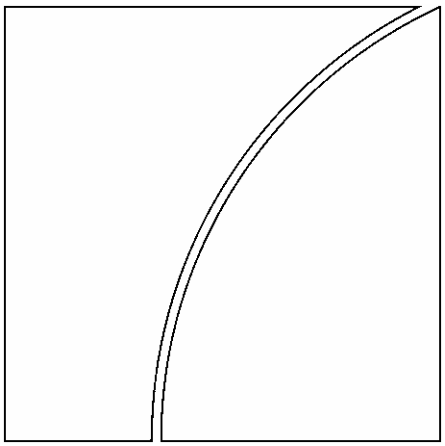
BANK FOR INTERNATIONAL SETTLEMENTS

BIS Quarterly Review

September 2004



International banking and financial market developments

BIS Quarterly Review
Monetary and Economic Department

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Special features

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.

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1. Overview: reassessing the recovery

July and August 2004 saw a divergence in market views about the strength of the global economic recovery. Bond yields and equity prices fell but credit spreads remained little changed. Increases in US policy rates in June and August – the first since 2000 – were well anticipated by market participants but surprisingly weak growth in US employment weighed on bond and equity markets. Higher oil prices added to the negative sentiment. By contrast, investors in corporate debt markets seemed unfazed by economic developments.

In emerging debt markets, investors even turned bullish despite signs of global economic weakness. Most of the widening in emerging market spreads seen in April and May had reversed by August, with the renewal of carry trades reportedly contributing to the rally. Owing to such favourable financing conditions, the pace of borrowing by emerging market debtors showed no signs of moderating in the second quarter and early part of the third, with Asian firms in particular stepping up their international issuance.

Yields fall on growing uncertainty

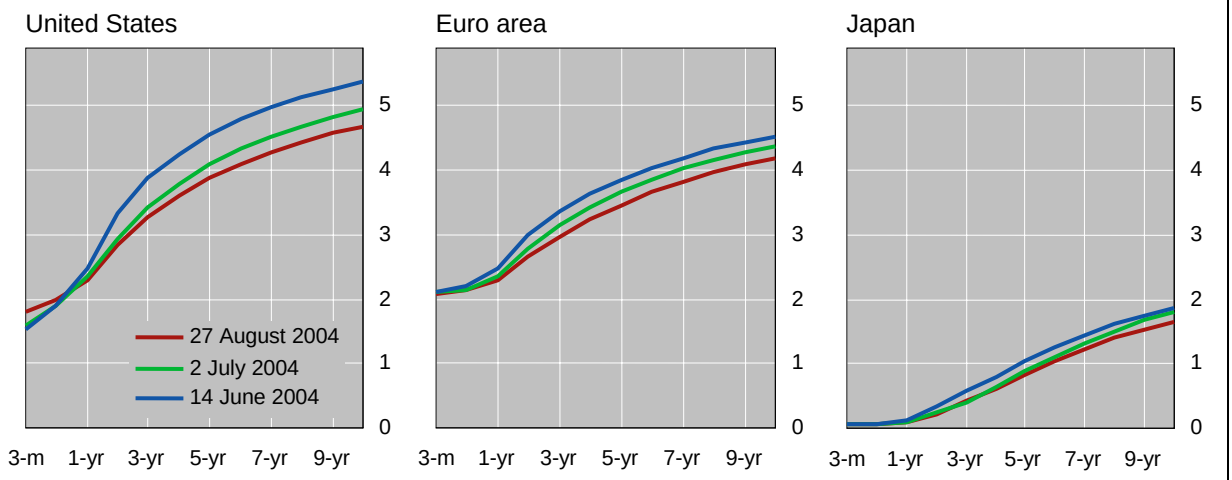
A muted response to higher policy rates …

The much anticipated turn in the US policy rate cycle finally occurred on 30 June, when the US Federal Reserve raised its target rate by 25 basis points. At its next meeting six weeks later, the Fed hiked rates by another 25 basis points. Significantly, the response of long-term yields was to fall rather than rise. From their peak in mid-June, yields on 10-year US dollar interest rate swaps moved 65 basis points lower by 27 August. Over the same period, yields on 10-year euro and yen interest rate swaps fell by around 35 and 20 basis points, respectively (Graph 1.1).

The movement of long-term yields contrasted sharply with their response to the first rate hike by the Fed in February 1994, also following a long period of low interest rates (Graph 1.2). In 1994 yields had risen sharply subsequent to the first move in the policy rate. The behaviour of volatilities also differed between 1994 and 2004. In 1994 implied volatilities had risen, while in July and August 2004 volatilities declined.

Swap yield curves

In per cent



Note: For three-, six- and 12-month US dollar and yen maturities, Libor; for three- and six-month euro maturities, euro deposit rates.

Source: Bloomberg.

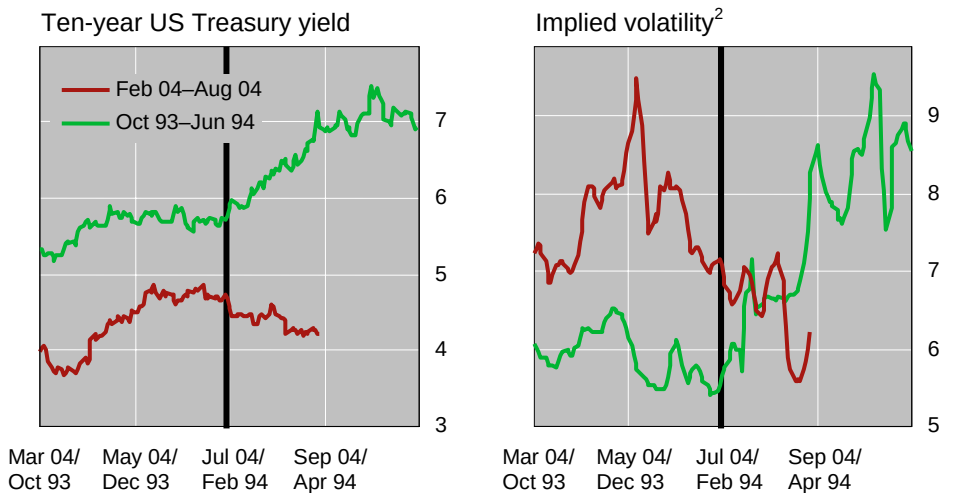
Graph 1.1

There are at least two reasons for the markedly different behaviour of bond markets in 2004 compared to 1994. One is that the Federal Reserve now communicates more fully and widely about its intentions.[1] As a result, whereas the move in February 1994 had surprised market participants, the most recent moves were already priced into bond markets. Indeed, in June and August

... due to prior Fed communication ...

US bond markets in 1994 and 2004[1]

In per cent



[1] Vertical lines = 29 June 2004/3 February 1994. [2] Five-day moving average; volatility implied by the price of at-the-money call options on 10-year US government bond futures contracts.

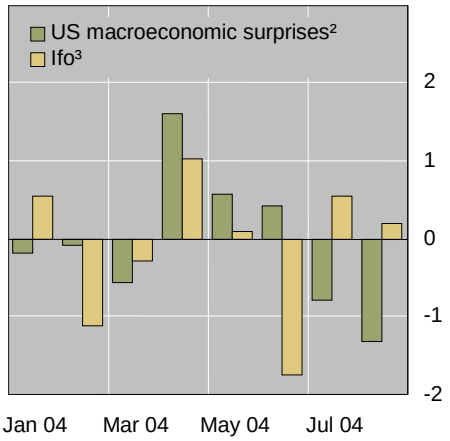
Source: Bloomberg.

Graph 1.2

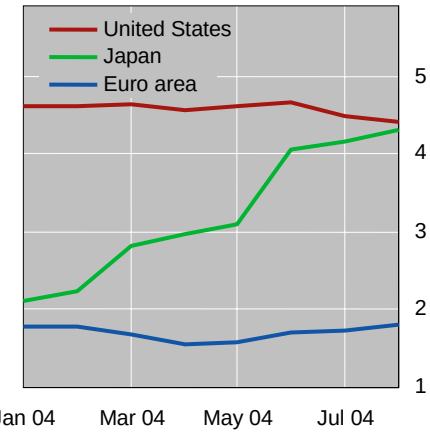
[1] See Bank for International Settlements, *74th Annual Report*, 28 June 2004, pp 73–80.

Macroeconomic data and growth forecasts

Macroeconomic surprises[1]



Growth forecasts for 2004[4]



[1] Normalised announcement surprises, based on the difference between actual numbers and consensus forecasts. The observations are positioned in the month in which the actual numbers were released. [2] Weighted average of normalised surprises of the ISM survey, non-farm payrolls, retail sales and producer price and consumer price announcements. [3] The German Ifo survey is a business climate index derived by the Institut für Wirtschaftsforschung from survey responses. [4] Percentage changes over previous year. Forecasts as published monthly by Consensus Economics. The observations are positioned at the end of the month in which the forecast was made.

Sources: Bloomberg; © Consensus Economics; BIS calculations. Graph 1.3

movements in long-term rates showed investors responding more to nuances in the statements accompanying the rate decisions than to the policy rate increases themselves. Market participants were reassured by the likely "measured pace" of future rate rises indicated by the Fed starting with its statement of 30 June.

… and a weaker than expected recovery

A second reason is that the economic news released in the weeks following the June rate increase indicated a less robust economy than seemed the case following the 1994 increases. The US employment reports released in early July and August were both far weaker than expected, triggering a sharp fall in bond yields around the world. Yields on 10-year US Treasuries fell by close to 20 basis points following each release. Combined with other weak reports, these caused economists to revise down their growth forecasts for the United States (Graph 1.3).

Bund yields respond more to US than to German data releases

In Europe, data releases came in stronger than many had expected. Nevertheless, long-term yields in the euro market, which had decoupled from dollar yields during the sell-off in April, tracked dollar yields closely in July and August. The fact that the European recovery depended on strong demand from abroad probably contributed to the renewed correlation in euro and dollar yields. For example, many observers interpreted the better than expected Ifo number on 27 July as reflecting improvements in exports rather than domestic demand, and the response of German bund yields to the announcement was muted.

In Japan too, market participants tended to attach greater significance to US news than to domestic developments. Macroeconomic data generally consistent with strong momentum in exports and business investment had

triggered a sharp run-up in long-term yen yields in June. However, yields moved back down in July and August despite further signs of a recovering economy. For example, on 9 August bond markets took little notice of a surprisingly strong machinery orders report and instead focused on the US employment report that had come out earlier.

Equity markets soften on profit warnings

Concerns about the strength of the economic recovery also loomed large in equity markets. Global equity markets had rebounded briefly in May but then in July resumed their downward trend. By 27 August, the S&P 500 was down by 3% compared to end-June 2004 (Graph 1.4). Similarly, the DJ EURO STOXX and TOPIX were 3% and 4% lower, respectively, than at the end of June 2004.

Profit warnings hurt equity markets …

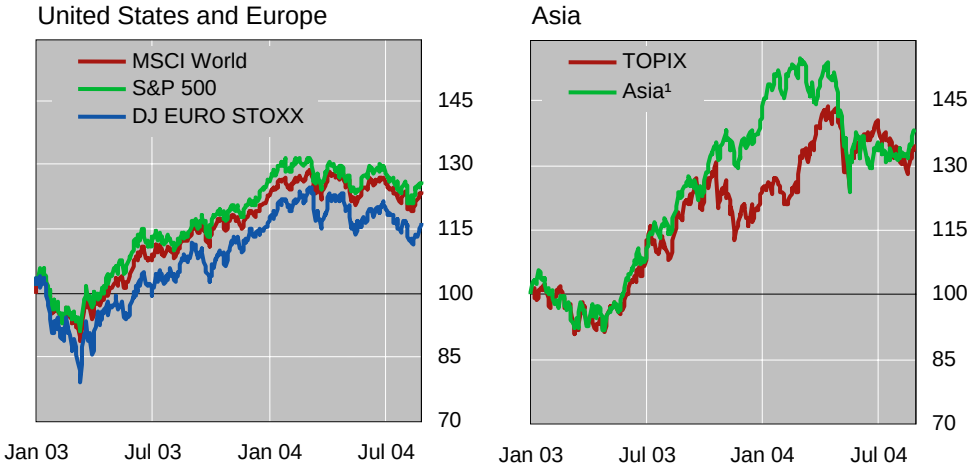
Equity markets tended to shrug off positive reports on second quarter earnings and instead focus on warnings about future profits. Nearly 70% of firms in the S&P 500 Index beat analysts' profit forecasts for the second quarter of 2004, up from approximately 65% for the same period a year earlier. However, firms' announcements about future earnings and revenue growth took a turn for the worse starting in June (Graph 1.5).

… especially in the IT sector

Profit warnings by IT firms had an especially large impact, and the IT sector underperformed broader indices. Intel's warning on 13 July that profit margins in the second half of 2004 would be less than expected led to a widespread sell-off in equity markets, including in Asian markets. Other bellwether technology companies whose guidance disappointed investors included Cisco Systems, Hewlett Packard and Nokia. Microsoft's announcement on 20 July of increased dividends and share buybacks totalling $75 billion over four years, which would normally have been viewed as positive for equity markets, was interpreted negatively by many investors as signalling a lack of investment opportunities in the technology sector.

Equity markets

In local currency; end-December 2002 = 100

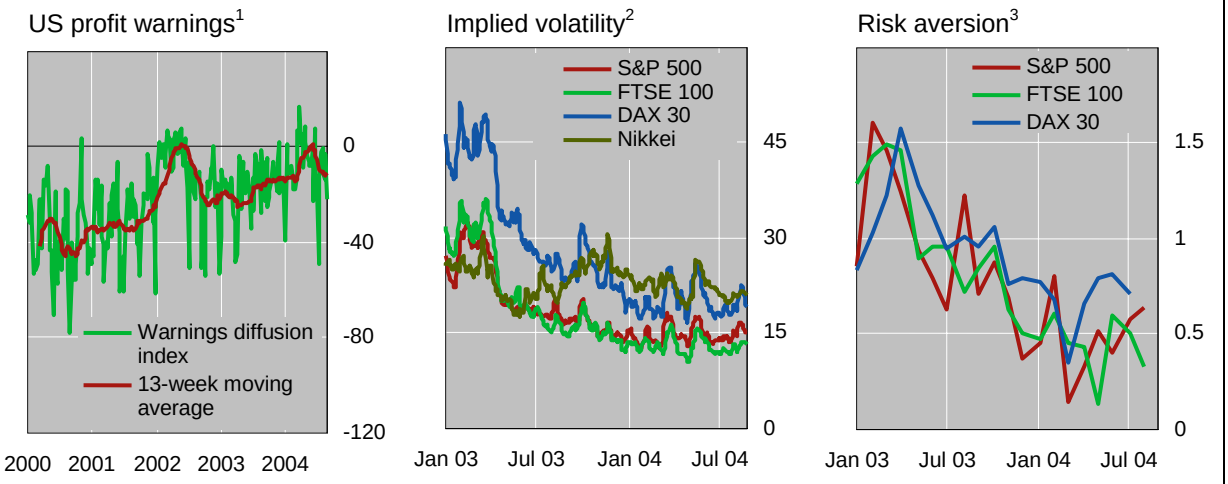


[1] Excluding Japan.

Source: Bloomberg.

Graph 1.4

Profits, volatility and risk aversion



[1] Companies in the S&P 500 Index. [2] Based on equity index put options; five-day moving average. [3] Derived from the differences between two distributions of returns, one implied by option prices with varying strike prices and one based on actual returns estimated from historical data. For more details, see the March 2004 issue of the *BIS Quarterly Review*.

Sources: Bloomberg; Chicago Mercantile Exchange; Eurex; London International Financial Futures and Options Exchange; BIS calculations. Graph 1.5

Higher oil prices hit equities as well

Rising oil prices also contributed to the weakness in global equity markets. Growing demand in the face of short-term constraints on supply helped to push up oil prices in 2004. By the end of June, the price of crude was nearly 14% higher than at the end of 2003; and the price rose another 17% by 27 August. Concerns about possible supply disruptions in some important oil-exporting countries, including Saudi Arabia, Russia and Venezuela, added to upward pressure on oil prices. Increased speculative activity was often cited as a factor contributing to the rise in oil prices, yet its significance is far from clear (see the box on page 6).

While higher oil prices have several times in the past preceded an increase in inflation, this time market participants seemed less concerned about this possibility and more worried about the dampening effect higher oil prices might have on aggregate demand and corporate profits. Long-term inflationary expectations – whether based on surveys or the prices of inflation-indexed bonds – remained restrained.

Low volatilities despite diminished risk appetite

Even as bond and equity investors reassessed near-term growth prospects, equity volatilities remained at low levels. The implied volatility of options on the S&P 500 Index stayed well below its 1995–2003 average of 20% and any upward jumps, such as following the release of the US employment report on 6 August, were quickly reversed. Measures of risk aversion derived from these options indicate that equity investors turned more risk-averse in the second and third quarters of 2004. This would normally be associated with an increase in implied volatilities. However, the impact was seemingly offset by investors' expectations that volatility would remain unusually low in the future.

In search of black gold: speculation in oil markets

The rapid increase in oil prices in recent months has focused attention on the role of speculators in the oil market. With prices in most major equity, bond and credit markets moving sideways or even declining, investors in search of higher returns have reportedly turned to commodity markets, oil in particular. Available data indicate that those market participants typically labelled as speculators have indeed increased their positions in oil markets. However, their motivation for increasing their positions and their influence on oil prices are unclear.

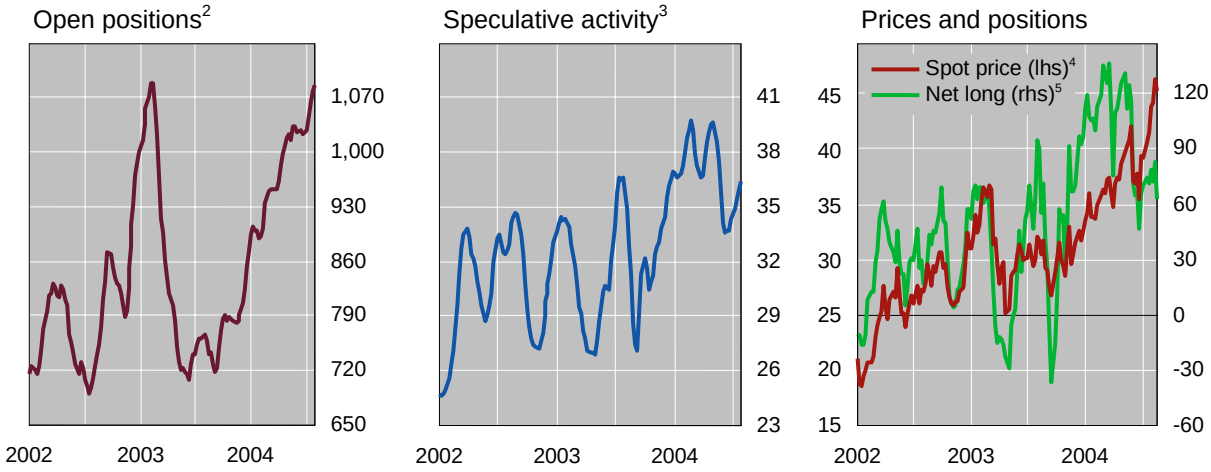
Speculation in oil markets occurs mainly in the futures market, where standardised contracts promote liquidity. A long position in futures markets is equivalent to borrowing funds to purchase the underlying good in the spot market and paying the carrying charges associated with storing the good until delivery. Consequently, arbitrage ensures a close link between futures and spot prices. Futures trading is highly concentrated: the New York Mercantile Exchange accounts for approximately 65% of global turnover in crude oil futures, the International Petroleum Exchange in London slightly more than 30%, and all other exchanges combined less than 5%.

Data compiled by the US futures regulator, the Commodity Futures Trading Commission (CFTC), indicate that non-commercial traders stepped up their activity in oil futures markets starting in late 2003. In particular, they sharply increased their long positions in expectation of a rise in oil prices. Non-commercial traders include investment banks, hedge funds and other market participants who trade in futures markets primarily for speculative purposes. Commercial traders are defined by the CFTC as those traders seeking to hedge their production or consumption.

Open positions in crude oil futures – contracts entered into but not yet offset by a reversing trade or delivery – increased by more than 25% over the first eight months of 2004 (see left-hand panel of graph below). Positions held by non-commercial traders increased to 37% of all open long positions on average over this period, up from 32% in 2003 (centre panel of graph below). By contrast, non-commercial traders' share of open short positions was on average down slightly from 2003. Changes in non-commercial traders' net long position – open long positions less open short positions – have tended to coincide with changes in the oil price. In fact, the correlation between weekly changes in oil prices and weekly changes in non-commercial traders' net long positions was close to 0.8 over the first eight months of 2004.

It is possible that the larger presence of non-commercial traders in the oil market contributed to herd-like behaviour. Their presence, coupled with the upward trend in oil prices, might have made traders wary of positioning against further increases in oil prices, thereby effectively reinforcing the upward trend. However, it is also possible that shifts in activity in the futures market were driven by changing perceptions of fundamental imbalances in the supply of and demand for oil, including the changing perceptions of commercial traders. The available data shed little light on the motivations behind changes in positions.

Oil futures markets[1]



[1] Crude oil futures contracts traded on the New York Mercantile Exchange. [2] Four-week moving average; in thousands of contracts. [3] Long positions of non-commercial traders as a percentage of total reportable long positions; four-week moving average. [4] Price of West Texas Intermediate oil; in US dollars. [5] Net positions (long minus short) of non-commercial traders; in thousands of contracts.

Sources: Bloomberg; New York Mercantile Exchange; national data; BIS calculations.

Improving credit quality supports credit spreads

Credit spreads tighten …

Investors in credit markets seemed unfazed by developments in bond and equity markets. Spreads on US dollar-denominated bonds issued by BBB-rated corporations were largely unchanged over the first eight months of 2004, fluctuating between approximately 120 and 130 basis points. Spreads on BBB-rated euro-denominated bonds actually inched downwards, falling to about 80 basis points by late August from 90 basis points at the end of 2003 (Graph 1.6). Corporations rated below BBB are typically more sensitive to higher interest rates than investment grade corporations because they tend to have larger debt burdens and shorter-term liabilities. Yet, even high-yield corporate spreads remained relatively stable following the increases in US policy rates. Indeed, in early August high-yield corporate spreads in the dollar market approached the lows reached earlier in 2004.

… as defaults decelerate …

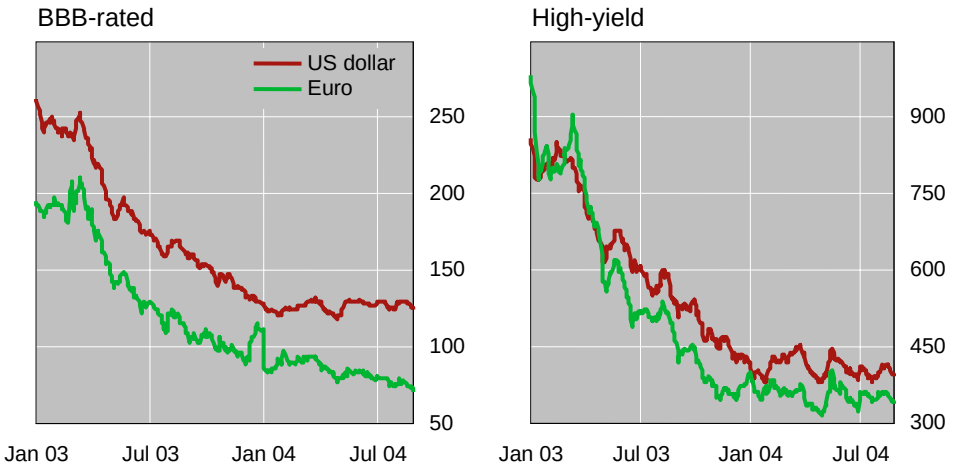
Credit investors appeared to take comfort from continued improvements in corporate credit quality. The number of defaults and rating downgrades fell further in the first half of 2004. Indeed, according to Moody's, global upgrades exceeded downgrades for the first time since 2000, albeit by a slim margin. In both Europe and the United States, the turnaround in credit quality was led by financial institutions, especially banks. Among non-financial corporations, downgrades still exceeded upgrades, but the gap continued to narrow.

… and corporations deleverage

New borrowing by US, European and Japanese corporations remained restrained as firms continued their efforts to deleverage. Corporate bond issuance in the US dollar market was down by 15% in the first half of 2004 compared to the same period a year earlier, and in the euro market issuance was almost 40% weaker (Graph 1.7). While syndicated lending surged to record levels in the second quarter, much of this reflected refinancing activity (see "International syndicated credits in the second quarter of 2004" on page 23). Banks enticed borrowers to refinance loans before maturity by

Credit spreads[1]

Option-adjusted spreads over government bond yields; in basis points



[1] Merrill Lynch corporate bond indices.

Sources: Bloomberg; Merrill Lynch. Graph 1.6

offering ever more attractive financing terms; spreads on syndicated loans appeared to continue to narrow in the first half of the year even though spreads on corporate bonds were little changed.

Corporate borrowing could pick up in the near future. In the United States especially, much of the improvement in corporate balance sheets in 2002–03 was driven by a rebound in corporate profitability.[2] With profit growth now beginning to slow, corporations' borrowing requirements are likely to increase if the rebound in capital investment, which began in mid-2003, persists. Already there are signs of a rise in short-term borrowing. For example, issuance of commercial paper by non-financial corporations in the United States and the euro area recovered in the first half of 2004 (Graph 1.7).

Increased corporate liquidity …

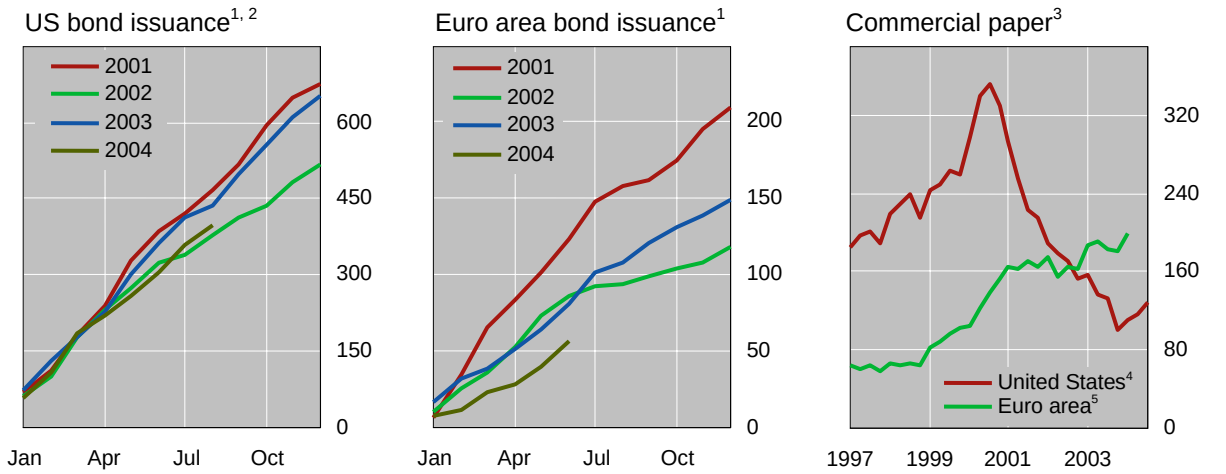
While US and European firms have in recent years accumulated substantial amounts of cash, it is not clear that they will choose to run down these assets either to reduce new borrowing or to retire outstanding debt. By end-March 2004, liquid assets equalled 23% of debt owed by US non-financial corporations, compared to 18% on average during the 1990s (Graph 1.8). Cash and deposits held by euro area corporations equalled nearly 25% of outstanding debt. These assets could be used to meet financing requirements, for example to retire maturing debt, and thereby benefit bondholders. Alternatively, they could be used to finance mergers and acquisitions, share buybacks or dividend payouts – actions which benefit shareholders more than bondholders.

… has triggered share buybacks

Firms appear to be opting for the latter uses. Acquisitions, including leveraged buyouts, and share repurchases are increasing. Available data indicate that share buybacks by US companies have risen by more than initial

Corporate debt markets

Non-financial corporations; in billions of local currency



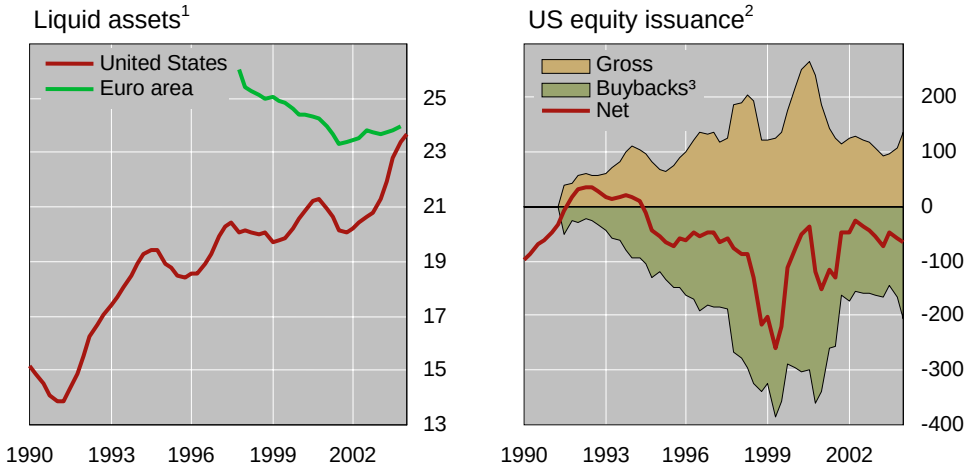
[1] Cumulative gross monthly issuance. [2] Including financial corporations. [3] Amounts outstanding. [4] Seasonally adjusted. [5] Issued in domestic and international markets.

Sources: European Commission; Bloomberg; Euroclear; national data; BIS calculations. Graph 1.7

[2] See Bank for International Settlements, *74th Annual Report*, 28 June 2004, pp 111–12.

Corporate financing

Four-quarter moving average



[1] Currency and bank deposits as a percentage of total debt (loans plus securities other than shares); for the United States, includes marketable financial assets; non-financial corporations. [2] In billions of US dollars; annualised. [3] Estimated as the difference between gross equity issuance reported by Bloomberg and net equity issuance from flow of funds data.

Sources: ECB; Bloomberg; national data; BIS calculations. Graph 1.8

and follow-on share offerings since mid-2003, resulting in a decline in the net issuance of equities. In contrast to the early 1990s, net issuance of equities by US firms never turned positive during the most recent period of corporate deleveraging.

Emerging markets rebound despite rate hikes

Emerging market spreads also tighten …

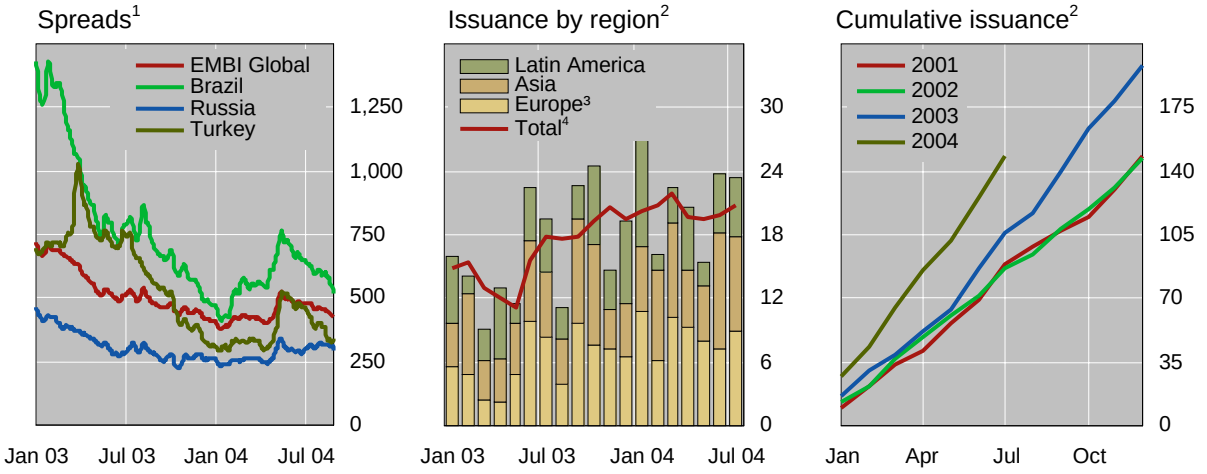
Emerging market investors, like credit investors, seemed unperturbed by the negative news that dragged down bond yields and equity prices in the major markets. In fact, spreads on emerging market debt tightened as US yields fell (Graph 1.9). Most of the widening in emerging market spreads that had occurred during the sell-off in global bond markets in late April and early May was reversed over the next three months. On 27 August, emerging market spreads stood at 425 basis points, 125 basis points below their mid-May peak.

… spurred by the renewal of carry trades

The renewal of carry trades that had been unwound during the sell-off reportedly contributed to the narrowing of emerging market spreads in July and August. Investors increased their positions in higher-yielding debt, helping to push sovereign spreads for Brazil, Turkey and other low-rated countries down sharply from their mid-May peak. Favourable domestic economic news, including a rising current account surplus in Brazil and strong productivity gains in Turkey, provided further support for the rally.

While changing expectations regarding US policy rates were the dominant drivers of market moves, other factors at times added to volatility. The German government's securitisation of bilateral loans to Russia raised the possibility of similar sales by other governments (see "The international debt securities market" on page 25). Consequently, immediately following the announcement of the transaction on 24 June, Russia's sovereign spread widened by more

Emerging markets



[1] Sovereign stripped spreads over government bond yields, in basis points; JPMorgan Chase emerging market bond indices. [2] Announced issuance of international bonds, notes and syndicated loans; in billions of US dollars. [3] Including the Middle East and Africa. [4] Three-month moving average.

Sources: Dealogic; JPMorgan Chase; BIS calculations. Graph 1.9

than 20 basis points and the EMBI Global by 10 basis points. However, conditions quickly stabilised as market participants came to understand the one-off nature of the transaction.

Minimal fallout from the Russian banking crisis

Notably, a run on Russian banks around mid-year had little impact on even Russian markets. The banking crisis began in May, when the Russian authorities closed a bank allegedly involved in money laundering. Depositors subsequently withdrew their money from other banks suspected of similar activities, culminating in early July in a massive withdrawal of deposits from several of the largest privately owned banks. To ease banks' liquidity problems, the central bank relaxed reserve requirements in late June, encouraged state-owned banks to increase their interbank lending, and sponsored the introduction of deposit insurance in mid-July. Owners of banks faced with withdrawals injected additional capital or sold the bank to a stronger bank. Owing to the prompt response of the authorities and bank owners to the banking crisis, Russia's sovereign spreads were little changed (Graph 1.9). Even overnight interbank rates remained below the highs reached during the general sell-off of emerging market debt in April.

High growth of debt issuance

Emerging market issuers moved quickly to take advantage of the favourable financing conditions prevailing through mid-year. The pace of borrowing by emerging market debtors in international bond and syndicated loan markets showed no signs of slowing, with $23 billion raised in July alone (Graph 1.9). Asian borrowers were especially active, mainly export-oriented firms from Korea and Taiwan, China. Prefunding in advance of anticipated increases in US policy rates contributed to the high level of issuance, with some of the surplus funds being deposited in turn with banks in the major financial centres (see "The international banking market" on page 11).

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2. The international banking market

Cross-border activity surged in the first quarter of 2004. US dollar-denominated interbank claims, much of them involving repo transactions, drove the increase. Euro-denominated claims were up too. Although overshadowed by interbank activity, new credit to non-bank borrowers was also robust. Notably, this credit seemed to reflect a pickup in lending to offshore and other major financial centres, as well as purchases of government and other international debt securities, rather than renewed corporate loan demand.

A record expansion in deposits placed with BIS reporting banks outpaced a rise in lending to emerging markets, resulting in an overall net outflow from these economies. The growth in deposits to some extent reflected the placement with BIS reporting banks of foreign exchange reserves held by monetary authorities in emerging markets. Among different regions, increased deposits in BIS reporting banks contributed to net outflows from Asia-Pacific, Latin America and the Middle East and Africa, while a rise in claims on emerging Europe led to a net inflow there.

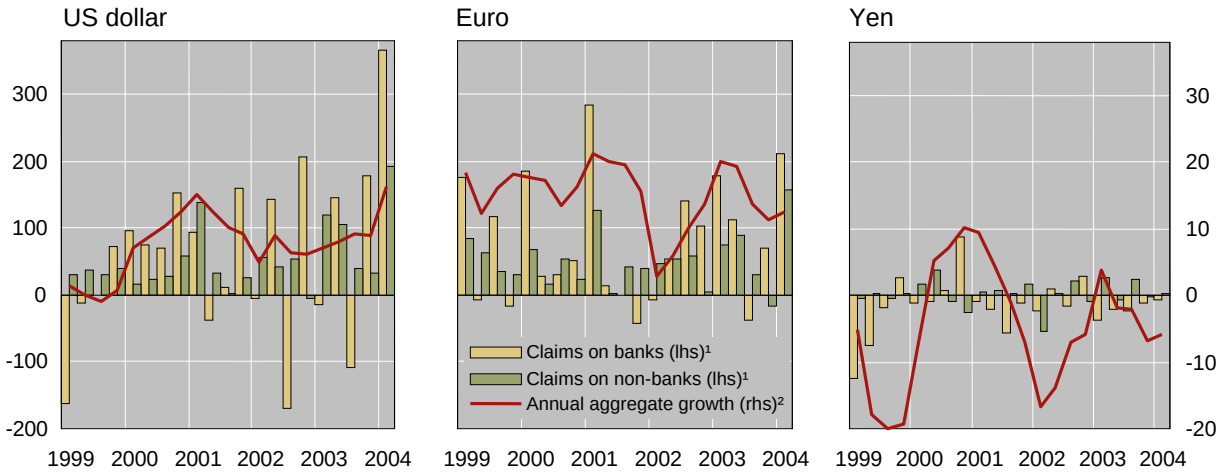
Record increase in claims fuelled by interbank activity

A record surge in total claims in the first quarter of 2004 was fuelled by US dollar- and euro-denominated interbank business (Graph 2.1). Total interbank claims of BIS reporting banks rose by $778 billion, by far the largest quarterly increase in the BIS coverage period. New credit to non-bank borrowers also rose by a record amount ($403 billion), driving total claims up by 7.5% from the previous quarter to $17.2 trillion. This pickup in credit to non-bank borrowers, while large, did not seem to indicate new lending to non-financial corporates. Rather, the flow was primarily to borrowers in the United Kingdom, offshore centres and other major financial centres, areas with a high concentration of non-bank financial activity.

Banks send dollars to London for distribution to borrowers elsewhere

Fuelled by a pickup in repurchase agreements, interbank claims soared in the first quarter of 2004. The $778 billion increase, almost double the previous record rise, was driven by US dollar-denominated interbank activity, although euro-denominated interbank claims expanded noticeably as well. Globally, Swiss, French, US, German and UK banks poured funds into the interbank

Cross-border claims by sector and currency



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

Graph 2.1

market. While virtually all of Swiss banks' activity was accounted for by inter-office transfers ($144 billion of a $146 billion increase), less than half of the overall rise in the interbank lending of French, US and UK banks reflected inter-office claims.[1]

Banks channel US dollars to London ...

Banks deposited substantial US dollar-denominated funds in the United Kingdom, driving London banks' largest net inflow of US dollars in the BIS reporting period. Deposits from banks in offshore centres, the United States and the euro area contributed to a $136 billion increase in interbank liabilities of banks in London, primarily German-, Swiss- and UK-headquartered banks located there. However, despite relatively robust interbank lending out of the United Kingdom, less than two thirds of the deposited funds were redirected back into the interbank market. This yielded a $69 billion net inflow of US dollars to banks in the United Kingdom.

... for distribution to borrowers elsewhere

These funds were used to finance US dollar lending to non-bank borrowers. Indeed, this sectoral transformation, by which US dollar funds from the London interbank market are used to finance US dollar borrowing by non-banks, has become more apparent since the late 1990s (see the special feature on London's interbank market on page 67. In the most recent quarter under review, banks in London channelled US dollars from the interbank market to non-bank borrowers resident in the United Kingdom ($30 billion in net funds), the United States (a net $22 billion) and offshore centres (a net $12 billion).

[1] Only $42 billion of French banks' $124 billion increase in interbank claims resulted from inter-office activity. The corresponding figure for US banks was $50 billion of a $119 billion increase, and that for UK banks was $56 billion of $113 billion. None of the interbank lending of German banks reflected inter-office activity (–$8 billion of $116 billion).

Loans flow to non-bank borrowers in major financial centres

More generally, the growth in credit to non-bank borrowers in the first quarter of 2004 seemed to reflect new lending to offshore centres and other financial centres, as well as investment in debt securities. Total claims on non-banks were up by a record $403 billion; the increase in US dollar-denominated credit ($193 billion) was driven by new loans and that in euro-denominated credit ($157 billion) reflected investment in euro area debt securities.

Credit to non-banks is driven by loans to offshore centres ...

While new loans to non-bank borrowers were strong by the standards of recent quarters, this is unlikely to have reflected a pickup in corporate loan demand. Nearly one quarter of the increase in US dollar-denominated loans to non-banks, and nearly two thirds of euro-denominated loans, flowed to non-bank borrowers in offshore centres, Luxembourg and the United Kingdom, areas with considerable non-bank financial activity. For instance, the BIS consolidated statistics, which track the global operations of banks headquartered in a particular country, indicate that roughly 90% of the expansion in German banks' claims on the non-bank private sector flowed to borrowers in these areas. The corresponding figures for Belgian and Dutch

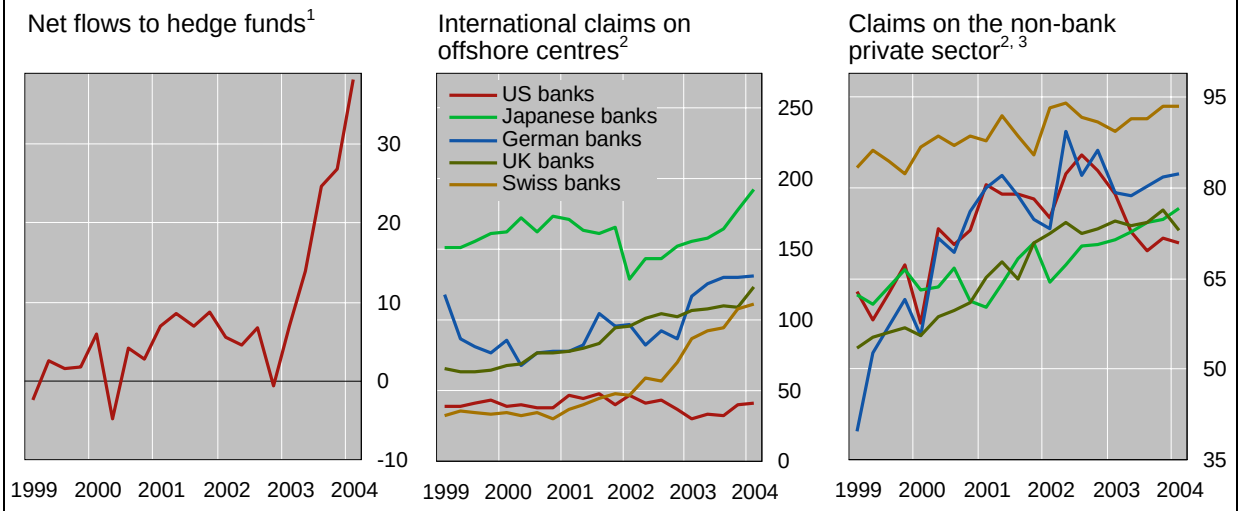
Cross-border claims of BIS reporting banks

Exchange rate adjusted changes in amounts outstanding, in billions of US dollars[1]

	2002	2003	2003				2004	Stocks at end-Mar 2004
	Year	Year	Q1	Q2	Q3	Q4	Q1	
Total cross-border claims	740.1	1,076.6	376.8	493.8	–110.0	315.9	1,180.8	17,185.2
on banks	425.0	531.0	175.6	307.9	–229.5	277.1	777.9	11,084.2
on non-banks	315.2	545.5	201.2	185.9	119.5	38.9	402.9	6,101.0
Loans: banks	392.9	453.2	142.1	325.6	–262.5	248.1	701.7	9,449.0
non-banks	103.8	277.4	142.0	24.3	91.4	19.6	213.5	3,225.4
Securities: banks	36.3	75.4	26.2	–8.2	21.1	36.3	64.0	1,154.5
non-banks	202.2	208.2	70.4	123.4	9.2	5.3	169.6	2,555.3
Total claims by currency								
US dollar	320.4	500.3	105.3	252.4	–68.3	210.9	559.2	6,881.7
Euro	453.3	503.0	254.4	202.6	–7.9	53.9	371.2	6,333.8
Yen	–42.3	–50.4	–10.9	–25.4	0.7	–14.8	–3.2	785.2
Other currencies[2]	8.7	123.7	28.0	64.2	–34.5	65.9	253.6	3,184.5
By residency of non-bank borrower								
Advanced economies	315.1	459.3	148.8	159.9	103.3	47.3	339.6	4,807.5
Euro area	117.4	157.5	57.2	67.5	50.5	–17.7	149.9	2,151.6
Japan	4.1	38.4	21.5	15.6	6.5	–5.2	–0.3	184.8
United States	153.1	179.9	25.8	60.0	40.9	53.3	101.3	1,621.4
Offshore centres	18.8	99.8	80.9	18.9	10.2	–10.2	42.7	672.2
Emerging economies	–16.5	5.1	–6.2	3.3	4.9	3.1	25.1	572.7
Unallocated[3]	–2.2	–18.7	–22.3	3.8	1.1	–1.3	–4.5	48.6
Memo: Local claims[4]	*44.5*	*415.2*	*180.6*	*88.8*	*51.7*	*94.1*	*194.2*	*2,534.1*

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

Inflows to hedge funds and claims on offshore centres



[1] In billions of US dollars. [2] BIS consolidated banking statistics, amounts outstanding in billions of US dollars. [3] As a percentage of total international claims.

Sources: TASS Research; BIS. Graph 2.2

banks, which channelled fairly substantial funds to this sector, were 75% and 48% respectively. This occurred in a quarter in which hedge funds enjoyed a record net inflow of funds (Graph 2.2).

... and borrowers in the United States

US dollar-denominated claims on non-bank borrowers outside these areas also rose noticeably, the result of new credit from banks in offshore and other major financial centres. In particular, over half of the increase in total US dollar-denominated loan activity was accounted for by $83 billion in new loans to non-bank borrowers in the United States. Three quarters of these loans came from banks in the United Kingdom, and much of the rest from banks in offshore centres, suggesting the funding of securities houses. While the pickup in loans could indicate renewed corporate loan demand, evidence from the US flow of funds data and the bond markets suggests otherwise. Total bank credit in the United States rose by $905 billion in the first quarter, but was driven by investment in agency securities and mortgage lending rather than lending to corporates. Moreover, the growth in corporate earnings in the United States, and prefunding by some firms in 2003, led to sluggish bond issuance in the first quarter of 2004, indicating weak corporate demand for funds.[2]

While US dollar-denominated loan activity drove overall claims on non-bank borrowers, investment in euro-dominated international debt securities was strong as well. Two thirds of the $157 billion increase in euro-denominated claims took the form of international debt security claims, over half of which

[2] Total bond issuance by non-financial corporations was down by roughly 5% over the first four months of 2004 compared to the same period in the previous year. See the Overview of the June 2004 *BIS Quarterly Review*.

were vis-à-vis Germany, Italy and France, countries which issued significant amounts of government debt in the first quarter of 2004.[3]

Deposits stoked by growth in foreign exchange reserves

A substantial increase in deposits placed with BIS reporting banks led to net outflows from developing countries for the third consecutive quarter. In the first quarter of 2004, banks in emerging markets, primarily those in Asia-Pacific and the Middle East and Africa, deposited a record $97 billion with BIS reporting banks. Credit to all sectors in emerging markets was overshadowed by the increase, yielding a net outflow of $34 billion, the largest since the first quarter of 2001.

A rise in deposits from emerging markets ...

The robust growth in deposits seemed to at least partially reflect the accumulation and management of reserves by monetary authorities in emerging economies. Deposit liabilities of BIS reporting banks to official monetary institutions (worldwide) grew by $58.5 billion in the first three months of 2004, the largest quarterly rise since late 1999. This occurred during a quarter in which foreign exchange reserves deposited with commercial banks by official monetary authorities in many *developed* countries decreased, suggesting that much of the growth observed in the BIS data was due to monetary authorities in emerging markets. Indeed, deposit liabilities to these monetary authorities accounted for an estimated two thirds, or $424 billion, of the total stock of deposit liabilities of BIS reporting banks to official monetary authorities.[4]

... coincides with an increase in FX reserves

Although data on reserves held as deposits are not available for most countries (see box on page 18), Graph 2.3 shows that the rise in *total* (across region) foreign exchange reserves observable since 2002 has coincided with an equally sharp rise in the stock of liabilities vis-à-vis banks in each region. Presumably, this reflects the placement of (a portion of) these foreign exchange reserves with BIS reporting banks.[5] In the most recent quarter under review, total foreign exchange reserves of emerging markets grew by

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[3] Net issuance of international debt securities (all currencies) by euro area governments hit a record $76.4 billion in the first quarter of 2004. Germany, France and Italy accounted for half of this. See the international debt securities chapter of the June 2004 *BIS Quarterly Review* for a discussion.

[4] Data on the BIS reporting banks' positions vis-à-vis official monetary authorities are available only on an aggregate basis (ie no vis-à-vis country breakdown). Thus, the estimate for total deposits with BIS reporting banks from emerging market monetary authorities is calculated as a residual. The foreign exchange reserves held as bank deposits for developed countries (from the IMF SDDS data) and the ECB, and the BIS's asset position vis-à-vis commercial banks (taken from the 2004 *BIS Annual Report*), are subtracted from the aggregate liabilities of BIS reporting banks to official monetary authorities.

[5] Liabilities vis-à-vis banks in the BIS data include liabilities to both commercial banks and central banks. The data from the IMF track total foreign exchange reserves held by monetary authorities in emerging markets, whether placed with banks abroad (and thus captured in the BIS data) or held in another form (eg debt securities).

Cross-border bank flows to emerging economies

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

	Banks' positions[1]	2002	2003	2003				2004	Stocks at end-Mar 2004
		Year	Year	Q1	Q2	Q3	Q4	Q1	
Total[2]	Claims	–37.0	65.0	34.3	–4.6	20.6	14.7	67.1	1,080.3
	Liabilities	–45.9	71.9	11.0	–10.3	28.2	43.1	101.5	1,324.4
Argentina	Claims	–11.8	-8.5	–1.9	0.9	–5.4	–2.1	–2.5	21.2
	Liabilities	0.0	–0.8	0.5	0.1	–2.2	0.7	0.2	25.0
Brazil	Claims	–11.2	–7.2	2.2	–1.7	1.4	–9.1	1.8	85.5
	Liabilities	–8.0	14.4	3.3	6.6	7.9	–3.4	4.9	61.7
China	Claims	–12.4	13.5	16.0	–6.4	4.9	–1.0	13.9	75.0
	Liabilities	–3.6	–6.4	1.4	–11.3	1.8	1.8	18.3	107.6
Czech Rep	Claims	2.3	3.7	0.7	0.5	0.8	1.7	–1.6	18.2
	Liabilities	–3.7	–2.4	–1.8	0.1	0.2	–0.9	–2.6	7.4
Indonesia	Claims	–6.0	–4.6	–1.0	–1.0	–1.9	–0.8	0.3	29.2
	Liabilities	–2.4	0.2	0.4	–0.1	–0.5	0.3	–0.3	12.2
Korea	Claims	8.2	–1.0	2.3	–2.0	–1.5	0.1	14.2	91.6
	Liabilities	0.5	7.3	–0.8	–6.1	2.1	12.1	21.7	61.7
Mexico	Claims	3.1	–0.7	–0.5	–0.1	0.8	–0.9	6.4	71.6
	Liabilities	–11.4	6.2	4.5	2.2	–0.3	–0.1	3.1	65.1
Poland	Claims	2.9	3.3	0.9	0.9	1.0	0.4	2.4	35.3
	Liabilities	–3.1	–0.1	0.8	–1.1	–1.0	1.2	3.0	21.8
Russia	Claims	3.6	12.1	1.8	1.7	2.8	5.8	3.5	55.5
	Liabilities	9.6	16.2	5.6	–4.4	7.2	7.9	4.9	62.6
South Africa	Claims	–0.4	–1.2	–0.2	0.5	–0.9	–0.7	–0.1	18.5
	Liabilities	2.7	9.7	0.6	4.8	1.4	2.8	4.1	36.3
Thailand	Claims	–5.0	–1.6	–0.3	0.3	0.0	–1.6	–1.0	18.0
	Liabilities	–4.6	5.7	2.5	–0.9	0.9	3.2	–1.5	16.2
Turkey	Claims	–2.8	5.3	2.4	–0.5	3.4	0.1	4.1	48.1
	Liabilities	0.0	–0.4	–3.9	1.5	1.0	0.9	2.8	23.1
Memo:									
EU accession countries[3]	*Claims*	*10.1*	*21.9*	*5.8*	*1.4*	*5.6*	*9.1*	*4.4*	*130.6*
	Liabilities	*–6.4*	*–-0.8*	*–2.1*	*–1.2*	*2.0*	*0.5*	*4.1*	*70.6*
OPEC members	*Claims*	*–9.9*	*–6.5*	*–0.1*	*–6.5*	*–1.9*	*2.0*	*9.2*	*139.1*
	Liabilities	*–8.8*	*–15.1*	*–5.2*	*–11.8*	*–10.2*	*12.2*	*16.1*	*266.9*

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

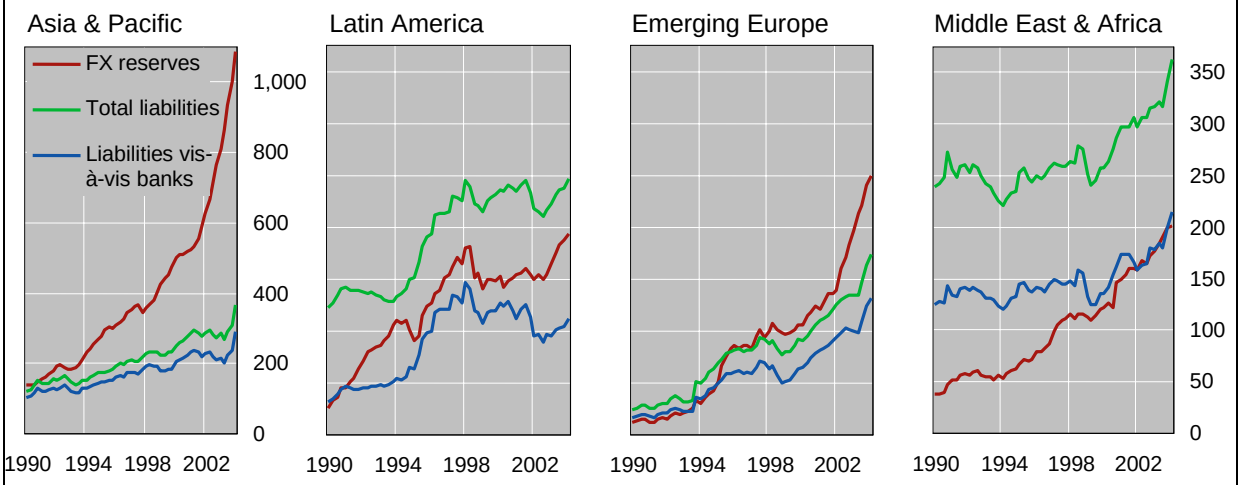
Table 2.2

$107 billion. At the same time, total liabilities of BIS reporting banks vis-à-vis banks in these same countries expanded by $88 billion, driven by an increase in deposits.[6]

[6] The countries included in these calculations are those emerging markets for which the IMF provides total foreign exchange reserve data (excluding those countries classified by the IMF as emerging markets but classified by the BIS as offshore centres). For Taiwan (China), total reserves minus gold is used, whereas total foreign exchange reserves is used for all other countries.

FX reserves and BIS reporting banks' liabilities

Amounts outstanding, in billions of US dollars



Sources: IMF; BIS. Graph 2.3

Over the longer term as well, changes in foreign exchange reserves seem to have been an important driver of BIS reporting banks' deposit liabilities to the banking sector in emerging markets. While this relationship is quite strong for several key countries, it is far from perfect for a number of reasons (see box on page 18). Overall, this link is clearest in Latin America, where Brazil and Mexico are the major reserve holders, but much weaker in Asia-Pacific, where China and Taiwan (China)[7] are the dominant countries. A longer-term analysis suggests that across all emerging markets, a $1 increase in foreign exchange reserves is associated with a 17 cent increase in deposit liabilities vis-à-vis banks.

Banks across Asia deposit funds abroad

Outflow from Asia-Pacific driven by ...

The largest placement of deposits came from banks in Asia-Pacific, fuelling an even larger net outflow of funds from the region than that which occurred in the previous quarter. Banks in Korea, India, China and, to a lesser extent, Malaysia contributed to a $62 billion increase in deposits placed abroad, bringing total liabilities of BIS reporting banks vis-à-vis banks in the region to $297 billion. While this region also saw the most significant growth in foreign exchange reserves, it was not always in those countries which deposited funds abroad. New credit to banks in the region was also exceptionally strong, with $29 billion in new loans flowing to banks, primarily in Korea, China and Taiwan.

[7] Hereafter Taiwan.

Exploring the link between BIS banks' liabilities and foreign exchange reserves

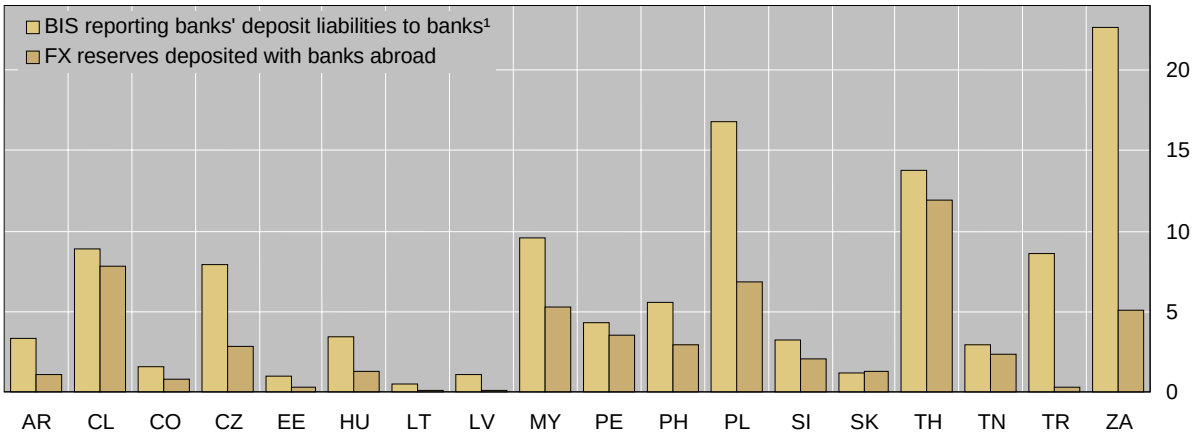
In many emerging markets, a large portion of foreign exchange reserves managed by the monetary authority is placed as deposits with commercial banks outside the country. Indeed, it appears that in several countries, these bank deposits placed abroad dwarf those placed by commercial banks, and account for a significant share of BIS reporting banks' deposit liabilities to these countries' banking sector. In several key emerging markets, however, only a small fraction of foreign exchange reserves is held as deposits in banks abroad. Drawing on several data sources, this box explores the link between emerging markets' foreign exchange reserves and the BIS banking data. Overall, the link between reserves and BIS reporting banks' deposit liabilities to banks appears to be quite strong for many countries, particularly in Latin America and emerging Europe, although regional differences are quite apparent.

Several emerging market countries provide data to the IMF on the *portion* of their monetary authorities' total foreign exchange reserves that is placed as deposits with banks abroad (Graph A). At end-2003, for example, more than three quarters of the BIS reporting banks' deposit liabilities vis-à-vis banks in Chile, Peru, Slovakia, Thailand and Tunisia, and more than half vis-à-vis those in Columbia, Malaysia, the Philippines and Slovenia, were accounted for by deposits of foreign exchange reserves (assuming these reserves were placed with banks in BIS reporting countries). Moreover, inspection of the time series data indicates that movements in reserves often drive the quarterly swings in the BIS deposit liability data, even for some countries where the stocks of reserves and deposit liabilities are quite different. However, many key countries do not report to the IMF, in particular Brazil, China, Korea, Mexico, Russia and Taiwan.

A less direct comparison between the BIS data and *total* foreign currency reserves is potentially useful in explaining movements in the BIS data, as these data are available for a much larger sample of countries. However, such a comparison is not without problems. The total reserve figures include investment in debt securities and deposits placed with other monetary institutions, domestic banks and banks abroad.[①] In general, only the latter are captured in the BIS banking data.[②] Moreover, for any particular emerging market, the BIS data record only the aggregate deposit liability position vis-à-vis banks, which includes deposit liabilities vis-à-vis the commercial

Emerging market deposits of FX reserves and deposit liabilities of BIS reporting banks

End-2003, in billions of US dollars



AR = Argentina, CL = Chile, CO = Colombia, CZ = Czech Republic, EE = Estonia, HU = Hungary, LT = Lithuania, LV = Latvia, MY = Malaysia, PE = Peru, PH = Philippines, PL = Poland, SI = Slovenia, SK = Slovakia, TH = Thailand, TN = Tunisia, TR = Turkey, ZA = South Africa.

[1] Deposit liabilities vis-à-vis banks in the country shown.

Sources: IMF; BIS calculations. Graph A

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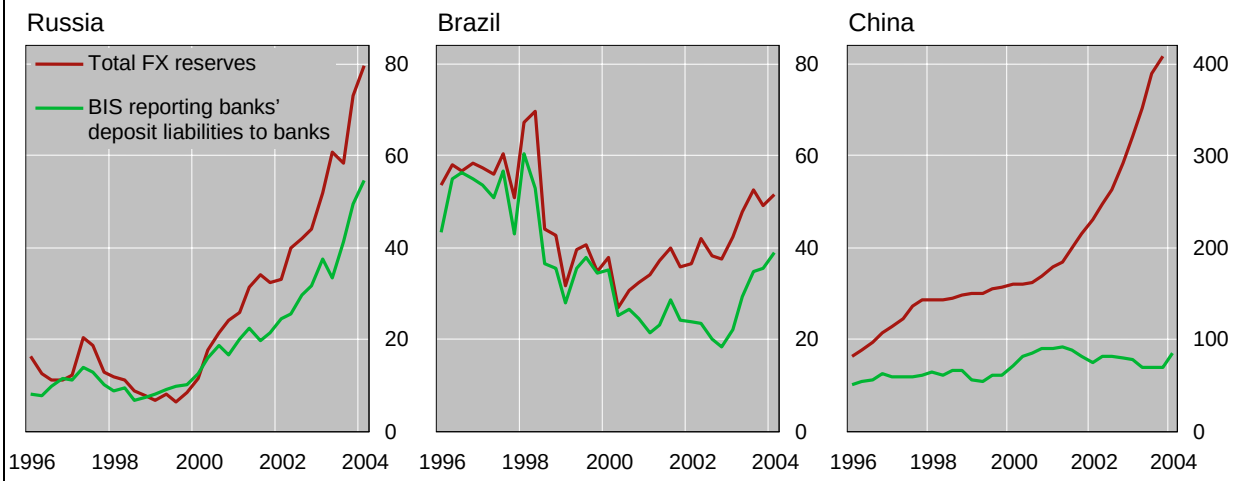
① The SDDS data imply that for the 18 countries listed in Graph A, on average roughly one quarter of total foreign exchange reserves are held as deposits with banks abroad. Robert McCauley and Ben Fung in "Choosing instruments in managing dollar foreign exchange reserves", *BIS Quarterly Review*, March 2003, estimate that, globally, 3% of total US dollar-denominated reserve assets are held as deposits in banks in the United States, and an additional 12% in banks offshore. ② Foreign currency deposits placed in banks located in the emerging market are captured in cases where the emerging market is also a BIS reporting country.

Emerging market total FX reserves and deposit liabilities of BIS reporting banks

In billions of US dollars



Sources: IMF; BIS. Graph B

banking sector as well as the monetary authority. Finally, in some countries, foreign exchange reserves are managed not by the monetary authority, but by separate institutions which may not be classified as banks in the BIS banking data. Thus, the extent to which the movements in the BIS banks' stock of deposit liabilities to a particular country's banking sector reflect that country's placement of foreign exchange reserves with banks abroad will depend not only on the portion of reserves held as bank deposits abroad, but also on the size of the reserve position relative to the size of the domestic banking sector.

That said, inspection of the data reveals that the stock of deposit liabilities vis-à-vis banks located in many emerging markets and these countries' stock of foreign exchange reserves do indeed move together. While the cases of Russia and Brazil are fairly obvious (Graph B, left-hand and centre panels), the co-movement is also quite strong for Argentina, Mexico, Libya and, to a lesser extent, Korea, all countries with a relatively large share of the total reserves of monetary authorities within their respective regions. For other large reserve-holding countries, such as China (Graph B, right-hand panel), Taiwan and India, the relationship is considerably less clear.

The broad regional links between movements in reserves and deposits placed with banks abroad can be assessed using simple regression analysis. On the margin, deposit liabilities to banks in all emerging markets, on average, rise by $0.17 for a $1 increase in reserves (see table below). This figure obscures the considerable heterogeneity across regions. In Latin America, for instance, the coefficient is much larger, implying 76 cents on the dollar. This is driven by the relatively high degree of co-movement in the reserve and deposit liability data series for Brazil and Mexico, countries which together account for roughly 60% of Latin America's reserves. At the other extreme, the coefficient for Asia-Pacific is *statistically insignificant* because of the inclusion of China and Taiwan, countries which together hold over 60% of the region's total foreign exchange reserves. Excluding these countries, the coefficient for this region rises to 10 cents on the dollar, much closer to the overall rate.

Sensitivity of BIS reporting banks' liabilities to foreign exchange reserves

OLS panel regression results[1]

Dependent variable: Change in liabilities	All emerging markets	Latin America	Asia-Pacific	Asia-Pacific excl China & Taiwan	Emerging Europe	Middle East & Africa
Change in reserves	0.17	0.76	–0.03	0.10	0.22	0.34
R-squared	0.06	0.51	0.03	0.04	0.16	0.04

[1] Estimates are based on panel regressions of the change in BIS reporting banks' deposit liabilities to banks in emerging market countries on the change in foreign exchange reserves held by the authorities in these emerging markets. These regressions are run on data from 131 emerging market countries covering the period from the first quarter of 1996 to the first quarter of 2004. Foreign exchange reserve data are missing for some countries in some years. All regressions include a constant term and country dummy variables. All coefficients with the exception of that for Asia-Pacific (including China & Taiwan) are statistically significant at standard confidence levels.

Banks in Korea placed the most funds abroad, leading to the third consecutive quarterly net outflow of funds from the country. Across all sectors, Korea remains the BIS reporting banks' largest net debtor in Asia-Pacific. However, a $22 billion increase in deposits in banks in offshore centres pushed total net claims vis-à-vis all sectors in Korea down to $30 billion from $37 billion in the previous quarter and $50 billion at end-September 2003. This rise in deposits abroad dwarfs that in foreign exchange reserves over the same period, which went up by only $8.2 billion, implying that it was mostly commercial activity.

... deposits from banks in Korea, India and China

Increases in deposits were also behind net outflows from India and China. India experienced its largest net outflow in the BIS coverage period as banks in the country placed $11 billion with BIS reporting banks, primarily in the United Kingdom and offshore centres. This drove total liabilities vis-à-vis all sectors in India to $41 billion, in a quarter in which foreign exchange reserves held by the Reserve Bank of India expanded by $9.8 billion. China also deposited substantial funds with BIS reporting banks, the first increase in seven quarters. Banks in China placed $14.6 billion in new deposits (largely denominated in US dollars) with BIS reporting banks, primarily in offshore centres. This brought net liabilities vis-à-vis banks in China to $29 billion ($85 billion gross), second only to that vis-à-vis banks in Russia.

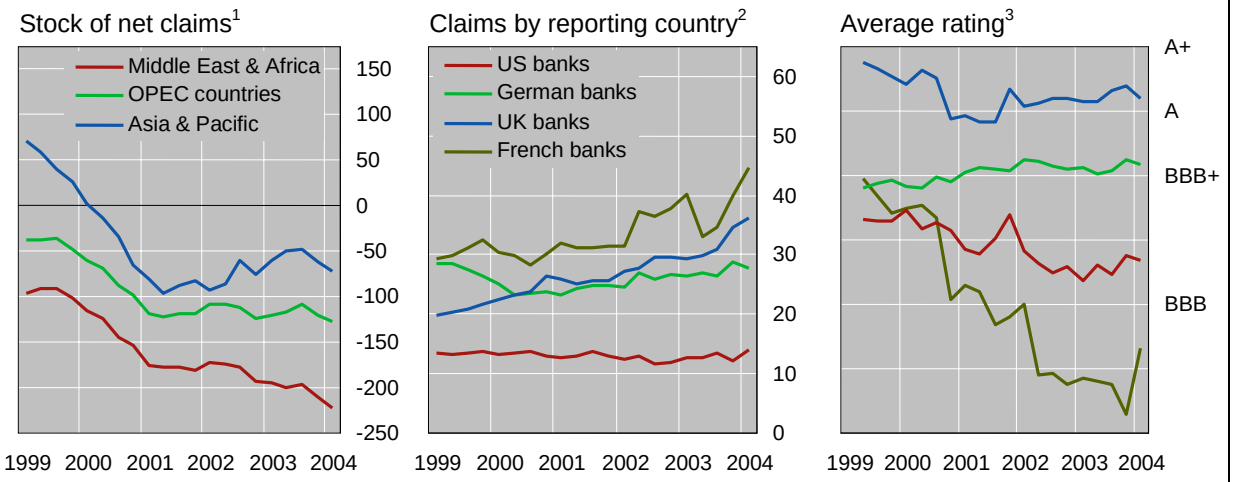
Net outflow from Middle East and Africa grows

Funds also flowed out of the Middle East and Africa, as banks in the region placed substantial funds with BIS reporting banks. A $15 billion increase in deposits by banks in Saudi Arabia, much of it denominated in euros, pushed total liabilities vis-à-vis the region to $408 billion. In absolute terms, this is less than the stock of liabilities of BIS reporting banks vis-à-vis Asia-Pacific, at $440 billion. However, amongst emerging market regions, the Middle East and Africa is by far the largest net supplier of funds to the international banking market (Graph 2.4, left-hand panel). Reflecting the surpluses generated by OPEC member countries, the region as a whole contributed a net $223 billion compared to $73 billion from Asia-Pacific.

Short-term credit to borrowers in the Middle East and Africa is on the rise

Banks in the reporting area also directed short-term credit to banks and the public sector in the Middle East and Africa. The BIS consolidated data indicate that both international and local currency claims on the region have tended to rise since early 2003, with the largest increase coming in the most recent quarter. Total foreign claims vis-à-vis the region surged to $198 billion (on an ultimate risk basis), fuelled by $5 billion in new short-term international credit from French banks to the Saudi Arabian public sector (Graph 2.4, centre panel). This latest move lifted the average rating of French banks' Middle East and Africa asset portfolio to near a BBB rating (Graph 2.4, right-hand panel). More generally, short-term claims on Saudi Arabia have trended upwards since at least mid-2001, reaching 84% of total international claims on the country in the first quarter from 74% in the previous one and 67% a year earlier.

Positions vis-à-vis the Middle East and Africa



[1] BIS locational banking statistics: total claims outstanding minus total liabilities of BIS reporting banks, in billions of US dollars. [2] BIS consolidated banking statistics: foreign claims outstanding on an ultimate risk basis, in billions of US dollars. [3] Average rating of the Middle East and Africa asset portfolio. See the box on pages 22–3 of the 2003 September *BIS Quarterly Review* for details on the calculation. Graph 2.4

Outflow from Latin America continues

An eighth consecutive quarter of net outflows from Latin America also reflected increased deposits placed abroad. Borrowers in the region deposited $13.2 billion with BIS reporting banks, overshadowing new credit and thus resulting in a net outflow of $9 billion. The link between foreign exchange growth and changes in liabilities of BIS reporting banks seems to be particularly strong in Latin America. For example, these series for Brazil, which accounts for over one quarter of the region's foreign exchange reserves, have tended to move together since at least 1995 (see Graph B in the box on page 18). This is also the case, although to a lesser extent, for Mexico, which accounts for roughly one third of the region's reserves.

Deposits from Brazil and reduced credit to Argentina drive outflow from Latin America

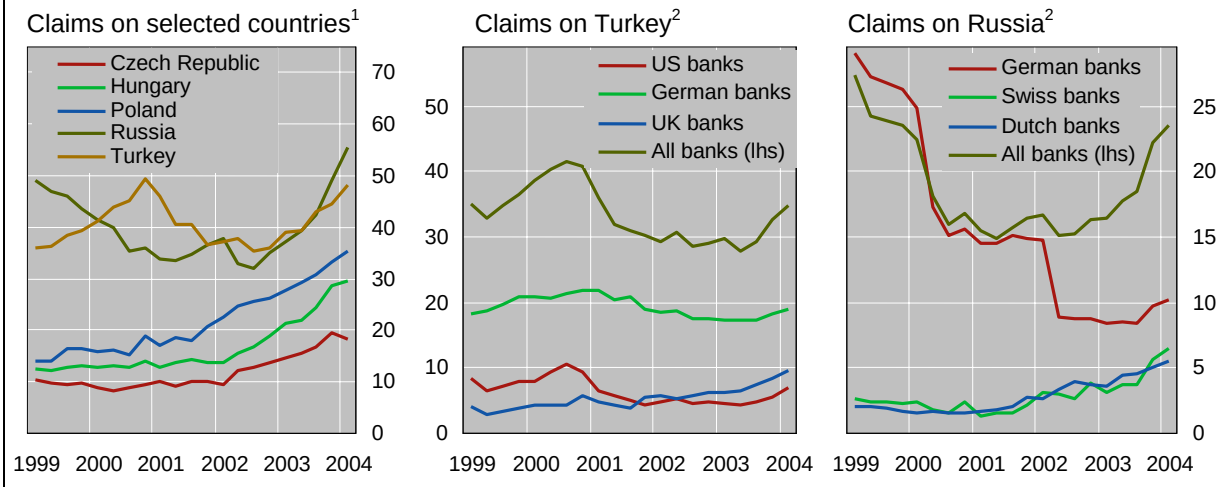
Movements vis-à-vis Brazil and Argentina were behind much of the large net outflow from the region as a whole. Accompanying a rise in foreign exchange reserves, banks in Brazil deposited $3.9 billion abroad, primarily with banks in the euro area and Japan. Although partially offset by purchases of international debt securities issued by banks in Brazil, the growth in deposits led to a net outflow of $3.1 billion. A third consecutive quarterly decline in lending to all sectors in Argentina also contributed to the net outflow from the region. While the decrease in credit to the Argentine banking sector probably reflected the continued writedown of loan positions following the country's default, loans to non-banks also continued to fall (for the ninth consecutive quarter), this time by $1.2 billion.

Inflow to emerging Europe despite large placement of deposits

Only in emerging Europe did new credit outpace deposits, generating a net inflow to the region for the sixth consecutive quarter. New claims on the region as a whole, at $13.3 billion, were directed at non-banks and took the form of loans as well as purchases of international debt securities issued by these

Claims vis-à-vis emerging Europe

Amounts outstanding, in billions of US dollars



[1] BIS locational banking statistics. [2] BIS consolidated banking statistics: foreign claims on an ultimate risk basis.

Graph 2.5

borrowers. Residents in the region also placed $10.9 billion in deposits with BIS reporting banks, the second largest increase for the region in the BIS coverage period. Much of this was accounted for by Russia, which also recorded a relatively large increase in foreign exchange reserves in the first quarter, although banks in Poland and non-banks in Turkey contributed to this rise too.

Inflow to emerging Europe reflects new lending to Turkey …

Over half of the new loans to the region were to non-bank borrowers in Turkey. Loans from banks in offshore centres and the United States accounted for the bulk of $2.6 billion in new loans to these borrowers, pushing total claims on the country to $48 billion (Graph 2.5, left-hand panel). Although Turkey is no longer the largest borrower in the region, the stock of claims has returned to levels not seen since late 2000, after bottoming out in mid-2002. German banks remain Turkey's biggest creditors, with total foreign claims (on an ultimate risk basis) of $9.5 billion, although the exposure of US, UK and other euro area banks has been on the rise in recent quarters as well (Graph 2.5, centre panel).

… and increased deposits from banks in Russia

Residents in Russia deposited substantial sums abroad for a third consecutive quarter, concurrent with an increase in foreign exchange reserves held by the Russian central bank. A $5.3 billion deposit by banks in Russia drove total liabilities vis-à-vis all sectors in the country to $62.6 billion. Claims on non-banks in Russia also rose for the sixth consecutive quarter, this time by $2.6 billion, pushing the total stock of net claims on the country to $25.6 billion, second behind Mexico among emerging markets. In the most recent quarter under review, banks in the United Kingdom purchased $1.8 billion in international debt securities issued by non-bank borrowers, much of it US dollar-denominated.

International syndicated credits in the second quarter of 2004

Jesper Wormstrup

Signings of international syndicated loans reached an all-time high in the second quarter. Supported by refinancing deals worth an unprecedented $240 billion, total signings exceeded $500 billion for the first time (see left-hand panel of graph below). The high level of refinancing deals is to some extent a result of borrowers taking advantage of benign financing conditions to prefinance existing facilities scheduled to mature at a later stage.

In line with the historical average, deals denominated in US dollars made up 75%, followed by 15% denominated in euros and 5% in sterling.

Borrowing by US entities was particularly buoyant. Total signings came to a record $325 billion, an increase of nearly 75% over the same quarter last year. Refinancing deals comprised $123 billion or 38% of the total, some 10 percentage points higher than the historical average. Large amounts were obtained by the energy, insurance and retail sectors. In addition, the financial services sector showed a marked presence, with signings totalling $50 billion, nearly half of which, $22.4 billion, was secured by General Electric Capital Corp, making it the largest individual borrower in the second quarter.

Although less momentous than US borrowing, activity by western European borrowers was still sizeable. In a total of $134 billion, refinancing deals comprised a striking 75% compared with a historical average of 50%. The largest individual deals were arranged for German automobile manufacturer Volkswagen AG (€11 billion) and France Telecom (€10 billion). While the largest amounts were raised by French, German and UK entities, the marked increase in Scandinavian borrowing is worthy of note.

Borrowing by emerging market entities remained robust in the second quarter (see right-hand panel of graph below). Total borrowing came to $27.8 billion, the highest level of any second quarter since 1997. As often before, the highest amount ($10.5 billion) was secured by Asian entities. Taiwanese corporates, mainly in the electronics sector, accounted for $4 billion. Malaysian financial institutions and corporates raised $1 billion each, and another $1.1 billion was obtained by the Korean corporate sector.

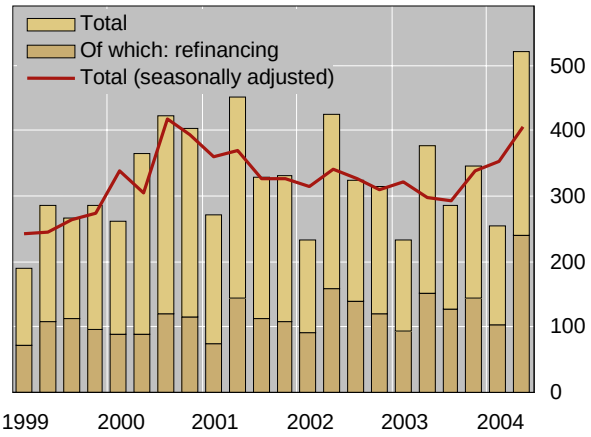
Business in eastern Europe was also brisk, with signings totalling $9 billion. Russian entities, predominantly oil and mining companies and commercial banks, were the most active, with total borrowing amounting to $3.8 billion. Hungarian banks signed deals worth $1.1 billion and the Bulgarian telecommunications company Mobiltel EAD raised €650 million to buy back its own shares. This was the largest ever signing by a Bulgarian entity in the international syndicated credit market.

In Latin America, borrowing was primarily driven by the Mexican corporate sector. The national oil company Pemex rolled over $1.25 billion, and another $2.3 billion was secured by private corporates. In a total of $3.1 billion for the Middle East and Africa region, two thirds was accounted for by the South African insurance company Old Mutual plc through a £1.1 billion refinancing deal, the largest emerging market signing in the second quarter.

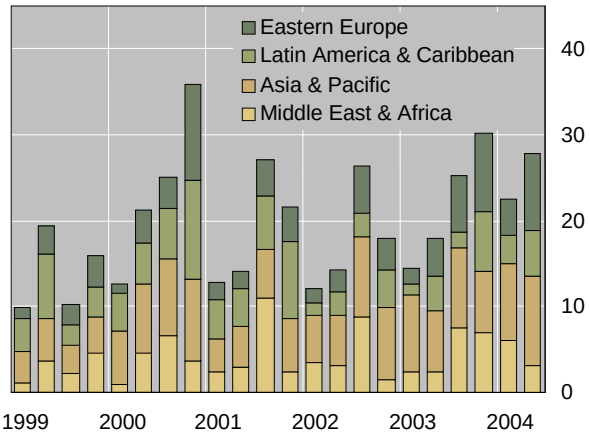
Activity in the international syndicated credit market

In billions of US dollars

Signed facilities



Facilities for emerging economies



Sources: Dealogic Loanware; BIS.

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3. The international debt securities market

New issuance in the international debt securities market slowed somewhat in the second quarter of 2004 relative to the first, but remained at a strong pace overall. Issuance was supported by a recovering global economy and the easing of concerns about the implications of a tightening of monetary policy in

Main features of net issuance in international debt securities markets

In billions of US dollars

	2002	2003	2003			2004		Stocks at end-Jun 2004
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Total net issues	1,011.4	1,472.4	351.4	303.9	458.9	521.0	347.5	12,332.0
Money market instruments[1]	1.7	75.4	3.7	–32.9	49.2	35.0	2.6	596.0
Commercial paper	23.7	83.3	13.3	–25.4	48.7	9.0	–3.4	414.9
Bonds and notes[1]	1,009.7	1,397.0	347.7	336.8	409.7	486.0	344.9	11,736.0
Floating rate issues	198.8	392.4	74.1	98.0	153.4	154.4	167.9	3,112.7
Straight fixed rate issues	800.8	983.7	273.0	234.5	240.6	338.5	169.5	8,267.4
Equity-related issues	10.2	20.9	0.6	4.3	15.7	–6.9	7.5	355.9
Developed countries	945.5	1,365.9	318.1	281.6	435.2	486.0	316.7	11,002.0
United States	330.7	275.6	30.5	91.2	98.2	126.4	6.9	3,200.3
Euro area	479.1	768.8	208.7	124.8	223.4	232.7	214.8	5,306.0
Japan	–22.7	–1.0	–1.8	–3.7	7.9	6.3	11.0	283.1
Offshore centres	8.1	16.3	4.0	0.4	9.1	0.9	5.0	137.4
Emerging markets	36.9	66.9	13.9	19.5	18.8	24.1	18.7	676.2
Financial institutions	833.2	1,188.6	248.2	256.4	409.8	417.3	282.1	9,082.4
Private	697.9	984.8	199.5	209.8	349.5	339.8	234.6	7,675.4
Public	135.4	203.8	48.7	46.6	60.4	77.5	47.5	1,407.0
Corporate issuers	55.3	113.3	33.9	22.0	40.9	7.4	10.8	1,495.9
Private	44.5	95.3	31.1	18.3	37.2	–0.0	7.2	1,249.1
Public	10.8	18.0	2.8	3.7	3.7	7.5	3.5	246.8
Governments	102.0	147.3	54.0	23.0	12.3	86.2	47.6	1,237.2
International organisations	20.9	23.2	15.3	2.4	–4.2	10.0	7.0	516.5
Memo: Domestic CP[2]	*–99.1*	*–41.7*	*–26.6*	*–36.6*	*7.5*	*58.4*	*–10.6*	*1,928.4*
Of which: US	*–91.4*	*–81.3*	*–41.9*	*–22.3*	*–1.5*	*47.8*	*–26.8*	*1,309.7*

[1] Excluding notes issued by non-residents in the domestic market. [2] Data for the second quarter of 2004 are partly estimated.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; national authorities; BIS. Table 3.1

Gross issuance in the international bond and note markets

In billions of US dollars

	2002	2003	2003			2004	
	Year	Year	Q2	Q3	Q4	Q1	Q2
Total announced issues	2,099.3	2,884.1	755.9	656.9	712.3	982.3	792.6
Bond issues	1,164.8	1,609.7	424.6	343.6	405.0	569.5	429.5
Note issues	934.5	1,274.4	331.3	313.3	307.3	412.8	363.0
Floating rate issues	602.5	963.8	233.6	241.2	257.6	337.9	321.5
Straight fixed rate issues	1,454.0	1,832.2	505.7	388.9	428.1	627.1	453.1
Equity-related issues[1]	42.8	88.1	16.6	26.8	26.6	17.3	17.9
US dollar	985.0	1,169.5	282.2	285.8	268.6	355.8	258.3
Euro	806.3	1,288.9	369.7	271.8	316.9	478.7	398.6
Yen	88.3	102.9	26.0	24.5	29.0	29.0	33.5
Other currencies	219.7	322.9	78.0	74.8	97.7	118.7	102.2
Financial institutions	1,631.5	2,281.2	569.7	536.2	593.8	786.6	623.6
Private	1,360.9	1,913.8	467.7	451.1	506.5	659.1	531.9
Public	270.6	367.4	102.0	85.1	87.3	127.5	91.6
Corporate issuers	211.6	271.0	78.3	67.0	68.8	62.0	73.6
Of which: telecoms	46.2	54.8	9.5	8.0	14.1	11.6	8.5
Private	187.5	220.7	69.9	53.6	56.5	52.7	61.2
Public	24.2	50.3	8.4	13.4	12.3	9.4	12.4
Governments	171.8	239.4	79.2	39.0	39.6	109.9	64.7
International organisations	84.3	92.5	28.6	14.7	10.1	23.8	30.7
Completed issues	2,098.3	2,865.2	728.0	684.1	735.3	934.0	792.6
Memo: Repayments	*1,088.6*	*1,468.2*	*380.3*	*347.3*	*325.6*	*447.9*	*447.7*

[1] Convertible bonds and bonds with equity warrants.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS. Table 3.2

the mature economies. New issues exceeded repayments by $347.5 billion, which was appreciably less than the $521 billion in net issuance seen in the first quarter of 2004 and just below the $351 billion recorded 12 months earlier (Table 3.1). Net issuance by US entities declined sharply, resulting in a slowdown in global dollar issuance despite increased use of the dollar by non-US borrowers. Low-rated and emerging market borrowers were especially active, as were Japanese borrowers. Preliminary data suggest that most of these trends continued in July.

Markets in the second quarter focused on the extent and consequences of the shift to a tightening cycle in US monetary policy. Data releases in April and May seemed to point to a relatively rapid pace of tightening, while in June further data announcements, augmented by public statements by Federal Reserve officials, suggested that the pace of tightening would not be as rapid as had been expected. Many borrowers, particularly lower-rated corporates from the industrial countries and borrowers from European and Asian emerging economies, rushed to take advantage of market conditions that were still receptive ahead of the phase of turbulence expected to accompany the US policy shift. Other borrowers, notably higher-rated corporates from the United

States, chose to reduce new issuance in view of the uncertain outlook. A rise in the share of floating rate debt in overall issuance signalled a willingness on the part of borrowers to accommodate investors' uncertainty over the path of interest rates in the near future.

US issuance declines

US net issuance falls sharply …

Net international issuance by borrowers based in the United States fell from $126 billion in the first quarter of 2004 to less than $7 billion in the second. This reflected a decline in gross issuance, which after growing sharply in the first quarter returned to the pace seen during much of 2003, together with a surge in scheduled repayments. The decline in net issuance incorporates the cancellation of some $20 billion of international bonds issued by WorldCom, as part of the completion of the Chapter 11 restructuring process by the renamed MCI Inc (bondholders were compensated with a combination of shares and notes). Domestic US issuance slowed as well, with net issuance declining from $186 billion in the first quarter to $121 billion in the second according to Bloomberg figures.

… especially among financial institutions …

Most of the decline in US activity occurred among financial institutions, whose international net issuance fell from $122 billion in the first quarter to $22 billion in the second. The two large mortgage issuers, in particular, reduced their borrowing sharply in the second quarter after expanding aggressively in the first. The uncertain outlook for interest rates during the

Net issuance of international debt securities by region and currency[1]

In billions of US dollars

		2002	2003	2003			2004	
		Year	Year	Q2	Q3	Q4	Q1	Q2
North America	US dollar	297.2	220.3	27.2	74.4	80.7	99.3	–26.5
	Euro	40.3	52.0	6.3	14.9	14.6	14.3	20.5
	Yen	–7.0	–1.9	–1.8	–1.2	0.6	1.3	1.6
	Other	12.3	25.1	7.6	6.0	9.6	12.0	12.6
European Union	US dollar	68.8	149.5	29.9	42.0	37.6	42.0	56.0
	Euro	463.6	749.4	212.9	118.5	211.4	224.9	184.4
	Yen	–26.6	–8.9	–3.2	–3.4	2.2	1.0	4.3
	Other	86.7	117.2	27.4	17.4	43.7	34.0	36.2
Others	US dollar	53.3	98.2	21.0	26.0	31.0	33.1	23.3
	Euro	18.9	32.9	14.5	6.9	6.2	37.8	16.3
	Yen	–9.6	6.6	1.9	–2.3	9.1	2.7	9.0
	Other	13.6	32.2	7.7	4.8	12.3	18.7	9.7
Total	US dollar	419.3	467.9	78.0	142.4	149.4	174.4	52.9
	Euro	522.8	834.3	233.8	140.3	232.2	277.0	221.3
	Yen	–43.3	–4.3	–3.1	–6.9	11.8	5.0	14.9
	Other	112.5	174.5	42.8	28.1	65.5	64.7	58.5

[1] Based on the nationality of the borrower.

Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS. Table 3.3

quarter may have led to a pause in new fund-raising by financial institutions, in anticipation of a slowdown in activities such as mortgage refinancing. However, net issuance also fell for non-financial corporations, suggesting that these borrowers adopted a similarly cautious stance towards increasing their external finance in the face of the shift in the monetary policy cycle.

... resulting in a fall in global dollar-denominated issuance ...

The slowdown in issuance by US entities led to a sharp decline in dollar-denominated net issuance on the international market, from $174 billion in the first quarter to $53 billion in the second (Table 3.3). North American borrowers actually reduced their dollar-denominated debt by $26.5 billion in the second quarter. Even without the cancellation of dollar-denominated WorldCom issues, which totalled $18 billion, there would have been a net decline in dollar-denominated North American debt outstanding, for the first time since December 1993. This development is even more remarkable considering that the share of the US dollar in net issuance by borrowers in Europe and elsewhere actually increased. The pullback by US issuers thus occurred in spite of a receptive global environment for dollar-denominated debt.

... despite relatively greater use of the dollar outside North America

Recovery in Japanese issuance continues

The steady return of Japanese borrowers to the international debt market continued in the second quarter, with net issuance rising to $11 billion and announcements to $33 billion. Japanese borrowers continued to be heavy issuers of convertible debt, which accounted for 27% of announcements of new bond and note issues in the second quarter, compared with only 2% for global issuance. Most of the new issuance of debt securities was denominated in yen, while net issuance in dollars was negative.

Japanese corporations and non-bank financials especially active

As in the previous two quarters, the most active issuers were corporations and non-bank financial institutions. Private sector banks announced $4.6 billion in new issues, but most of this went to refinance matured debt. Among the most active non-financial issuers were Nippon Telegraph and Telephone, which announced a €500 million seven-year medium-term note in early June, and the Toshiba Corporation, which announced ¥150 billion in five- and seven-year bonds at the end of June. The Japan Finance Corporation for Municipal Enterprises, a public sector body, issued a €900 million 10-year fixed rate eurobond in late May.

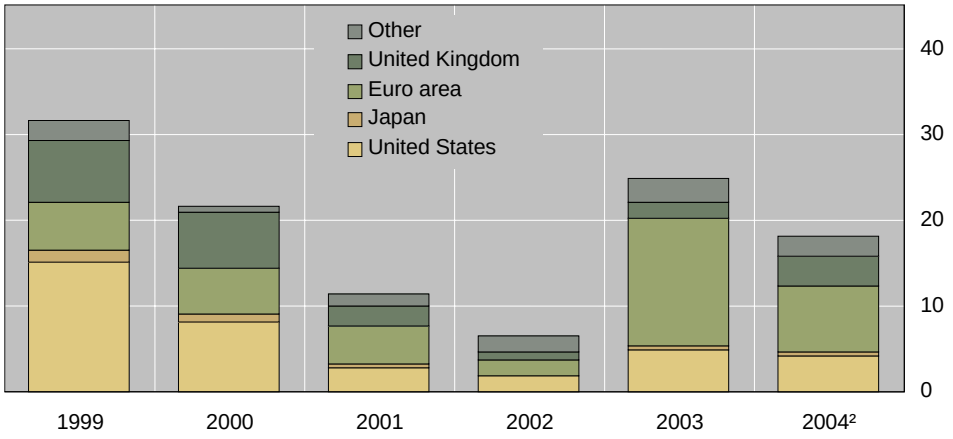
High-yield corporate issuance is strong

High-yield issuance boosted by European borrowers ...

Lower-rated borrowers continued to borrow at a rapid pace in the second quarter (Graph 3.1). Announcements of sub-investment grade bond and note issues totalled $19.8 billion, virtually the same level as in the first quarter. Entities in Europe were especially active, with net borrowing by UK corporates jumping from $0.7 billion in the first quarter to $2.7 billion in the second, while euro area corporates increased issuance from $2.4 billion to $5.3 billion over the same period. By contrast, issuance by lower-rated emerging market borrowers, both sovereign and private, declined from $13.0 billion to $6.0 billion. As was the case with some emerging market borrowers (see

Non-investment grade[1] issuance of international bonds by developed country entities

In billions of US dollars, by nationality of issuer



[1] Issuers rated BB or lower. [2] Issuance up to June 2004.

Sources: Dealogic; BIS. Graph 3.1

below), issuance slowed in May and early June amidst uncertainty regarding the pace of monetary tightening in the United States, but picked up again in mid- to late June as fears of an abrupt increase in US rates eased.

… telecoms firms …

High-yield issuance was boosted by strong activity in the telecommunications sector. The largest high-yield issue in the quarter was a €1.3 billion 10-year fixed rate instrument issued in April by the Italian telephone directory company SEAT Pagine Gialle. A number of cable television firms brought substantial high-yield issues to market, including Charter Communications of the United States (which issued on the US domestic market), NTL of the United Kingdom, Tele-Columbus and Kabel Deutschland of Germany, and Cableuropa of Spain.

… and private equity

Another important source of high-yield issuance was financing operations related to private equity deals. In June, the private equity firm Blackstone Capital Partners issued $1.2 billion in 10-year paper to finance the leveraged buyout of Celanese Corporation. Inmarsat, a UK satellite company, issued a $103 million add-on to an eight-year note issued in January as part of the financing for its LBO.

Borrowers prefer floating rate structures

Floating rate structures were used in 41% of announcements and 49% of net issues of bonds and notes in the second quarter. This was consistent with past patterns, with markets becoming more receptive to floating rate issues during times of rising interest rates. For example, floating rate structures jumped from 17% of net issuance in 1993 to 29% in 1994, and from 27% in 1999 to 33% in 2000.

As in past quarters, financial institutions were disproportionately active in floating rate issuance. Among the more prominent floating rate issuers were US financial institutions, which announced $59 billion in new floating rate bond

and note issues. In Europe, UK and German financial institutions, which announced $46 billion and $42 billion in new issues respectively, were also active in issuing floating rate bonds and notes.

However, non-financial entities also responded to investor demand for floating rate instruments. Announcements of new floating rate bond and note issues by non-financial corporates rose from $9 billion in the first quarter to $14 billion in the second. Pemex, the state-owned Mexican oil company, announced a $1.5 billion six-year floating rate note in early June. Even governments, which traditionally favour fixed rate debt, increased their floating rate offerings. Venezuela and the Kingdom of Thailand each issued $1 billion floating rate notes in the quarter, while the Hellenic Republic raised €1 billion in a 30-year floating rate bond in May.

Emerging market issuance remains strong

Borrowing by emerging economies is healthy ...

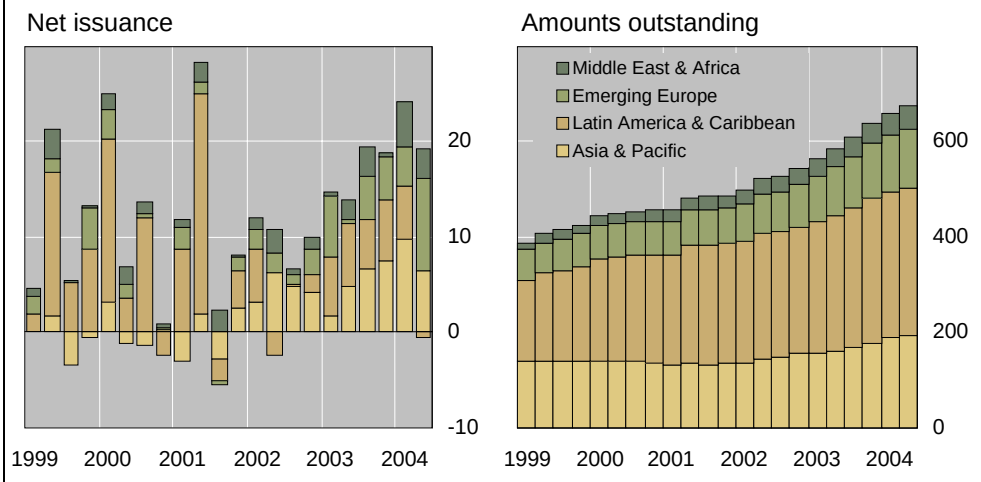
Despite turbulence in emerging market credit spreads, issuance by emerging economies maintained a healthy pace in the second quarter (Graph 3.2). In parallel with broader trends in the global debt securities markets, net issuance by emerging economies fell from $24 billion in the first quarter to $19 billion in the second, but remained above the quarterly average of $17 billion in 2003. European emerging economies accounted for $9.6 billion of the total, and Asia-Pacific borrowers for $6.5 billion. Latin American borrowers, by contrast, reduced outstanding debt by around $0.5 billion in the second quarter, reflecting both a slowdown in new issuance and an increase in repayments.

... despite wider spreads

The strong US employment figure released in early May caused a widening of spreads and a sharp slowdown of new issuance in May and the first half of June. Even in this period a few favoured borrowers retained market access, with the BBB/Baa2-rated Republic of South Africa issuing a $1 billion fixed rate 10-year global bond at the end of May.

International debt securities issues by emerging market entities

In billions of US dollars, by nationality of issuer



Sources: Dealogic; Euroclear; ISMA; Thomson Financial Securities Data; BIS. Graph 3.2

Issuance activity is high in emerging Europe …

In emerging Europe, traditionally active international issuers such as Poland, Turkey and Russia were joined by Hungary, the Czech Republic and Slovakia. Borrowing by several of these countries was spurred by their accession to the European Union on 1 May. Slovakia issued a €1 billion 10-year eurobond in May, while the Czech Republic issued a €1.5 billion 10-year note in June. Turkey issued a $750 million fixed rate global bond in June, with investors encouraged by the scheduling of negotiations for EU entry, progress on the Cyprus issue and an improving current account. In the region as a whole, most issuance was by governments, which borrowed $6 billion net. However, non-government issuers were also active, particularly in Russia, the Czech Republic and Estonia. Higher energy prices provided a good environment for a $1.2 billion 30-year note programme announced by Gaz Capital of Russia at the end of April.

In late June, the German government announced that it would issue securities backed by a portion of the bilateral debt owed to Germany by Russia. The transaction, which was completed in early July, comprised roughly $6 billion in three-, five- and 10-year notes, of which the first two were denominated in euros and the third in dollars. While there were some initial concerns that the issue would disrupt the market for Russian sovereign debt, the widening of spreads that followed the announcement was in fact relatively mild compared with recent spread movements.

… and East Asia …

Of the $6.5 billion in net issuance by Asian emerging economies, $4.4 billion was by private sector entities. Significant net issuance by the non-government sector has been a feature of Asian international securities market activity since late 2001. The most active issuers were from Korea ($2.3 billion of net issuance in the second quarter) and Taiwan, China ($2.1 billion), with significant borrowing by both financial institutions and corporates in both cases.

… but not Latin America

Announcements of new issues by Latin American borrowers fell to $9.7 billion, compared with $12.1 billion in the first quarter and a quarterly average of $14 billion in 2003. With repayments running somewhat above their recent pace, the result was negative net issuance, of $0.5 billion, for the first time since the second quarter of 2002.

Driving the fall in overall net issuance in Latin America was lower net borrowing by governments and significant net repayments by non-financial corporates. The shift among sovereign borrowers was mostly attributable to Brazil, which reduced its outstanding securities market debt by $1.2 billion in the second quarter after average net issuance of $1.4 billion over the previous four quarters. In an atmosphere of strong growth and a healthy current account, the Brazilian authorities chose to refinance only part of a $2 billion matured eurobond with new debt (a $750 million floating rate note issued at the end of June), repaying the remainder out of foreign exchange reserves. Among the region's other sovereign issuers, Mexico ($2.8 billion in announced new issues) and Venezuela ($1 billion) continued to tap international markets in the quarter. The fall in corporate net issuance in Latin America was largely due to net repayments by Mexican and Brazilian corporates, with Mexican firms reducing outstanding international debt by $2 billion and Brazilian firms by $1.1 billion.

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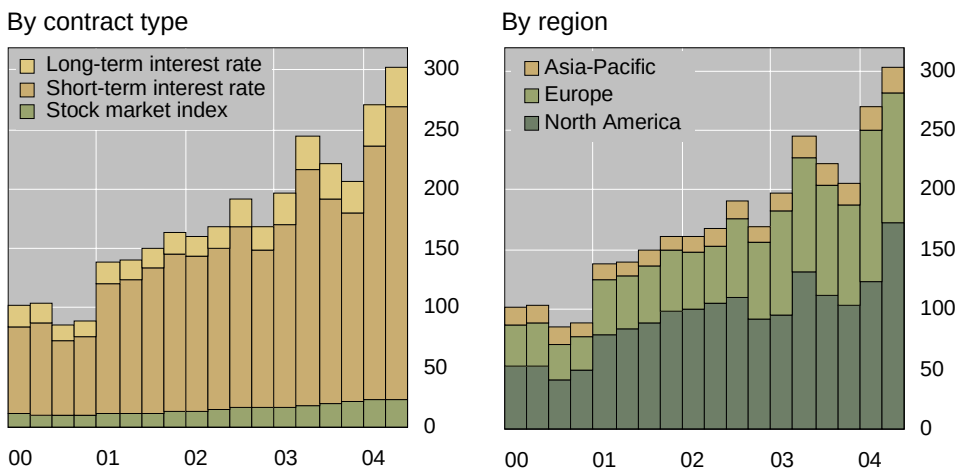
4. Derivatives markets

The aggregate turnover of exchange-traded financial derivatives contracts expanded strongly in the second quarter of 2004. The combined value of trading in interest rate, stock index and currency contracts amounted to $304 trillion, a 12% rise from the first quarter of the year (Graph 4.1). The busy quarter followed an even more active first quarter, resulting in 43% growth for the first half of the year. This represented a remarkable recovery from the second half of 2003, when turnover had fallen by 16%.

However, the expansion was not shared by all risk categories and was uneven across geographical areas. Indeed, activity fell for currency contracts and stagnated for stock indices. Turnover in currency derivatives contracted by 8%, a striking reversal of the 35% rise in the previous quarter. Even for interest rate contracts, the increase in trading for bond futures and options was slight, with money market contracts accounting for most of the growth. Geographically, turnover was weak across the board in Europe, with trading in currencies dropping by nearly 50% and that in interest rates and stock indices by 14%. In the United States, activity declined for currencies and stock indices (by 9% and 4% respectively) but was very strong for interest rates, especially short-term contracts, trading in which grew by nearly 50%.

Turnover of exchange-traded futures and options

Quarterly data, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.1

Signs of US growth boost money market derivatives

The aggregate turnover of exchange-traded fixed income contracts continued to rise in the second quarter of 2004. The volume of transactions reached $280 trillion, a quarterly growth of 13% over the first quarter. This increased activity is especially striking considering that turnover had already grown by 34% in the quarter before. Nonetheless, such activity in exchange-traded derivatives is not surprising. Long-term interest rates had started to rise in the first quarter, and surprisingly strong US labour market data in the second quarter led market participants to expect Federal Reserve policy rates to rise sooner than they had thought. In response, market participants relied heavily on the derivatives markets, some to change their positions and others to hedge.

Strong activity in interest rate derivatives ...

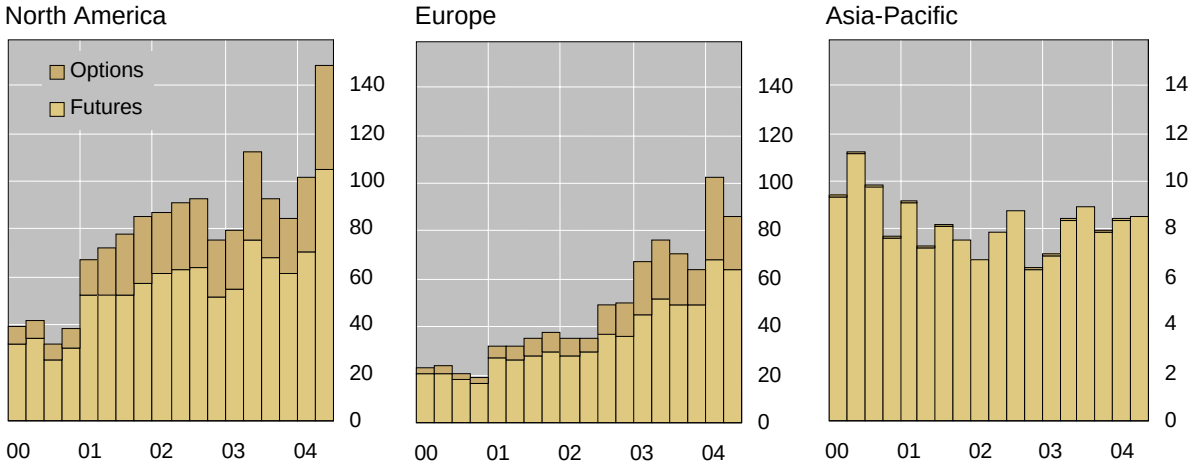
Unlike in the previous quarter, when the increase in activity was equally strong for money market and government bond contracts, overall turnover in the most recent period was boosted largely by derivatives on short-term interest rates. Trading in money market contracts, including those on eurodollar, Euribor and euroyen rates, was $245 trillion, a 15% expansion. However, business in derivatives on longer-term instruments, including US Treasury notes, German government bonds and Japanese government bonds, rose by only 1.5%. At an aggregate level, the 15% increase in trading in short-term contracts mainly reflected activity in futures, where turnover was up 21%, while options turnover was virtually unchanged. By contrast, for government bonds, activity in futures was almost the same as for the previous quarter, while that in options grew by 11%.

... especially money market contracts

Activity varied significantly across geographical regions. Business fell by 14% in Europe, mainly due to options on short-term rates; by contrast, it expanded by 44% in the United States, exceeding the high reached one year ago (Graphs 4.2 and 4.3). Such a divergence in both the sign and the size of activity in interest rate derivatives across the two main geographical areas had not been seen since the last quarter of 2000.

Turnover of short-term interest rate contracts

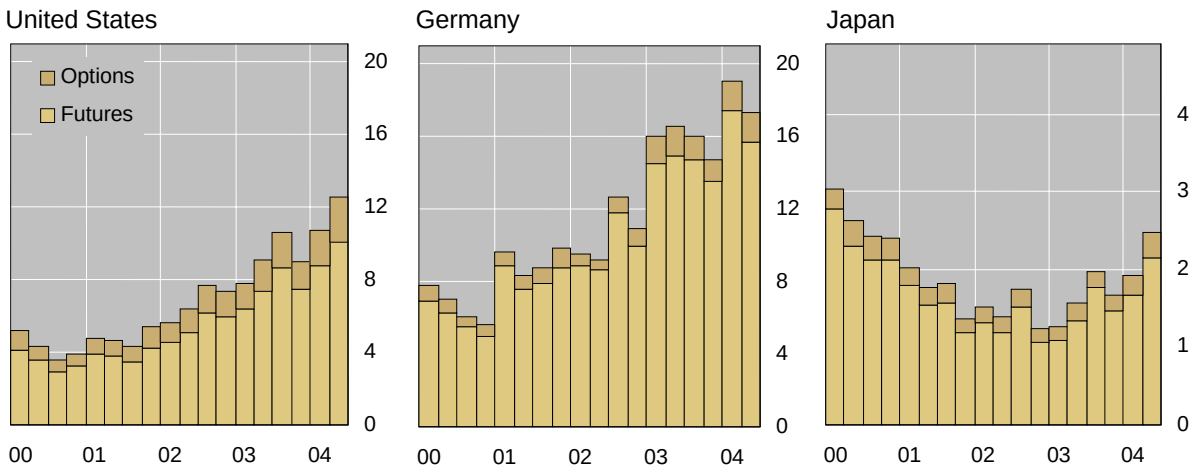
Quarterly contract turnover, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.2

Turnover in government bond contracts

Quarterly contract turnover, in trillions of US dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.3

High US turnover despite lower implied volatility ...

The US market saw strong activity in money market derivatives despite a marked decline in implied short-term interest rate volatility (Graph 4.4). This is not surprising. At monthly and quarterly frequencies, the relationship between the turnover of exchange-traded instruments and the volatility in underlying market returns has always been quite weak. One reason for this empirical regularity is the fact that volatility is only one of two components of the risk premium, the variable to which turnover might be ultimately related, the other being the coefficient of risk aversion.[1] Evidence derived from the prices of equity index options suggests that the risk aversion coefficient has recently risen in the United States (see Graph 1.7 on p 6 of the June 2004 *BIS Quarterly Review*). As a result, despite falling expected volatility, the risk premium demanded by economic agents may have remained high, accounting for the substantial demand for financial protection.

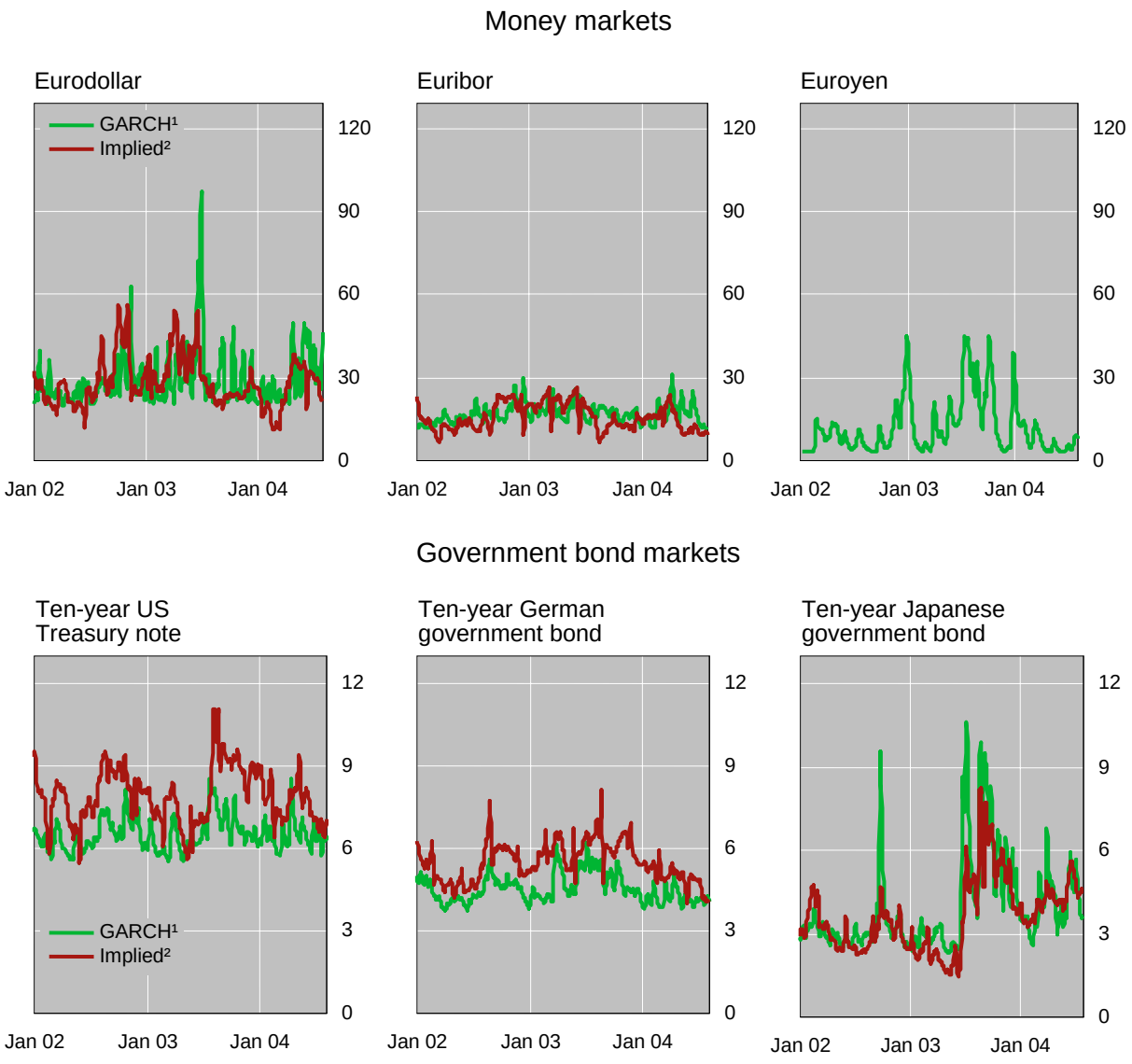
... perhaps boosted by risk aversion

The highly negative correlation between trading in derivatives on short-term rates in the United States and Europe in the second quarter of 2004 is a tendency that first emerged at the end of 2000. Correlation in activity growth rates, measured over rolling intervals of 12 months, has in fact been gradually falling over time, from 90% at the beginning of 2001 to less than 50% as of last June. Over the same time interval, the diverging growth rates have been accompanied by diverging implied volatilities of US and euro area short-term rates. At the end of 2000 the two volatilities were both close to 15%. Subsequently, the implied volatility of US rates has risen sharply, averaging 50% in the last two years. In the euro area, implied volatility has also been rising but the trend has been less pronounced, remaining on average around

[1] The product of risk aversion (the price of risk) and volatility (the quantity of risk) defines the risk premium.

Volatility of major fixed income rates

Five-day moving averages



[1] Annualised conditional volatility of daily changes in eurocurrency yields and bond prices from a GARCH(1,1) model. [2] Volatility implied by the prices of at-the-money call options.

Sources: Bloomberg; national data; BIS calculations. Graph 4.4

25%. However, the decreasing correlation between trading in the two areas does not seem to derive from the different perceptions of risk in the two markets. The correlation between the differential in monthly changes in US and European turnover of short-term interest rate derivatives and the corresponding differential in the implied volatility of such rates has in fact been rather low; 12% for futures and –8% for options. However, as is the case with the link between turnover and volatility, monthly figures may hide the existence of a significant relationship between the two variables at a higher frequency.

Strength in US bond derivatives ...

In the United States, activity was also particularly robust for long-term bond contracts. Turnover in these contracts reached $34 trillion, up by 17%

(15% for futures and 24% for options). In European exchanges, on the other hand, overall business dropped by 9% (10% for futures and 4% for options). The heightened activity in derivatives on US long-term instruments may reflect the size of the market decline which took place over the quarter, with yields increasing by more than 100 basis points in two months after the strong labour market statistics of April and May. In Europe, where trading in long-term instruments fell, the bond market recorded much smaller losses than in similar episodes of rising US yields. In April and May yields in Europe posted gains of less than half those recorded in the comparable US episode of last summer.

The strong activity recorded in the US long-term interest rate segment could also be linked to long-term yields becoming relatively more volatile compared to short rates. The differential between the volatilities implied in US short-maturity interest rate swaptions written on the one-year and the 10-year rates fell from 22% to 15% between the first and second quarter of 2004. Finally, the growth in activity for US long-term interest rate derivatives may also reflect a change in the behaviour of the most active participants in the derivatives market, especially investors in mortgage-backed securities. Investors and dealers in this market now seem to react to rising yields by adjusting their hedges in the cash and futures markets more frequently than in the past and by making greater use of options.

... may reflect mortgage hedging activity

In the Asia-Pacific region, turnover expanded by 5%. Most of the increase was concentrated in the long-term segment, which rose 18%, while short-term interest rate contracts grew by just 1%. This activity derived entirely from a spike recorded in the Japanese market following the emergence of more solid signs of business cycle strength. Business in Japanese interest rate futures surged by 43%, with short-term rates up 60% and long-term rates up 29%. Activity also expanded for Japanese long-term rate options, by nearly 20%. Turnover in Singapore, the other major Asian marketplace for short-term interest rate futures (together they represent 97% of overall Asian business), fell by 7.6%. In Australia and New Zealand, activity contracted by 13% in the second quarter, after having grown by 37% in the first.

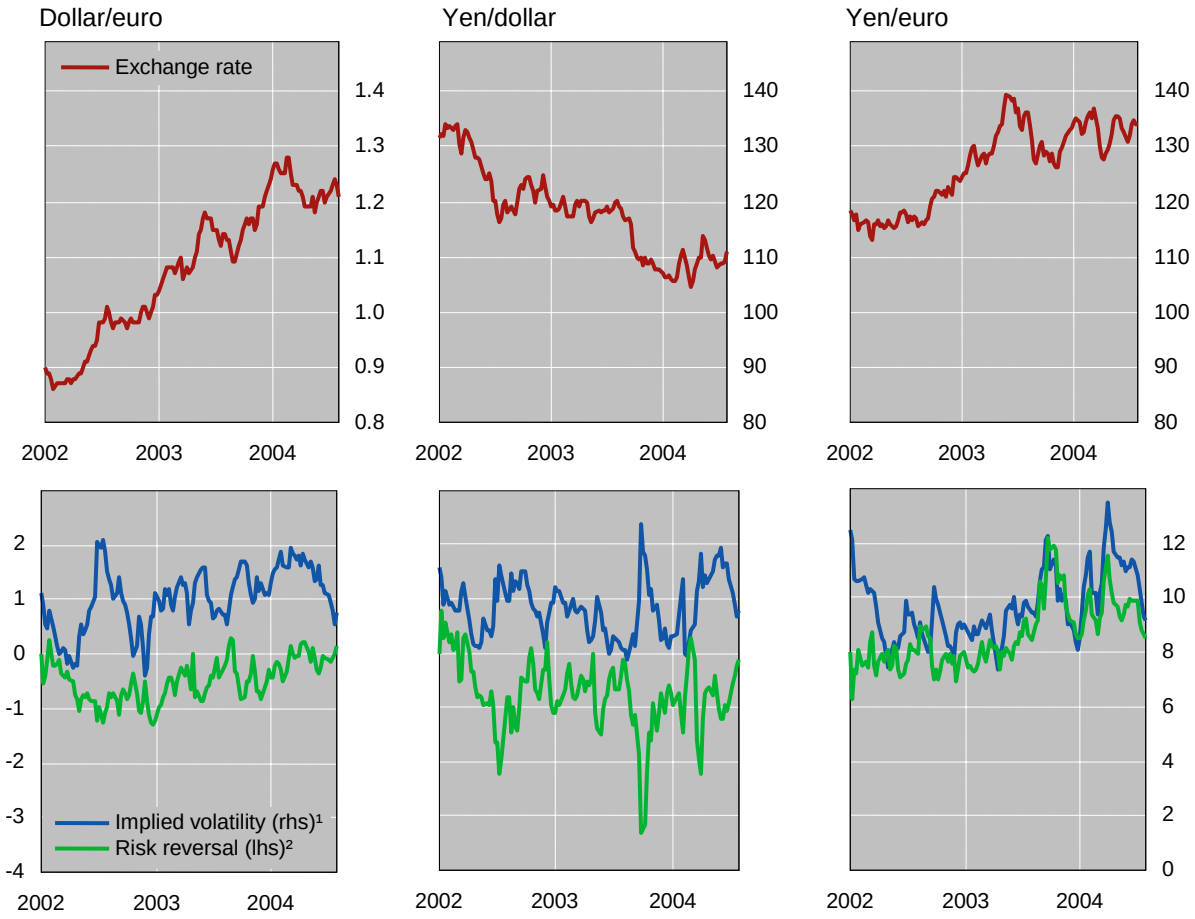
Business in currency contracts slows despite large swings in exchange rates

Currency turnover drops, especially in Europe

Turnover of exchange-traded currency derivatives amounted to $1.5 trillion in the second quarter of 2004, a drop of 8% from the first quarter of the year. Most of the decline in activity came from Europe, with futures and options down 50% and 40%, respectively; the corresponding changes in the United States were –9% and –18%.

After growing strongly in the first quarter, particularly in March, trading on the dollar/euro and other major currency contracts turned subdued in the second. Overall, transactions involving the dollar and the yen remained unchanged, while those on the euro, sterling and the Canadian dollar fell by 21%, 10% and 4%, respectively. At regional level, transactions involving the dollar remained substantial on US exchanges, with turnover rising by nearly 17%; those involving the euro, by contrast, were weak on both US and

Exchange rates, implied volatilities and risk reversals



[1] One-month horizon, in per cent. [2] A positive value indicates a bias towards dollar strength in the left-hand and centre panels, and towards euro strength in the right-hand panel.

Sources: DrKW Research; Reuters; BIS calculations. Graph 4.5

European exchanges, down by 20% and 64%, respectively. The decline in activity from the first to the second quarter conceals large monthly swings. Transactions were sharply down in April (by between 28% and 38%) and, to a lesser extent, in May (by between 1% and 20%). Business surged again in June (by between 27% and 65%), probably reflecting the changes in expected interest rate differentials induced by the surprisingly strong macroeconomic data on the US economy.

Reduced activity may reflect stability in implied volatilities

Market activity seems to have been influenced less by currency movements than by the relative stability of market uncertainty as measured by implied volatilities. In the second quarter, the shifts in the dollar with respect to the other two major currencies were even more substantial than in the first quarter (Graph 4.5). Generally, large market movements, especially when accompanied by reversals of market trends such as those that took place in the second part of the last two quarters, give rise to a surge in the aggregate volume of transactions. While this occurred in the first quarter, in the second economic agents may have regarded the swing in exchange rates and their high historical volatilities as transitory effects related to the changed macroeconomic scenario after the strong US data of April and May. Consistent

with this, despite the high historical volatility generated by the large exchange rate movements, implied volatilities remained rather flat or even fell slightly during the second quarter, oscillating between 10 and 12% on an annualised basis (Graph 4.5). In the first quarter, by contrast, high historical volatilities had gone hand in hand with larger and more persistent swings in implied volatilities.

Activity stagnates for stock indices

After four quarters of growth, stock index contracts stagnated in the second quarter. Global turnover remained unchanged from the previous quarter at close to $24 trillion. Despite this, there were significant differences across the major geographical areas. Trading in the Asia-Pacific region, mainly dominated by options on the Korea Stock Exchange's KOSPI 200 index introduced in October 1997, went up by 14% to $9 trillion. Transactions on North American marketplaces declined by 4% to $9 trillion, while on European exchanges they dropped by 13% to $4.8 trillion. Trading fell almost uniformly in Europe, by between 11 and 14% in Germany, the United Kingdom and France. The contraction was sharper for options than for futures in France and Germany; the opposite was true for the United Kingdom.

Only in Asia is there more activity

The overall stability in stock index business in the second quarter probably reflected the lack of significant movements in the underlying market. It may also have been due to the unusually low levels of market uncertainty as measured by the volatility implied in index options. Indeed, implied volatilities were close to historical lows in both the United States and the euro area. Other, more forward-looking considerations may also have dampened activity. Although US firms recorded positive earnings during the second quarter, markets grew increasingly concerned about a rise in policy rates, a factor which probably offset the positive effect of higher earnings and limited position-taking activity through derivatives.

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Basel II – towards a new common language

The Basel II framework provides a common language that improves communication about risk exposures among banks, supervisors and investors.

JEL classification: G180, G280.

On 26 June 2004, the banking supervisors and central bankers forming the Basel Committee on Banking Supervision released Basel II, a new capital adequacy framework for banks, with the endorsement of G10 central bank governors and heads of supervision. Whereas the 1988 Basel Capital Accord, Basel II's predecessor, focused on the amount of capital a bank has, Basel II emphasises the measurement and management of key banking risks: credit risk, market risk and operational risk among others. Basel II compares the maximum losses a bank might suffer over the year ahead with the available buffer for the losses. It provides a methodology for a bank to prepare a statement comparing risk and buffer.

Since the introduction of modern accounting methods in the 15th century, we have used these methods mostly to describe the current state of affairs as an accumulation of past occurrences. However, in the 1990s, we developed a new technology to better assess the implications of possible developments in the future, in addition to things that actually happened in the past. Basel II has transformed this technology – quantitative risk measurement techniques – into a standard by which financial institutions can prepare verifiable and comparable statements.

This transformation will allow banks, supervisors and markets to communicate about risks with a common language. It represents a major innovation in banking supervision, but may have an even wider potential. To achieve this transformation, however, the Committee had to overcome many practical challenges, some of which will be outlined below.

[1] Secretary General, Basel Committee on Banking Supervision. The views expressed are those of the author and do not necessarily reflect those of the Basel Committee on Banking Supervision or the Bank for International Settlements. This article is based on a presentation at a meeting in Singapore on 5 July 2004 concerning the practical application of Basel II, co-sponsored by the Financial Stability Institute of the BIS and the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP). The author would like to thank Frank Packer for his help in transforming the oral presentation into the current article.

Benefits of a common language

Given the common framework provided by Basel II, all those concerned with the risk exposure of banks can now communicate with each other without having to confirm multitudes of assumptions and translate numbers based on one set of assumptions into those based on another. The new common language will facilitate the dialogue among supervisors as well as between bankers and supervisors. It will also enhance the communication between banks and the markets. Perhaps still more valuable, it will encourage all to think and behave in a forward-looking manner.

The issue of procyclicality

It is sometimes asserted that early recognition of changes in credit portfolio quality, and consequent changes in banks' willingness to lend, could exacerbate the ups and downs of economic cycles. If properly utilised to prepare well in advance for possible future difficulties, however, Basel II can work to counter, rather than amplify, cyclical fluctuations in the ability of banks to provide credit to sound borrowers.

Under Basel I, a deterioration in the credit quality of a bank's portfolio during a cyclical downturn is reflected in its capital adequacy ratio only at the last moment, ie at the time of the accounting recognition of the impairment. At that stage, banks often have no effective measures available to improve their capital ratios other than to stop extending new credit, which can in turn aggravate the downturn.

In contrast, under Basel II, the deterioration of a portfolio should begin to be reflected in the bank's capital adequacy ratio at a much earlier stage, and no further deterioration should occur in the capital adequacy ratio at the moment it is recognised as an accounting loss.

In addition, even when minimum capital requirements become binding constraints, the incentives to reduce exposures to good borrowers are much smaller than under Basel I, as this would not improve the capital ratio by much. The most effective way to reduce the total capital requirements under Basel II is timely restructuring, selling or foreclosing of exposures to borrowers already in trouble, behaviour which can pave the way for the recovery of the economy.

Benefits for market participants

The benefits of the new common language, however, will not be limited to providing early warning signals for banks and supervisors. It will be equally useful for investors, counterparties and other market participants. For instance, while investors need to know that a bank has, say, $100 billion worth of assets and $80 billion of liabilities, it is equally important for them to know whether the assets are $100 billion of risk-free cash or $100 billion worth of high-risk securities. Basel II techniques can quantify such differences and convey summary information about risk exposures. Basel II will thus complement accounting standards to meet the needs of investors and markets that have become increasingly attentive to risk. A common language to assist effective communication and to standardise disclosure on risks will materially aid the exercise of market discipline, which is a key ingredient for economic efficiency.

The challenges of transforming theory into a common language

Why did it take six years?

The Basel process has taken many years, with discussions starting in early 1998, and the first consultative paper (CP1) published nearly five years ago (Figure 1). Over this period, supervisors, bankers and academics around the world contributed invaluable comments, data and analysis. Many of the changes made through the process, especially those made between the second and the third consultative papers (CP2 and CP3), reflected the results of the Committee's intensive discussions with authorities from non-G10 countries. In particular, many of these authorities felt the need for the new framework to be not just appropriate for more advanced banking systems and markets but adaptable to a variety of infrastructure conditions.

Over the years, many changes were also needed to transform advanced risk measurement concepts into truly workable and comprehensive standards. This proved to be much more challenging than initially expected. Best practice in the industry is well established for some areas, but is still evolving for others. Moreover, the information available to allow banks to assess their risk exposures accurately is currently limited and also varies depending on the nature of the business activities considered. For these and other reasons, the general framework in many cases had to be tailored to the characteristics of specific portfolios. The conceptual approaches developed to capture potential changes in economic values also had to be adjusted given that the regulatory capital adequacy framework relies in practice on accounting information based mostly on accrued cost concepts. The Committee sought standards that were theoretically consistent but, more importantly, represented practical solutions to maximise the reliability of the results given the limitations of the available data.

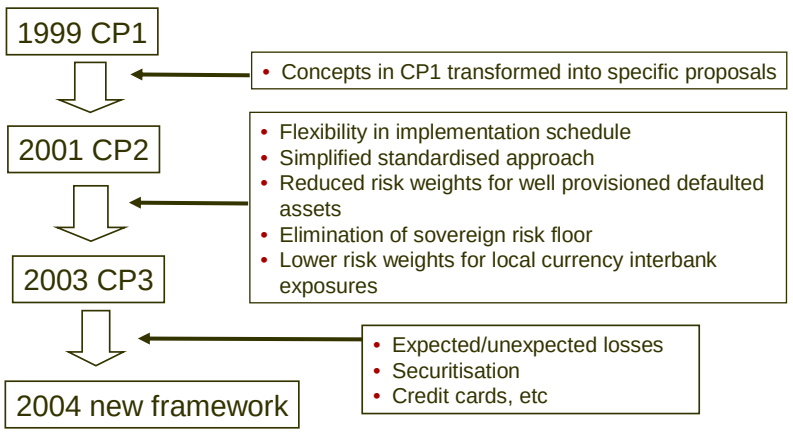

Figure 1

A VaR number can mean anything

The Basel Committee made a particular effort to transform the simple concept of value-at-risk (VaR) into comprehensive standards workable for all types of exposures, under different environments and with limited information. The reality is that a one-year 99.9 percentile VaR number can mean anything depending on the assumptions and the nature of the inputs used. Without such time-consuming attention to practical complications, a workable standard would not have emerged to serve as a common language that produces verifiable statements that are comparable across institutions.

In the following sections, the difficulties of transforming concepts into workable standards are illustrated using three examples of recent changes to the Basel II framework: expected versus unexpected losses, securitisation exposures and credit card exposures. These were the final issues that the Committee had to focus on, after its meeting in October 2003, and their resolution paved the way for the publication of the new framework in June 2004.

Expected versus unexpected losses – bridging regulatory and accounting approaches

Expected versus unexpected losses

The Committee's task was to come up with a new common language for the preparation of statements on risk exposures and capital buffers. This task was especially challenging because regulatory statements on risks and buffers have to be based on accounting statements, which are currently prepared differently in different countries. Moreover, and more fundamentally, the Committee had to bridge risk measurement concepts such as "expected losses" and "unexpected losses" and standard accounting concepts such as "provisioning" and "impairment".[2]

To illustrate the issue, suppose a bank has a $1 billion portfolio composed of exposures to corporate borrowers. For simplicity's sake, suppose as well that the bank can recover only 50% of the outstanding amount from each defaulted loan. If the bank expects that 1% of the loans will default in the coming year, then the "expected loss" for the portfolio is $5 million (ie $1 billion $\times$ 1% $\times$ 50%).

However, should economic conditions deteriorate over the coming year, then the number of defaults could turn out to be larger than expected. If the bank thinks that in the vast majority of cases (eg 99.9%) the default ratio will not exceed 10%, then the maximum loss it needs to be prepared to suffer under these conditions would be $50 million. The gap between the maximum loss and the expected loss is defined to be an "unexpected loss", in this example $45 million.

Many risk managers and supervisors adopt the principle of putting aside provisions (reserves) to cover expected losses ($5 million in the case above) and holding enough capital to cover unexpected losses ($45 million). In practice, however, the use of provisioning differs from bank to bank and from

[2] Borio and Lowe (2001) explores issues and options in provisioning policies and their interaction with capital adequacy standards.

jurisdiction to jurisdiction. This reflects differences in accounting standards and other factors such as national tax laws. Some banks provision well beyond the expected loss amount, while others provision much less.

The Committee thus had to solve the difficult question of how a single set of standards might still satisfy a wide set of practical considerations: (1) the new capital standards should ensure that a bank is able to withstand both expected and unexpected losses; (2) good provisioning practices should not be discouraged by capital standards; (3) a level playing field should be maintained among banks with different provisioning practices; (4) the risk management practices prevalent in the industry should be respected as far as possible to avoid divergence between internal control and regulatory requirements; and (5) standards of capital adequacy should be based on accounting statements as far as possible so as to keep the preparation and verification burdens at manageable levels.

An unpopular first try

The practical solution proposed in CP3 was to set capital requirements to cover both expected and unexpected losses ($50 million in the case above), with complex rules on the extent to which provisioning could reduce the capital requirements arising from expected losses. However, this proposal differed significantly from most industry practices and also resulted in various distortions, as indicated on the left-hand side of Figure 2. A significant portion of the more than 200 letters of comment that the Committee received on CP3 referred to this problem.

Many of the reservations expressed were subsequently taken on board in the 2004 framework. As shown on the right-hand side of Figure 2, the denominator of the capital ratio is now calibrated solely to unexpected losses ($45 million in the example). The gap between provisions and expected

Treatment of expected/unexpected losses (EL/UL) under the internal ratings-based approach

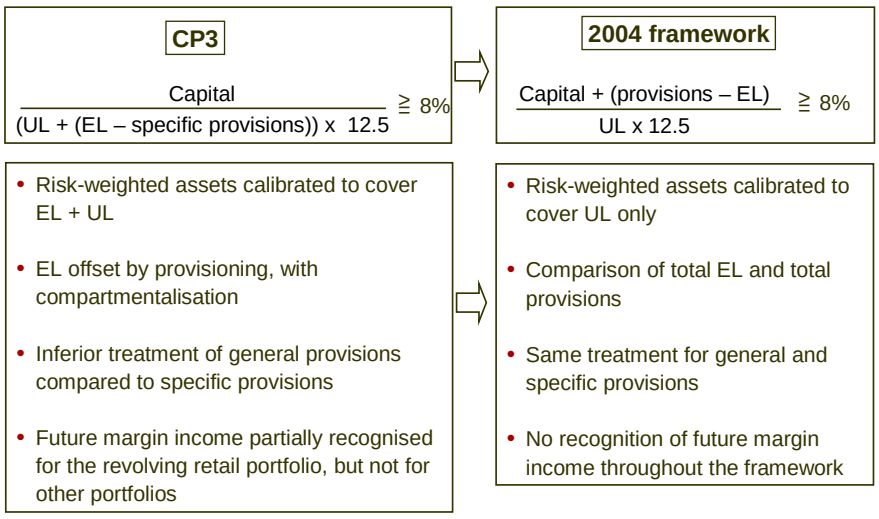

Figure 2

losses is taken account of in the numerator (hence, if not provisioned at all, $5 million will be deducted from capital in the example). Thus the 2004 framework has developed a simpler solution based more firmly on practices already in use.

Aligning the framework with industry practice

Securitisation – choosing reliable inputs given limited information

A second challenge that the Committee had to face was ensuring that those using the language of risk could compile available information into a coherent statement of exposures. The task is relatively easy when all necessary information is available, but this is commonly not the case. A particular problem was posed by securitisaton, where different banks play different roles – originator, investor, etc – and types of available information typically differ depending on the roles banks play.

Suppose the bank cited above (Bank A) decides to securitise its $1 billion loan portfolio. Bank A transfers the loan portfolio to a special purpose company (SPC), but agrees to cover the first $10 million of losses arising from the portfolio. Another bank, Bank B, agrees to cover losses beyond those covered by Bank A up to $40 million, and a third bank, Bank C, agrees to assume all the losses beyond the $50 million already covered by Banks A and B. Suppose as well that a rating agency is asked to rate Bank C's exposure and rates it AA–, but does not rate the exposures held by Bank A or B.

The $1 billion portfolio has now been decomposed into different exposures with different risks. In addition, available information differs among the three banks. Bank A, which originated the scheme, should be able to gather information on the credit quality of the securitised pool, but others might not. Bank C will continue to get rating information on its exposure from the external rating agency but not other banks. How can we measure and express the risks for the three banks?

Inputs are the key

CP3 had already tried to utilise any available information if it is reliable. Bank A will start from the information on the total amount of credit risk for the entire securitised pool (called K_{IRB}. $50 million in the case above). Utilising a Supervisory Formula provided by Basel II, Bank A will assess how the total risk of the pool is shared among the three banks and find its own share. Bank C will start from the rating information (AA–), and utilise the chart provided in Basel II showing the correspondence between the external rating and required capital (Ratings-Based Approach). If no information is available, then the capital requirement will be made equal to the size of the tranche; Bank B may need to deduct $40 million from capital in its calculation of its capital ratio (Figure 3).

The focus of the Committee's recent efforts to improve the approach to securitisation was to reduce the frequency of cases where neither of the two types of information was available. Responding to comments received on CP3, the Committee decided to acknowledge industry practices other than the two approaches cited above. Firstly, it decided to allow banks to internally assess the credit quality of the exposure and to map their assessments to equivalent external ratings under certain circumstances (the Internal Assessment

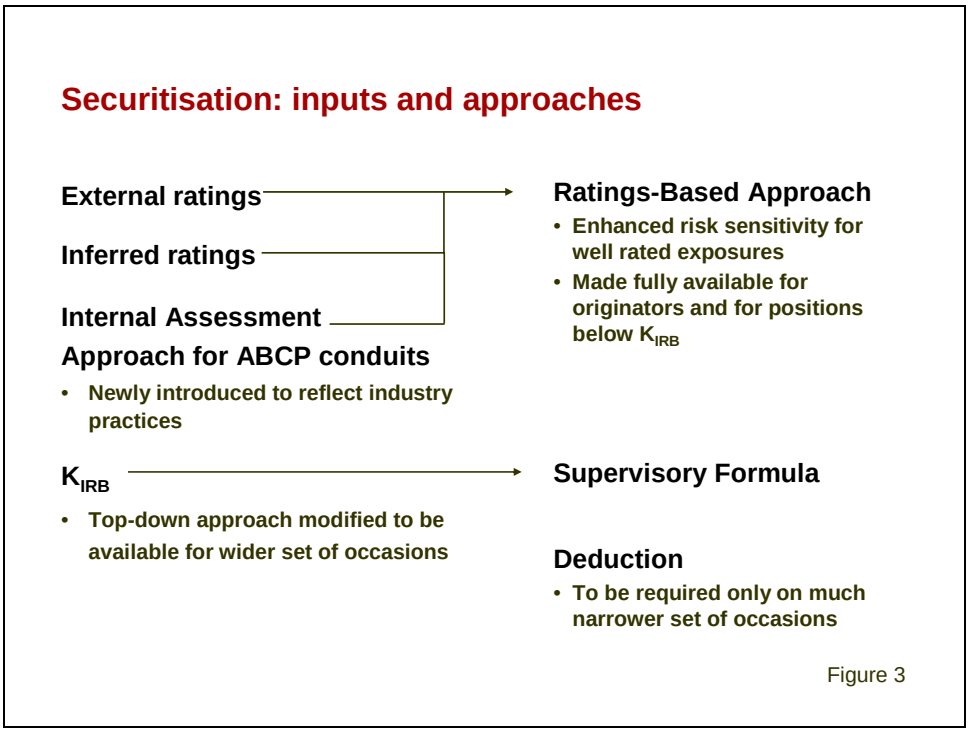

Figure 3

Approach (IAA) for exposures to asset-backed commercial paper (ABCP) conduits). Secondly, the Committee decided to expand the range of circumstances under which a bank is allowed to estimate K_{IRB} through average pool-wide information, rather than through the information on each and every asset in the securitised pool ("top-down approach").

The Committee also streamlined the specification of which approach to use if several types of information are available. The CP3 treatment differed depending on whether the bank was the originator or an investor, and on whether the exposure was below K_{IRB} or above. The 2004 framework significantly simplifies the hierarchy: if an external rating is available (Bank C), use it, and if not (Banks A and B), use other information.

Simpler solutions

To agree on the above revisions to the framework for the treatment of securitised exposures, the Committee had to assess and compare the availability, relevance and reliability of information. This was not an easy process. Nevertheless, after much experimentation, the Committee, by aligning the approaches closer to industry practice, reduced the complexity of the framework, at the same time enabling better use of available information.

Credit card exposures – reflecting characteristics specific to a particular portfolio

A third challenge that the Committee tackled was to make sure that the dictionary of the language of risk contained the right vocabulary to describe the particulars of important business lines. Credit card exposures, for example, have many unique characteristics. However, the responses to CP3 indicated that the proposals did not provide the right terms to understand and measure the risk of such exposures properly.

Suppose now that what Bank A securitised was not a portfolio of corporate loans but a large number of credit card exposures. If the expected default probabilities and recovery rate from defaulted accounts are the same as the corporate loan portfolio, then the expected loss amount will also be the same. In spite of this similarity, however, it emerged that it would not be appropriate to apply the same framework described above to this situation.

Unique characteristics and …

One distinct feature of credit card exposures is that, while economic recessions are among the key factors behind defaults of corporate borrowers, credit card borrowers tend to default for a variety of personal reasons often unrelated to general economic developments. If those personal reasons occur randomly, things will average out due to the large number of customers and the number of defaults may not fluctuate much year to year. This implies that unexpected losses could be much smaller for given expected losses, compared to the corporate loan portfolio.

CP3 had already incorporated this characteristic, but recent empirical studies gave the Committee additional insights. For example, the Committee found that random personal reasons are more important in explaining defaults of low risk customer groups than was assumed in CP3 and reduced the unexpected loss assessment for exposures to such customer groups.

Another distinctive characteristic of a credit card portfolio is that a customer borrows many times a month and repays every month, making the outstanding balance fluctuate significantly over time. To securitise such a portfolio, a bank (in our example, Bank A) often undertakes to add new exposures if the pool falls below a certain limit and to assume newly drawn exposures on its own balance sheet if the pool exceeds the limit. Thus, the components of this securitised pool will be "revolving" over time. To give comfort to investors (Banks B and C) on the quality of this revolving pool, Bank A typically agrees that the securitisation structure will repay Banks B and C before its contractual maturity (early amortisation) should the quality of the securitised pool deteriorate below a certain predefined level. Such a particular structure of "revolving securitisation with early amortisation provisions" affects the allocation of risks among Banks A, B and C.

… tailored solutions

While the risk arising from securitised undrawn lines was assumed to stay on Bank A's balance sheet under CP3, the 2004 framework now allocates it between Bank A's own balance sheet and the securitised pool, consistent with the behaviour of the "revolving" securitisation scheme. Moreover, the securitisation framework has been refined to reflect more properly the risk which can accrue to Bank A in the event of an early amortisation of the securitised pools.

Conclusion

The process leading to the 2004 framework had many difficult junctures. It took much longer than initially expected, with legitimate differences in views which had to be reconciled. Since the publication of the 2004 framework, two questions have often been asked: "Why was the process so difficult?" and "Why did it ultimately succeed?" These two questions have a common answer:

because it was the first attempt to produce a common language on risks. As it was the first attempt, the Committee had to face many unexpected challenges over the course of the discussion. However, because all the participants recognised the value of having such a common language, they were prepared to make the special effort required to find solutions.

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Diversifying with Asian local currency bonds[1]

Asian local currency bonds offer diversification potential in global bond portfolios.

JEL classification: E440, G150, H630, O160.

A special feature in the *BIS Quarterly Review* of June 2004 profiled the Asian local currency bond markets as a potential asset class, contrasting their considerable capitalisation with their mixed liquidity. The article found that larger markets with larger issues saw more trading at narrower bid-ask spreads. For a market of a given size, concentration of holdings among investors depresses liquidity. A broader investor base might thus be expected to improve liquidity, particularly at times of stress (Jiang and McCauley (2004)).

Foreign investors might find these markets' recent performance attractive. Half of them returned more than US Treasury securities of similar duration on an unhedged basis from January 2001 to March 2004. This special feature addresses the question of how such bonds might fit into a global bond portfolio.

Asian local currency government bonds offer scope for diversification since their returns co-move only moderately with their US Treasury counterparts. In particular, their correlations with US Treasury bonds mostly lie below those of euro area or Australian government bonds. If Asian bonds' risk is measured by just the volatility of returns, then only by being combined in a portfolio would they offer a favourable risk-return trade-off relative to US Treasury bonds. If risk is measured by co-movement with the US bond market, almost every Asian bond market shows a very favourable risk-return trade-off.

The scope for diversification is greater for bonds of lower credit standing and for less globalised domestic bond markets. In particular, non-investment grade local currency bonds show lower correlations. These also tend to be lower in markets with a more limited presence of international banks.

Diversification sometimes fails when it is most needed during a bear market. Sell-offs in mid-2003 and the second quarter of 2004 tested the diversification possibilities suggested by our short-sample analysis. We find that Asian local bonds offered less refuge from the global sell-off than might have been expected.

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

Co-movement of returns and yields

We measure co-movement ...

How do returns on Asian local currency bonds relate to those on global bonds? To address this question, we focus on the co-movement of local and US Treasury returns, in terms of US dollar returns on unhedged investments and own currency returns (Table 1). The correlation and variability of returns on an unhedged or hedged basis is most relevant from the perspective of a manager of a portfolio with US dollar bonds as its most important single constituent. We analyse unhedged returns directly and give some attention to own currency returns as a proxy for hedged returns, given generally narrow interest rate differentials.[2] To help understand the relationship of returns, we also analyse the co-movement of yields, specifically the extent to which US Treasury yield changes pass through to the yields on local currency bond benchmarks.[3] The pass-through analysis provides rules of thumb like: "A 10 basis point rise in US Treasury yields is associated with a 5 basis point rise in Singapore government yields."

Benchmark government bonds and return indices

	Benchmark bond analysis	Dollar return analysis		
		Duration of HSBC local bond index (years)	Matching US Treasury index	Duration of US Treasury index (years)
China (CN)	2011	5.6	USGATR (all > 1 year)	6.1
Hong Kong SAR (HK)	5-year	2.7	US17TR (1–7 years)	2.7
India (IN)	10-year	5.4	USGATR (all > 1 year)	6.1
Indonesia (ID)	7-year	…	.	.
Korea (KR)	3-year	2.4	US17TR (1–7 years)	2.7
Malaysia (MY)	10-year	3.4	US10TR (1–10 years)	3.7
Philippines (PH)	3-year	2.8	US17TR (1–7 years)	2.7
Singapore (SG)	10-year	4.6	US30TR (3–10 years)	4.6
Taiwan, China (TW)	10-year	8.9	US3OVERTR (3+ years)	7.9
Thailand (TH)	10-year	4.6	US30TR (3–10 years)	4.6
Asia local bond index	.	3.7	US10TR (1–10 years)	3.7
Memo:				
Australia (AU)	*10-year*	*4.4 (all > 1 year)*	*US30TR (3–10 years)*	*4.6*
Euro area (XM)	*10-year*	*5.5 (all > 1 year)*	*USGATR (all > 1 year)*	*6.1*
Japan (JP)	*10-year*	*5.5 (all > 1 year)*	*USGATR (all > 1 year)*	*6.1*

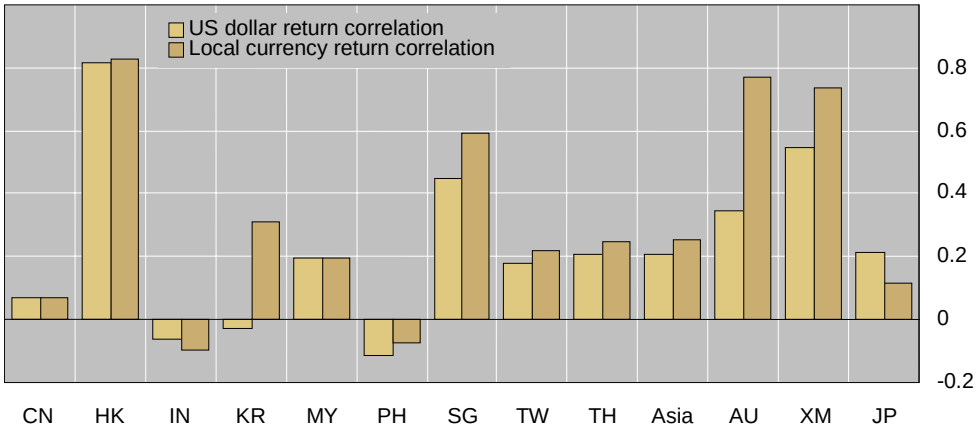
Note: US, Australian, German and Japanese indices are constructed by the European Federation of Financial Analysts Societies (EFFAS). The analysis is based on Wednesday closing data for US Treasuries and Thursday closing data for Asia from 1 January 2001 to 5 March 2004, except the benchmark analysis for China and the Philippines, which starts in October 2001, and Indonesia, which starts in January 2003.

Sources: Bloomberg; CEIC; HSBC; BIS calculations. Table 1

[2] Hedging costs are higher the higher are local currency short-term interest rates relative to the base currency and the wider are bid-ask spreads on forward contracts. Thus, local currency returns differ most from hedged returns for the higher-yielding currencies like the Indonesian rupiah or the Philippine peso.

[3] Granger causality tests generally show that movements in US Treasury yields precede changes in Asian bond yields and not vice versa. A Granger causality test assesses how

Return correlations between local currency and US Treasury bonds[1]



Note: For an explanation of the country codes, please refer to Table 1.

[1] Based on weekly US dollar and local currency returns at Thursday closing for Asia and Wednesday closing for US Treasuries. The period is from January 2001 to March 2004.

Sources: Bloomberg; EFFAS; HSBC; BIS calculations. Graph 1

... taking account of differences in time zones ...

Timing must be handled with care. Closing prices on US Treasury securities precede or follow those on Asian bonds by about 12 hours. As a result, an analysis of daily data would inevitably introduce the variance resulting from half a day's news and positioning into just one or the other market's daily movements. The effect of such non-simultaneous observation is to bias downwards estimated correlations and betas. We mitigate this daily effect, and also the effect of differences in liquidity, by using weekly data.

... and duration ...

Duration must also be treated cautiously. In Korea and the Philippines, three-year government bonds serve as the benchmark; in Hong Kong SAR, the five-year bond serves this purpose; in China and Indonesia, seven-year bonds seem most representative. In other Asian markets the international standard of 10-year bonds provides a reasonable benchmark. The market aggregates assembled by HSBC similarly vary in duration, and so we compare them to US Treasury indices of different duration.

... to assess the balance of global and domestic influences

The covariance of local currency and dollar bond returns reflects the balance between global and purely domestic influences. Deeper economic and financial integration tends to produce higher correlations, which can go even higher during periods of market stress. However, prices of local bonds are also affected by purely domestic macroeconomic conditions, such as those that affect domestic demand. Local financial market conditions, for instance households' reallocation of funds between financial institutions with different propensities to hold bonds, and official debt management policies can also move bond prices. The greater the influence of purely domestic factors on local bond prices, the lower will be international correlations and the greater the potential benefits from diversification.

much of the current *y* is explained by past values of *y* and whether adding lagged values of *x* explains more. *Y* is said to be Granger-caused by *x* if *x* helps in the prediction of *y*.

Asian bond returns show limited co-movement with US Treasuries

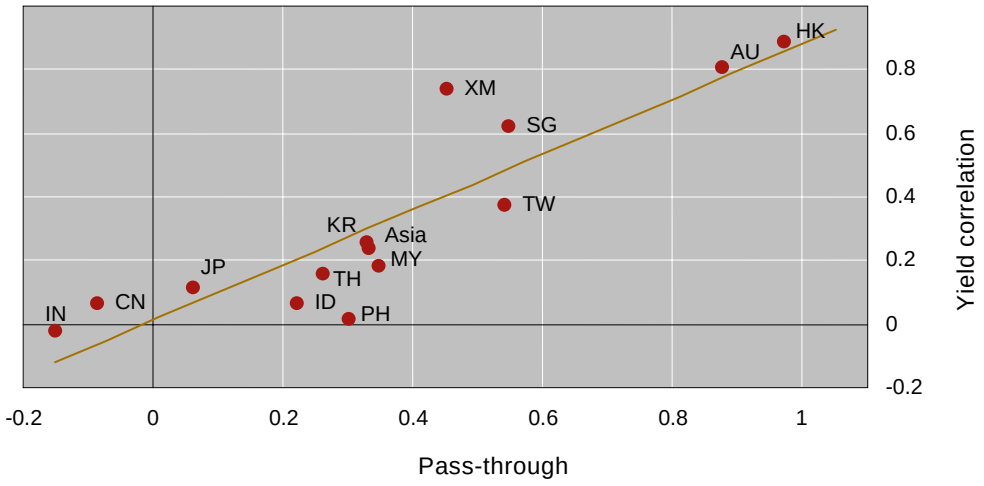
Dollar returns on Asian local currency bonds bear little relation to returns on their US Treasury counterparts (Graph 1). On average, Asian returns show a low correlation of about 0.2, like that on Japanese government bonds. This contrasts with a measured correlation of over 0.5 on euro area government bonds. Only for Hong Kong, and to a lesser extent Singapore, could the correlation of dollar returns with US Treasury returns be described as high. Indeed, for three economies, India, Korea and the Philippines, the sample correlation of returns was actually negative.

Correlations of local currency returns with US Treasury returns are generally higher, especially in Korea. This suggests that exchange rate changes tend to add noise. However, the contrast between the lower correlation of returns on Asian bonds and that on euro area government bonds is even sharper for local currency than for dollar returns. These observations suggest the possibility that Asian local currency bonds offer substantial scope for diversification,[4] perhaps especially in the context of currency-hedged investment.

Return relationship reflects pass-through of yield changes

Underlying these return relationships are varying degrees of pass-through from changes in US Treasury benchmark yields to local benchmark yields (Graph 2). Higher pass-through of yield changes or yield correlations makes for higher return correlations. Only in Hong Kong does the Exchange Fund paper move one for one with US Treasury yields. In Singapore and Taiwan, China[5]

Bond yield correlation and pass-through coefficients[1]



Note: For an explanation of the country codes, please refer to Table 1.

[1] Correlation is based on weekly changes in benchmark yields at Thursday closing for Asia and Wednesday closing for US Treasuries. Bond market pass-through coefficients are estimated by regressing weekly changes in benchmark yields at Thursday closing for Asia on weekly changes in Wednesday closing for US Treasuries, over the period January 2001 to March 2004. The line refers to the regression of the yield correlation on a constant and pass-through coefficients.

Sources: Bloomberg; BIS calculations. Graph 2

[4] From a European investor's perspective, the high correlation between US and euro area bonds and the low correlation between Asian and US bonds imply that the correlation between Asian bonds and euro area bonds is low. That correlation measured in euros will be even lower as exchange rate movements add noise to the relationship.

about half of US Treasury yield changes pass through. In Indonesia, Korea, Malaysia, the Philippines and Thailand, and for Asia on average, 20–35% of US Treasury yield changes pass through. In the two largest and most financially closed economies, China and India, there was no pass-through on average during the sample period.[6]

Risk and return in Asian local currency bonds

We assess performance with two measures ...

This section compares the risk and returns on the HSBC aggregates of Asian local currency bonds to those on US Treasury baskets of comparable duration using two approaches. The Sharpe ratio measures risk as the overall volatility of returns. It turns out that, in our sample period at least, most Asian local currency bonds did not offer a higher ratio of returns in relation to their overall volatility than their US counterparts. However, a second approach considers only the systematic risk of returns; that is, in this context, the extent to which returns co-vary with global bond returns. The Treynor ratio indicates that Asian local currency bonds offered relatively high returns in relation to their systematic risk.

Each approach has its strengths and weaknesses. For a diversified portfolio, focusing on systematic risk has considerable appeal. For instance, Sharpe penalises Korean bonds for the pronounced movement in government bond prices connected with a corporate accounting scandal and the difficulties of credit card companies in early 2003. Treynor ignores such idiosyncratic bond market events and instead rewards Korean bonds for having performed well when major markets sold off. Operationally, overall volatility may be a more stable, less sample period dependent measure of risk. The latter consideration suggests that the favourable finding under the second approach depends on the stability of the covariance of returns between Asian local currency bonds and US Treasury returns. This special feature's last section takes up this question.

Sharpe ratios

... one capturing the overall volatility of returns ...

Sharpe (1966) compared the returns of portfolios in relation to their risk by dividing their returns in excess of the riskless rate of return by the volatility of their returns. A portfolio with a higher Sharpe ratio is preferred in that it offers a higher return per unit of risk, as measured by return volatility.

The Sharpe ratio is computed by taking dollar returns and subtracting the US Treasury bill return and then dividing by the volatility of returns (see last four columns of Table 2). Sharpe would rank Chinese, Malaysian, Singaporean and Taiwanese bonds below their US Treasury counterparts because the volatility of the Asian bond returns was not low enough to offset their low excess returns (Table 3). While the dollar returns on Hong Kong and Thai

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[5] Hereinafter referred to as Taiwan

[6] These relationships are not very stable: rolling correlations show large fluctuations, with many episodes of a *negative* relation in the past three years.

Yields, returns and volatility of Asian local currency bonds

Economy	Benchmark bond analysis				Local currency and dollar return analysis					
	Asia		US		HSBC local bond index		HSBC local bond index (in USD)		Matching US Treasury index	
	Yield	Vol[1]	Yield	Vol[1]	Return	Vol[2]	Return	Vol[2]	Return	Vol[2]
China	2.97	51	4.18	111	3.41	3.24	3.41	3.24	7.24	5.63
Hong Kong SAR	4.09	128	3.71	116	6.33	3.37	6.39	3.44	6.04	2.89
India	7.37	122	4.51	107	17.63	5.14	18.41	5.65	7.24	5.63
Indonesia	12.27	178	4.18	111	25.68	10.10	30.52	18.63	...	...
Korea	5.34	152	3.02	111	6.81	3.08	8.07	8.57	6.04	2.89
Malaysia	4.10	95	4.51	107	3.84	3.67	3.82	3.69	6.37	3.46
Philippines	10.59	270	3.02	111	13.94	5.52	10.95	12.31	6.04	2.89
Singapore	3.36	94	4.51	107	4.09	3.77	3.97	6.39	7.51	5.06
Taiwan, China	3.22	100	4.51	107	8.92	5.55	7.63	6.10	8.11	7.41
Thailand	4.57	171	4.51	107	5.16	5.92	7.36	7.73	7.51	5.06
Asia	...	...	3.71	116	...	...	10.52	4.07	6.37	3.46
Memo:										
Australia	*5.62*	*117*	*4.51*	*107*	*5.15*	*5.07*	*14.67*	*11.61*	*7.51*	*5.06*
Euro area	*4.55*	*65*	*4.51*	*107*	*5.93*	*3.60*	*14.09*	*11.83*	*7.24*	*5.63*
Japan	*1.21*	*59*	*4.51*	*107*	*1.81*	*2.44*	*3.27*	*9.56*	*7.24*	*5.63*

Note: US, Australian, German and Japanese government bond indices are constructed by EFFAS. The analysis is based on Wednesday closing yields on US Treasuries and Thursday closing yields in Asia from 1 January 2001 to 5 March 2004 for all economies, except the benchmark analysis for China and the Philippines, which starts in October 2001, and Indonesia, which starts in January 2003.

[1] In basis points. [2] In per cent.

Sources: Bloomberg; CEIC; HSBC; BIS calculations. Table 2

bonds were similar to those of US Treasuries, these Asian bonds' higher return volatility also ranks them below US Treasuries. Finally, the higher returns on Indian, Indonesian, Korean and Philippine bonds were more than offset by their higher volatilities in all but the case of the best-performing Indian bonds. On this showing, most of the Asian local currency markets offered inferior returns in relation to risk as compared with US Treasury bonds.

In contrast, the Sharpe measure for the overall index of Asian local currency bonds compiled by HSBC (which overweights liquid markets and excludes China and Indonesia altogether) tells a different story. This index outperformed its US Treasury counterpart, owing largely to India (weighted almost a quarter). More importantly, it showed less volatility of returns. This shows the potential volatility reduction arising from a combination of bonds with imperfectly correlated returns. In particular, the index's volatility is lower than all but two of its constituent portfolios from dollar-linked economies (Hong Kong SAR, weighted about 15%, and Malaysia, weighted about 4%).

Treynor ratios

... the other focusing on shared volatility

An alternative way of looking at risk and return casts a more flattering light on the performance of Asian bonds. The Treynor ratio suggests that all but one market (as well as the aggregate) had a favourable relation of risk to return in the sample period (Table 3). This measure divides excess returns on a portfolio

Portfolio performance of Asian local currency bonds				
Economy	Sharpe measure		Treynor measure	
	Asia	US	Asia	US
China	0.45	0.94	83.86	7.24
Hong Kong SAR	1.29	1.41	6.66	6.04
India	2.91	0.94	–277.57	7.24
Indonesia	1.53	...	...	...
Korea	0.71	1.41	–104.37	6.04
Malaysia	0.50	1.27	18.33	6.37
Philippines	0.73	1.41	–23.49	6.04
Singapore	0.31	1.09	6.95	7.51
Taiwan, China	0.93	0.83	53.48	8.11
Thailand	0.70	1.09	23.11	7.51
Asia	2.10	1.27	53.31	6.37
Memo:				
Australia	*1.09*	*1.09*	*18.35*	*7.51*
Euro area	*1.02*	*0.94*	*13.60*	*7.24*
Japan	*0.14*	*0.94*	*9.12*	*7.24*

Note: See Table 2.

Sources: Bloomberg; CEIC; HSBC; BIS calculations. Table 3

by the beta relating returns on it to the global portfolio. Here, we take the global portfolio to be the US Treasury matched duration portfolio.[7] On this basis, all but one Asian local bond market (Singapore) had a more favourable ratio of risk to return than its US Treasury counterpart. The largest constituent of the HSBC overall Asia index, Korea, had a very favourable negative ratio, owing to the negative covariance between Korean government bond returns in dollars and US Treasury returns.[8] To take another example, the low Sharpe ratio for Philippine bonds says that their additional return, compared to US Treasuries, is purchased at a high price in terms of the volatility of returns. Over the sample period, however, their returns covaried negatively with US Treasury returns. If systematic risk is the focus, then Philippine bonds are very attractive: their addition to a portfolio of US Treasury bonds could add return while lowering the portfolio's overall systematic risk. The next section examines the reasons for the moderate co-movement of Asian bonds with US Treasury notes.

[7] As a result, the Treynor ratios for the US Treasury baskets are their excess returns divided by one. This use of the US Treasury to proxy the global portfolio is subject to the Roll critique as being too narrow for this purpose. A broader global bond portfolio would include euro and yen government bonds in addition to US Treasuries. This would tend to raise the Treynor ratios for US Treasury bonds and thereby narrow the advantage of the Asian bonds. But even if the beta for US Treasuries were reduced to one third, while that for Asian bonds remained the same, the performance of the Asian bonds would still appear in a favourable light.

[8] Since this covariance is positive for won returns, the Korean won must have systematically weakened when US bond yields fell. One interpretation is that weak US activity led to higher US Treasury two-year note returns and a weaker won.

Reasons for relatively low correlation with US dollar bonds

Relatively low correlations ...

The relatively low correlation between returns on Asian local currency bonds and US Treasury notes could reflect the strong influence of domestic factors as well as incomplete integration into global capital markets. Domestic factors would include exchange rate policy and the credit standing of government issuers. The degree of integration with global markets has two aspects, namely the participation of global firms in domestic market-making and the involvement of non-resident investors. Each of the four factors is considered in turn.

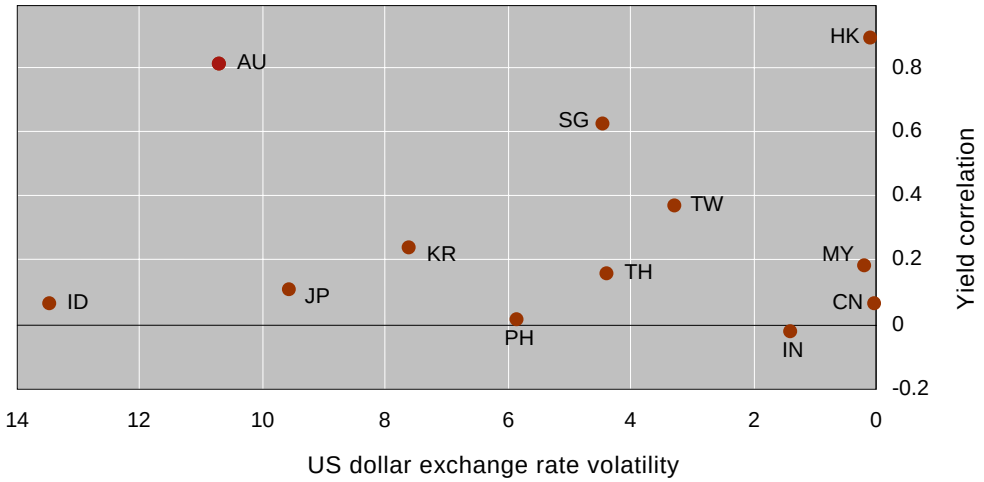
Exchange rate policy and bilateral dollar exchange rate volatility

... not explained by exchange rates ...

There is a widespread view that East Asia is basically part of the dollar bloc of currencies. If true, this would imply that the region's bond markets offer little in the way of diversification possibilities for a portfolio already having a large share of US dollar bonds. However, both the dollar bloc view and the inference of extremely limited diversification possibilities are overstated.

Currencies in the region move against the dollar more than is generally recognised. Moreover, exchange rate stability is not systematically associated with higher co-movement between local currency bonds and their US Treasury counterparts (Graph 3). Despite currencies pegged to the dollar, yields on Chinese and Malaysian bonds move with US Treasury bonds only to a limited extent owing to effective capital controls. Conversely, Australian (and euro area) bonds share considerable yield movement with US Treasury bonds despite the volatility of the respective dollar exchange rates.[9]

Yield correlation and exchange rate volatility[1]



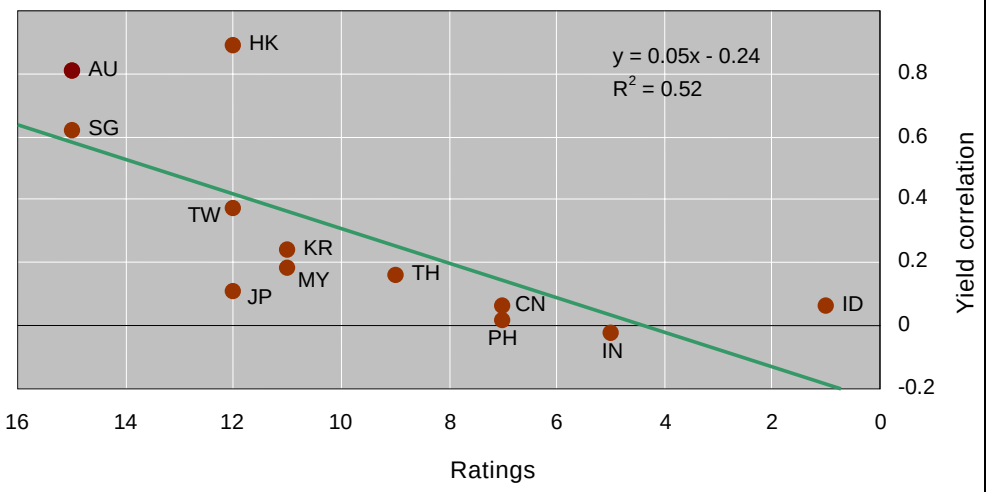
Note: For an explanation of the country codes, please refer to Table 1.

[1] Based on Wednesday closing yields in US Treasuries and Thursday closing yields in Asia. Exchange rate volatility is average 50-day historical volatility during January 2001–March 2004.

Sources: Bloomberg; BIS calculations. Graph 3

[9] A simple regression of yield correlation coefficients on rating, dollar exchange rate volatility and a dummy variable reflecting capital controls in China and Malaysia shows that only credit rating has a significant effect on yield correlation. The regression result is as follows: Yield correlation = –0.166 –0.182*dummy –0.005*exchange rate volatility +0.053*ratings. Only the coefficient on ratings is statistically significant at the 5% level.

Yield correlation and rating[1]



Note: For an explanation of the country codes, please refer to Table 1.

[1] Based on weekly changes in Wednesday closing yields in US Treasuries and Thursday closing yields in Asia. Ratings used are S&P local currency ratings, with AAA defined as 15 and B– as 0. The standard error of the estimated coefficient is 0.017.

Source: Bloomberg. Graph 4

Credit standing

... but instead by credit risk and related factors ...

Lower-rated credits show lower correlations of weekly changes in yields (Graph 4). One way of interpreting this relationship is that country-specific factors, for instance political events like elections, weigh more heavily on bond markets in lower-rated economies. Note, however, that even for economies with medium to high ratings, such as Korea, Malaysia, Thailand and China, the pass-through or correlation coefficients are still relatively low. The implication would seem to be that realising the benefits of diversification does not necessarily entail taking on high levels of credit risk.

Globalisation of market-making in local bond markets

... local market-making ...

Foreign banks' securities operations have become active in some domestic securities markets, even in the absence of a cross-border bid for local currency bonds. One measure of this is the turnover reported by a global trade association, EMTA, in local currency bonds, as a fraction of overall market turnover reported by national sources (Table 4). The share of foreign market-makers in domestic market turnover varies from almost 90% in Hong Kong SAR to about a third in Malaysia and Singapore and less than 10% elsewhere.

This share is associated with a stronger correlation with the US Treasury market. This is true even if the outlier of Hong Kong is excluded (Graph 5). One interpretation is that the firm-wide risk management techniques and risk appetite help to raise the co-movement of bond markets with a larger representation of global firms in market-making.

Trading volume in 2003 reported by international banks

In millions of US dollars

	Eurobonds	Local currency bonds	Foreign participation ratio
China	3,390	169	…
Hong Kong SAR	23,618	75,497	0.88
India	868	30,235	0.06
Indonesia	5,207	2,212	0.09
Korea	45,437	52,416	0.03
Malaysia	16,781	20,937	0.29
Philippines	34,030	3,048	0.04
Singapore	20,602	86,582	0.32
Taiwan, China	846	73,474	0.04
Thailand	1,939	3,374	0.06
Total	152,718	347,944	0.07
Percentage of emerging markets total	10	19	...

Note: EMTA's *2003 Annual Debt Trading Volume Survey* reports secondary market purchases and sales of debt with original maturity over 12 months, excluding repos. The foreign participation ratio is EMTA-reported local currency bond trading divided by total local currency bond market turnover.

Sources: Barclays; Deutsche Bank; EMTA; BIS calculations. Table 4

Scale of foreign investment

... and the virtual absence of foreign investors

Equity markets in East Asia tend to be more correlated with the S&P 500 Index than regional bond markets are with the US Treasury market (Graph 6). Richards (2003) shows that non-resident purchases of Asian equities respond positively to the performance of the S&P 500, and in turn boost Asian equity prices. If portfolio equity flows underpin the correlation of equity markets, then the paucity of portfolio bond flows helps explain lower bond market correlation.

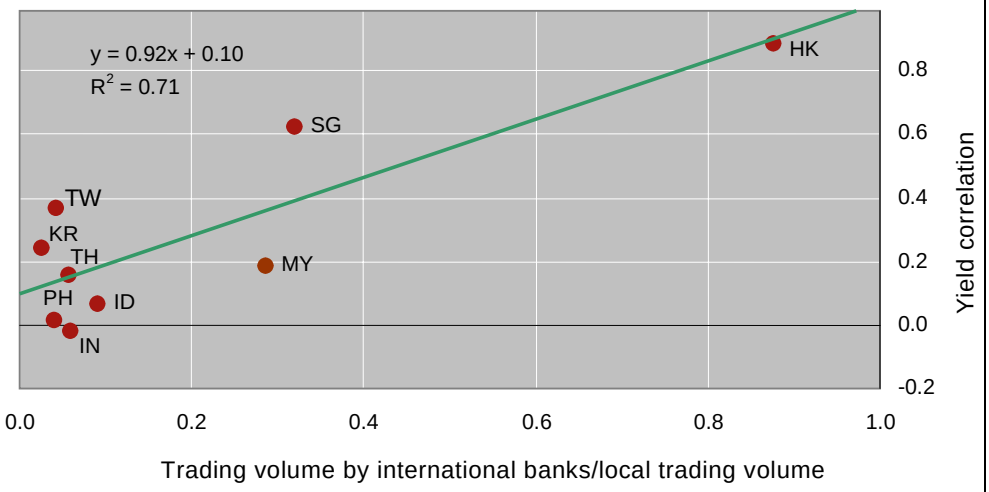
Korea represents an extreme case in that foreigners hold some 40% of Korean equities but less than 0.4% of Korean bonds. In Thailand, at end-2003, foreigners held about 28% of Thai equities, but again less than 1% of Thai bonds. Apparently, Indonesia's bond market has attracted most investment by non-residents in the region: foreign holdings reached about 2% last year.[10]

Precisely why equity markets are international while bond markets are local is not clear (Takeuchi (2004)). While a number of explanations have been suggested, many fail to stand up to scrutiny or lack generality. Capital controls have limited foreign investment in China and India, but these must be recognised as exceptional cases.[11]

[10] Shirai (2001, pp 72, 81, 95, 108) reports that in 1999 non-residents held 0.3% and 0.1% of public and corporate bonds respectively in Korea, and 0.5% and 1.5% respectively of government securities and corporate bonds (November 2000) in Malaysia.

[11] Capital controls on investment in Taiwanese equities (albeit more liberal than Chinese or Indian barriers to foreign investment in their bonds) did not prevent these equities from being included in major global equity indices.

Foreign market-making and yield correlation[1]



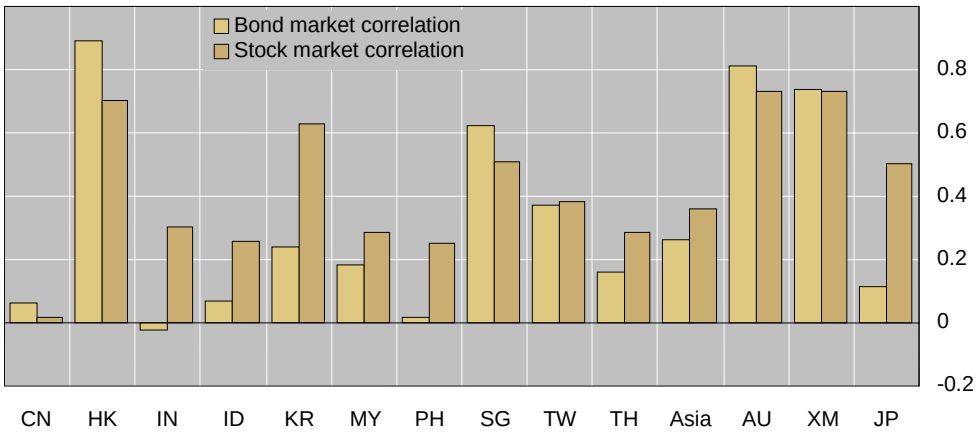
Note: For an explanation of the country codes, please refer to Table 1.

[1] Bond market correlation is based on weekly changes in benchmark yields at Thursday closing for Asia and Wednesday closing for US Treasuries. The period is from January 2001 to March 2004. Foreign participation is measured as the share of EMTA-reported trading volume by international banks in total local trading volume. The standard error of the estimated coefficient is 0.22.

Sources: Barclays; Bloomberg; EMTA; BIS calculations. Graph 5

Lack of hedging markets and *weak infrastructure* are often cited as factors deterring foreign investors, but any such impediments have not sufficed to keep non-residents out of equity markets.[12] *Low credit ratings* have not prevented

Bond and stock market correlations[1]



Note: For an explanation of the country codes, please refer to Table 1.

[1] Bond market correlation is based on weekly changes in benchmark yields at Thursday closing for Asia and Wednesday closing for US Treasuries. Stock market correlation is based on weekly changes in stock market price indices at Thursday closing for Asia and Wednesday closing for the S&P 500. The period is from January 2001 to March 2004.

Sources: Bloomberg; BIS calculations. Graph 6

[12] Admittedly, this could particularly be the case for bonds given the greater propensity of bond investments to be hedged than equity investments. See Hohensee and Lee (2004) on hedging markets in general. Ma et al (2004) discuss how non-deliverable forward exchange markets in

Asian governments from selling dollar bonds to non-residents, even though these bonds generally carry lower ratings than their domestic currency counterparts (Kisselev and Packer (2004)).

Two other explanations may go further. *Withholding taxes* may in fact be a larger barrier than either the rates levied or the bilateral arrangements for reclaiming such taxes might suggest. "Real money" accounts often simply do not want to submit themselves to the administrative burden of taking advantage of tax treaty rights.[13] The *low levels of yields* in East Asia may also have dissuaded foreign buying (Schmidt (2004)): the increase in foreign ownership of Indonesian bonds to 2% in part reflects the allure of its relatively high yields. In the global bond market, "exotic" currencies like the South African rand or the Polish zloty have generally offered high coupons.

Will low correlations continue?

This section considers whether the low correlations of Asian bonds with global bond markets should be expected to continue. This question has a trend aspect, related to the reasons just offered for relatively low correlations, and a cyclical aspect, related to the ongoing upturn in global bond yields.

Integration with global financial markets and credit upgrades

A trend towards higher correlations?

A possible implication of all the reasons offered for relatively low correlations is that Asian local bonds might offer less in the way of diversification possibilities over time. Higher credit ratings, more globalised domestic markets and increased foreign investment might undermine the rationale for investing in local bonds. As noted, higher correlations have not prevented global equity investors from investing in local stock markets in the hope of higher returns. Bond market investors, however, may be attracted more by low beta (prospect of diversification) than high beta (a leveraged play on global equity markets).

Co-movement in a bear market

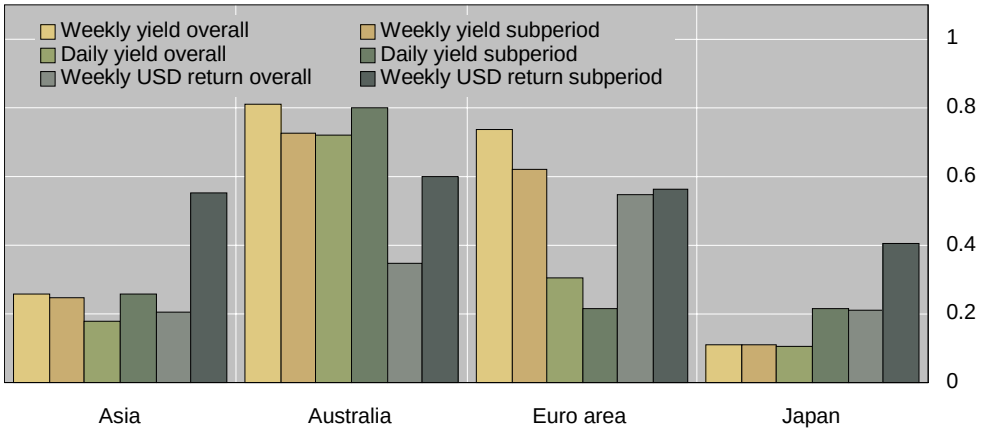
Higher correlations in bear markets?

The hardest test of a diversification comes during a period of rising bond yields, especially for markets that have grown up during years of generally declining global yields. Markets that usually trade with low or moderate correlations can track each other more closely when prices fall. This may occur if, as has been observed, declining markets prove to be more volatile (Borio and McCauley (1996)). As argued by Loretan and English (2000), among others, higher volatility tends to result in higher correlations, even if the underlying process remains the same. Market dynamics can also lead to higher correlations during a bond market sell-off, as leveraged investors in one market

particular have developed to serve the hedging needs of equity investors. Braeckevelt (2004) reviews shortcomings in clearing and settlement systems.

[13] The US dollar bond market before the repeal of withholding tax on bond interest in the mid-1980s provided strong evidence of the deterrent effect of the tax: top-rated US corporations were able to offer lower yields offshore through an offshore finance unit than those on comparable tax-withheld US Treasury bonds. This ended quickly after the repeal of the withholding tax.

Yield and dollar return correlations during June–September 2003[1]



[1] Based on weekly or daily changes in benchmark yields and on weekly US dollar returns at Thursday closing for Asia and Wednesday closing for US Treasuries. The overall period is from January 2001 to March 2004 and the subperiod is from 19 June 2003 to 18 September 2003.

Sources: Bloomberg; BIS calculations. Graph 7

experience losses and liquidate similar positions in another market – though such market dynamics may be less relevant in insular markets.

A test in mid-2003 ...

Asian local bond markets did not perform well during the sell-off in the US Treasury market starting in mid-2003. Correlations of weekly changes of yields showed a limited rise, although there was some increase at the daily frequency, as in Australia and Japan (Nakayama et al (2004); Graph 7). From the international investor's standpoint, the substantial increase in the correlation in weekly *US dollar* returns would have been bad news. When US Treasury yields rose, the US dollar tended to strengthen against the local currencies.

Worse news, however, was that two Asian local bond markets underperformed US Treasuries over the whole period, while three more suffered almost as large a rise in yields as US Treasuries. This performance to some extent reflected the initial conditions in which local bond yields in China, Malaysia, Singapore, Taiwan and Thailand had all fallen substantially below those on US Treasuries. Heightened by the outbreak of SARS, deflation fears drew on recent falls in consumer prices in most of these economies. Low inflation expectations and subdued economic activity in the first half of 2003 were reinforced by accommodative monetary policy, ample liquidity in the banking system and growing demand from institutional investors in depressing long-term government bond yields. As equity markets tended to recover in the second half of the year, bond yields in these economies rebounded towards expected GDP growth rates.

... and another in the second quarter of 2004

Asian local currency bonds again disappointed during the sell-off in the second quarter of 2004 (Table 5). This time, only one Asian market showed a substantially larger rise in yields than the US Treasury market. Still, these markets provided less of a refuge than might have been hoped, with more surprises in the direction of higher yields.

Performance of Asian bonds in the second quarter of 2004

	Mid-2003				2004 Q2				Deltas		
	19 June		18 September		30 March		30 June		Estimated pass-through[1]	Actual Δ Own/Δ UST[2]	
	Own	UST	Own	UST	Own	UST	Own	UST		Mid-2003	2004 Q2
CN	2.9	2.9	3.2	3.6	4.0	3.4	4.9	4.2	–0.09	0.35	1.13
HK	2.5	2.3	3.0	3.1	2.6	2.8	3.6	3.8	0.97	0.69	1.02
IN	5.8	3.4	5.3	4.2	5.1	3.8	5.8	4.6	–0.15	–0.54	0.92
ID	11.9	2.9	11.6	3.6	11.5	3.4	12.0	4.2	0.22	–0.38	0.58
KR	4.1	1.6	4.2	2.1	4.4	1.9	4.2	3.1	0.33	0.10	–0.16
MY	3.5	3.4	4.2	4.2	4.9	3.8	4.9	4.6	0.35	0.87	0.00
PH	9.5	1.6	9.9	2.1	11.4	1.9	11.4	3.1	0.30	0.82	0.07
SG	2.0	3.4	3.6	4.2	3.1	3.8	3.4	4.6	0.55	1.87	0.48
TW	1.5	3.4	2.8	4.2	2.3	3.8	2.9	4.6	0.54	1.61	0.91
TH	2.7	3.4	3.4	4.2	4.0	3.8	5.1	4.6	0.26	0.87	1.50
Asia	.	.	.	.	.	.	.	.	0.33[3]	0.62[3]	0.64[3]
Memo:											
AU	*5.6*	*4.0*	*5.1*	*3.6*	*5.4*	*3.8*	*5.9*	*4.6*	*0.88*	*0.87*	*0.56*
XM	*4.1*	*4.0*	*4.0*	*3.6*	*4.0*	*3.8*	*4.3*	*4.6*	*0.45*	*0.60*	*0.43*
JP	*0.7*	*4.0*	*1.1*	*3.6*	*1.4*	*3.8*	*1.9*	*4.6*	*0.06*	*0.83*	*0.63*

Note: For country names in Column 1, see Table 1.

[1] Estimated betas based on weekly data from 1 January 2001 to 5 March 2004 for all economies, except for China and the Philippines, which start in October 2001, and Indonesia, which starts in January 2003. [2] Change over the period in own yield divided by change over the period in US yield; for 2004 Q2, Asian data cover 1 April–1 July, while US data cover 31 March–30 June, including the Federal Open Market Committee meeting on 30 June. [3] Average of above.

Sources: Bloomberg; CEIC; HSBC; BIS calculations. Table 5

The two biggest markets, those of China and India, showed as large a rise as US yields over the period as a whole, notwithstanding their indifference to US events over January 2001–March 2004 at the weekly frequency. Thailand's government bond yields also more than matched the rise in US Treasury yields. Almost as surprising on the other side was the performance of the Korean bond market, which managed a modest rally in the quarter, while Malaysian and Philippine bonds also held up better than one might have predicted. Taken as a group, Asian local currency bonds showed an increase in yields over the quarter twice as high as one might have anticipated based on the rise in US Treasury yields alone – and higher than that on euro area or Australian bonds.

In the two largest economies, rapid growth, rising inflation and speculation about increases in policy interest rates produced a cyclical position unusually similar to that of the United States. The People's Bank of China raised its rediscount rate in April, although it did not raise administered deposit and lending rates. Indian yields rose as the monetary policy statement hinted at higher policy rates and widened even more after the election as market participants feared pressure for a larger fiscal deficit. Rising headline inflation, despite well behaved core inflation, and recovering investment spending led Thai rates to follow US rates upwards and then not to retrace steps in June.

Expectations of a rise in overnight rates in Korea, by contrast, were pushed out as news of consumer sentiment and business investment disappointed.

Japanese bonds also suffered an unusual parallel sell-off in the second quarter. Yields rose as the country's growth prospects were upgraded and the end of the de facto zero interest rate policy seemed to market participants to be closer. In contrast, many observers remarked upon the "uncoupling" of the euro area bond market and the US Treasury market.

Conclusions

This special feature has reviewed the evidence for the period January 2001–March 2004 and found that Asian local currency bonds offer scope for diversification. Their return correlations with the US Treasury market generally lie below those of the euro area or Australian government bond markets, although above that of the Japanese government bond market. Asian bond returns, taken in conjunction with their volatility, compare unfavourably with their US Treasury counterparts market by market. But an aggregate of Asian bonds gives a more positive picture, in part because aggregation reduces the volatility of returns. If the assessment of returns and risk focuses on Asian bonds' systematic risks, and thereby gives them credit for their moderate return correlations with US Treasury notes, the performance of Asian local currency government bonds compares favourably both severally and collectively.

The co-movement of Asian local currency bonds with US Treasury notes seems unrelated in general to exchange rate policy. The prior view that the stability of exchange rates in Asia against the dollar would produce very similar bond returns is not supported in the cross section. Instead, differences in credit standing and the openness of these markets help explain their varying co-movement. In particular, higher-rated government bonds show higher co-movement. At the same time, a greater role of foreign firms as market-makers seems to be associated with higher co-movement, even in the absence of much cross-border investment. The greater openness of equity markets in the region to international investment seems consistent with the generally higher correlation of the region's stock markets with the US stock market than of Asian bonds and US Treasury notes.

Will low correlations between Asian bond markets and global bond markets continue? Our findings suggest that the scope for diversification could narrow over the long run if the trend towards higher ratings in the region is sustained, and if the markets in the region open up. In the short run, the analysis of the second quarter of 2004 sounds a warning. Correlations or, equivalently, pass-through coefficients estimated over a period of mostly declining yields internationally may provide an unreliable basis for gauging performance during a bear market.

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A shift in London's eurodollar market[1]

London's interbank market went through a sectoral shift in recent years. The rate at which banks channel funds back into the interbank market declined sharply following the introduction of the euro and the subsequent contraction in foreign exchange trading. Surplus dollars from the banking sector have been used to finance non-bank borrowers, primarily in the United States, and may reflect the greater role of the London market in financing securities trading in New York.

JEL classification: G150

London remains the largest depository for US dollars outside the United States. In recent years, however, the eurodollar market in London seems to have undergone a sectoral shift. Specifically, the "interbank recycling ratio" – the proportion of total funds deposited in London's banks which are recycled back into the interbank market – has declined sharply. Banks in London continue to receive deposits from banks abroad, but are directing an increasingly large share of these deposits to non-bank borrowers, particularly in the United States. Moreover, this shift seems to have been rather abrupt. An analysis of the patterns of activity in the London US dollar market suggests that the relative size of interbank lending remained remarkably stable from the late 1970s until at least 1996. A striking contraction in interbank business becomes clear only after 1997.

Although it is difficult to isolate the precise reasons for this move towards non-bank borrowers, it does seem to be consistent with several broader developments in the international banking market. The shift roughly coincides with the introduction of the euro and the subsequent drop in foreign exchange transactions involving the US dollar as a conduit currency. In addition, considerable global consolidation in the banking and financial services sectors in the 1990s is likely to have impacted the flow of funds passing through London. Indeed, the decline in the interbank recycling ratio in London has been accompanied by higher levels of activity between banks located there and non-bank borrowers in the United States. Increased business with US securities firms and other non-bank financial institutions may be a driving factor.

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

The remainder of this paper is organised as follows. The next section discusses the role that London has played in the eurodollar market over the last 25 years, and highlights its growing importance as a global repository for US dollars placed outside the United States. The section which follows investigates the scale of the interbank activity over the period, measured as the share of total funds placed in London that are redeposited in the interbank market. Special attention is given to changes that have emerged in recent years with the introduction of the euro. After this, possible explanations are suggested for the shift towards non-bank borrowers, focusing on the increasing ties between European banks and residents of the United States.

London at the centre of the eurodollar market

The geopolitical environment during the cold war and the regulation of US domestic banks in the 1960s and 1970s led oil-producing countries to search for a home outside the United States for their US dollar deposits. A long history as a global trade centre, coupled with a loosening of regulations on offshore transactions in the late 1950s, allowed London to emerge as the repository for these dollars.[2] Over the past 30 years, US dollar deposits outside the United States, or "eurodollars", have grown exponentially, with London remaining at the centre of this market.[3]

London remains at the centre of the international banking market ...

This growth in eurodollar deposits has been a function of the greater efficiency of eurobanks relative to banks in the United States. Because eurobanks face fewer regulations than their domestic counterparts (eg reserve requirements), they can operate at lower spreads and hence offer more competitive deposit and loan interest rates.[4] With these lower operating costs, eurobanks have been able to attract deposits that would otherwise be placed in US domestic banks. As a result, the eurodollar market serves as an arena for the global recycling of funds, whereby eurobanks not only manage their own US dollar positions vis-à-vis other currencies, but ultimately place them in the hands of the global borrowers best able to use them.

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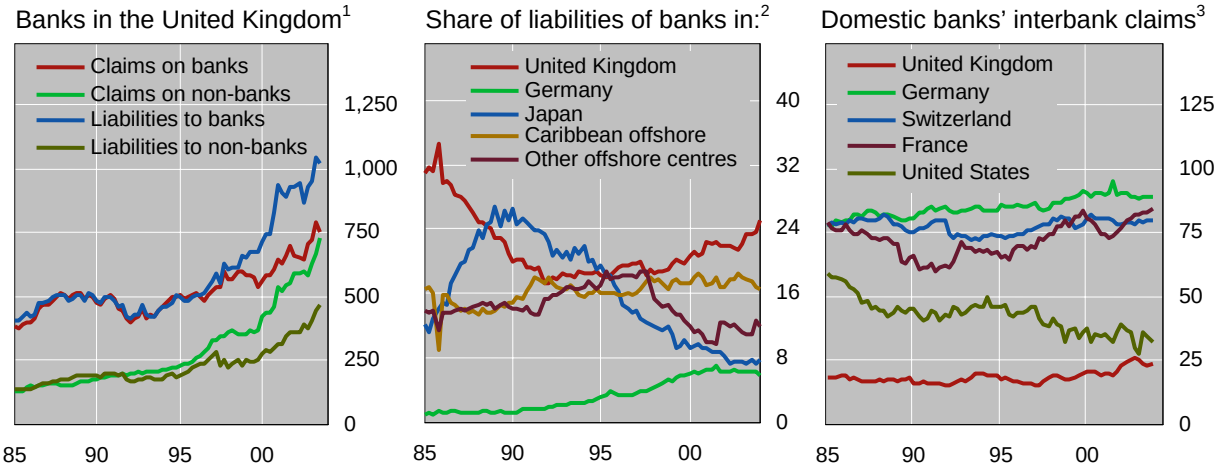
[2] For a thorough treatment of the development of the eurodollar market, see Mayer (1979), McKinnon (1979), Johnston (1983), Niehans (1984) and Krugman and Obstfeld (1991).

[3] Formally, a eurodollar is a US dollar deposit, typically a 30-, 90- or 180-day time deposit, which is placed in a bank located outside the United States (often called a "eurobank"). Neither the nationality of the bank nor the location (or nationality) of the supplier of funds is relevant. What is relevant is the location of the bank accepting deposits. Thus, a US dollar deposit by a US manufacturing firm in a branch of a US bank in London is considered a eurodollar, while a US dollar deposit by a French company in a German bank in New York is not.

[4] In addition to regulations on reserve requirements, restrictions on dollar lending and borrowing in New York in the 1960s and 1970s contributed to the growth of eurodollar activity. In particular, the Interest Equalization Tax and the Foreign Credit Restraint Program placed limits on loans available to foreigners and US companies investing abroad. In addition, the Federal Reserve's Regulation Q limited the interest paid on domestic deposits. See Grabbe (1986) for a discussion.

US dollar international claims and liabilities



[1] In billions of US dollars. [2] The share of US dollar liabilities of selected reporting countries in total US dollar liabilities of all reporting countries excluding the United States; in per cent. [3] Calculated as the share of total claims on banks for each reporting country that is accounted for by banks headquartered in the reporting country; in per cent. For example, German banks' share of Germany's total claims on banks.

Source: BIS. Graph 1

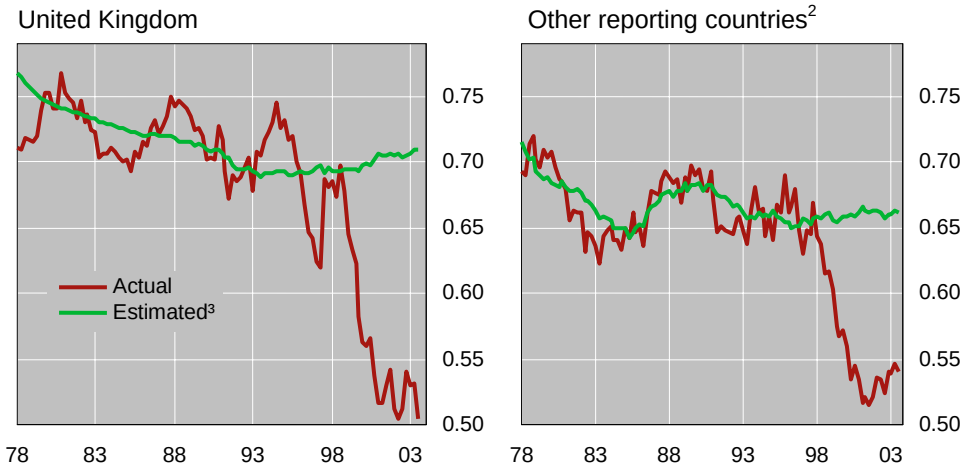
... despite competition from offshore and other financial centres

Despite the enormous expansion in eurodollar banking transactions over the last 30 years, the globalisation of the world's major banks and the rise of competing offshore centres over the last decade, London, if anything, occupies an increasingly important position in the eurodollar market. Since the market's infancy, a significant share of market participants' eurodollar deposits has been concentrated in London. As of the first quarter of 2004, $1.86 trillion, or 25% of all US dollar liabilities of banks located outside the United States, were placed in banks in London, almost double that of the next largest repository country (the Cayman Islands). This share has been gradually rising over the last few years, from 18% in the third quarter of 1997 (Graph 1, centre panel).

Moreover, London remains the most diverse international banking centre in the world. While roughly 80% of the international interbank claims of banks located in Switzerland and France (and 90% for banks in Germany) are accounted for by domestic banks (ie banks actually headquartered in these countries), the corresponding figure for the United Kingdom is only 20% (Graph 1, right-hand panel). The United States, which has become more diversified over recent years, comes in second at 34%. Consistent with this, cross-border banking activity in the United Kingdom remains the least concentrated in terms of bank nationality relative to all other major international banking centres.[5]

[5] Other measures also indicate that the United Kingdom remains the most diverse international banking centre. For example, Herfindahl indices, which capture the degree of concentration of lending banks in each reporting country, indicate that the United Kingdom is the least concentrated reporting country. In contrast, Germany, where the majority of cross-border claims originate from domestic banks, is one of the most concentrated reporting countries among the developed economies.

Interbank recycling ratio[1]



[1] Calculated as total US dollar claims on banks normalised by total US dollar liabilities vis-à-vis banks and non-banks. [2] Based on an aggregate across 13 countries for which a complete time series is available. Excludes the United Kingdom and the United States. [3] Based on an estimated cointegrating vector which includes a constant and a trend term and uses data up to 1997.

Source: BIS. Graph 2

Evidence of a structural shift

Even casual inspection of the data suggests that the flow of US dollars through banks in London has changed in recent years. Looking past short-term fluctuations, the funds recycling activity through the London interbank market should be, on average, roughly proportional to the total funds available to eurobanks located there.[6] This suggests that a long-term average "interbank recycling ratio" could be measured using statistical tools that filter out the considerable short-term fluctuations in interbank activity.[7]

The broad characteristics of the US dollar interbank market in London are summarised in Graph 1. For all banks located in the United Kingdom, the stock of claims on banks abroad (interbank claims), and total liabilities vis-à-vis all sectors abroad, has risen consistently over the last two decades. While the relative size of these stocks remained stable during the 1970s and 1980s, visual inspection suggests that the expansion in lending to non-bank borrowers, as well as the growth in the stock of liabilities to banks, picked up in

[6] Interbank claims have relatively large quarterly swings for at least two reasons. First, short-term misalignments in the demand for and supply of funds to end-use borrowers mean that deposits in eurobanks may be temporarily passed to other banks. Each leg of this chain is reflected in the aggregate claims figure, and generates what appear to be swellings in interbank loan flows. Second, a significant portion of the stock of interbank claims is related to the foreign exchange activities of global banks, in particular their building-up and unwinding of forward positions (McKinnon (1979)).

[7] Cointegration analysis can be used to estimate the long-term equilibrium relationship between economic variables. It is based on the premise that some economic variables, while subject to idiosyncratic shocks, tend to move together in a defined way over time and can be described by a set of parameters which governs the long-term relationship (ie a cointegrating vector). When embedded in a dynamic econometric model (VAR), the cointegrating vector will tend to push the variables towards their long-run relationship.

the early 1990s, with no corresponding pickup in interbank lending from banks in London.[8]

This shift can be seen more clearly after normalising the stock of interbank claims out of London. The ratio of interbank US dollar claims of banks located in London to these banks' total US dollar liabilities (primarily deposits from other banks, corporations and governments) is but one of several possible normalisations, but has the advantage that the resulting ratio is the share of *total* funds available to banks in London that is redeposited in the interbank market, ie an estimate of the recycling ratio.

The interbank redeposit rate remained stable until the mid-1990s ...

This ratio is presented in the left-hand panel of Graph 2. From the end of the 1970s to the mid-1990s, between 66 and 75 cents of every dollar placed in London was recycled in the interbank market. Put differently, roughly two dollars flowed to banks (including own-office lending) for every dollar that was lent to non-bank, or end-use, borrowers. The graph also displays the long-term relationship (based on an estimated cointegrating vector) between the size of the interbank market and total liabilities.[9] For the United Kingdom, the long-term average between the late 1970s and the mid-1990s implied that 71 cents of every dollar placed in London was channelled back into the interbank market. Moreover, at no time during this period did the actual ratio deviate from the estimated ratio by more than 8%, suggesting structural regularities.

... but declined sharply after 1997 in London and elsewhere

Sometime in the second half of the 1990s, however, the relationships governing the flow of funds through London seem to have changed. The actual ratio of interbank claims to total liabilities began to fall in the mid-1990s, a trend which accelerated after 1997. By mid-2002, interbank lending had sunk to 50 cents on the dollar, a 25% deviation from the recycling ratio estimated on the assumption that the previous regime continued beyond the mid-1990s.

This phenomenon has not been restricted to London, although it seems to have been less pronounced elsewhere. A similar analysis of 13 other BIS reporting countries indicates that a decline in the relative size of interbank claims has been characteristic of global activity in the eurodollar market. The right-hand panel of Graph 2 plots the ratio of claims on banks to total liabilities for a sample of 13 reporting countries (excluding the United Kingdom and the United States).[10] Analysed together, the data imply that roughly 67 cents of every dollar placed in banks in these countries in the years prior to 1997 was

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[8] For banks located in the United Kingdom, the average year-over-year growth in US dollar-denominated claims on non-banks between the first quarter of 1979 and the fourth quarter of 1994 was 8.9%, while that of total liabilities of these banks was 8.4%. Between the first quarter of 1995 and the third quarter of 2003, these rates increased to 13.6% and 9.2%, respectively. The growth in claims on banks actually fell from 8.8% on average prior to 1995 to 5.2% more recently.

[9] The parameters of the cointegrating vector were estimated using data up to 1997.

[10] Only reporting countries for which a complete time series is available are used in this exercise. The 13 countries in the sample are Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Sweden and Switzerland. The United States was not included here because its domestic currency is the US dollar.

redeposited in the interbank market.[11] This is a smaller share than that reported for the same period in the United Kingdom, and reflects London's unique position at the centre of the eurodollar market. However, similar to changes in the level of activity in the London interbank market, the recycling ratio for these 13 countries fell dramatically in the second half of the 1990s and eventually ended up over 20% away from the long-term relationship of the 1970s and 1980s.

Explaining the change

This decline in the interbank recycling ratio in London might be explained by structural changes observable over the second half of the 1990s. The first of these was a fall-off in foreign exchange trading in the late 1990s which reflected the introduction of the euro, consolidation in the corporate sector, and the growing role of electronic broking in foreign exchange markets. The second trend relates to banks' increased ties with non-bank financial firms, such as hedge funds and securities houses, which evolved concurrently with the consolidation in the banking industry over the 1990s. Claims out of the United Kingdom have increasingly gravitated towards non-bank borrowers, particularly those in the United States.

Foreign exchange trading and the interbank market

The timing of the decline in the interbank recycling rate roughly coincides with the introduction of the euro. This is likely to have contributed to a decline in the *volume* of foreign exchange-related transactions in the interbank market and in turn the recycling rate for dollar deposits. This relationship reflected the fact that throughout the 1970s and 1980s, almost all trading of convertible currencies used the US dollar as a conduit currency.[12] Moreover, banks located in London have generally been the dominant players in the foreign exchange market.

The interbank market is intimately linked to the foreign exchange market

The consolidation of 11 European currencies into one led to reduced foreign exchange business, which shows up in the BIS data as relatively lower eurodollar interbank activity. This occurs because of the intimate link between the foreign exchange market and the interbank market. Forward contracts are priced on the basis of interest differentials in the interbank market and are almost always hedged with deposits in that market. For example, a bank in Berlin might borrow US dollars in London from another bank, convert these into yen in the spot market, and lend the yen for three months to another bank or a non-bank customer. Meanwhile, the bank will cover the exchange risk by selling the yen three months forward for dollars. In three months, the yen loan is repaid and the funds are immediately exchanged for dollars at the rate

[11] While this aggregation certainly masks considerable cross-country heterogeneity, it is clear from inspection of individual reporting country data that the recycling ratio fell in most major banking systems in the second half of the 1990s.

[12] The Deutsche mark was also used as a conduit currency within the countries that later came to form the euro area.

specified in the forward contract. The original interbank loan, as well as the repayment, appears in the BIS international banking data as US dollar-denominated interbank activity. The forward contract, by contrast, is not captured.

The advent of the euro led to a drop in forex trading ...

Data from recent BIS triennial central bank surveys on foreign exchange and derivatives market activity show a relatively sharp drop in foreign exchange activity after the introduction of the euro.[13] Overall, global foreign exchange turnover declined from a daily average of $1.49 trillion in 1998 to $1.2 trillion in 2001. US dollar business in particular shrank from $1.25 trillion to $1.06 trillion between 1998 and 2001, a reduction of 15% (Table 1). This reflected a fall-off in activity with regard to most of the major currencies. Moreover, the sum of US dollar foreign exchange activity in the United Kingdom which involved the legacy currencies averaged $281 billion per day in April 1998, or half of all foreign exchange business in the United Kingdom. However, these transactions declined after the introduction of the euro, with the

US dollar foreign exchange turnover by currency pair[1]

Currency pair	All reporting countries[2]						United Kingdom[3]					
	1995		1998		2001		1995		1998		2001	
	Amt[4]	Share[5]	Amt[4]	Share[5]	Amt[4]	Share[5]	Amt[4]	Share[5]	Amt[4]	Share[5]	Amt[4]	Share[5]
US dollar/euro	.	.	.	.	354	33	.	.	.	.	170	37
US dollar/legacy currencies	427	45	537	43	.	.	193	50	281	50	.	.
Of which:												
US dollar/ Deutsche mark	254	27	290	23	.	.	100	26	138	25	.	.
US dollar/ French franc	51	5	58	5	.	.	25	6	29	5	.	.
US dollar/ECU	18	2	17	1	.	.	15	4	13	2	.	.
US dollar/ other EMS	104	11	172	14	.	.	53	14	101	18	.	.
US dollar/other currencies[6]	520	55	711	57	706	67	195	50	277	50	291	63
Total	947	100	1,248	100	1,060	100	388	100	558	100	461	100

[1] Daily averages in April of each year, adjusted for local and cross-border double-counting. [2] Net of local and cross-border inter-dealer double-counting. [3] Net of local double-counting. [4] Amount, in billions of US dollars. [5] In per cent. [6] Includes the total of yen, sterling, Swiss franc, Canadian dollar, Australian dollar and other currency exchanges with the US dollar.

Source: BIS (1999, 2002). Table 1

[13] See the BIS publications on the triennial central bank surveys of May 1996, May 1999 and March 2002 and Galati (2001) for details. The surveys were conducted by central banks and monetary authorities in April 1995, April 1998 and April 2001. They collected data on (monthly) turnover in traditional foreign exchange markets – spot, outright forwards and foreign exchange swaps – and in over-the-counter currency, interest rate, equity, commodity, credit and other derivatives.

US dollar foreign exchange turnover by counterparty[1]

Daily averages in April, in billions of US dollars

	1995		1998		2001	
	Amount	% share	Amount	% share	Amount	% share
With reporting dealers	610	64	806	64	637	60
With other financial institutions	197	21	245	19	298	28
With non-financial customers	140	15	197	17	125	12
Total	947	100	1,248	100	1,060	100

[1] Adjusted for local and cross-border double-counting. Excludes estimated gaps in reporting.

Source: BIS (1996, 1999, 2002). Table 2

daily average falling by April 2001 to $170 billion, roughly one third of all activity in London.[14]

... and changes in the distribution of counterparties

In addition, changes in the *distribution* of counterparties in foreign exchange transactions, as indicated by the triennial surveys, are suggestive of a growing link between non-bank financial institutions and large commercial banks (Table 2). In 1998, 64% of the average daily turnover in foreign exchange transactions involving the US dollar was with other dealers, including many of the global banks covered in the BIS international banking statistics. In contrast, only 19% of these transactions had non-bank financial institutions as counterparties. By 2001, transactions with these counterparties had risen in absolute as well as percentage terms, to 28% of all activity, while transactions between dealers had fallen to 60%. Galati (2001) cites the growing reliance on electronic broking in the foreign exchange market, as well as consolidation in the banking sector, as reasons for the fall in inter-dealer transactions and, by extension, the rise in the share of transactions with non-bank financials.

Financing of securities trading

A move towards a "hub and spoke" banking structure ...

The decline in foreign exchange activity, while significant, cannot completely account for the relative contraction in interbank lending out of London. In particular, a fall in US dollar-related foreign exchange business should presumably have similar implications for both the asset and liability side of bank balance sheets. Yet the BIS data indicate that, even as the growth in interbank claims *from* banks in London has slowed in recent years, banks located around the world have continued to deposit US dollars *in* banks in London. This suggests a deeper structural change in the intermediation activities of banks.

Market participants often refer to the emergence (over the last decade) of a "hub and spoke" banking structure. Increasingly, large commercial banks are

[14] In 1995, outright forwards involving the US dollar and the legacy currencies accounted for 43% of total US dollar turnover in outright forwards (38% in 1998). By 2001, the corresponding share for the euro had fallen to 36%.

concentrating their international operations in a single location, typically a major financial centre like London. In the most generic structure, branches of these banks located around the world serve as a means of collecting deposits, which are then funnelled to the global "hub", thus inflating the stock of claims (reported in the BIS data) on banks located there. These funds are then redistributed from this central location to both banks and, increasingly, non-banks (often financial institutions) around the world.

... has contributed to sectoral shifts in the London interbank market

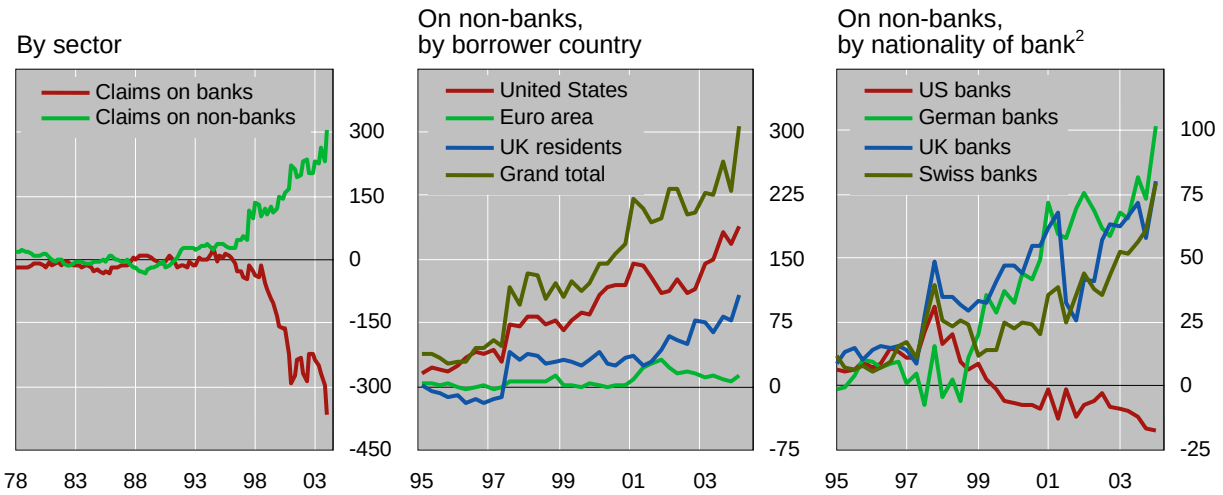
Such a shift is clearly evident in London. Relative to the early years in the eurodollar market, more and more of the dollars placed in London by banks around the world are being lent to non-bank borrowers (Graph 3, left-hand panel). Total US dollar liabilities of banks in the United Kingdom to banks totalled $1.3 trillion in the first quarter of 2004, more than double the level at end-1997. Interbank *lending*, by contrast, did not keep pace with the growth in liabilities, rising by less than 60% over this same period.[15] Combined, this generated a $368 billion net stock of dollars which has not been redeposited in the interbank market.

Increased lending to borrowers in the United States ...

These excess dollars have been used to finance US dollar borrowing by non-banks, primarily in the United States (Graph 3, left-hand panel). Overall, the net stock of claims on non-bank borrowers reached $307 billion in the first quarter of 2004, up from $97 billion at end-1997. Almost two thirds of these funds flowed to borrowers in the United States (Graph 3, centre panel). Much

US dollar net claims of banks in the United Kingdom[1]

In billions of US dollars



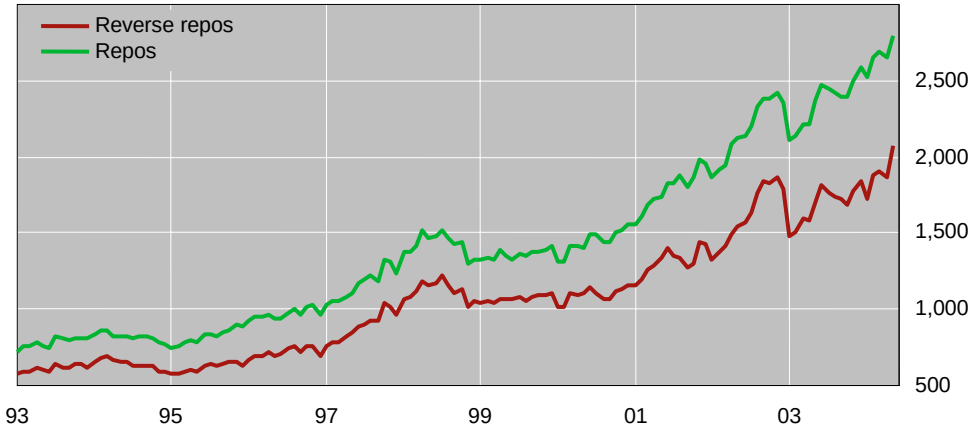
[1] Calculated as the stock of total assets minus total liabilities of all banks located in the United Kingdom. [2] US dollar net claims of banks located in the United Kingdom vis-à-vis non-banks in all countries.

Source: BIS. Graph 3

[15] The net stock of liabilities vis-à-vis banks in the United States increased by $122 billion, while the net stock vis-à-vis banks in offshore centres increased by $40 billion, in Japan by $22 billion, in the euro area by $23.5 billion and in developing countries by $40 billion.

Repo activity in the United States

Amounts outstanding, in billions of US dollars



Source: Federal Reserve Bank of New York. Graph 4

of the remainder ($82 billion) flowed to non-bank residents in the United Kingdom.[16]

... may reflect strengthened ties with non-bank financials

Identifying the non-bank borrowers in the United States is more difficult, but the trends in global banking in the 1990s point to securities houses, hedge funds and other non-bank financials which have relied on banks in London to leverage their capital in taking positions in fixed income securities. The BIS data indicate that the London offices of UK, German and Swiss banks have mostly been responsible for the rise in the United Kingdom's net stock of US dollar claims on this sector globally (Graph 3, right-hand panel). Over this same period, a number of major banks headquartered in these countries shifted some or all of their global operations to London. In addition, much of the consolidation in the financial services sector which took place in the 1990s involved banks headquartered in these European countries and non-bank financial institutions, some of which were located in the United States.[17]

The strengthened ties between banks and securities dealers may have facilitated the increased use of repurchase agreements, or "repos", a primary instrument by which dealers in fixed income securities markets finance their positions. Concurrent with the shifts described above, outstanding repos recorded in the United States, which include agreements with both domestic and foreign counterparties, grew from roughly $1 trillion in 1997 to over $2.5 trillion at end-2003 (Graph 4).

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[16] In recent years, UK-owned banks and building societies have tapped foreign currency wholesale markets to fund domestic lending (Speight and Parkinson (2003)).

[17] To name but a few, Deutsche Bank acquired Morgan Grenfell Group in the United Kingdom in 1989, Bankers Trust in the United States in 1999, and Scudder Investments, a US asset management firm, in 2002. UBS/SBC acquired SG Warburg plc in London in 1995. In 1997, it acquired Dillon, Read & Co, an investment bank in New York, and later merged with PaineWebber (in 2001). Credit Suisse increased its holdings in First Boston in 1990, and then reorganised into CSFB in 1996–97. Barclays created an investment banking operation in 1986, which subsequently developed into Barclays Capital. In 1995 Barclays purchased the fund manager Wells Fargo Nikko Investment Advisors, which was integrated with BZW Investment Management to form Barclays Global Investors.

Conclusion

Eurodollar deposits are increasingly concentrated in London. While the overall structure of the London interbank market remained stable for much of the period of eurodollar growth, the long-term relationships governing the flow of funds through banks in London appear to have changed recently. Whereas 75 cents of every dollar deposited in London was returned to the interbank market until the mid-1990s, this redeposit rate has dropped to just above 50 cents on the dollar in recent years.

Changes in banks' business, as well as the fall in US dollar foreign exchange activity related to the introduction of the euro, have apparently been factors behind this decline. Banks in London continue to receive US dollar deposits from banks abroad, but are directing increasingly large portions of these deposits to non-bank borrowers, primarily in the United States. Reduced interbank dealing in the currency markets, a broadening of the menu of services offered by major commercial banks, and the financing of securities houses, particularly in the United States, have coincided with the shift towards non-bank borrowers.

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Macroeconomic announcements and implied volatilities in swaption markets[1]

Some of the sharpest movements in the major swap markets take place during days of US economic data releases. These yield movements induce spikes in volatilities during those days. Swaption prices adjust to reflect the spikes: the volatilities implied by these prices tend to fall once the volatility spike induced by an announcement has passed. For a given type of announcement, the decline in implied volatility is consistent with the average size of the spike in realised volatilities.

JEL classification: G10, G14.

A large body of literature has identified macroeconomic announcements as among the most important information events in fixed income markets. One common finding is that the effect on yields of a given announcement depends on the magnitude of the surprise, ie the difference between the released number and the prevailing consensus forecast for this number. However, not much is known about the impact of such announcements on market uncertainty, especially as measured by the volatility implied in interest rate options.

This special feature looks at the swaptions market to analyse the effect of macroeconomic announcements on implied volatility. To do this, the analysis first identifies the subset of economic indicators that exert a significant impact on swap yields at a daily frequency in both the United States and the euro area. The effects of these indicators are then shown to translate into realised volatilities, leading to a pattern of volatility spikes on certain announcement days, with the size of a given spike depending on the type of announcement released that day and the magnitude of the surprise relative to the consensus forecast. Finally, we show that, as one would expect, the forward-looking volatilities implied by the prices of swaption contracts tend to fall once the volatility spike induced by the announcement is over. The actual size of a given data surprise seems to have little effect on how much such forward-looking volatilities decline after the announcement.

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

Which announcements matter? Reviewing the evidence

US macroeconomic announcements drive yield changes ...

An extensive literature has measured the impact of macroeconomic announcements on financial prices. One common finding is that announcements about a small number of US macroeconomic variables tend to have significant effects on both domestic and euro area yields, while euro area macroeconomic announcements have only a small or negligible effect on either domestic or US rates. Using high-frequency data, Fleming and Remolona (1997) and Furfine (2001) study the impact of macroeconomic announcements on the US Treasury market. They find that the effect on yields depends on the data surprise – that is, the deviation of an announced macroeconomic statistic from its expected value as measured by analyst forecasts. Other recent papers have analysed the overseas transmission of the impact of macroeconomic announcements. Goldberg and Leonard (2003) find that US data releases on non-farm payrolls, the unemployment rate, initial unemployment claims and consumer sentiment tend to account for the largest moves in both US and German sovereign bond markets. Consistent with the view that US variables have more influence on yields than European ones, Pedersen and Wormstrup (2001) find that only a few euro area indicators affect euro area bond returns. Ehrmann and Fratzscher (2002) confirm that, even though the linkages between the two economic areas increased between 1993 and 2002, the impact of US data releases tends to be greater than that of euro area releases. In earlier studies, US announcements were also found to significantly affect the changes in Australian bond prices (Campbell and Lewis (1998)). The same conclusions were obtained by Gravelle and Moessner (2001) for Canadian short-term futures rates and for government bond yields between 1995 and 2000.

... in the euro market as well as the US market

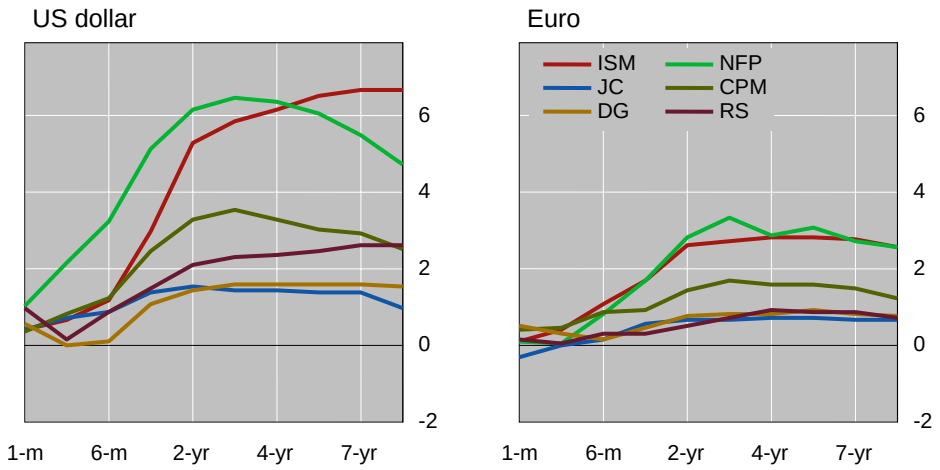
In this section, we confirm for swap yields the announcement effects that have been documented for US and euro area government bond yields. We examine 35 indicators, 16 belonging to the United States, five to the euro area as a whole, seven to Italy, five to France and two to Germany. "Surprises" are defined as the difference between the announced value for an indicator and the consensus forecast.[2] We standardise the surprises so as to compare the impact across announcements. In all cases, a positive surprise is defined as an event in which the value of the indicator differs from its expected value in a direction that indicates stronger economic growth or higher inflation than had been expected.

We run regressions that take as dependent variables the daily changes in eurodeposits and swap rates, with maturities ranging from one to six months

[2] All surprises are taken from Bloomberg. For the United States they include: consumer price index (CPI), Institute for Supply Management (ISM) index, jobless claims, non-farm payrolls, durable goods orders, GDP, housing starts, Chicago Purchasing Managers (CPM) index, index of leading indicators, producer price index (PPI), retail sales, factory orders, capacity utilisation, industrial production, balance of trade, productivity. For the euro area: CPI, consumer confidence, industrial confidence, industrial production index, PPI. For Italy: preliminary CPI, consumer confidence, business confidence, producer price index, industrial production index, hourly wages, retail sales. For Germany: retail sales, Ifo index. For France: CPI, consumer confidence, consumer spending, industrial production, PPI.

Swap yield change following a one standard deviation positive surprise[1]

In basis points



ISM = US Institute for Supply Management index (formerly known as NAPM); NFP = US non-farm payrolls; JC = US jobless claims; CPM = Chicago Purchasing Managers index; DG = US durable goods orders; RS = US retail sales.

[1] For all variables except jobless claims, the graph shows the impact on yields of a one standard deviation increase in the unconditional mean of the variables. For jobless claims, it displays the impact of a one standard deviation fall in the unconditional mean.

Sources: Bloomberg; BIS calculations. Graph 1

for eurodeposit rates and from one to 10 years for swap rates. The regressors are the contemporaneous values of the 35 data surprises.[3] The sample runs from January 2000 to May 2004. Because the surprises have been standardised, the coefficients of these regressions can be interpreted as the change in yields, measured in basis points, induced by a one standard deviation contemporaneous surprise.

Swap markets are subject to the same phenomenon

Confirming the results of previous studies, six US news variables are found to exert a significant impact on both US and euro area swap rates, while no euro area news variable plays a statistically significant role in the yield changes in either area.[4] Graph 1, left-hand panel, shows that US non-farm payrolls and the US Institute for Supply Management (ISM) index are the most influential variables, while the effects of jobless claims, the Chicago Purchasing Managers (CPM) index, durable goods orders and retail sales announcements are smaller and of approximately similar magnitude. The right-hand panel of the graph shows that the impact of these announcements on euro area swap rates tends to be smaller, nearly half that observed for US rates.[5]

[3] The same regressions were run including among the regressors a small number of lags of the daily changes in the swap rates, thus controlling for the existence of some degree of predictability in such series. Results did not change significantly.

[4] These results are not reported.

[5] It is quite interesting to observe that non-farm payrolls and the ISM index have the same impact on the euro area rates, while the former variable exerts a stronger effect on US swap yields.

Impact of economic announcements on volatilities

While many studies have analysed how data announcements move yields, only a few have focused on their effect on second moments of financial returns. Andersen et al (2003) observe that *realised* volatility, as measured by squared yield changes, spikes just after the announcements, reflecting the change in yields. They also show that, on average, the positive spike in volatility occurring on release days lasts longer than the impact of the announcement on returns. Ederington and Lee (1996) had earlier shown that *implied* volatilities, ie the volatility extracted from option prices, tend to rise in the days preceding a data release. They also found that there is a sharp drop in implied volatilities just after announcements, because the announcement itself helps resolve uncertainty.

The announcements also affect volatilities ...

What then is the relationship between the behaviour of realised volatility and that of implied volatility? Realised volatility is an *ex post* measure of volatility. As such, its behaviour would depend not only on the type of announcement but also on how large the surprise in the announcement turned out to be. By contrast, implied volatility is an *ex ante* measure. It is supposed to reflect the expected average realised volatility over the remaining life of the option contract.[6] As such, the behaviour of implied volatility would depend on the type of announcement but not necessarily on the size of the surprise on a given announcement day, which is unknown a priori. In principle, the implied volatility before an announcement will reflect the average volatility spike generated by such an announcement. After the announcement, the implied volatility for a given option contract should fall to reflect the fact that there is now one less volatility spike to consider during its remaining life. As a first approximation, how large the surprise turns out to be should be irrelevant. We formally test this hypothesis in the final section.

... but implied volatilities differ from realised volatilities

As shown in the previous section, swap yields rise after a positive surprise and fall after a negative surprise. The jump in yields translates into a positive spike in realised yield volatility. In the case of US swap rates between January 2000 and May 2004, we measure realised volatilities as the absolute values of yield changes for swap yields on maturities of one, five and 10 years. As shown in Table 1, the change recorded for realised volatilities on days characterised by the release of one of the six news items, relative to the realised volatility prevailing on any other day of the sample, is always positive and significant. The biggest spikes are observed for the release of non-farm payrolls (between 8% and 18% for the three rates), jobless claims (between 3% and 5%) and retail sales (around 4.5% for all three rates).

We now analyse how implied volatility behaves on announcement days. First, we estimate implied volatilities from swaption contracts written on swap rates for maturities of one, five and 10 years, and with expirations ranging from

[6] In general, implied volatility will also be affected by the preferences of investors, in particular by how risk-averse they are.

Average spike in realised volatility on US announcement days[1]

In per cent per annum

	1-year rate	5-year rate	10-year rate
US non-farm payrolls	18.35	10.90	7.96
ISM survey	1.70	4.95	4.28
CPM index	2.10	1.20	1.11
US durable goods orders	0.34	1.93	1.20
US retail sales	4.62	4.79	3.95
US jobless claims	5.18	3.51	3.18

[1] Change in realised volatility on days on which economic announcements occur.

Sources: Bloomberg; BIS calculations. Table 1

one month to one year.[7] We then regress daily changes in such volatilities on dummy variables for announcement days, with each type of announcement represented by its own dummy variable. The dummy variable is unity on the announcement day of a given type of announcement and zero for all other days. Graph 2 reports the results for three of the six major economic announcements that we have identified. Consistent with previous findings, the impact of announcement days on implied volatilities is always strongly negative and the pattern tends to be similar across maturities and time horizons. Across the term structure, implied volatilities for the one-year US swap rate tend to have the strongest reaction to data surprises, with the non-farm payroll figure causing a decline of nearly 100 basis points in the implied volatilities of six-month and one-year options on the one-year rate. In the case of euro swaps, volatilities of interest rates respond significantly only to one announcement, the ISM survey, with US non-farm payrolls having only a marginal impact (not reported). In addition, the effects of US announcements on these implied volatilities (also not reported) tend to be much smaller than in the case of US rates. Consistent with what has been found for swap yield changes, no European news release has a statistically significant effect on the implied volatilities of euro area swap rates.

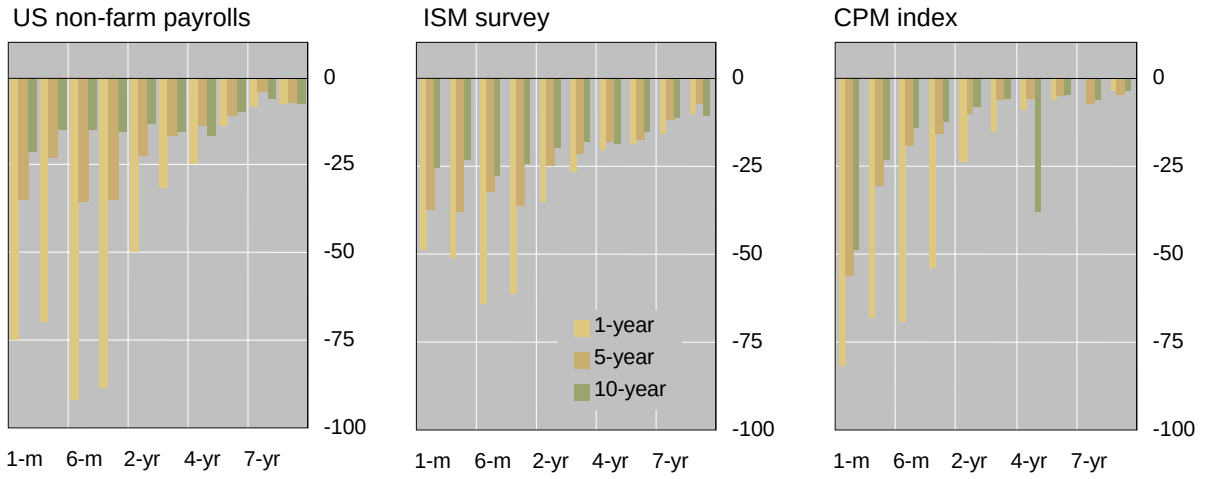
Dummy variables capture the announcement effects …

Are the declines in implied volatilities consistent with the average volatility spikes associated with the types of announcements released on those days? In other words, can we expect these declines not to vary from one release date to the next for a given type of announcement? This would be the case if specific announcements did not lead agents to revise their beliefs about future volatility or to modify the compensation they require for the risk of such volatility.[8]

[7] A swaption is an option on a swap rate, ie an option on a portfolio of forward Libor rates. A European-type payer swaption gives the owner the right to enter a swap at a predetermined fixed rate, where he/she pays the fixed leg of the contract and receives the floating leg, ie the Libor rate, at the expiration (maturity) of the option. For example, at the beginning of the contract, a swaption on the one-year swap rate with a time to maturity of two years and a strike price of 4% gives the owner the right to enter, after two years, a one-year swap contract under which he/she pays 4% and receives the sequence of floating Libor rates at semiannual intervals.

[8] We formally check the consistency between the spike in realised volatility and the fall in implied volatility as follows: on each day before an announcement, we build a forecast of the

Impact of US economic announcements on implied volatilities[1]



[1] Change in implied volatilities, expressed in basis points, on days on which economic announcements occur. The bars indicate the maturity of the swap rates, while the horizontal axis indicates the maturity of the swaption.

Sources: Bloomberg; BIS calculations. Graph 2

Does the size of the surprise matter for implied volatilities?

The analysis carried out so far shows that implied volatilities in swaptions fall significantly on announcement days. The analysis has not taken into account the surprise in the announcements on those days. Indeed, previous research carried out on yield changes, as opposed to volatility changes, has highlighted the importance of the size of economic surprises, ie the bigger the surprise the bigger the impact on yields. As already noted, however, in the case of implied volatilities, only the ex ante expectation of realised volatility should matter, unless the size of the surprise changes market participants' views about future volatility.

To see whether the size of announcement surprises matters for the behaviour of implied volatilities on announcement days, we run additional regressions. As before, these regressions take as dependent variables the observed changes in implied volatilities for each of the three yields and for each of the three swaption maturities, and as independent variables dummy variables for announcement days. This time, however, we add to these regressions the absolute values of the corresponding standardised surprises. If the coefficients associated with the standardised surprises turn out to be significantly different from zero, we would then conclude that the size of the

change in implied volatility which will take place after the announcement by subtracting the expected spike in the realised volatility, taken from Table 1 and rescaled to reflect the maturity of the swaption, from the implied volatility prevailing on that day. We then compare, for each type of announcement, the difference between the realised and the predicted changes in the implied volatility. In nearly two thirds of the comparisons (the total number of comparisons was 54) we cannot reject the hypothesis that our forecast is statistically indistinguishable from the actual values of the changes in implieds. See Tarashev et al (2003) for an application to the US, UK and German stock indices.

Regression of the change in implied volatilities on announcement dummies and economic surprises[1]

In basis points

		1-year rate		5-year rate		10-year rate	
		1-m[2]	6-m[2]	1-m[2]	6-m[2]	1-m[2]	6-m[2]
US non-farm payrolls	A	–70	–55	–44	–27	–55	–26
	S	–18*	33*	–32*	–2*	–10*	3*
ISM survey	A	–84	–29	–67	–29	–60	–24
	S	29*	–23*	1*	–6*	0*	–3*
CPM index	A	–82	–29	–67	–29	–61	–24
	S	32*	19*	12*	9*	1*	1*
US jobless claims	A	–84	–29	–68	–29	–61	–23
	S	–5*	3*	–2*	3*	–9	1*
US retail sales	A	–84	–32	–68	–29	–61	–24
	S	–15*	–47	–16	–15	–6*	–3*
US durable goods orders	A	–85	–30	–68	–29	–61	–24
	S	–53	–5*	–23	0*	–24	–3*

[1] The dummy is unity on a day when an announcement occurs and zero on all other days. A = change in implieds due to the announcement dummy; S = change due to the size of the standardised surprises. The asterisk indicates that the coefficient is not statistically different from zero. [2] Maturity of the swaption. Table 2

surprise does matter and that it contains relevant information about future volatilities.

… and the surprise on a given day tends not to matter

Results based on the implied volatilities of the US swap rates show that the coefficient associated with the absolute value of the surprise is negligible for five of the six analysed announcements (non-farm payrolls, ISM survey, CPM index, jobless claims, durable goods orders; see Table 2). This result means that knowing the size of the surprise in any of these five announcements does not translate into a significant advantage in forecasting future volatilities. Only in the case of the retail sales announcement does the size of the surprise seem to matter. However, the effect is the opposite of what we would expect: a bigger surprise leads to a sharper decline in implied volatility, suggesting that future volatilities are expected to be smaller. Nonetheless, for the most part, the decline in implied volatilities on announcement days does not depend on how large the announcement surprise turns out to be.

Conclusions

We confirm previous findings that show how the releases of a small number of US economic variables produce significant changes in both US and euro area interest rates. We have not been able to find any euro area news that affects either domestic or US rates. We also show that for at least six specific US announcements, implied volatilities extracted from interest rate swaptions tend to fall on announcement days. The declines are in line with the realised volatility spikes that these announcements produce on average, suggesting that the behaviour of implied volatilities can be explained largely by the removal of an expected volatility spike from the relevant horizon for swaptions.

In particular, we show that the size of the economic surprise on a given announcement day does not help forecast the change in implied volatilities.

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

Basel Committee on Banking Supervision

Financial firms seem to have made good progress in improving their disclosure practices but greater levels of disclosure would still be desirable.[1] This was the conclusion of a report released in May by the Joint Forum.[2] Entitled *Financial Disclosure in the Banking, Insurance and Securities Sectors: Issues and Analysis*, the report examines the progress made by financial firms in adopting the recommendations made by the Multidisciplinary Working Group on Enhanced Disclosure (also called the Fisher II working group) in April 2001, and other efforts of regulators and standard setters in the area of financial disclosure.

New capital adequacy framework released

In June, central bank governors and the heads of bank supervisory authorities of the G10 met and endorsed the publication of *International Convergence of Capital Measurement and Capital Standards: a Revised Framework*, the new capital adequacy framework commonly known as Basel II (see the special feature on page 41).

The Basel II framework, which was developed by the Basel Committee on Banking Supervision (BCBS), sets out the details for adopting more risk-sensitive minimum capital requirements for banking organisations. The new framework reinforces these requirements by laying out principles for banks to assess the adequacy of their capital and for supervisors to review such assessments to ensure banks have adequate capital to support their risks. It also seeks to strengthen market discipline by enhancing transparency in banks' financial reporting. The text reflects the results of extensive consultations with supervisors and bankers worldwide. It will serve as the basis for national rule-making and approval processes to continue and for banking organisations to complete their preparations for the new framework's implementation.

[1] The report is available on the websites of the BIS (www.bis.org), the International Organization of Securities Commissions (IOSCO; www.iosco.org) and the International Association of Insurance Supervisors (IAIS; www.iaisweb.org).

[2] The Joint Forum was established in 1996 under the aegis of the Basel Committee on Banking Supervision (BCBS), IOSCO and the IAIS to deal with issues common to the banking, securities and insurance sectors.

Basel II embraces a comprehensive approach to risk management and bank supervision. It should enhance banks' safety and soundness, strengthen the stability of the financial system as a whole, and improve the financial sector's ability to serve as a source of sustainable growth for the broader economy.

Basel II emphasises risk measurement and management

The Basel Committee intends the new framework to be available for implementation in member jurisdictions as of year-end 2006. The most advanced approaches to risk measurement will become available as of year-end 2007, in order to allow banks and supervisors to benefit from an additional year of impact analysis or parallel capital calculations under the existing and new rules.

The G10 governors and supervisors supported the Committee's plans to continue discussions on key implementation issues with the industry and other authorities as domestic adoption and approval processes proceed. They also encouraged authorities in non-BCBS jurisdictions to consider the readiness of their supervisory structures for the Basel II framework and recommended that these jurisdictions proceed at their own pace, and according to their own priorities.

Potential impact of IAS 39 on regulatory capital

In June, the BCBS announced that it had discussed the potential impact of the implementation of international financial reporting standards (IFRS) on regulatory capital and whether it should be adjusted. Under IAS 39, the cumulative fair value gains and losses on cash flow hedges of financial instruments measured at amortised cost are recognised directly in equity but only to the extent the hedges are considered effective. The Committee believes that, for regulatory capital purposes, it would be appropriate for national supervisors to exclude the cumulative gains and losses from the definition of Tier 1 and Tier 2 capital.

The BCBS also examined the appropriate regulatory treatment of any gains and losses arising from changes in an institution's own credit risk as a result of applying the fair value option to its liabilities. The Committee believes that the potential inclusion of these gains and losses in Tier 1 or Tier 2 capital raises significant supervisory concerns, and that they should be excluded. Accordingly, it takes the view that it would be appropriate for national supervisors not to recognise these gains and losses in regulatory capital. Application of the fair value option may also have other supervisory implications with respect to regulatory capital. The BCBS will continue to review these implications concurrently with the International Accounting Standards Board's planned finalisation of its revised approach to the fair value option, along with other consequences of the introduction of IFRS.

Financial Stability Forum

In May, the Financial Stability Forum (FSF) held its third regional meeting in the Asia-Pacific region in Beijing, China. Meeting participants exchanged views on strengths and vulnerabilities in international and regional financial systems. They agreed that growth has been particularly strong in the Asia-Pacific region, reflecting domestic structural reform and policy improvements, the global

recovery and a benign global financing environment. Another topic was policy challenges faced by regional authorities in managing a sustainable upturn and maintaining financial system soundness. There was particular interest in the adjustment path of the Chinese economy and the possible consequences this could have for the regional and global economy. Participants also discussed the potential impact on regional economies and financial systems of the transition of global interest rates to more neutral settings, high oil and commodity prices, global imbalances and rising household indebtedness.

FSF regional meeting in Asia on strengths and vulnerabilities in financial systems

The meeting reviewed recent progress made in strengthening regional financial systems, and the associated challenges that lie ahead. The participants shared the view that, though strong growth in the region has generally reduced levels of non-performing loans and increased profitability of banks, challenges remain in a number of regional financial sectors. In particular, banks' capacity to manage various risks associated with growing new business areas, such as consumer lending, needs to be strengthened. Participants pointed to the importance of coordination among financial authorities in the development of domestic and regional bond markets as a means of deploying regional savings more effectively, increasing financial resiliency and enhancing the competitive environment in the financial sector as a whole. They also exchanged views on regional experiences with regard to the entry of foreign financial institutions into the domestic markets, including its impact on financial efficiency and stability, and the related supervisory issues. They noted the increased activities of hedge funds in financial markets and the need for adequate risk management, counterparty discipline and transparency.

Participants considered the regional implications of current international initiatives to strengthen corporate governance, transparency and audit quality and to put in place stricter enforcement mechanisms, focusing on the most critical reforms and the obstacles that need to be overcome. They attached particular importance to ensuring robust corporate governance in the financial sector, especially in banks, given their dominant role in regional financial systems. Participants also emphasised the need for enhanced audit quality and auditor oversight mechanisms, as well as efforts to strengthen accounting standards. Note was taken of the work of the International Organization of Securities Commissions with regard to credit rating agencies. Participants underscored that further headway is needed in all these areas, in the region as elsewhere.

Regional participants also exchanged views on the Basel II framework. They noted that a certain level of flexibility for non-G10 countries regarding the implementation schedule would support the smooth transition to the new framework.