase expected returns is to take on credit risk. Corporate bond spreads tend to be much wider than would be implied by expected losses from default, so corporate bond portfolios do offer a high potential for enhanced returns. For example, as shown in the left-hand panel of Graph 2, the spread between yields on triple-B corporate bonds and US Treasury securities averaged about 203 basis points during 1998–2002. During the same period, the average probability of default for these bonds was about 0.5%, and the average recovery rate given default was 50%. Hence, the spread was more than eight times the expected loss from default as measured by the average loss over five years.⁷

Corporate spreads are wide relative to expected losses ...

Corporate spreads are largely a compensation for bearing credit risk, and one reason why they are so wide is that actual losses from default can easily differ substantially from expected losses. Moreover, such risk of unexpected loss is evidently difficult to diversify away. To illustrate, consider a hypothetical portfolio worth a total of \$10 million and divided equally among 1,000 different triple-B names.⁸ Assume further that these names have identical default probabilities and independent default times (that is, defaults that are uncorrelated).⁹ The right-hand panel of Graph 2 shows the probabilities of varying amounts of default losses for this portfolio given the triple-B default probability of 0.5% and recovery rate of 50%; the dark bar indicates an expected loss from default of \$25,000. However, as the graph also shows, the probabilities of greater losses are significant. For example, 1% value-at-risk represents a 1% probability that losses would exceed \$50,000. As corporate bond portfolios go, one with 1,000 names is already unusually large, and yet our example shows that it could still be poorly diversified in that unexpected losses remain significant. By contrast, in the equity market a portfolio with 30 different stocks can often be considered well diversified.

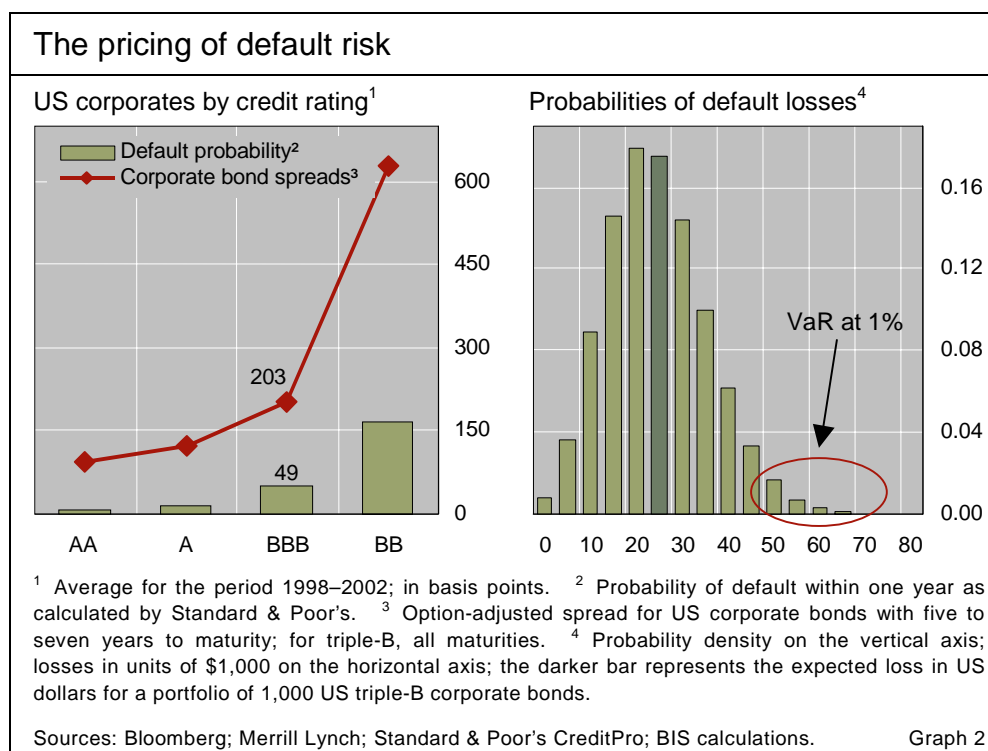
... because default risk is hard to diversify

Even 1,000 names may not be enough

⁷ Indeed, there are investment strategies that attempt to arbitrage between spreads and expected default losses. The most prominent example of these strategies is the collateralised debt obligation (CDO), in which low-rated bonds are pooled together in a securitisation to create highly rated securities. Elton et al (2001) find that a significant portion of the spread can be accounted for by taxes.

⁸ To keep things simple, we account only for the probability of default. In practice, losses can also arise from downgrades and wider spreads. Indeed, it is important to integrate credit and market risk in risk management. Duffie and Singleton (2003), for example, show how this might be done.

⁹ We discuss the role of correlations below.



Correlations are higher for lower-rated names

It is important to understand the role a correlation in defaults would play in the risk of a corporate bond portfolio. Such a correlation would naturally limit the scope for diversification. In the extreme, a portfolio with 1,000 names but with 100% default correlation would have the risk profile of a portfolio with a single name. In practice, it is difficult to estimate default correlations with any precision. Market participants often assume that for firms in the same industry such correlations are significant, while for firms in different industries correlations are small.¹⁰ Correlations are also likely to be higher between low-rated names than between highly rated names.¹¹ Such correlations are also likely to vary over time, increasing for precisely those periods when the benefits of diversification are most sought after. To estimate such correlations more accurately, some market participants rely on models that attempt to derive these correlations from the degree to which sharp downward movements in equity prices coincide between firms.

However, while such correlations limit the scope for diversification, they are not what makes corporate bond portfolios difficult to diversify. After all, equity returns tend to be much more highly correlated than default risk. And yet, as mentioned above, a small equity portfolio can be well diversified in that the idiosyncratic risk of individual stock returns is negligible, while a large

¹⁰ For example, in evaluating CDOs, Moody's assigns so-called "diversity scores" to the pool of collateral. These scores reflect the default correlations the rating agency sees, and the scores tend to differentiate mainly between correlations within an industry and correlations between firms in different industries.

¹¹ Zhou (1997) and Gersbach and Lipponer (2003), for example, show that credit losses are more highly correlated for debt with higher probabilities of default. This means that as credit quality declines over the cycle, default correlations would also rise.

corporate bond portfolio is likely to remain poorly diversified in that unexpected losses from default are significant.

The essential characteristic of credit risk that makes diversification so difficult is the asymmetry in the distribution of returns that this risk generates. In particular, the return distribution for a corporate bond portfolio is characterised by a rather long tail on the left, representing low probabilities of heavy losses from defaults or rating downgrades. In other words, the distribution is negatively skewed. By contrast, equity returns tend to show a much more symmetric distribution, in which the probabilities of large losses tend to be matched by the probabilities of large gains. It is the skewness in returns that presents the reserve manager with the challenge of diversifying a corporate bond portfolio.

Corporate bond returns are negatively skewed

Instruments in other currencies: do higher yields mean higher returns?

At present, most central banks manage their reserves by fixing their currency allocations, with a substantial portion devoted to US dollar-denominated highly rated fixed income assets. Until recently, these assets have offered rather low yields. Can we gain by deviating from these currency allocations to tilt towards assets in currencies with higher yields? The hypothesis of uncovered interest rate parity suggests that on average there should be no gain: currencies with higher yields are likely to depreciate such that the loss from the exchange rate offsets the gain from the yield differential. In its strict form – where the maturity of the instruments matches the investment horizon – the hypothesis is empirically found not to hold.¹² However, reserves are often placed in securities with maturities that exceed the investment horizon, and to our knowledge the uncovered interest rate hypothesis has not been tested for this case.

Do exchange rates move to offset yield differentials?

Do higher yields lead to higher returns once exchange rate movements are taken into account, particularly for longer-maturity instruments? For present purposes, we compare returns on government bonds denominated in euros (Deutsche marks for the pre-euro period), pounds sterling, Japanese yen and US dollars. We examine yields and returns for the period January 1994 to December 2002, calculating returns in terms of US dollars. We fix the investment horizon at one year while comparing returns for securities with a five-year duration. If the uncovered interest rate parity hypothesis holds, yield differentials should have no effect on differential returns, because differences in yield should be offset by changes in the exchange rate.

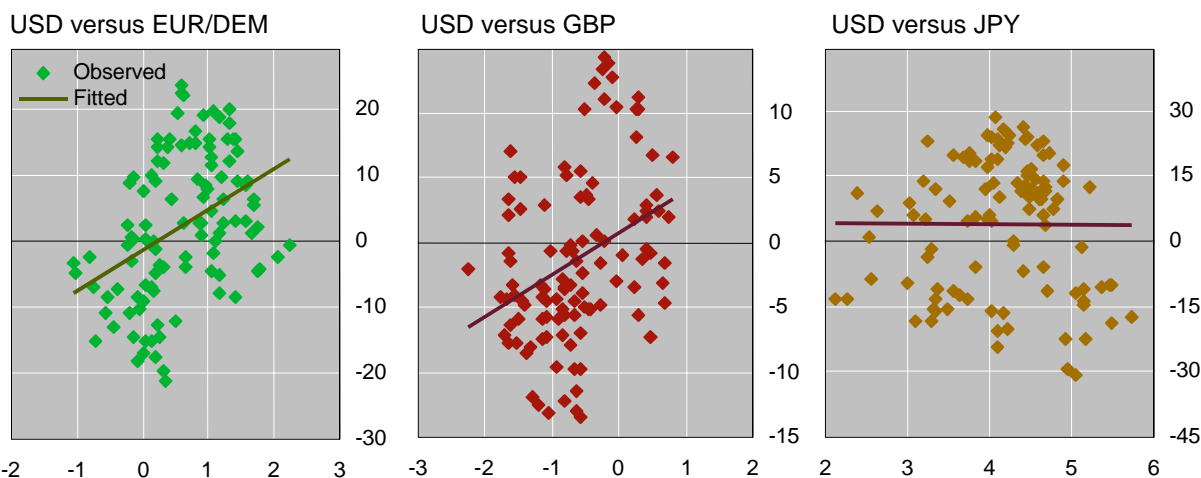
We look at bond returns instead of short-term yields

The results are striking for the sample period considered. For yield differentials between the euro and dollar and between the pound and dollar,

¹² The body of evidence against uncovered interest rate parity is quite large. One of the most careful tests is provided by Hansen and Hodrick (1980). More recent investigations of this issue include Flood and Rose (1999) and Brooks et al (2001). The literature thus far relies on tests using maturities that match the holding periods, for example a one-year instrument for an investment horizon of one year.

Return differentials against yield differentials for five-year bonds¹

January 1994–December 2002; in annual percentage rates



¹ The return differential (shown on the vertical axis) is defined as the return on the US Treasury security minus that on the other currency government bond in US dollar terms. The yield differential (horizontal axis) is the difference between the nominal yields. The fitted line is based on an OLS estimate of $r_{t+1}^{US} - r_{t+1}^J = \alpha + \beta(y_t^{US} - y_t^J)$, where $r_{t+1}^{US} - r_{t+1}^J$ is the return differential between the US dollar and the other currency and $y_t^{US} - y_t^J$ is the corresponding yield differential.

Sources: National data; BIS calculations.

Graph 3

not only do we reject our version of the uncovered interest rate parity hypothesis but we also find that return differentials exceeded yield differentials by large amounts. As shown in Graph 3, a 10 basis point yield differential between euro and dollar bonds meant a 62 basis point differential in returns, while the same yield differential between sterling and dollar bonds led to a 32 basis point differential in returns. It happens that during this period the higher-yielding currency also tended to be the appreciating currency. Hence, exchange rate movements served to magnify the effect of yield differentials on returns.¹³ Note, however, that this phenomenon did not extend to yield differentials between yen and dollar bonds. In this case, the outcome was roughly consistent with the hypothesis: exchange rate movements tended to just offset the yield differentials.

Higher-yielding currencies offer scope for enhancing returns

Our results suggest only that there may be some scope for enhancing returns by considering higher-yielding currencies. On the one hand, yield differentials are generally not offset, and indeed may often be reinforced, by currency movements. On the other hand, the relationship does not seem to be reliable for all currencies and may not hold for all periods.

Another issue to consider in deviating from one's currency allocation is the benefits of diversification in reducing risk. As is well known, a low correlation between returns on different assets in a portfolio can reduce the volatility of

¹³ For this sample period, conducting the test using one-year government bonds, so that the maturity matches the investment horizon, leads to qualitatively similar but weaker results. The tendency of higher-yielding currencies to appreciate seems to be more strongly associated with long-term yields than with short-term ones.

returns of the overall portfolio. To what extent is this gain from diversification present in returns across currencies? In general, for the major currencies fluctuations in exchange rates contribute more to the volatility of bond returns than do movements in interest rates. For example, over the 1994–2002 sample period, the volatility of returns in US dollar terms on a two-year German government bond was two and a half times the volatility for a two-year Treasury note. Although the correlation between returns is low between German government bonds and US Treasuries, the gain from diversification is limited by the fact that the return volatilities are so far apart. Note, however, that if the reserve manager calculates returns in local currency, there may be more scope for diversification, since here the difference in volatilities across foreign currencies would not be so pronounced.

Exchange rates can add volatility to bond returns

Conclusion

The alternatives available to reserve managers who are seeking higher yields include extending their duration benchmark, investing in corporate bonds and shifting towards instruments in higher-yielding currencies. For each of these alternatives, we raise specific issues about either risk or return. In none of these cases do we by any means resolve the issue. The intention here is limited rather to providing analyses that would allow a reserve manager to pose important questions in more focused ways.

For the alternative of extending the duration benchmark, we find that the critical risks have changed in a way that seems favourable to the reserve manager. In particular, we find that as yields on highly rated government securities have declined, so have the relevant return volatilities for any given duration. This means that an unchanged value-at-risk standard would allow the reserve manager to take advantage of the higher yields offered by longer durations. At the same time, however, the trade-off between risk and return also seems to have changed in a way that may not favour longer durations. One particular measure of this trade-off, the Sharpe ratio, seems to recommend durations not longer than two years. The question then becomes the appropriate standard for judging risk and return.

In the case of corporate bonds, we argue that the main challenge is one of diversification in the face of skewness in returns. Such skewness – representing the risk of small probabilities of large losses – makes corporate bond portfolios rather difficult to diversify. The good news is that this difficulty is reflected in corporate spreads that are much wider than would be implied by expected losses from default.

Finally, in the case of currency allocations, we find that, over a long sample period, exchange rates on average move in favour of the higher-yielding currencies, thus resulting in return differentials that magnify the yield differentials. Our analysis applies to the common case in which the instruments considered have longer maturities than the investment horizons. We find results that are stronger than the usual rejections of the hypothesis of uncovered interest rate parity in which maturities and investment horizons are kept equal. Given our findings, the open question becomes the reliability of

these results for a given currency pair and their robustness for different currency pairs.

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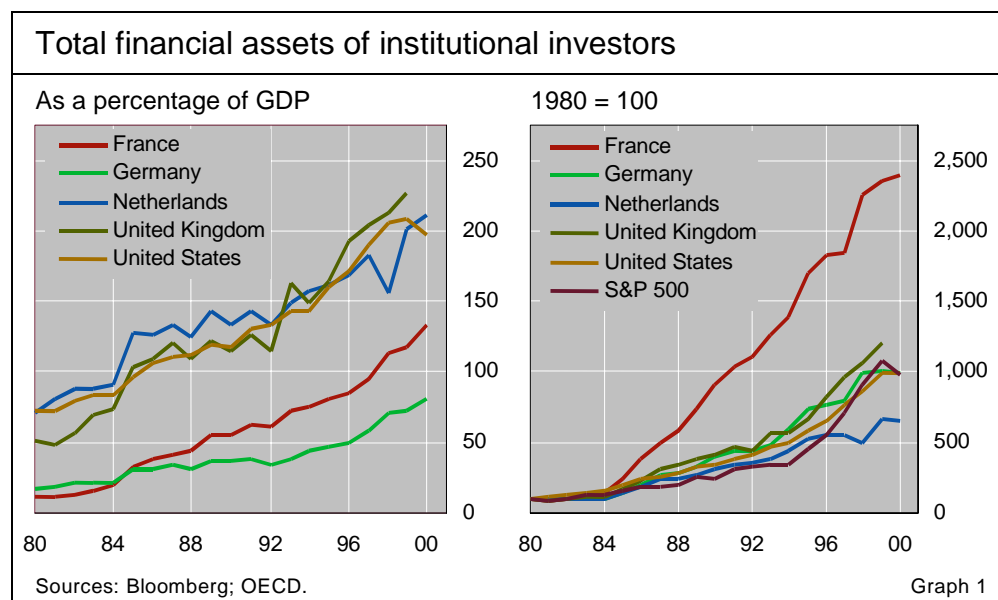
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Institutional asset managers: industry trends, incentives and implications for market efficiency¹

In recent years, investors have increasingly delegated the management of their investment portfolios to institutional asset managers. The scale of such delegated investing and its development over time are apparent from the growth in the size of assets under management by different types of institutional investors across various countries (Graph 1). Moreover, demographic trends can be expected to sustain the industry's growth well into the future.

Institutional asset management has grown in size and importance ...

The distinguishing characteristic of the industry is that asset management activities involve a series of delegated processes, linking the "triangle" formed by invested funds, fund owners and fund managers. As a result, contractual structures that seek to align the incentives of fund owners with the incentives of those charged with the management of these funds are an integral part of the business – and are bound to change as the industry continues to evolve.



¹ This article summarises the main findings of a report published by the Committee on the Global Financial System; any errors and omissions are those of the author. The views expressed in this article do not necessarily reflect those of the BIS.

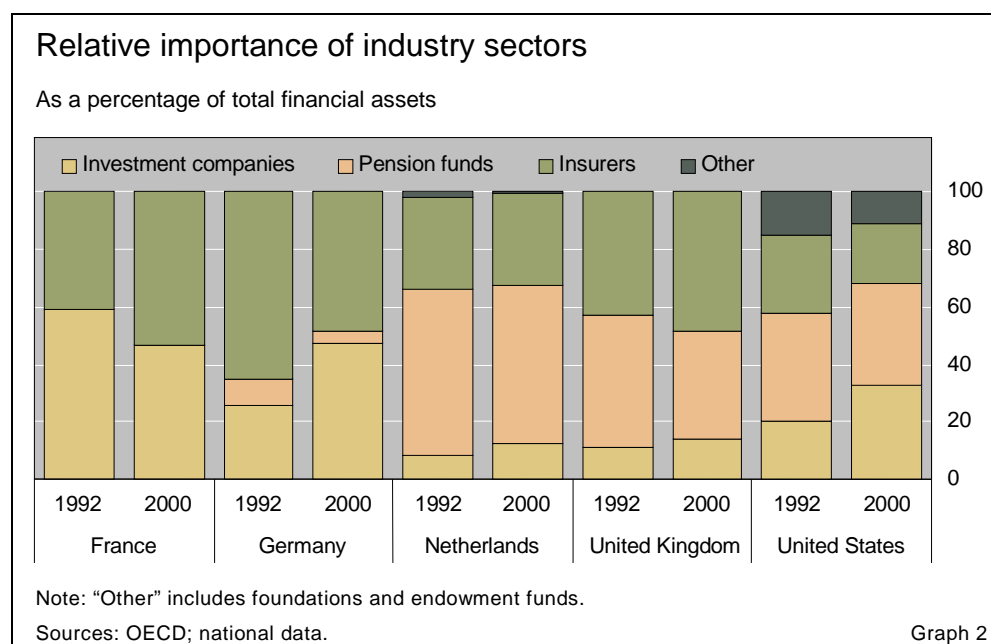
Asset allocation is not independent of the context in which decisions are taken. Current industry trends, to the extent that they affect asset managers' incentives, therefore have an obvious potential to change investor decision-making and investment behaviour.² This, in turn, may matter for global financial markets – an issue that has attracted particular attention against the background of the recent phenomenal increase and subsequent collapse in the values of world equity market indices.

... and industry trends may matter for financial markets

Realising the asset management industry's increasing importance for financial markets, the Committee on the Global Financial System (CGFS), which monitors global financial markets for the central bank governors of the G10 countries, established a working group to investigate these issues. This article provides an overview of the group's work and highlights some of its principal findings, which have recently been published in a report.³

Evolving industry structure

Institutional asset managers consist largely of *collective investment vehicles*, *pension funds* and *insurance companies*. All of these entities construct and maintain investment portfolios on behalf of their customers, both individual investors and companies. The management of these investments may either be performed in-house or be delegated to external asset managers. As a result, pension funds and insurance companies may make use of outside asset managers to manage the assets entrusted to them or may themselves offer asset management services to third parties.



² See BIS (1998).

³ The Working Group on Incentive Structures in Institutional Asset Management was chaired by Michel Cardona of the Bank of France. The report (CGFS (2003)), is available online at www.bis.org.

The worldwide growth of institutional asset management, supported by demographic changes, financial liberalisation and technological advances, has been accompanied by a fundamental restructuring of the industry. Notably, this has included a shift in the importance of different industry sectors over time (Graph 2). It has also meant that traditional sectoral distinctions among industry players have become increasingly blurred. Insurance companies, for example, have launched their own investment funds and have become involved in pensions provision, while banks are acquiring money management and insurance companies, bridging different industry sectors.

While the specifics of these developments have differed across countries, there are three broad industry trends common to the entire institutional investor business: the growing importance of indexed portfolios; increasing numbers of distinct asset classes; and the industry's consolidation and specialisation.

Indexing

Indexing has become more important ...

The increasing popularity of passively managed, ie index-tracking, portfolios is perhaps the most significant of these industry trends. Index funds emerged in 1971, when the first such fund, designed to track the S&P 500 Index, was created by Wells Fargo Bank with initial funding of \$6 million from the Samsonite Co pension fund. Since then, indexed portfolios have steadily gained in importance, with global passive assets under management growing by some 70% between 1998 and 2001. Regional differences, however, remain large. Indexed investment funds now account for about 30% of combined equity and bond allocations in the United States and 20% in the United Kingdom. By contrast, across Europe as a whole, only some 5% of total assets and about 10% of equity assets are managed on a passive basis (Table 1).

The trend towards indexing has been driven by the development of capitalisation-based benchmark indices and the recognition that, at least in the largest and most informationally efficient markets, actively managed funds do not, on average, earn returns sufficient to offset their costs.⁴ Index-tracking funds, given their low fees, were therefore seen to offer investors a means of obtaining a high degree of diversification, indeed the possibility of holding "the market", at a relatively low cost. Until recently, the attractiveness of passive funds was further supported by rising stock markets, as passively managed portfolios presented a cost-effective way of assuming equity exposure in an environment of rapidly rising market valuations.

Among passive funds, enhanced passive strategies have recently gained prominence. Such strategies, based on the realisation that ensuring tracking errors⁵ close to zero involves considerable transaction costs, allow for some

⁴ See Sharpe (1966) and Jensen (1968). While individual portfolio managers might earn excess returns, these are typically not found to be persistent when controlling for risk and survivorship bias (Carhart (1997)).

⁵ *Tracking error* is defined as the standard deviation of a portfolio's excess returns over a sample period and is thus a measure of the divergence of a portfolio's return from that of the selected benchmark. Limits on allowable tracking error are now a standard feature of investment mandates, even if the underlying portfolios are actively managed.

Institutional asset allocation in 2001		
In percentages		
Asset class	European asset allocation	US asset allocation
Public equity	44	54
of which: active	90	64
of which: passive	10	36
Fixed income	43	32
of which: active	98	87
of which: passive	2	13
Money markets	8	9
Real estate	4	2
Other (including hedge funds)	1	3

Sources: UBS Warburg/Oliver, Wyman & Company (2002); *Pensions and Investments* (2002).
Table 1

flexibility in replicating a given index. This, in turn, enables the necessary transitions to be managed more smoothly when indices are being reweighted. In part, interest in enhanced passive strategies can also be explained by the past practice of basing benchmarks on total market capitalisation rather than free float.⁶ This meant that shares of companies with large capitalisations but small free floats, such as spun-off businesses, tended to be very volatile, with shortages being created as index weightings were based on the entire market capitalisation.

At the same time, indexing remains much less popular in the bond markets than in equity markets. This is for two reasons. First, while idiosyncratic risk is very important for individual stocks, this is much less the case for individual bonds, as interest rates are very highly correlated. This may limit the attractiveness of indexing for bond portfolios, as the diversification advantage is less pronounced. Second, bond indices, especially those for corporate issues, are more complex to replicate. Adjustments are required, for example, on major coupon redemption dates and to take account of maturing issues and auctions. In addition, it is difficult to weight a bond index accurately by market value because the amounts outstanding of each component could be unclear due to coupon stripping (on government bonds), prepayments (on mortgage securities) and call features (on corporates).

Increasingly, the trend towards indexing is encompassing not only wholesale funds managed, for example, on behalf of a pension fund, but also the retail part of the institutional asset management business. While index-tracking mutual funds have been around for some time, so-called exchange-traded funds (ETFs) are a relatively new phenomenon. ETFs are passively managed baskets of stocks or, in some cases, bonds that mirror a particular index and are traded on stock exchanges on an intraday basis, ie like ordinary shares. The first of these funds was launched in 1993, tracking the S&P 500.

... but its popularity differs across markets

⁶ *Free float* measures the market value of the outstanding amount of a security that is free to trade among institutional and individual investors.

By late 2002, net ETF assets, as measured by the top 50 funds, amounted to \$159 billion or about 6% of total indexed assets, with some \$70 billion managed by the 10 biggest funds alone (Table 2). One advantage of these funds is that they can be bought on margin and sold short, possibly enabling investors to quickly adjust their equity market exposures. Other advantages of these contracts for retail investors include low annual expenses, although commissions have to be paid to trade ETFs, and tax efficiency. This is because, as ETFs do not redeem shares for cash, they do not need to hold cash in anticipation of redemptions or sell securities (possibly realising capital gains) for redemption purposes.

Asset classes

More distinct asset classes and styles ...

The second important development has been the notable increase in the number of distinct asset classes offered to ultimate investors. That is, the overall increase in professionally managed assets, both in absolute terms and as a share of GDP, has gone hand in hand with rising interest in non-traditional markets and instruments. This has included private equity and venture capital funds and has also led to an acceleration in the rate of growth of funds placed with unregulated asset managers. As a result, global hedge fund⁷ assets are reported to have risen from \$120 billion to around \$600 billion between 1994 and 2002.

Hedge fund strategies and other alternative investments were seen to offer diversification benefits based on presumed low or negative correlations with more traditional asset classes. On this basis, hedge fund investments can be viewed as the natural reaction to the ongoing trend towards indexing and the scope for arbitrage that might be opened up in the process. Yet, despite

Top 10 exchange-traded funds in 2002		
In billions of US dollars		
Fund	Index tracked	Net assets
SPDR Trust Series 1	S&P 500	30.45
Nasdaq 100 Trust Series 1	Nasdaq 100	18.85
Midcap SPDR Trust Series 1	S&P Midcap 400	6.19
Diamonds Trust Series 1	Dow Jones Industrial Average	3.84
iShares S&P 500	S&P 500	3.54
iShares Russell 2000	Russell 2000	2.64
Vanguard Total Stock VPR	Wilshire 5000	1.17
iShares S&P Smallcap 600	S&P Smallcap 600	1.09
iShares Russell 1000 Value	Russell 1000 Value	0.87
iShares Russell 2000 Value	Russell 2000 Value	0.83
Sum: top 10 assets		69.47
<i>Memo: top 50 assets</i>		<i>158.90</i>

Source: *Pensions and Investments* (2002), as of 30 August 2002. Table 2

⁷ See Tsatsaronis (2000).

Top 10 managers of indexed assets in 2001				
Asset manager	Total assets (\$ billions)	Equity (% of total)	Fixed income (% of total)	Enhanced indexed (% of total)
Barclays Global	768.0	77.2	22.8	13.0
State Street Global	641.2	69.4	30.6	3.0
Vanguard Group	234.6	87.1	12.9	0.0
Deutsche AM	145.0	88.3	11.7	4.0
TIAA-CREF	85.6	100.0	0.0	90.0
Mellon Capital	79.7	82.5	17.5	5.0
Fidelity Investments	69.4	90.3	9.7	39.0
Northern Trust	62.6	73.0	27.0	0.4
JPMorgan	52.4	100.0	0.0	100.0
Dimensional Fund	32.8	98.8	1.2	96.0
Sum: top 10 assets	2,171.3			
<i>Memo: top 60 assets</i>	<i>2,600.0</i>			

Source: *Pensions and Investments* (2002), as of 31 December 2001. Table 3

their recent growth, alternative investments, such as hedge and private equity funds, continue to account for only a small overall fraction of institutionally managed portfolios (Table 1).

Consolidation and specialisation

The third broad trend is the industry's tendency towards increasing consolidation and specialisation. Consolidation has been encouraged mainly by increased indexing and the fact that, owing to scale economies, index funds tend to outperform their active counterparts, particularly in periods of rising markets. This has tended to eat into assets under management at the more traditional active funds, putting pressure on their fee incomes and pushing forward inter- and intragroup concentration. In addition to the usual effect based on fixed costs, scale economies arise, in particular, from lowered transaction costs. These are due to the reduced overall need for transactions, the *crossing of trades* (ie the simultaneous off-market sale and purchase of assets for different customers), and the fact that passive management avoids *churning* (unnecessary trading activity to generate commissions). Reflecting these effects, passive asset management is now dominated by a relatively small number of asset managers, with the major three accounting for a large share of the global market (Table 3). Even as the pace of consolidation has accelerated, specialisation has become more pronounced among active asset managers as the industry has branched out into research-intensive, non-core asset classes. Consequently, the number of highly specialised, non-traditional asset management firms has been growing.

... and indexing have fostered consolidation and specialisation

Trends in incentive structures

The broad, underlying structural trends reviewed above have also been reflected in changing incentives for institutional asset managers. These

Incentive structures for asset managers have changed ...

changes are, potentially, of particular importance, as they apply to the very core of the asset management industry, ie the separation between ownership and control of financial wealth. This separation, and the associated existence of agency relationships, has given rise to certain contractual arrangements to encourage prudent behaviour by the asset manager.

In practice, incentive structures tend to be based on sets of simple, easily verifiable rules, which are made up of three core components:

- a *profit-sharing rule/fee structure*, used to align incentives in terms of returns (eg fund management fees based on assets under management with or without performance-based bonuses);
- a *relative performance component*, measured against a benchmark that serves as a basis for monitoring performance, comparing returns and controlling for common uncertainty (ie shocks that affect the entire market); and
- *checks on risk-taking*, such as maximum allowable tracking error, reporting requirements, and constraints on available investment choices and strategies.

Three main developments in incentive structures can be identified: more stringent contractual arrangements; an increased emphasis on the investment processes; and changes in the importance of different compensation schemes.

Through more tightly defined contractual arrangements, responsibility for strategic asset allocation has increasingly been shifted back to fund owners. Examples include the decomposition of investment portfolios into a bigger number of separate specialist mandates and an increasing focus on specific investment strategies and styles, such as growth and value-oriented equity investments.⁸

This tiering and narrowing of investment mandates is also reflected in more stringent rules for tactical day-to-day management. Such contractual features include tighter tracking errors and more pervasive use of other investment constraints, for instance diversification rules and limits on investments in specific securities. It is common, for example, for fixed income investment mandates to restrict the manager's investment choices to investment grade credits. This serves to limit monitoring costs, while defining a broad maximum level of portfolio risk. At the same time, tracking error is now widely used as a measure of and constraint on portfolio risk. Accordingly, even actively managed portfolios tend to be based on limits on allowable tracking error around the benchmark, with the error bounds increasing in the riskiness and expected return of the benchmark portfolio. Contractual and regulatory investment constraints, when used together with such limits on tracking error, can significantly restrict the asset manager's room for manoeuvre, potentially converting actively managed into quasi-passive funds. Consequently, as

... as investment mandates have become more tightly defined ...

⁸ Growth-oriented strategies seek above average returns by investing in companies whose earnings are expected to grow at an above average rate relative to the market, ie stocks with high price/earnings (p/e) ratios. Value-oriented funds target stocks with lower than average price-to-book or p/e ratios, seeking to select stocks that trade below their intrinsic value.

enhanced passive funds⁹ have recently gained prominence among indexed portfolios, the dividing line between active and passive management has tended to blur somewhat.

In addition, ultimate investors are increasingly focusing on investment processes and investment style consistency. As a result, investors, usually aided by investment consultants, will monitor and evaluate asset managers against appropriate style benchmarks and perform detailed operational reviews concerned with those procedural aspects of the investment manager's activities that are thought to produce superior long-term performance. Among these, risk controls and risk management systems are gaining prominence. Historical performance, although part of the evaluation process, is therefore no longer regarded as the sole driving factor in manager selection and evaluation.

Finally, the importance of different compensation schemes has been changing. In particular, the industry appears to increasingly favour arrangements in which management fees are a fixed percentage of assets under management, as opposed to performance-based management fees. Fee levels will differ across management styles and asset classes. Although not performance-based as such, schemes based on fixed percentages of assets indirectly reward the relative performance of asset managers (with the return on a market index or, now less common, investment returns generated by a peer group of asset managers used as performance benchmarks), with the nexus between performance and fund inflows acting as an implicit incentive structure. Notably, however, this trend away from explicitly performance-driven fee structures¹⁰ has excluded hedge funds and other alternative investment vehicles, which have retained their focus on absolute, rather than relative, returns.

... and as investors increasingly focus on processes and style consistency

Fees are now largely based on fixed percentages of assets under management

Institutional investors and the efficiency of financial markets

The above-mentioned trends in the institutional asset management industry point to a number of potential implications for financial markets. One set of implications relates to market efficiency and volatility and is discussed below. Additional influences emanating from changing incentive structures in asset management can be highlighted with regard to market liquidity and the risk management needs of households as well as asset managers. These, along with a number of policy-related implications, are discussed in detail in CGFS (2003).

⁹ Market commentary suggests average tracking errors for *actively managed* fixed income portfolios at around 1% and in the 2–6% range for *active* equity portfolios. Portfolios with tracking errors at around 0.25% and 2% for fixed income and equities, respectively, will be regarded as *enhanced passive*, those with smaller tracking errors as *passive*.

¹⁰ Industry practitioners tend to highlight possible adverse incentive effects inherent in particular in asymmetric performance fees, arising from the option-like payoff structure of these schemes. In addition, asset managers appear to have themselves actively discouraged explicit performance fees as these tend to induce high earnings volatility.

Due to their size and potentially long investment horizons ...

The efficiency of financial markets relies on the capacity of certain investors to act on, and correct, apparent “pricing errors”. These investors will tend to sell or short overvalued securities while taking an offsetting long exposure in close substitutes of these securities in order to hedge their risks. If close substitutes are not available to establish such an offsetting exposure or if investors opt for an open, contrarian position, such arbitrage operations are inherently risky. Not only are mispricings difficult to identify, but they can also become worse before disappearing. That is, even when prices ultimately converge with certainty, such trades may generate substantial temporary losses. This, in turn, raises the question of whether the investor is prepared to hold out in the face of these temporary losses and whether there is enough capital to allow for such a strategy. Under risky arbitrage, therefore, market efficiency requires the existence of investors with enough capital and sufficiently long investment horizons to maintain a given position until all available information is fully incorporated into prices.¹¹

... institutional investors may help correct pricing errors

Institutional investors, owing to their size and potentially long investment horizons, could be well placed to play this role. Their existence favours, in principle, a faster, more comprehensive and thorough investment process, ranging from improved information gathering and analysis to more consistent decision-making. That is, assuming they invest on the basis of fundamentals and provided they have the ability to maintain their positions long enough, arbitrage by large institutional investors could stabilise asset prices by making sure that prices do not substantially deviate from fundamentals. For much the same reasons, institutional investors would be expected to serve as structural providers of market liquidity, particularly in times of stress.

In practice, however, questions must be raised as to whether there are features in the evolving incentive structure of institutional asset managers that might affect their ability to use their size and, in principle, relatively long investment horizons to serve the various functions outlined above. For example, if the effective investment horizon of institutional investors were to be shortened, prices might not converge quickly enough for their risky arbitrage positions to be sustained. This would prevent or further delay the correction of any misalignments.

But industry practice may limit their ability to do so ...

One often cited explanation of why this might happen is based on the observation that fund managers tend to end up being evaluated against each other.¹² This is because investment performance is now largely measured relative to a benchmark. To avoid falling behind the benchmark, managers may then have incentives to herd, ie close an existing or refrain from establishing a new arbitrage position, to avoid the reputational risk of acting differently from their peers. Such effects can occur for portfolios that formally rely on peer groups in terms of reviewing performance, but can also be compensation-based. In these cases, when fee structures are implicitly based on returns relative to a market index, managers may want to avoid underperformance and

¹¹ See Shleifer and Vishny (1997).

¹² See Scharfstein and Stein (1990).

fund outflows by staying close to the benchmark. Accordingly, fund managers can become most constrained precisely when they have the best opportunities to profit from contrarian positions, ie when the mispricing they are trying to adjust widens further. By implication, the fear of this happening will make asset managers more cautious in the first place, when putting on their initial trades. As a result, arbitrage-based incentives might be particularly ineffective in extreme circumstances, contributing to potential instability.

In fact, some of the ongoing industry trends reviewed above do seem to suggest that the ability of institutional investors to engage in risky arbitrage strategies might have been reduced. Examples of such trends are the general tendency towards a narrowing of investment mandates, the adoption of established market benchmarks in evaluating performance, and the reduction of permissible tracking error (see the box).

... by restricting asset managers' room for manoeuvre

Performance measurement, tracking error and investor behaviour

Investors need to evaluate carefully their managers' performance using objective criteria. The criterion most commonly used for this purpose is performance relative to established market indices, such as those in the MSCI and S&P families. During the working group's interviews, industry representatives commented that the increasing use of core market indices, along with the recent tendency to impose somewhat tighter limits on tracking errors, might lead to convergence in investor behaviour. In particular, interviewees referred to three different factors that might, at times, encourage such effects and that are associated with the use of market benchmarks:

- overvalued stocks or big issues of highly leveraged debtors tend to find their way into major indices, which are generally capitalisation-weighted and, thus, more likely to include overvalued securities than undervalued securities. Asset managers may therefore need to buy these assets even if they regard them as overvalued, as otherwise they risk violating agreed tracking errors;^①
- once a given asset is included in an index, scope for underweighting is limited by the allowable tracking error. Both effects together lead to a trade-off between the risk of increased tracking error and the risk of holding overvalued securities. The problem is most severe for more narrowly defined indices that may be dominated by a relatively small number of individual securities;
- assuming an index is only partially replicated, feedback effects might be generated as asset managers are forced to increase their holdings of the main drivers of the index when rising index values coincide with underperformance of these index components against the index.^② This last effect is likely to arise for broad indices and those that are difficult to replicate, eg corporate bonds, while smaller indices tend to be fully replicated.

As the market indices used for indexing are now largely based on market capitalisations (as defined by the free float), portfolios that fully replicate the underlying index will be self-rebalancing. That is, the value of the portfolio will change in line with the index, obviating the need for the asset manager to make adjustments, provided the index constituents remain unchanged. The effects mentioned above are, therefore, much more subtle than they would be if the market indices used for indexing had static, adjustable weights or if weights were not based on market capitalisation. Furthermore, all three effects may be subject to negotiation between asset manager and customer, who might agree on some degree of customisation, say, through putting limits on particular assets. This, in turn, could limit any adverse implications.

^① Alternatively, asset managers can be forced to sell assets they might have liked to hold on to. One example for such a case arises when benchmark indices, as is common with bond benchmarks, are based on ratings-related criteria, such as the exclusion of sub-investment grade bonds. A downgrade to below investment grade would thus remove the respective issue from the index, though with a certain lag, triggering a rebalancing of investment portfolios and the forced selling of the downgraded bond. Similar effects can occur if asset managers' mandates contain ratings-based investment constraints. ^② It should be noted that, in principle, such feedback can also be negative, depending on the structure of the covariances between the principal components (index drivers) and the overall index.

However, as other industry trends suggest offsetting effects ...

Other developments, however, suggest offsetting effects. At the strategic level, the increased number of different asset class and investment style choices should permit individuals to take on greater or less risk. Given the shift of strategic asset allocation back to owners of funds, individual investors can hence allocate their investments across more broadly defined asset classes and strategies according to their personal views of future market trends. In addition, the rising proportion of assets managed by alternative investment vehicles may serve to enhance the role of institutional investors that are not as strictly constrained by benchmarks or limits on tracking errors as their more traditional counterparts. At the tactical level, the declining reliance on (explicitly) peer-based benchmarks may alleviate reputational pressures on individual asset managers, thus limiting incentives to “trade with the crowd”. Furthermore, with increasing emphasis being put on investment processes, ultimate investors may be inclined to maintain effective performance assessment periods at times of underperformance, encouraging fund managers to assume and retain more long-lived investments in assets that seem inappropriately priced relative to fundamentals.

... the overall impact remains uncertain

Unfortunately, reconciling the overall impact of the various effects highlighted above is a demanding exercise, particularly given their at least partially offsetting nature. Therefore, it is perhaps not surprising to find, on balance, no clear-cut empirical support for the hypothesis that aggregate market efficiency (and volatility) are unduly affected by ongoing industry trends or that institutional investors systematically contribute to or consistently fail to correct large-scale misalignments. Hence it is uncertain whether or to what extent changes to the incentive structure of institutional asset managers have affected their overall ability to counter asset pricing errors. While, at times, asset managers might find their performance horizons shortened, profit opportunities and relatively free entry suggest incentives to help correcting pricing inconsistencies over the medium term, once misalignments grow too large. That is, while some aspects of the industry structure in institutional asset management may suggest scope for influencing market outcomes, robust evidence on these effects is not available.

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

Basel Committee on Banking Supervision

The BCBS issues a third consultative paper on the New Basel Capital Accord ...

In April, the Basel Committee on Banking Supervision (BCBS) issued to banks and all other interested parties a third consultative paper on the New Basel Capital Accord. Comments received will help the BCBS make final modifications to its proposal for a new capital adequacy framework. The goal of the Committee continues to be completion of the New Accord by the fourth quarter of 2003, with implementation to take effect in participating countries by end-2006. With that in mind, work has already begun in a number of countries on draft rules that would integrate Basel capital standards with national capital regimes. An overview paper, which accompanies the third consultative document, provides a summary of the new capital adequacy framework.¹ It also outlines changes to the proposal since the release in October 2002 of the third Quantitative Impact Study (QIS 3), which banks from 43 countries used to assess the impact of the New Accord on their portfolios.

... releases the results of the third Quantitative Impact Study ...

In May, the BCBS released an overview of the global results of QIS 3.² QIS 3 aimed at allowing the Committee to gauge the impact of the proposals for a New Basel Capital Accord before finalisation of the third consultative paper (CP 3). Overall, the results were in line with BCBS objectives; minimum capital requirements would be broadly unchanged for large internationally active banks, taking into account the fact that they are likely to use the internal ratings-based (IRB) approaches. The proposals would offer an incentive for internationally active banks to adopt the more sophisticated IRB approaches. For smaller, more domestically oriented G10 and EU banks capital requirements could be substantially lower than currently under the IRB approaches, largely reflecting the importance of retail lending for these banks. In other countries there would be significant variations depending on the conditions in the different markets and the focus of activity of the banks.

¹ See *Overview of the New Basel Capital Accord*, April 2003, at www.bis.org.

² See *Quantitative Impact Study 3 – overview of the global results*, May 2003, at www.bis.org.

However, all the results are thought to be somewhat overstated, in part because of difficulties in identifying new forms of collateral.

The BCBS also noted that changes made to the second consultative paper (CP 2) proposals had generally delivered the desired results. For example, capital requirements for loans to small and medium-sized enterprises will generally be no higher than currently. The Committee has decided to make a few targeted reductions to the standardised approach proposals, in particular a lower risk weight of 35% for residential mortgages, and recognition that “past due” loans with significant levels of provisioning warrant a lower risk weight than 150% on the net amount remaining. An alternative standardised treatment for operational risk will be offered at supervisory discretion, available for use with any of the three credit risk approaches. Finally, elements of the IRB proposals have been fine-tuned. In late May, the BCBS published a further supplementary document providing more detail on some areas of QIS 3.³

Also in May, the BCBS published the results of the 2001 disclosure survey, which provides an overview of the disclosure practices of a sample of internationally active banks.⁴ The publication of the results forms part of a sustained effort by the Committee to promote transparency and effective market discipline in the banking and capital markets, especially in the light of the coming implementation of the New Basel Capital Accord. The survey focuses on the annual reports of 54 banks. It includes 104 questions covering quantitative and qualitative disclosures in a number of categories: capital structure, capital adequacy, market risk modelling, internal and external ratings, credit risk modelling, securitisation activities, asset quality, credit derivatives and other credit enhancements, other derivatives, geographic and business line diversification, accounting and presentation policies, and other risks.

The survey reveals that many banks have continued to expand the extent of their disclosures. Overall, in 2001 banks disclosed 63% of the items included in the survey, up from 59% in 2000 and 57% in 1999. The main other findings are: (i) the most prevalent disclosures in 2001 were those on accounting and presentation policies, other risks and capital structure, while those on credit enhancements (including credit risk modelling and credit derivatives) were least widespread. Disclosure of information on internal risk models was also much more common for market risk than for credit risk; (ii) disclosures of information on securitisation activities, internal and external ratings and credit enhancements has considerably expanded since 1999. The most noteworthy improvement is the increase in the disclosure of information on other risks (operational and legal risks, liquidity risk and interest rate risk in the banking book), with the result that this became one of the most commonly provided

... and publishes the 2001 disclosure survey results

The survey reveals improvements in disclosure ...

... particularly for operational, legal and banking book risks

³ See *Supplementary information on QIS 3*, May 2003, at www.bis.org.

⁴ See *Public disclosures by banks: results of the 2001 disclosure survey*, Basel Committee Publications No 97, May 2003, at www.bis.org.

disclosures in 2001; and (iii) regarding individual disclosure items, the most common were on the structure of capital, accounting and presentation policies, market risk modelling or capital adequacy.

The BCBS encourages further transparency in credit risk mitigation

In view of these results, the BCBS encourages banks to further enhance transparency in their use of credit risk mitigation techniques, asset securitisation and internal ratings, given that disclosure in these areas will be qualifying criteria for the recognition or use of these techniques under the New Basel Capital Accord. Furthermore, the few banks that do not provide the most common disclosures are urged to improve their practices, as such disclosures will, for the most part, be required under the New Accord.

Committee on Payment and Settlement Systems

The CPSS issues a new reference paper on payment arrangements

In April, the Committee on Payment and Settlement Systems (CPSS) issued a new edition of its reference work on payment arrangements in various countries, widely known as the “Red Book”. This new edition of the Red Book, *Payment and settlement systems in selected countries*, is a further step towards understanding the way payment systems, including securities settlement systems, work in the countries represented in the CPSS. The latest edition of the Red Book significantly revises and enhances the previous edition, published in 1993. The coverage of different segments and developments in payment systems and securities settlement systems has been broadened. In addition to individual country chapters, this edition also contains a chapter on international payment arrangements and a more comprehensive glossary.

Other initiatives

Market supervisors publish a note on money laundering and terrorism financing

In June, the BCBS, the International Association of Insurance Supervisors and the International Organization of Securities Commissions published a joint note providing a record of the initiatives taken by each sector to combat money laundering and the financing of terrorism. The note was first prepared for the March 2003 Joint Forum meeting in Hong Kong SAR, and thereafter submitted for the information of the Coordination Group at its March 2003 meeting in Berlin. To the extent that institutions in each sector are offering the same services, measures and standards concerning anti-money laundering (AML) and combating the financing of terrorism (CFT) need to be reasonably consistent, otherwise there could be a tendency for criminal funds to flow to institutions in those sectors operating under less stringent standards. However, variations in patterns of relationships between institutions and customers in each sector require AML/CFT measures to be tailored to the circumstances of the relationship. Hence, AML/CFT standards may reasonably differ in the detail and intensity of their application.