BANK FOR INTERNATIONAL SETTLEMENTS

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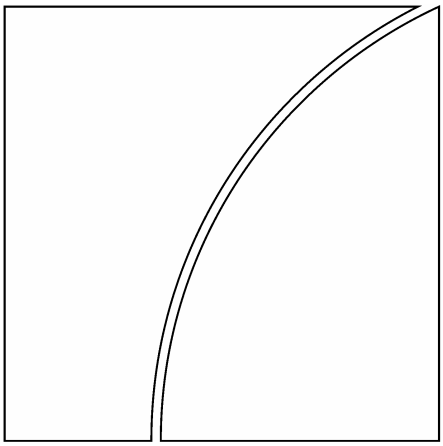
December 2004



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: markets rally as confidence returns

Doubts among investors about the strength of the global economy receded in November. Investors regained their appetite for risk as news pointing to a firming of growth accumulated, most notably in the United States. Although a run-up in oil prices weighed on global financial markets in October, markets quickly rebounded as concerns about oil supplies eased. By the end of November, credit and equity prices were at their highest levels in years and volatilities at their lowest. Increases in US policy rates were widely anticipated and had little impact on markets. Not even the poor performance of corporate profits relative to expectations seemed to dampen investors' confidence.

Investors' renewed appetite for risk also helped to drive spreads on emerging market debt down to their lowest level in years. Emerging market borrowing in international markets remained on track to equal its 1997 high, as debtors took advantage of the favourable financing conditions on offer. Swings in commodity prices contributed to a widening of spreads in October, but this proved to be only temporary. Investors also focused on China, where an increase in interest rates was perceived to signal a greater willingness by the authorities to use market mechanisms to guide the economy.

Despite unexpectedly strong macroeconomic releases in the United States in November, the US dollar fell to new lows against the major currencies. The catalyst seemed to be renewed concerns about the US current account deficit. As a result of the depreciation of the US dollar and differing trends in growth expectations, yen and especially euro yields diverged from dollar yields to a greater extent than they had earlier in the year. Even so, long-term yields in the major markets stayed well below their June highs.

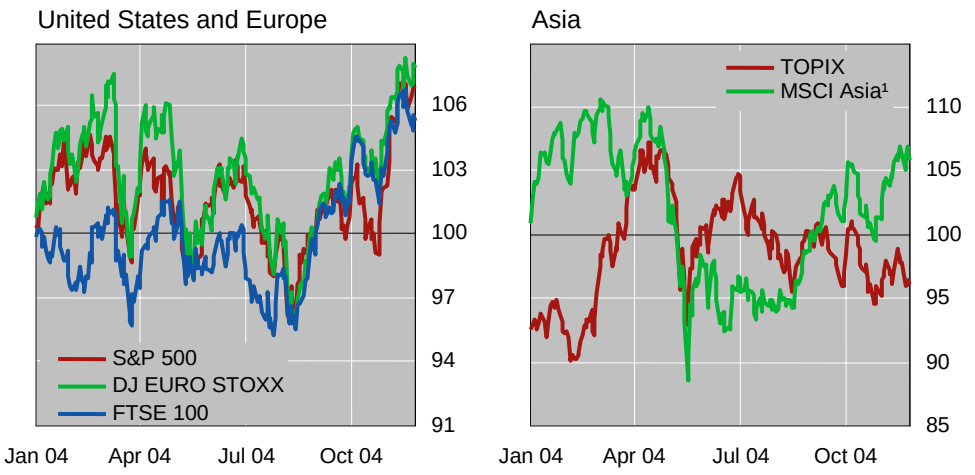
Equity investors shrug off profit warnings

Equity prices reach their highest level since 2001 ...

Relief regarding the economic outlook was most evident in equity markets. After drifting downwards in July and early August on concerns about the strength of the economic recovery, equity markets around the world rallied from mid-August (Graph 1.1). The rally was interrupted in October but then gathered steam in November, with many markets closing the month at their highest level since 2001. The S&P 500 Index rose by 11% between 12 August, its low for the

Equity prices

In local currency; 1 September 2004 = 100



[1] Morgan Stanley Capital International equity index for Asia excluding Japan.

Sources: Bloomberg; Datastream. Graph 1.1

year, and 26 November. Over the same period, the Dow Jones EURO STOXX was up by 12% and the MSCI Asia excluding Japan index by 11%.

The only major equity market not to increase during the period under review was Tokyo. After making strong gains earlier in the year, Japanese equity prices were held back by disappointing news about the strength of the Japanese economy. For example, the TOPIX index fell by ½% on 10 September when revised GDP data for the second quarter came in weaker than market participants had expected.

... boosted by a firming of the growth outlook ...

In those markets that did advance, valuations were boosted not so much by an unambiguous improvement in growth forecasts as by news that was interpreted as ruling out a near-term slowdown or reversal of the global recovery. Whereas many key US economic indicators had disappointed investors in July and August, data releases in subsequent months were close to or above expectations. Consequently, after being revised downwards during the third quarter, growth forecasts stabilised in the fourth, for the United States in particular (Graph 1.2). Confidence in the outlook for the US economy was bolstered by the release of a stronger than expected US employment report on 5 November, which led to a ½% increase in the S&P 500. This followed a 1% increase on 3 November, when the dissipation of political uncertainty in the wake of the US presidential election had lifted equity markets.

... and a decline in risk aversion

A decline in risk aversion played a key role in the market rally. Growing risk aversion had weighed on equity markets between April and June, reflecting uncertainty about the course of US monetary policy (Graph 1.3). Estimates of effective risk aversion derived from equity index options suggest that this trend had reversed by September. As the number of negative macroeconomic surprises diminished, investors appeared to grow more confident in their forecasts of economic growth and future policy rates.

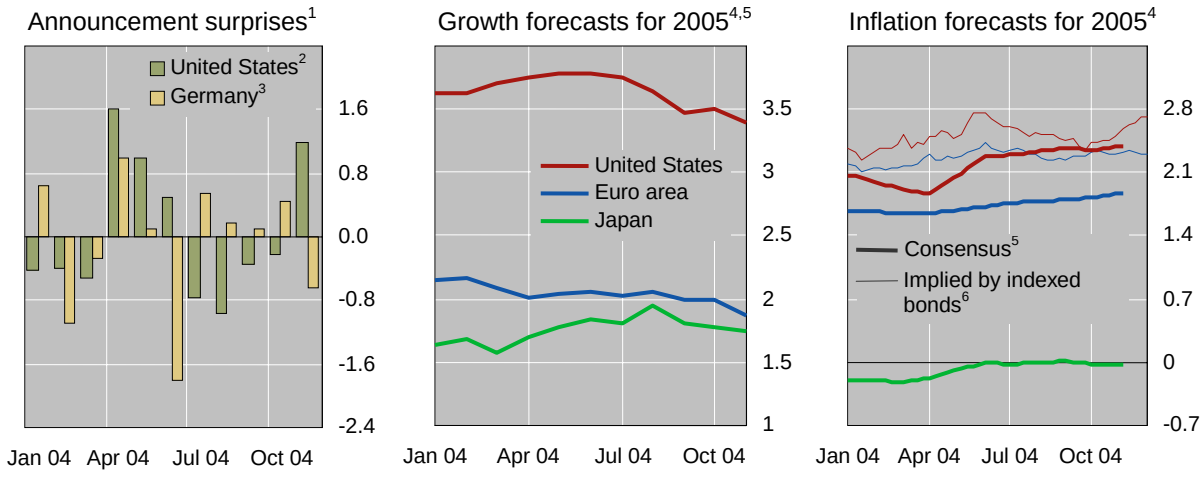
Poor earnings reports occasionally caused markets to stumble, in October especially. For example, the S&P 500 fell by 1% on 7 October and by the same amount on 14 October, after aluminium producer Alcoa and automaker General Motors, respectively, reported earnings well below investors' expectations. Indeed, in the third quarter of 2004 the profits of companies in the S&P 500 grew by less than expected for the first time in more than a year. One quarter of US financial institutions reported earnings below analysts' forecasts, almost double the number in the same period a year earlier (Graph 1.3). Furthermore, the gap between the number of US companies announcing negative revisions to their earnings forecasts and the number of companies announcing positive revisions reached its widest level since mid-2003. Investigations by the New York Attorney General's office into the insurance sector added to the US market's woes in October (see below).

Nevertheless, strong earnings growth – in double digits even if below expectations – has supported the market's rising trend and in retrospect helped justify the high valuations observed at the beginning of the year. Based on a five-year average of trailing earnings, the price/earnings ratio for the S&P 500 declined from 30 in January 2004 to 26 in August before moving higher again. In November, the price/earnings multiple equalled 28, well above its 1961–95 average of 17. The ratio based on forward earnings would be close to this average. However, such earnings forecasts have in the past tended to be overly optimistic.

Concern about the impact of high oil prices on growth

The high level of oil prices at times also weighed on equity markets. Markets had for some time been concerned by longer-term trends in the supply of and demand for oil, in particular the persistence of strong growth in large oil-

Macroeconomic news



[1] Difference between actual data and consensus forecasts normalised by the standard deviation of past surprises; observations are positioned in the month in which the actual data 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] Survey of the business climate in Germany compiled by the Institut für Wirtschaftsforschung (Ifo). [4] Percentage change over the previous year. [5] Forecasts as published monthly by Consensus Economics; observations are positioned in the month in which the forecast was made. [6] Inflation rate implied by the difference between nominal yields and yields on inflation-indexed bonds of the same maturity; for the euro area, French government indexed bonds; weekly averages.

Sources: Bloomberg; © Consensus Economics; BIS calculations. Graph 1.2

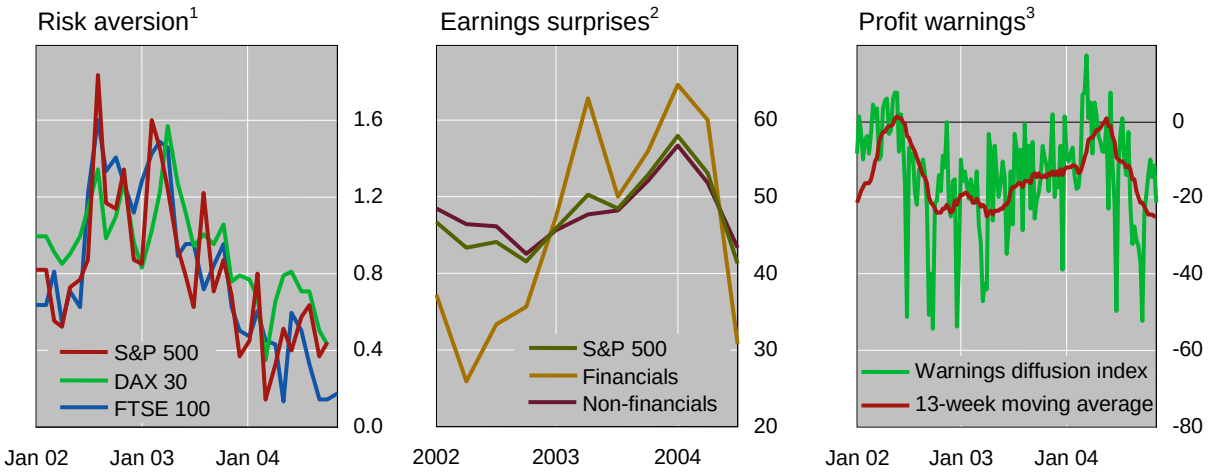
consuming nations such as China and low levels of excess capacity in the global oil industry. In mid-September, hurricane damage to oil platforms in the Gulf of Mexico – the source of approximately 10% of the crude oil consumed in the United States – added to these concerns. The damage was more severe than expected, with many companies announcing that output would remain below normal well beyond September. The impact of this disruption was compounded by civil unrest in Nigeria and a labour dispute in Norway, which led to the closure of several oil installations. These events caused oil prices to soar, in particular the prices of sweet crudes such as West Texas Intermediate (WTI) or Brent (Graph 1.4). Supplies of sour crudes such as Dubai were less affected and so their prices did not increase as dramatically.[1]

Any concerns investors had about higher oil prices appeared to focus on the impact on growth rather than on inflation per se. Market participants apparently subscribed to the view that, unlike the oil price shocks of the 1970s, the latest run-up in oil prices would not lead to an acceleration of inflation. Instead, market participants appeared to worry that insufficient excess capacity in the oil industry would act as a brake on the recovery. This fear was especially acute for the US economy because, relative to other large economies, it consumes more sweet crude.

Equity prices rebound as oil prices fall

Concerns about the impact of higher oil prices on growth eased when oil prices fell sharply towards the end of October. On 27 October, news that US oil inventories had risen by more than expected caused oil prices to plummet; WTI

Risk aversion and corporate earnings

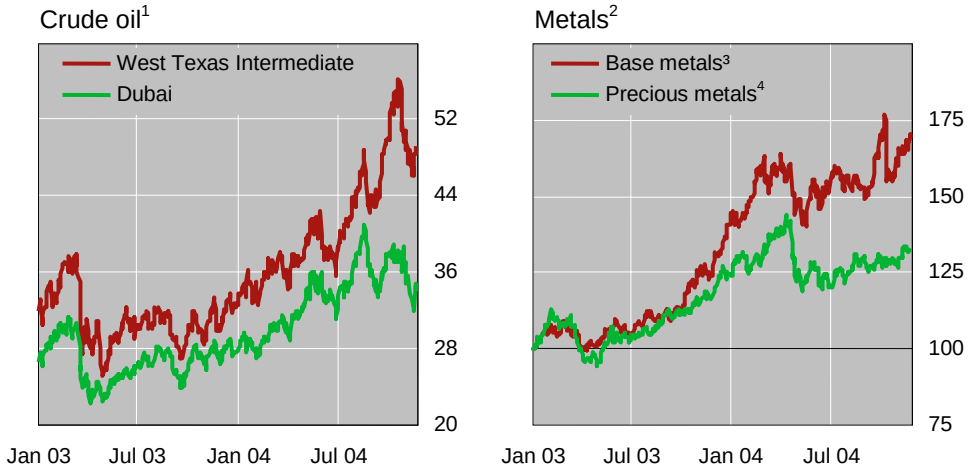


[1] Derived from the differences between two distributions of returns, one implied by option prices with varying strike prices and one based on actual returns estimated from historical data. For more details, see the March 2004 issue of the *BIS Quarterly Review*. [2] Percentage of S&P 500 companies which announced higher than expected quarterly earnings minus the percentage which announced lower than expected earnings. [3] Number of S&P 500 companies which announced positive revisions to their earnings outlook minus companies which announced negative revisions.

Sources: Bloomberg; Chicago Mercantile Exchange; Datastream; Eurex; London International Financial Futures and Options Exchange; BIS calculations. Graph 1.3

[1] The principal difference between sweet and sour crude is the sulphur content. Sour crude contains more sulphur than sweet crude and so is more difficult to refine. As a result, sour crude is typically priced at a discount to sweet crude.

Commodity prices



[1] Spot price in US dollars per barrel. [2] 2 January 2003 = 100. [3] London Metal Exchange index; weighted average of spot prices of aluminium, copper, lead, nickel, tin and zinc. [4] Bloomberg index; weighted average of spot prices of gold, silver, palladium and platinum.

Source: Bloomberg. Graph 1.4

fell by 5% from its near record high of $55 per barrel the day before. This was followed by a 1% jump in the S&P 500 on 27 October and further increases over the next several days. Government intervention earlier in the week to end the labour dispute in Norway is likely to have amplified the impact of the oil inventory report. Oil prices continued to decline in the weeks that followed, reversing much of the run-up that had occurred in September and October. Nevertheless, in late November oil prices were still significantly higher than their levels in the first half of the year.

Search for yield in credit markets

Credit spreads tighten to their lowest level in years

The firming of growth expectations and decline in risk aversion also triggered a rally in credit markets. After moving sideways in the first half of 2004, spreads on both investment grade and high-yield corporate bonds tightened between late August and late November (Graph 1.5). By 26 November, spreads on US dollar-denominated bonds issued by BBB-rated corporations had fallen to 112 basis points – not far above their previous low of January 1998 – and spreads on euro-denominated BBB-rated bonds to 79 basis points.

The low level of credit spreads was underpinned by ongoing improvements in corporate credit quality. Strong earnings growth coupled with still weak capital spending supported further deleveraging. The steady decline in the number of downgrades by the rating agencies – and the increase in the number of upgrades – evident since late 2002 continued in the third quarter of 2004. During this period, Moody's upgraded almost two issuers for every issuer downgraded, compared to less than one upgrade per downgrade in the third quarter of 2003.

Troubles of auto and insurance companies

In those few sectors which experienced a deterioration in creditworthiness, the cause was invariably specific to the sector or firm. Investors focused in particular on the troubles of auto and insurance companies. Spreads on bonds

issued by General Motors – one of the largest issuers in the US corporate bond market – widened by as much as 50 basis points in mid-October after the company reported disappointing earnings. The downgrade of the company by Standard & Poor's to BBB–, the lowest investment grade credit rating, compounded the sell-off. The spreads of several insurance companies widened in late October after the New York Attorney General's office filed a civil suit alleging that broker Marsh & McLennan had rigged bids with the cooperation of insurers. Marsh & McLennan's financing costs rose dramatically, in part because its large commercial paper liabilities meant that it was more exposed to liquidity risk than the other companies under investigation.

High-yield spreads fall despite heavy issuance

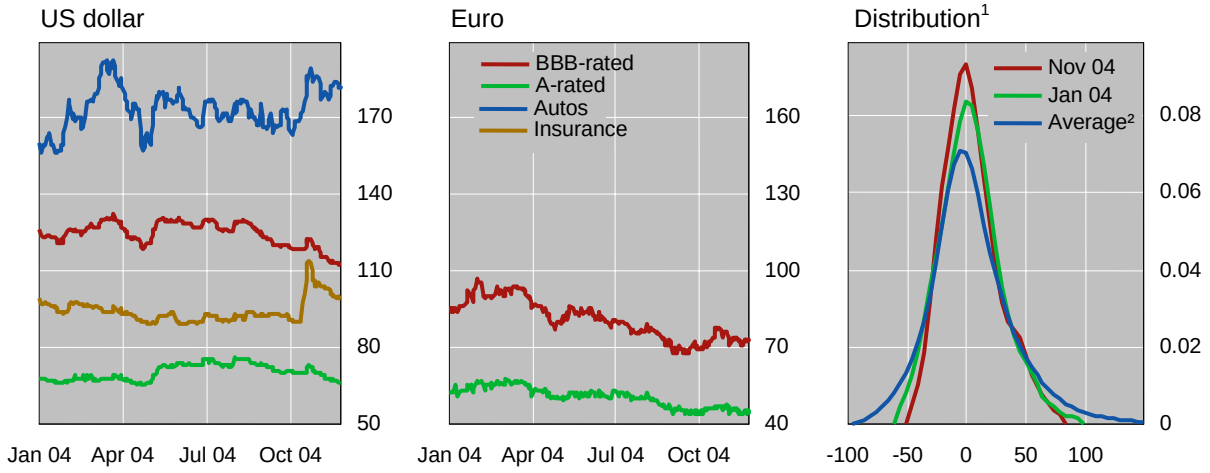
A decline in risk aversion contributed to the compression of spreads. The persistence of low nominal returns on less risky investments supported a continuation of the search for yield that has characterised financial markets since late 2003. In the high-yield debt market, investors continued to bid up prices despite heavy issuance (Graph 1.6). Indeed, spreads on high-yield bonds fell to their lowest level since 1998. Even the least creditworthy borrowers found ready buyers for their debt; Moody's estimates that corporates rated B3 or Caa, Moody's lowest ratings for new issues, accounted for more than one third of US high-yield issuance in the third quarter of 2004. Signings of syndicated credit facilities to finance leveraged buyouts reached a record high of $26 billion in the third quarter (see the box on page 28).

Less discrimination by investors

Another way in which the search for yield manifested itself in credit markets was through less discrimination among issuers. The narrowing of the distribution of credit spreads for issuers in a given rating class suggests that investors in late 2004 did not discriminate as much between issuers as they once had (Graph 1.5). For example, A-rated spreads clustered together more

Credit spreads

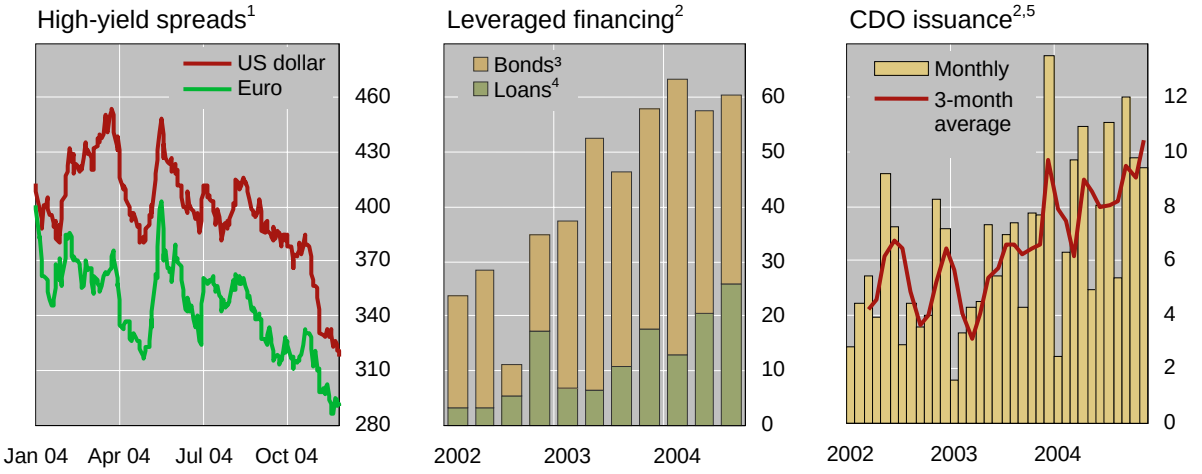
Option-adjusted spreads over government bond yields, in basis points



[1] Distribution at mid-month of option-adjusted spreads for the constituents of the Merrill Lynch A-rated US corporate bond index; difference from the median spread in basis points; fitted using a normal-based kernel probability density function. [2] January 1997–November 2004.

Sources: Merrill Lynch; BIS calculations. Graph 1.5

The search for yield



[1] Option-adjusted spread over government bond yields, in basis points; Merrill Lynch high-yield corporate bond indices. [2] In billions of US dollars. [3] Issuance of US high-yield bonds. [4] Signings of international syndicated credit facilities for leveraged or management buyouts. [5] Arbitrage-funded CDOs.

Sources: Bloomberg; Dealogic Loanware; JPMorgan Chase; Merrill Lynch. Graph 1.6

closely in November 2004 than they had on average since 1997, or even than they had earlier in 2004.

Demand from CDO managers

Demand from managers of collateralised debt obligations (CDOs) also helped to keep credit spreads narrow. Arbitrage CDOs are structured to take advantage of the fact that spreads on individual bonds tend to be wider than would be sufficient to cover likely losses from default in a well diversified bond portfolio.[2] After slowing in the early part of 2004, the issuance of such structures picked up in the second and third quarters (Graph 1.6). Owing to the tightness of credit spreads and the dearth of new issuance by higher-rated corporates, debt rated B or lower reportedly accounted for an increasing proportion of the collateral backing funded structures.

Significantly, the interaction of the above-mentioned factors tended to magnify the compression of spreads. Improvements in credit quality led to lower risk premia, which in turn strengthened investors' incentive to seek higher-yielding investments, including structured products such as CDOs, and put further downward pressure on risk premia.

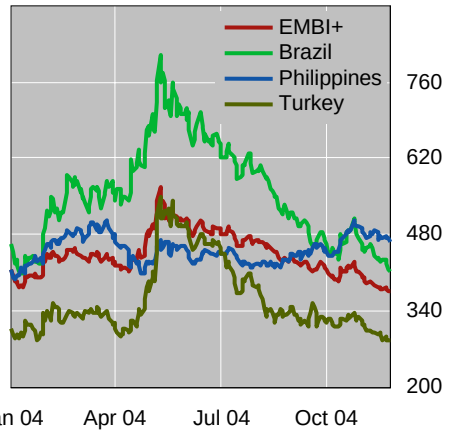
Emerging market spreads touch new lows

Similar factors put downward pressure on emerging market spreads. After jumping sharply higher during the sell-off in global bond markets in April and May, spreads on emerging market debt gradually declined up to late November (Graph 1.7). On 26 November, the EMBI+ spread stood at 376 basis points, its lowest level since October 1997.

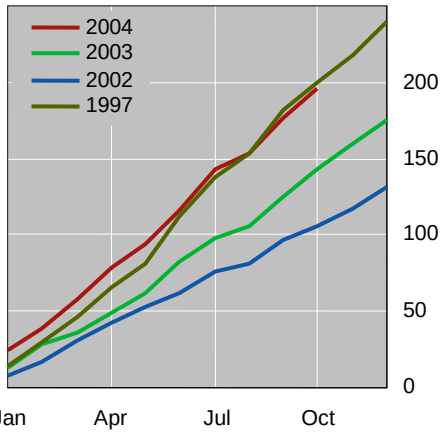
[2] See J Amato and E Remolona: "The credit spread puzzle", *BIS Quarterly Review*, December 2003, pp 51–63.

Emerging markets

Spreads[1]



Cumulative issuance[2]



[1] Sovereign stripped spreads over government bond yields, in basis points; JPMorgan Chase emerging market bond indices. [2] Announced issuance of international bonds and notes plus signings of syndicated loans, in billions of US dollars.

Sources: Datastream; Dealogic Bondware; Dealogic Loanware; BIS calculations. Graph 1.7

Emerging market issuance is on track to equal its 1997 high

Emerging market issuers continued to take advantage of the very favourable financing conditions on offer. Issuers not only raised substantial amounts in international bond and loan markets, they also borrowed at ever longer maturities and in a wider variety of currencies, including local currencies (see "The international debt securities market" on page 29). Emerging market borrowing in international bond and loan markets in 2004 is on track to equal its previous high in 1997. In a sign of investors' increased receptivity to innovative funding strategies, in November Colombia became only the second sovereign rated below investment grade to issue a regular global bond denominated in its own currency, thereby helping to reduce its vulnerability to currency mismatches (see "Assessing new perspectives on country risk" on page 47).[3]

Within this broadly improved market environment, fluctuations in commodity prices were a key source of uncertainty affecting emerging markets. High commodity prices have underpinned strong growth in many emerging markets in the last few years, especially in Latin America and Africa, and have contributed to improvements in current account balances. Base metal prices rose by 12% during September, but then reversed direction following the release of weaker than expected US employment figures on 8 October (Graph 1.4). On 13 October, prices on the London Metal Exchange dropped by nearly 10%, reportedly because of concerns about the outlook for the US and Chinese economies.

This cumulation of negative surprises caused emerging market spreads to widen noticeably in mid-October. Brazil, the Philippines and other countries

[3] Argentina was the first, issuing a global bond denominated in Argentine pesos in 1997. For the Colombian issue, all payments are denominated in Colombian pesos but paid in US dollars based on the average peso/dollar exchange rate calculated over a 28-day period prior to payment.

Temporary sell-off in emerging markets as metal prices drop

with large external debt burdens were among those most adversely affected. The sell-off proved temporary, however. Renewed confidence in the outlook for the United States plus reports of low inventories of certain commodities pushed metal and other non-oil commodity prices higher and emerging market spreads tighter in late October and early November.

Unlike during previous sell-offs in emerging markets, spreads on Turkey's foreign currency bonds remained more or less unchanged in mid-October. The prospect of membership of the European Union helped Turkish spreads to decouple from those of other heavily indebted emerging economies. In early October, the European Commission recommended that accession negotiations with Turkey begin, a recommendation which market participants apparently expect EU governments to endorse in December.

Growing concern about the Philippines' debt burden

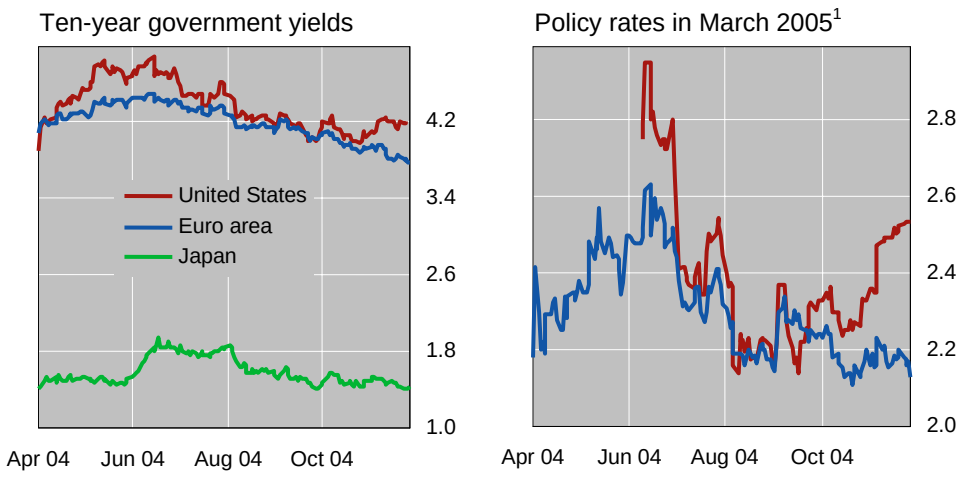
Whereas by late November spreads for most emerging markets were close to or below their lows for the year, concerns about the Philippine government's growing debt burden kept its spreads at an elevated level. Spreads began to widen in late August, when the president highlighted the urgency of fiscal restraint. They came under further pressure in October following warnings of a possible downgrade by the major rating agencies. Delays in passing legislation intended to boost government revenues added to the negative sentiment.

Long-term yields remain low

Even as equity, credit and emerging markets all rallied, long-term yields stayed well below their June highs. From their peak on 14 June, yields on 10-year US Treasuries fell by 90 basis points to 4% on 22 September (Graph 1.8). They subsequently fluctuated within a 25 basis point range, stabilising at 4.2% in late

Interest rates

In per cent



[1] Policy rates implied by futures contracts expiring in March 2005; for the United States, federal funds futures; for the euro area, EONIA futures.

Source: Bloomberg. Graph 1.8

November before rising again at the end of the month. Yen yields followed a similar pattern. Euro yields continued to drift down until late November, two months after US yields had bottomed.

Yields remain low even as the inflation outlook deteriorates

While stable inflation expectations contributed to the decline in long-term yields up to September, in subsequent months yields remained low even as the inflation outlook deteriorated. Economists' inflation forecasts, which had been revised sharply upwards in the second quarter, continued to creep upwards in the third and fourth quarters. Similarly, break-even inflation rates implied by yields on inflation-linked bonds moved higher in the fourth quarter, most notably in the United States, after declining in the third. Even after the fall in oil prices in late October, the inflation outlook in the United States in particular continued to deteriorate. Nevertheless, the shift in expectations did not lead to market turbulence; implied volatilities in the major bond markets declined to their lowest level in years (see the box on page 13).

Bond investors remained especially sensitive to changing expectations about US policy rates. Actual policy decisions, which amounted to a cumulative increase of 100 basis points in the target federal funds rate between June and November, by themselves had little impact on long-term yields. These increases had been anticipated by market participants since mid-year and were already incorporated in yields. Instead, bond markets focused on data releases and official statements that were thought to offer signals about what the Federal Reserve was likely to do in 2005 and beyond. As the growth outlook firmed and investors revised their expectations about the likely path of monetary policy, the dollar yield curve moved out in parallel, by approximately 20 basis points between late September and late November (Graph 1.9).

Largest yield movements follow surprises in US payroll data

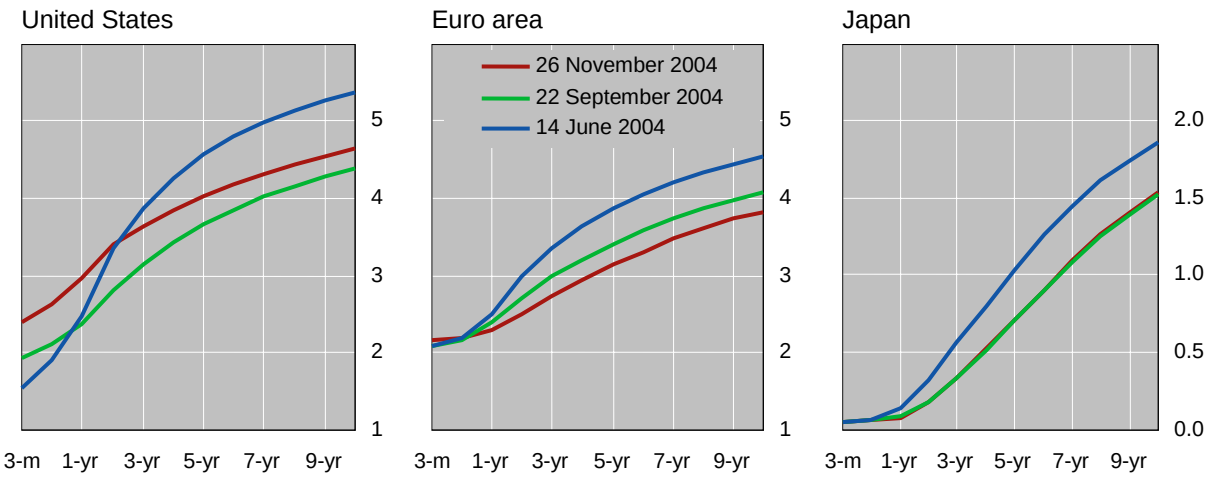
For some time now, the widely held perception among market participants has been that conditions in the US labour market would be an important determinant of the pace of monetary tightening. As a result, in recent months the largest changes in yields have tended to be associated with surprises in US employment data. Whereas between January 1998 and July 2003 an unexpected change in non-farm payrolls of 100,000 jobs had led on average to a 2 basis point change in 10-year yields, over the past year the impact has been closer to 10 basis points.[4] The impact of the payroll announcements has tended to be determined as much by the picture they give of labour market developments over the past several months as by that of the immediately preceding month. Thus, even though the August payroll data released on 3 September were in line with expectations, yields jumped by 10 basis points on that date because of upward revisions to the June and July data.

In Japanese and euro area long-term debt markets, the largest daily movements also tended to be associated with US macroeconomic announcements; the impact of domestic news was more muted, as has long been the case. For example, yields on 10-year German government bonds fell by 7 basis points in response to the surprisingly weak US employment report released on 8 October. Yet the release of an unexpectedly strong Ifo survey of

[4] See Bank for International Settlements, *74th Annual Report*, 28 June 2004, p 105.

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 1.9

German business confidence on 25 October produced virtually no change in euro yields.

Euro and yen yields diverge from dollar yields

The high correlation of daily movements notwithstanding, longer-term trends in yen and especially euro yields were less closely aligned with movements in dollar yields than they had been in the third quarter. In the first two weeks of November in particular, yen and euro yields declined while dollar yields moved higher. Changing expectations regarding the economic outlook were in part responsible for the divergence in yields. Investors remained sceptical about the strength of the recovery in Japan and the euro area even as they grew more confident about the recovery in the United States.

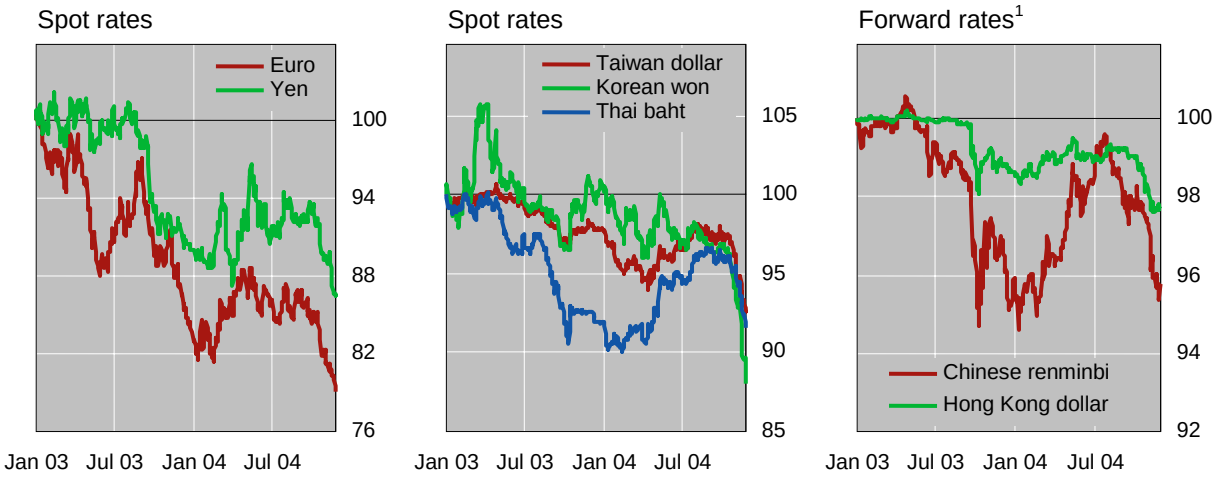
Renewed depreciation of the US dollar

Investors focus on the US current account deficit ...

Despite the surprisingly strong macroeconomic releases in the United States in November, the US dollar depreciated to new lows against many currencies during the period under review (Graph 1.10). The dollar began to weaken following the release of data on 14 October showing the US trade deficit in August to have been the second largest on record. The slide in the dollar gained momentum a few days later on news that foreign purchases of US securities had slowed unexpectedly in August. The slowdown in purchases was seen by some market participants as confirmation that Asian central banks and oil exporters were diversifying out of US dollars and into euros in particular (see “The international banking market” on page 15). If such a portfolio shift were to persist, it could undermine the sustainability of the large US current account deficits that have emerged in recent years. Comments on 18 November by the chairman of the Federal Reserve Board about the financing of the US current account deficit added to negative sentiment towards the dollar.

Exchange rates against the US dollar

Currency units per US dollar; 1 January 2003 = 100



[1] Twelve-month forward rate; for the renminbi, non-deliverable forward.

Sources: Bloomberg; WM/Reuters. Graph 1.10

The depreciation of the US dollar appeared to contribute to the divergence between euro and dollar yields. On 25 November the euro reached a new high against the dollar, just shy of $1.33. The strength of the euro was seen as potentially dampening growth in the euro area and reducing the likelihood of an increase in policy rates in the near term, thereby putting downward pressure on euro yields. At the same time, portfolio shifts out of dollars reportedly added to upward pressure on dollar yields.

... and drive the dollar to new lows against many currencies

Asian currencies also rose against the US dollar. Between the end of September and the end of November, the yen and Korean won appreciated by 6% and 9%, respectively, against the US dollar, to their highest level in years. The Chinese renminbi and Hong Kong dollar also came under heightened pressure. Expectations of a revaluation of the renminbi increased markedly on 5 November following comments by Chinese officials that were interpreted as suggesting that some fluctuation in the exchange rate was desirable. A few days earlier the Chinese monetary authorities had for the first time in nearly a decade raised interest rates with the aim of preventing the economy from overheating. The move was significant not because of the direct effect of the higher rates but because it signalled that the Chinese authorities were increasingly turning to market mechanisms to guide the economy.

The recent decline in volatility

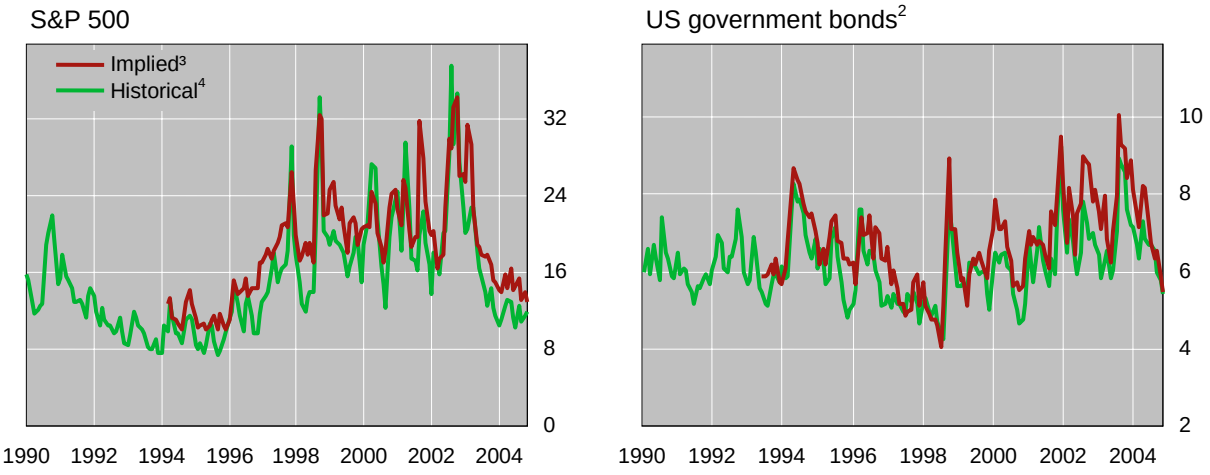
Volatility in equity and bond markets has been declining for most of the past two years. This has been the case even at times when markets seem to have been shaken by data surprises regarding the strength of the global recovery. In the equity market, the realised volatility for returns on the S&P 500 fell from over 35% in October 2002 to 10% in July 2004, and remained at this level till late November. The implied volatility in corresponding option prices slid from 34% to 15%. In the bond market, the realised volatility of 10-year US Treasury returns declined from over 9% in early August 2003 to around 5% in late November 2004, its lowest level since the summer of 2001. The implied volatility derived from option prices fell from 10**%** to 5**%**.

In trying to understand the factors behind these movements in volatility, the timing of the declines is helpful. In equity markets, the decline started around October 2002. This was the end of an extended period of unusual volatility, marked by the rise and collapse of a market bubble and by serious accounting scandals. It was also the beginning of a period of improved corporate earnings growth and stronger balance sheets. With improved balance sheets, the leverage effect usually associated with high volatility seems to have been dampened, a factor that has also resulted in narrower credit spreads. In addition, the rally that followed the long bear market of 2000–02 may have reduced the fear that the market is vulnerable to a further large correction.

In bond markets, volatility seems to have reached a peak during the summer of 2003. This turbulent period was a time when market participants had apparently misjudged the likelihood of the US Federal Reserve's recourse to unconventional policy measures. The central bank's decision on 25 June to cut its policy rate by 25 basis points rather than the expected 50 basis points served to stabilise market participants' expectations. Subsequent signals and statements from the Fed seem to have contributed to a remarkably high degree of agreement among market participants about the future path of policy rates. The resulting decline in volatility took place in spite of occasionally sharp shifts in expectations about the underlying recovery, especially at the time of releases of US non-farm payroll data. The effectiveness with which monetary authorities have been able to communicate their intentions seems to have nullified the effects of the data surprises.

A second factor contributing to the decline in volatility in the US bond market in particular has been a reduced incidence of yield movements related to the hedging of mortgage portfolios. On a number of previous occasions, most recently in August 2003, rising long-term yields led to increases in the duration of portfolios of mortgage-backed bonds as borrowers reduced their refinancing activity. This in turn led to increased hedging activity, which caused long-term yields to temporarily rise further. This effect appears to have been less strong in 2004 than it was previously; for example, the rise in yields in April 2004 was associated with only a small increase in volatility. The long period of relatively low nominal yields may have reduced the scope for additional refinancing, so that unexpected shifts in refinancing patterns no longer take markets by surprise.

Measures of volatility[1]



[1] Annualised daily volatility; monthly averages. [2] Ten-year futures contracts. [3] Volatility implied by the price of at-the-money call options. [4] Conditional volatility of daily returns estimated over the period January 1990–November 2004 using a GARCH(1,1).

Sources: Bloomberg; Merrill Lynch; BIS calculations.

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2. The international banking market

Following exceptional growth in the first quarter of 2004, cross-border activity in the international banking market was muted in the second. US dollar- and euro-denominated business was particularly weak, as investors unwound securities positions in the face of rising bond yields in the United States and elsewhere. By contrast, yen-denominated claims exhibited signs of growth. US dollar credit to non-bank borrowers fell for the first time since late 2002, particularly to borrowers in the United States. This was offset by a modest uptick in interbank lending.

Emerging market economies as a whole experienced a net inflow of funds, even as the differences across regions persisted. Funds continued to flow out of Latin America, while increased lending to banks in Asia-Pacific led to a net inflow there. Claims on borrowers in emerging Europe grew, although a large placement of deposits with BIS reporting banks resulted in a net outflow from the region. Despite the rise in oil prices in the second quarter, deposits placed with BIS reporting banks by oil-exporting countries decreased. Moreover, since mid-2001, when the most recent run-up in oil prices began, the currency composition of banks' net liabilities vis-à-vis oil-producing countries has shifted slightly away from the US dollar.

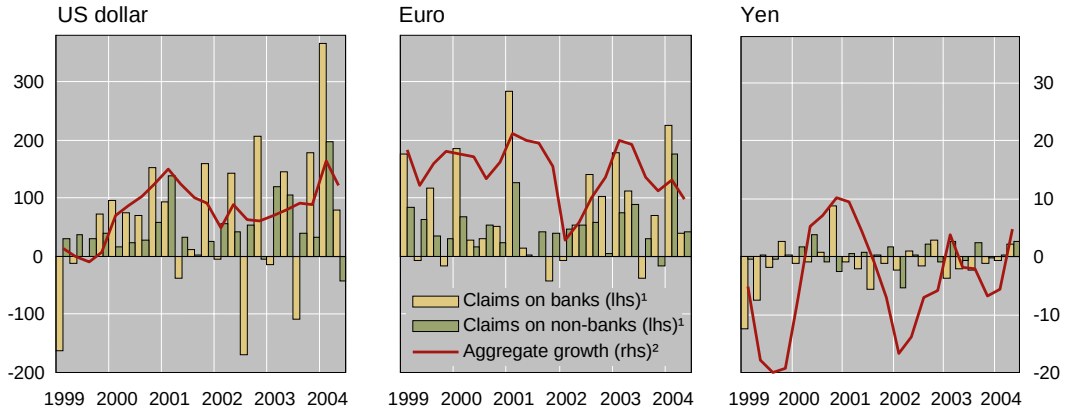
Second quarter calm follows first quarter surge in claims

Weak claim growth despite pickup in interbank activity

Following an exceptional surge in the first quarter, total claims rose only modestly in the second. US dollar- and euro-denominated business was noticeably weak, as investors unwound positions amidst the rise in bond market yields in the second quarter.[1] Only yen activity showed signs of life (Graph 2.1). Interbank claims of BIS reporting banks were up by $200 billion, accounting for over 80% of the total increase in claims. New credit to corporate and other non-bank borrowers was stagnant, rising by only $40 billion, over three quarters of which flowed to entities in offshore centres. Combined, these moves pushed total claims up a mere 1.4% from the previous quarter, driving down the year-over-year growth rate to 11% (from 14% in the previous quarter).

[1] See the Overview of the June 2004 *BIS Quarterly Review* for discussion.

Cross-border claims by sector and currency



¹ Exchange rate adjusted changes in amounts outstanding, in billions of US dollars. ² Annual changes, in per cent, calculated as the sum of exchange rate adjusted changes in amounts outstanding between periods *t*–3 and *t*, divided by the amount outstanding in period *t*–4. Graph 2.1

US dollar activity weak as lending to non-banks declines

US dollar-denominated activity was particularly weak in the second quarter, owing largely to a decrease in credit to non-bank borrowers in the United States. Total US dollar-denominated claims rose by $38 billion, as stronger interbank activity offset a fall in claims on non-bank borrowers. Movements in the interbank market were somewhat unusual in that investment in international debt securities issued by banks overshadowed actual lending between banks.[2] Total US dollar claims on *non-bank* borrowers globally actually fell by $42 billion, the first outright decrease since end-2002, and the largest in the BIS coverage period.[3]

Securities firms unwind repo positions

Most significantly, loans to non-bank borrowers in the United States decreased for the first time since the third quarter of 2001. This $57 billion contraction occurred during a quarter in which *domestic* short-term financing (bank loans and commercial paper issuance) rose, and thus is not necessarily evidence of weak corporate loan demand.[4] Rather, this drop in international loans probably reflected the unwinding of repo positions by securities firms

[2] Interbank claims rose by $80 billion. Almost one third of this reflected inter-office activity, while $32 billion was accounted for by international debt security claims. Banks in offshore centres purchased securities issued by banks in the United Kingdom, other offshore centres and China, and banks in the United States purchased securities issued by banks in Canada and the United Kingdom.

[3] Loans to non-banks borrowers contracted by $51 billion, accompanied by a drop in international debt security claims. This was partially offset by purchases of equities issued by US residents by banks in offshore centres and, to a lesser extent, the United Kingdom.

[4] The US flow of funds data for the second quarter of 2004 indicate that bank loans to non-farm non-financial corporate businesses rose by $22 billion, the first increase since 2000. In addition, commercial paper issuance rose by $34.4 billion in the first quarter of 2004 and by $32.9 billion in the second.

between mid-March and mid-May, when yields on US Treasuries widened by 100 basis points. The financing of securities trading through repo transactions, in particular the link between banks in the United Kingdom and securities firms in the United States, seems to be an increasingly important determinant of international bank flows.[5] Consistent with this unwinding, the overall decrease in loans to the non-bank sector in the United States in the most recent quarter was largely the result of reduced positions of banks in the United Kingdom and offshore centres. In addition, holdings by banks in the United Kingdom of US dollar-denominated international debt securities issued by non-banks in the United States fell by $14 billion, also the largest drop recorded in the BIS reporting period.

Globally, the overall contraction in loans to non-banks would have been more severe if not for a sizeable increase in loans to borrowers in the Cayman

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-Jun 2004
	Year	Year	Q2	Q3	Q4	Q1	Q2	
Total cross-border claims	740.1	1,076.4	492.6	–110.0	315.8	1,232.5	239.8	17,341.4
on banks	425.0	531.0	306.7	–229.5	277.1	826.9	200.0	11,247.8
on non-banks	315.2	545.4	185.9	119.5	38.7	405.5	39.8	6,093.6
Loans: banks	395.4	452.9	324.3	–263.8	249.3	727.9	128.5	9,554.8
non-banks	103.8	277.0	24.8	92.3	18.1	196.2	–32.6	3,163.1
Securities: banks	36.3	75.8	–8.2	22.5	35.1	76.0	58.9	1,205.0
non-banks	202.2	208.3	122.9	8.3	6.5	192.2	31.3	2,570.7
Total claims by currency								
US dollar	320.4	500.3	252.4	–68.3	210.9	562.8	37.8	6,922.2
Euro	453.3	502.9	202.6	–8.0	53.9	400.9	82.8	6,381.1
Yen	–42.3	–50.5	–25.4	0.7	–15.0	–1.9	49.4	820.7
Other currencies[2]	8.7	123.7	64.2	–34.5	65.9	270.7	69.8	3,217.4
By residency of non-bank borrower								
Advanced economies	315.1	459.0	159.9	103.3	47.0	344.5	11.2	4,771.6
Euro area	117.4	157.3	67.5	50.5	–17.7	151.4	32.4	2,174.1
Japan	4.1	38.4	15.6	6.5	–5.2	0.1	20.4	200.2
United States	153.1	179.6	60.0	40.9	53.0	87.3	–41.1	1,557.1
Offshore centres	18.8	100.0	18.9	10.2	–10.1	41.6	30.7	702.9
Emerging economies	–16.5	5.1	3.3	4.9	3.1	23.9	1.1	574.5
Unallocated[3]	–2.2	–18.7	3.8	1.1	–1.3	–4.5	–3.1	44.6
Memo: Local claims[4]	*44.5*	*415.2*	*88.8*	*51.7*	*94.1*	*187.5*	*35.1*	*2,527.1*

[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

[5] See the special feature on "A shift in London's eurodollar market" in the September 2004 *BIS Quarterly Review* for discussion.

Islands. Banks in the United States channelled $17 billion in loans to these borrowers, while banks in the United Kingdom and the euro area contributed an additional $1.4 billion, driving total claims on non-bank borrowers in the Cayman Islands to $221 billion, or 9% of total US dollar claims on non-bank borrowers (up from 8% in the previous two quarters). This lending may have been the result of greater hedge fund activity; estimated inflows into hedge funds, many of which are legally domiciled in the Cayman Islands, were again robust in the second quarter.

Pickup in yen-denominated claims

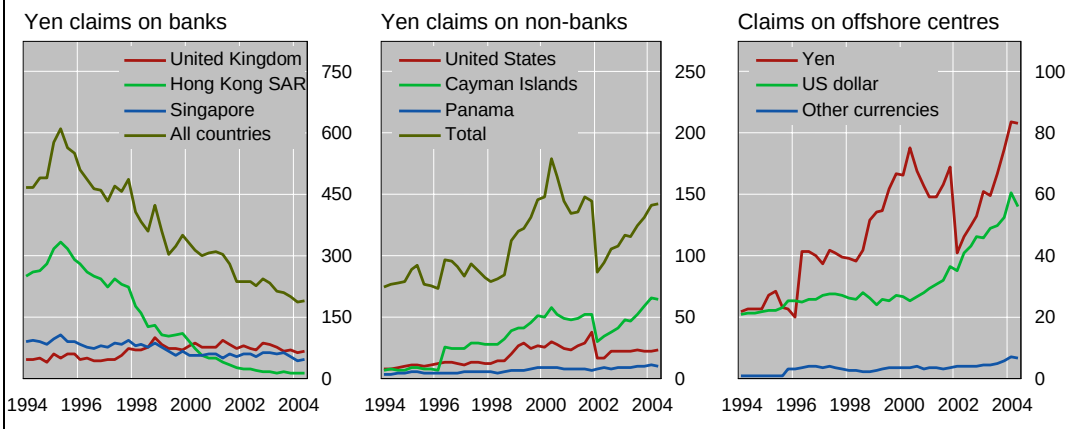
Japanese interbank activity drives a rise in yen claims

Yen-denominated claims picked up in the second quarter of 2004, although hardly enough to offset the weak claims growth in other currencies (Graph 2.1). The $49 billion increase in total claims was the largest since the last quarter of 2000, and mainly reflected new claims of banks in Japan ($19 billion), the United Kingdom ($15 billion) and Luxembourg ($14 billion). Banks in the United Kingdom laid off $11 billion in yen with banks in Japan, in addition to smaller amounts with those in the Cayman Islands and the United States. At the same time, yen-denominated international debt security claims of banks in the United Kingdom vis-à-vis non-banks in Japan dropped by $8.7 billion, even as Japanese borrowers issued a net $11 billion in international debt securities (and announced $33 billion).[6]

The resurgence in yen lending by Japanese banks, while not particularly large by historical standards, was perhaps the most noteworthy. Total claims of banks in Japan rose by $31 billion in the second quarter, less than the $44 billion expansion in the first quarter, but significant nonetheless because this growth reflected both yen ($19 billion) and US dollar ($14 billion) claims.

Claims of banks in Japan

In billions of US dollars

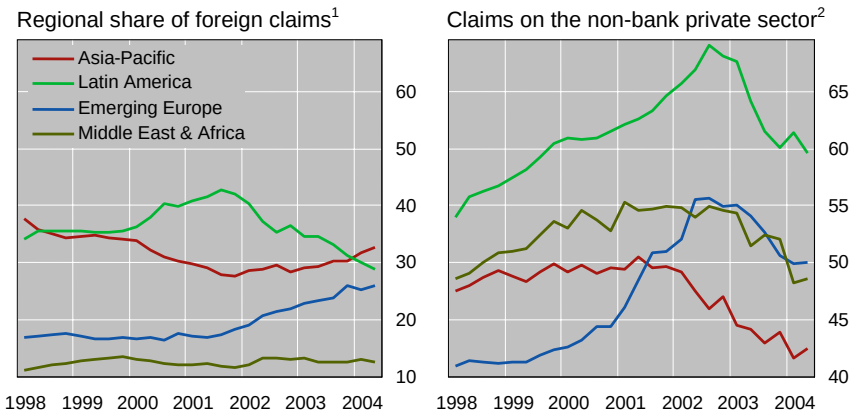


Graph 2.2

[6] See "The international debt securities market" in the September 2004 *BIS Quarterly Review* for discussion.

Consolidated claims on emerging markets

In per cent



[1] Share of total foreign claims, on an ultimate risk basis, on all emerging markets. [2] Share of total international claims for each region.

Graph 2.3

Although yen-denominated interbank activity of banks in Japan has been on the decline since at least 1995 (Graph 2.2, right-hand panel), lending to other banks accounted for over half of their overall yen-denominated activity in the most recent quarter, the first rise in lending to this sector in six quarters. Conversely, their yen-denominated lending to non-banks, primarily those in offshore centres, has been on the increase since the second quarter of 2002.

Shift out of Latin America and into Asia continues

Banks continue to shift out of Latin America ...

New lending to emerging markets slightly outpaced a small rise in deposits placed abroad, yielding the first net inflow to these economies in a year. The aggregate figures, however, mask significant differences across regions. Funds flowed out of Latin America and emerging Europe, while new lending to banks in Asia-Pacific drove a net inflow there. The BIS consolidated statistics, which net out inter-office positions, indicate that reporting banks' exposures shifted further towards Asia-Pacific and emerging Europe and out of Latin America in the second quarter of 2004, a continuation of a trend evident since at least end-2001 (Graph 2.3). Foreign claims (ultimate risk basis) on Latin American borrowers dropped to $450 billion, or 29% of total foreign claims on emerging markets, from 30% in the previous quarter and 35% a year earlier.

Latin America turns into a net contributor of funds

Banks continued to reduce their exposures to countries in Latin America, driving the ninth consecutive quarterly net outflow from the region. While large placements of deposits in BIS reporting banks have, in recent quarters, contributed to these outflows, the $5.1 billion net outflow in the most recent quarter was primarily due to a $6.3 billion fall in claims on the region. However, differences across countries were substantial. Venezuela experienced the most significant net outflow, the result of increased deposits placed abroad in a

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-Jun 2004
		Year	Year	Q2	Q3	Q4	Q1	Q2	
Total[2]	Claims	–37.0	65.0	–4.6	20.6	14.7	67.9	26.1	1,102.6
	Liabilities	–45.9	71.9	–10.3	28.2	43.1	107.5	21.7	1,346.8
Argentina	Claims	–11.8	–8.5	0.9	–5.4	–2.1	–2.6	–1.1	20.0
	Liabilities	0.0	–0.8	0.1	–2.2	0.7	0.3	0.1	25.2
Brazil	Claims	–11.2	–7.2	–1.7	1.4	–9.1	1.8	–4.0	81.2
	Liabilities	–8.0	14.4	6.6	7.9	–3.4	5.0	–3.6	58.0
China	Claims	–12.4	13.5	–6.4	4.9	–1.0	13.9	10.1	84.6
	Liabilities	–3.6	–6.4	–11.3	1.8	1.8	21.6	20.6	130.9
Czech Rep	Claims	2.3	3.7	0.5	0.8	1.7	–1.7	0.8	18.8
	Liabilities	–3.7	–2.4	0.1	0.2	–0.9	–2.6	2.5	9.9
Indonesia	Claims	–6.0	–4.6	–1.0	–1.9	–0.8	0.3	–0.9	28.1
	Liabilities	–2.4	0.2	–0.1	–0.5	0.3	–0.2	–2.1	33.8
Korea	Claims	8.2	–1.0	–2.0	–1.5	0.1	14.3	–8.5	82.7
	Liabilities	0.5	7.3	–6.1	2.1	12.1	21.7	–4.8	56.6
Mexico	Claims	3.1	–0.7	–0.1	0.8	–0.9	7.5	–0.6	71.8
	Liabilities	–11.4	6.2	2.2	–0.3	–0.1	4.0	–0.7	65.2
Poland	Claims	2.9	3.3	0.9	1.0	0.4	2.4	2.1	37.2
	Liabilities	–3.1	–0.1	–1.1	–1.0	1.2	3.0	3.9	25.6
Russia	Claims	3.6	12.1	1.7	2.8	5.8	3.4	–0.3	55.1
	Liabilities	9.6	16.2	–4.4	7.2	7.9	5.0	7.8	70.3
South Africa	Claims	–0.4	–1.2	0.5	–0.9	–0.7	–0.1	0.3	18.7
	Liabilities	2.7	9.7	4.8	1.4	2.8	4.1	1.8	37.9
Thailand	Claims	–5.0	–1.6	0.3	0.0	–1.6	–1.0	–0.4	17.4
	Liabilities	–4.6	5.7	–0.9	0.9	3.2	–1.5	–0.8	26.4
Turkey	Claims	–2.8	5.3	–0.5	3.4	0.1	4.1	3.4	51.4
	Liabilities	0.0	–0.4	1.5	1.0	0.9	2.9	0.9	24.0
Memo:									
New EU countries[3]	*Claims*	*9.2*	*20.9*	*1.2*	*5.6*	*8.5*	*3.9*	*6.7*	*129.3*
	Liabilities	*–5.9*	*–0.4*	*–1.3*	*2.0*	*0.8*	*3.2*	*4.8*	*69.1*
OPEC members	*Claims*	*–9.9*	*–6.5*	*–6.5*	*–1.9*	*2.0*	*9.2*	*1.4*	*139.8*
	Liabilities	*–8.8*	*–15.1*	*–11.8*	*–10.2*	*12.2*	*16.5*	*–2.4*	*287.3*

[1] External on-balance sheet positions of banks in the BIS reporting area. Liabilities mainly comprise deposits. An increase in claims represents an inflow to emerging economies; an increase in liabilities represents an outflow from emerging economies. [2] All emerging economies. For details on additional countries, see Tables 6 and 7 in the Statistical Annex. [3] Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. Table 2.2

quarter of high and rising oil prices. A smaller outflow from Argentina stemmed from reduced claims vis-à-vis all sectors in the country, as writedowns and repayments continued. Claims on all sectors in Brazil also fell noticeably, by $4 billion, but were largely offset by a repatriation of deposits.

... as region becomes a net creditor ...

On balance, the region has become a net contributor of funds to the international banking system over the last three quarters. This is the result of the continued placement of deposits in BIS reporting banks, as well as the repayment and writing-down of loans vis-à-vis several borrowing countries in the region. Overall, the net stock of claims (total claims minus total liabilities) on the region has turned negative in the last three quarters, driven by growing

net liabilities vis-à-vis its banking sector, and waning net claims vis-à-vis the non-bank sector (Graph 2.4, left-hand panel).[7] In particular, the banking sector in Brazil, still an overall net debtor, has accounted for much of the transition, with the stock of net claims on banks in the country falling to $1.5 billion in the most recent quarter from $27 billion in mid-2002. As shown in the centre panel of Graph 2.4, this has primarily been the result of increased deposits placed with BIS reporting banks. At the same time, the fall in net claims on non-banks in Argentina has also been significant (Graph 2.4, right-hand panel), although mainly caused by ongoing loan writedowns and repayments.

... even while issuing bonds

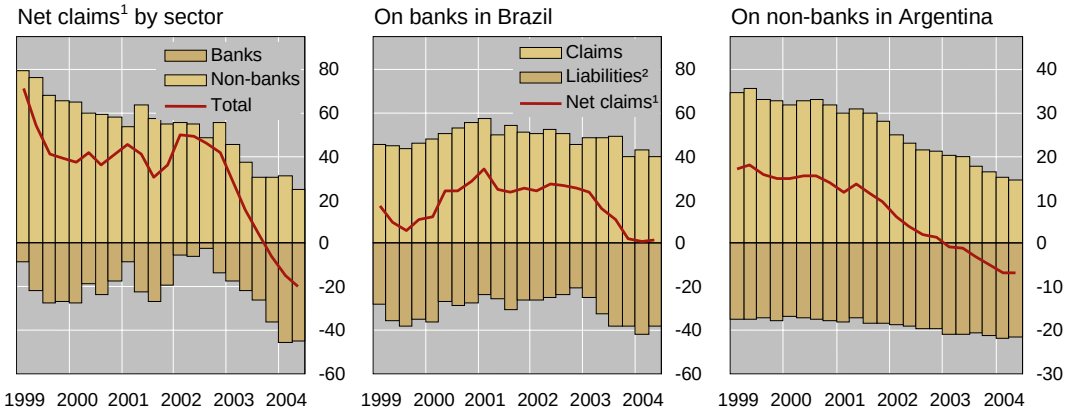
This change has been accompanied by robust issuance of international debt securities by borrowers in the region. Although net issuance by borrowers in Argentina, Brazil and Mexico was negative in the second quarter (Graph 2.5), the longer-term trends are suggestive of a shift away from bank financing and towards bond financing, particularly by non-bank borrowers. International debt securities now account for 59% of total international credit to non-banks in the region, up from 54% in the first quarter of 2001 and 46% in the first quarter of 1999. Concurrent with the rise in securities issuance, the BIS consolidated statistics, which allow for a finer sectoral breakdown of bank claims, indicate that reporting banks' exposure has trended away from the non-bank *private* sector, or those borrowers that have most actively issued securities (Graph 2.3, right-hand panel).

Inflow to Asia-Pacific in spite of China's placement of deposits

New lending to banks in the region, coupled with repatriation of deposits by some countries, contributed to a net inflow to Asia-Pacific. The net stock of

Positions vis-à-vis Latin America and the Caribbean

In billions of US dollars



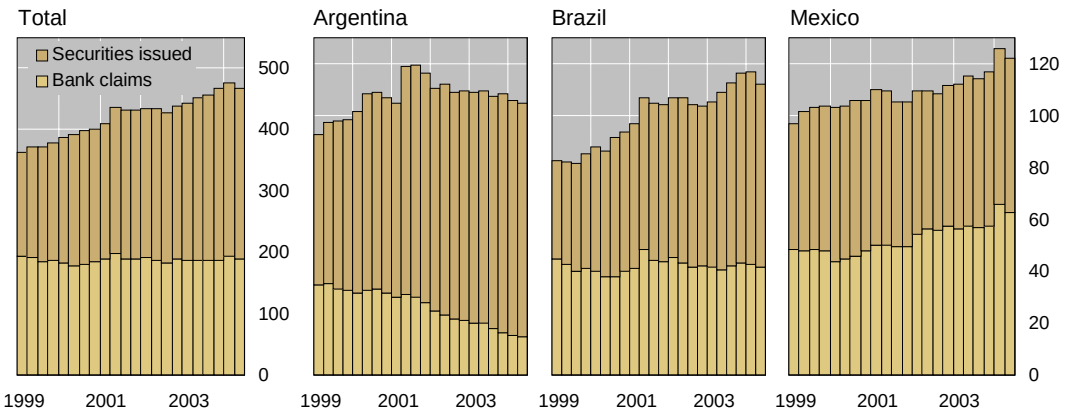
[1] Claims minus liabilities. [2] Inverted.

Graph 2.4

[7] The portion of the total stock of net claims on the region which is not allocated to a particular country has been a contributing factor. It reached –$18.7 billion in the second quarter of 2004,

Credit to non-banks in Latin America and the Caribbean

In billions of US dollars



Graph 2.5

claims on the region has fluctuated in recent quarters under the combined influence of net funds placed abroad by residents of China, and a rise in net claims on residents of Taiwan, China[8] (Graph 2.6, left-hand panel). In the most recent quarter, the stock of net funds channelled to the international banking system from the region fell to $64 billion, after having trended upwards over the previous three quarters. Banks in Taiwan, the Philippines, Indonesia and Korea repatriated deposits while those in China and, to a lesser extent, India placed relatively substantial amounts abroad for the second consecutive quarter.

Deposit repatriation into Taiwan …

Inflows into Taiwan were the largest in the region, the result of the repatriation of deposits and interbank lending. This possibly reflected expectations of an appreciation of the New Taiwan dollar vis-à-vis the US dollar. Banks in Taiwan repatriated $7.1 billion in US dollar-denominated deposits from banks in the United States, and borrowed a relatively robust $9.4 billion from BIS reporting banks.[9] This led to a $17 billion net inflow into Taiwan, and pushed the net stock of claims vis-à-vis the country closer to positive territory (Graph 2.6, centre panel). At the same time, non-bank residents of Taiwan stepped up their US dollar borrowing from Taiwanese banks for the second consecutive quarter, this time by $2.4 billion.

… despite net outflows from China and Korea

Other countries in the region, in particular China and Korea, experienced net outflows of funds. For the second consecutive quarter, banks in China deposited substantial sums abroad in BIS reporting banks, this time

from –$1.4 billion in the first quarter of 2003. Excluding this unallocated portion, the stock of net claims on the region as a whole turned negative only in the most recent quarter.

[8] Hereinafter Taiwan.

[9] This deposit repatriation occurred even as Taiwan's total foreign exchange reserves rose in the second quarter. Partly offsetting this large repatriation, banks in Taiwan increased their deposits with banks in the United Kingdom by $2.1 billion.

$21 billion.[10] These were primarily US dollar-denominated deposits, but yen and Hong Kong dollar deposits rose as well (Graph 2.6, right-hand panel). This increase in deposits, though partially offset by $11.5 billion in new interbank lending to banks in China, resulted in a $10.5 billion net outflow from the country. Korea's fourth consecutive net outflow stemmed from reduced lending to all sectors as well as sales of equity claims of BIS reporting banks on non-banks in the country. This decrease in claims was accompanied by a $4.4 billion repatriation of (primarily US dollar) deposits by banks in Korea.

On a consolidated basis, an acquisition of a bank in Korea led to a large increase in local currency claims of US banks on the country's residents. This $36 billion move, which reflected a reclassification of existing claims, was matched by a similar rise in local currency liabilities. This inflated BIS reporting banks' local currency claims on Korea to 48% of total foreign claims on the country, from 29% in the previous two quarters.[11] Excluding the claims of US banks, local currency claims on the region remained stable.

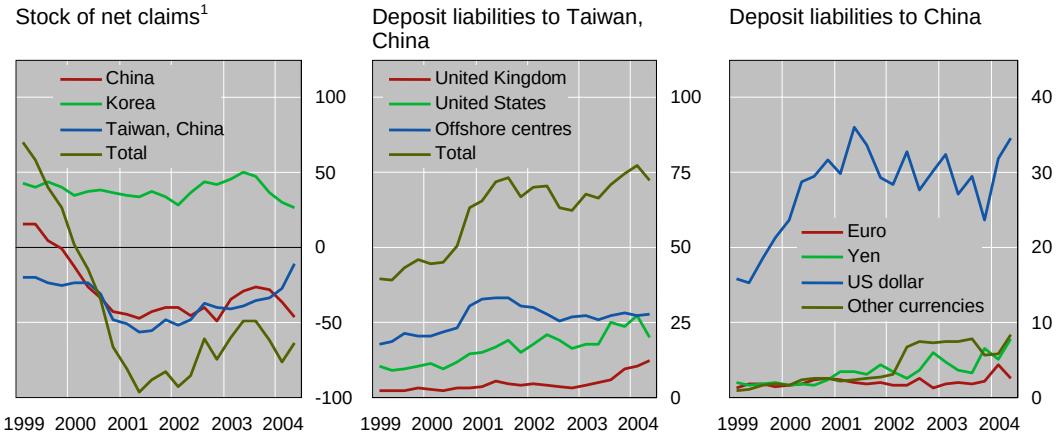
Russian deposits fuel first net outflow from emerging Europe in six quarters

Outflow from emerging Europe ...

Despite relatively strong lending to all sectors in the region, increased deposits placed with BIS reporting banks led to a net outflow of funds from emerging Europe. Claims on all sectors rose for the 11th consecutive quarter, this time by a relatively robust $11 billion. Yet the deposit placements were larger, leading to a $6 billion net outflow, the first since the third quarter of 2002. As in the previous three quarters, the most significant placement was by banks in

Positions vis-à-vis Asia-Pacific

In billions of US dollars



[1] Claims minus liabilities.

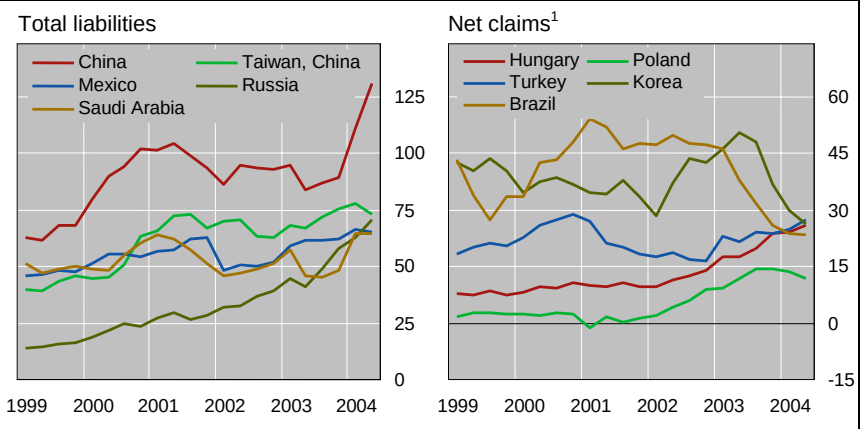
Graph 2.6

[10] China's total foreign exchange reserves increased from $440 billion in the first quarter of 2004 to $471 billion in the second.

[11] US banks' local currency claims on Korea jumped to 86% of their total foreign claims on the country from 52% in the previous quarter.

Positions vis-à-vis selected emerging market countries

In billions of US dollars



[1] Claims minus liabilities.

Graph 2.7

Russia. However, banks in Poland deposited $3.7 billion while banks in the Czech Republic placed $2.6 billion, partially the result of greater foreign exchange reserves held with banks abroad.[12] This outflow from the region as a whole occurred even as the new EU member countries (collectively) experienced a net inflow of $2 billion.

... driven by Russian deposits ...

Residents of Russia continued to place deposits with BIS reporting banks in the second quarter, driving the net outflow from the region. Banks in Russia placed $7.4 billion in deposits abroad, primarily in banks in the United Kingdom, the United States and France.[13] The domestic liquidity difficulties experienced by some Russian banks in June appear to have had no impact on their international activities. The sustained outflow of deposits since late 2002 pushed the stock of total liabilities of BIS reporting banks vis-à-vis Russia to $70.3 billion, surpassing Saudi Arabia ($64.4 billion) and Mexico ($65.2 billion), and ranking third overall behind China ($130.9 billion) and Taiwan ($72.9 billion) (Graph 2.7, left-hand panel). On a net basis, while Russia still ranks behind many other countries, the contribution of funds to the international banking system by all sectors in Russia has risen to $15.2 billion from Russia being a net borrowing nation in 2002 – more than that contributed by Kuwait and Taiwan and nearly on a par with Egypt and Venezuela.

... despite increased claims on Turkey, Poland and Hungary

Claims on the region were boosted by lending to residents of Turkey, Poland and Hungary. New loans to all sectors in Turkey, primarily from banks in the United Kingdom, pushed total claims on the country to $51.4 billion, placing it second behind Russia in the region. The stock of net claims on both

[12] In the second quarter, the Czech Republic's foreign exchange reserves held with banks abroad increased by $755 million, while Poland's increased by $1.4 billion.

[13] Russia's total foreign exchange reserves increased from $79.6 billion in the first quarter to $84.5 billion in the second.

Turkey and Hungary has trended upwards in recent quarters, as claims vis-à-vis these countries have risen. In the most recent quarter, the net stock of claims on Turkey ($27.4 billion) surpassed that on Korea, making Turkey the largest net borrower among all emerging market countries (Graph 2.7, right-hand panel). Hungary comes in a close second, with the stock of net claims having risen to $26 billion from $17.5 billion a year earlier.

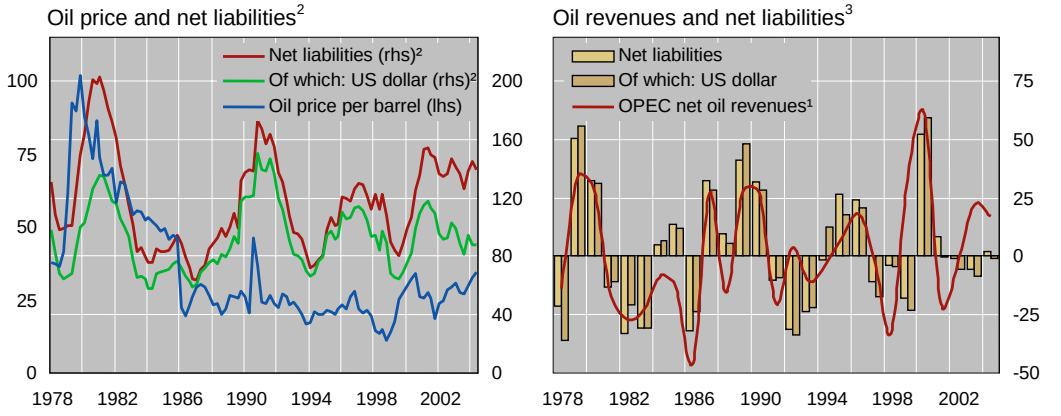
Oil prices and OPEC surpluses: a shift into euros?

While higher oil prices can play a role in boosting surpluses emanating from OPEC member countries, the recent rise in oil prices has had little if any significant impact on the stock of deposits placed abroad. However, there is some evidence suggesting that OPEC member countries are shifting the proportion of such deposits denominated in US dollars. In short, the co-movement between oil prices and OPEC dollar surpluses evident in previous periods seems to be less evident in the most recent cycle.

The historical relationship between oil prices and deposits abroad ...

Past experience suggests a rough, but discernible, relationship between oil prices, oil revenue and the net stock of funds placed by OPEC member countries with BIS reporting banks. Graph 2.8 (left-hand panel) shows that the real net stock of liabilities to OPEC member countries – a measure of their net funnelling of funds into the international banking system – has tended to rise with real oil prices, at times with a lag.[14] These countries placed (a portion of) oil revenues with banks abroad, subsequently drawing down these deposits during periods of slower revenue growth. This is highlighted in the right-hand panel of Graph 2.8, which shows that periods of high growth in the net stock of

Petrodollars and BIS reporting banks' positions vis-à-vis OPEC[1]



Note: Data are in real end-June 2004 US dollars, deflated by the US consumer price index.

[1] Excluding Indonesia. [2] Stock of liabilities minus claims of BIS reporting banks, in billions of US dollars. [3] Annual percentage changes, end-December figures. Data on net liabilities for 2004 are based on end-June figures. Oil revenues for 2004 are estimated.

Sources: US Department of Energy, Energy Information Administration (EIA); OPEC; BIS. Graph 2.8

[14] Indonesia is excluded from the list of OPEC member countries for this exercise.

liabilities vis-à-vis OPEC member countries moved in line with the growth in oil revenue flows. This relationship was most clear during the second oil shock in the late 1970s, and less so during the late 1980s, when large net placements of US dollars did not seem to be prompted by a correspondingly large jump in real oil prices. This may have reflected a flight to safety or investment in alternative assets rather than an amplified reaction to the relatively modest and short-lived spike in real oil prices around the first Gulf war.

... is less evident in the most recent cycle

The picture in the most recent cycle is considerably less clear. In real terms, oil prices reached levels in the second quarter not seen since their spike during the first Gulf war, although they were still substantially lower than their peak during the second oil shock of the late 1970s. Between the fourth quarter of 1998 and the third quarter of 2000, real oil prices rose by 207%.[15] This was accompanied, with a slight lag, by a near doubling in the real stock of net liabilities vis-à-vis OPEC member countries (Graph 2.8).[16] After falling by almost 50% between late 2000 and mid-2001, real oil prices have been on the increase again, up 85% since the fourth quarter of 2001. However, the net stock of funds placed abroad has not risen in this most recent cycle, as past experience would suggest. The real net stock of liabilities of BIS reporting banks vis-à-vis OPEC member countries has remained relatively flat since the second quarter of 2002, rising by only 3%. Moreover, the outstanding stock of real US dollar-denominated net liabilities actually decreased over this period, by 4%. Overall, this suggests that oil revenues have not been channelled into the international banking system in the most recent cycle, at least not to the extent that they were in previous periods.

OPEC deposits partially shift out of US dollars

Despite these muted placements from OPEC member countries into BIS reporting banks, there has been a subtle but noticeable shift in the composition of deposits over the last three years. Since the third quarter of 2001, oil revenue seems to have been channelled increasingly into euro and other currency deposits. As shown in Graph 2.8, and highlighted in the left-hand panel of Graph 2.9, non-US dollar currencies account for an increasingly large share of the funds deposited by OPEC member countries with BIS reporting banks. US dollar-denominated deposits fell from 75% of total deposits in the third quarter of 2001 to 61.5% in the most recent quarter, while the share of euro-denominated deposits rose from 12% to 20% over this same period. This shift out of US dollars probably reflected to some extent the relative change in interest rates in the United States and the euro area since 1998. US dollar short-term interest rates were, on average, 2.1 percentage points higher than their euro equivalent between December 1998 and March 2001, but 1.3 percentage points lower, on average, between April 2001 and June 2004.

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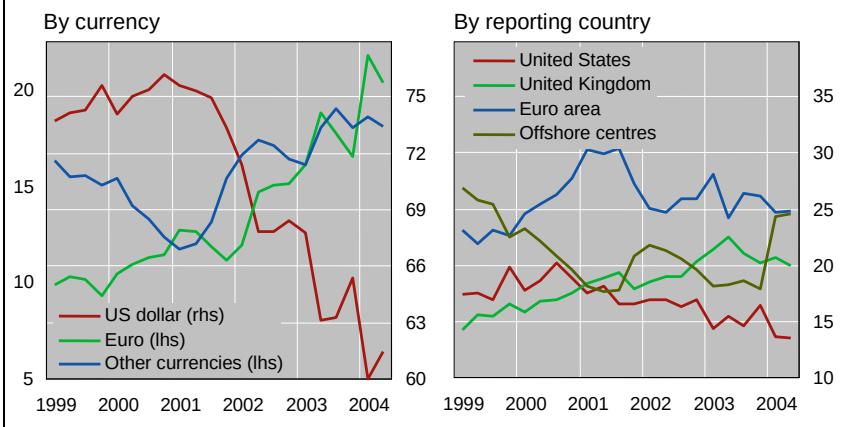
[15] Annual data from the US Energy Information Administration indicate that OPEC oil revenue increased from $126 billion in 1998 to $267 billion in 2000, a 113% increase. Oil revenue for 2004 is forecast to be $286 billion.

[16] The real net stock of liabilities vis-à-vis OPEC member countries rose by 91% between the third quarter of 1999 and the second quarter of 2000.

OPEC deposits with BIS reporting banks

In per cent



Graph 2.9

In the most recent quarter, when *nominal* oil prices hit an all-time high, BIS reporting banks' net liabilities vis-à-vis OPEC member countries actually fell (to $142 billion).[17] The drop from the previous quarter was the result of a $4.9 billion reduction in euro-denominated deposits held by banks in Saudi Arabia with banks in Germany, offshore centres and the United Kingdom. US dollar-denominated liabilities vis-à-vis OPEC member countries grew only modestly in the second quarter, by $2.8 billion, supported by increased deposits with BIS reporting banks from residents of Venezuela.

[17] The gross stock of liabilities vis-à-vis OPEC member countries (excluding Indonesia) fell to $253 billion in the second quarter.

Continued brisk activity in the market for international syndicated credits

Jesper Wormstrup

Activity in the market for international syndicated credits remained strong in the third quarter of 2004. Despite a drop from the previous quarter's record, the total volume of $430 billion implies an all-time high on a seasonally adjusted basis (see left-hand panel of graph below). As was the case in the previous quarter, refinancing deals – including prefinancing of facilities scheduled to mature at a later stage – reached a high level ($232 billion), reflecting the favourable financing conditions prevailing in the market. Facilities for mergers and acquisitions – including leveraged buyouts – jumped to $90 billion from a quarterly average of around $40 billion observed over the last three years. This increase was mainly attributable to companies in the health care, pharmaceuticals, telecommunications, and oil and gas sectors.

Albeit lower than the previous quarter's peak, signings by US entities remained fairly strong with a total volume of $206 billion. While the largest amounts were granted to the energy, health care and foodstuffs sectors, the largest individual deal was arranged by the machine and engine manufacturer Caterpillar Inc in the form of a $5 billion revolving credit. Non-investment grade borrowers (ie with a rating below BBB) secured an unusually high proportion of the total amounts obtained by all rated borrowers; over 40% compared with a historical average of around 20%.

In contrast to US signings, volumes for western European borrowers increased moderately from the previous quarter. Of a total of $150 billion, a remarkable $66 billion was accounted for by French entities. The government agency CADES signed a €20 billion short-term bridge facility/ revolving credit, the third largest deal ever in the market for international syndicated credits,[1] and the pharmaceutical company Sanofi-Synthélabo SA arranged a €16 billion deal for acquisition and refinancing purposes. Other large facilities secured by western European entities included refinancing deals by Deutsche Telekom AG (€5 billion) and Spanish telecommunications operator Auna Operadores de Telecomunicaciones SA (€4.5 billion).

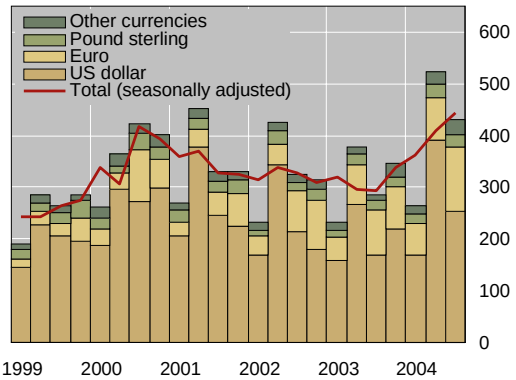
Lending to emerging market entities continued its upward trend in the third quarter of 2004 (see right-hand panel of graph below). At $32.5 billion in total, signings reached the highest level of any third quarter since 1997. In line with most recent quarters, Asian entities generated the most substantial volume ($11.3 billion), with large amounts going to the Taiwanese electronics and computer manufacturing sectors, and commercial banks in India, Korea and Kazakhstan.

Business in eastern Europe, totalling $7.9 billion, was primarily driven by Russian oil companies and metallurgical corporations. Turkish commercial banks also showed a marked presence, closing deals worth $2.2 billion at spreads up to 65 basis points lower than a year ago. Borrowing by entities in the Middle East and Africa region was supported by large signings by the Angolan national oil company Sonangol ($2.35 billion), the energy company Dolphin Energy Ltd of the United Arab Emirates ($1.36 billion) and the South African Reserve Bank ($1 billion). In Latin America, over half of the total volume of $6.5 billion was due to Mexican corporate sector borrowing, boosted by a $2.4 billion term loan signed by the telecommunications company Telmex, the largest emerging market deal in the third quarter.

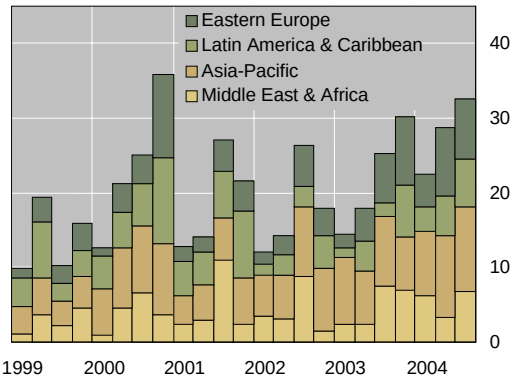
Signings of international syndicated credit facilities

In billions of US dollars

Total signings by currency



Signings by emerging market entities



Sources: Dealogic Loanware; BIS.

[1] Cf the €30 billion deal by France Telecom in July 2002, and the $25 billion deal by AT&T Corp in December 2000.

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3. The international debt securities market

Aided by steadily declining long-term interest rates, a gradual global recovery, and a market environment receptive to a broad range of credit exposures, borrowers continued to issue international debt securities at a strong pace in the third quarter of 2004. Issuance of short- and long-term instruments, net of

Main features of net issuance in international debt securities markets

In billions of US dollars

	2002	2003	2003		2004			Stocks at end-Sep 2004
	Year	Year	Q3	Q4	Q1	Q2	Q3	
Total net issues	1,010.4	1,472.3	303.6	458.9	520.9	351.9	324.6	12,778.7
Money market instruments[1]	1.7	75.3	–33.0	49.2	34.9	4.4	17.5	621.2
Commercial paper	23.7	83.3	–25.5	48.7	8.8	–3.4	25.8	445.3
Bonds and notes[1]	1,008.7	1,397.0	336.5	409.7	486.0	347.5	307.1	12,157.5
Floating rate issues	197.9	392.1	98.0	153.4	154.5	167.4	132.8	3,278.3
Straight fixed rate issues	800.7	983.9	234.2	240.6	338.4	172.4	177.0	8,523.4
Equity-related issues	10.2	20.9	4.3	15.7	–6.8	7.7	–2.7	355.8
Developed countries	944.5	1,365.3	281.3	434.9	485.3	321.1	293.3	11,408.8
United States	328.5	274.3	90.4	97.7	125.6	6.8	41.7	3,245.8
Euro area	479.1	768.7	124.6	223.4	231.7	216.1	139.2	5,531.2
Japan	–22.7	–1.0	–3.7	7.9	6.5	11.0	0.7	282.5
Offshore centres	8.1	16.3	0.4	9.1	0.9	5.1	9.8	147.9
Emerging markets	36.9	67.4	19.5	19.0	24.6	18.6	14.5	694.3
Financial institutions	832.4	1,188.2	256.4	409.6	418.2	285.9	295.8	9,469.1
Private	697.1	983.3	209.8	349.2	340.7	237.5	233.6	7,982.2
Public	135.4	204.9	46.6	60.4	77.5	48.4	62.2	1,486.9
Corporate issuers	55.1	113.1	21.7	40.9	7.2	11.3	10.5	1,517.6
Private	44.3	94.9	18.0	37.2	–0.4	7.8	10.2	1,267.7
Public	10.8	18.2	3.7	3.7	7.6	3.5	0.2	249.9
Governments	102.0	147.8	23.0	12.5	85.5	47.6	11.3	1,264.2
International organisations	20.9	23.2	2.4	–4.2	10.0	7.0	7.1	527.8
Memo: Domestic CP[2]	*–99.1*	*–41.0*	*–36.6*	*8.2*	*57.9*	*–21.7*	*0.8*	*1,927.1*
Of which: US	*–91.4*	*–81.3*	*–22.3*	*–1.5*	*47.8*	*–26.8*	*6.7*	*1,316.4*

[1] Excluding notes issued by non-residents in the domestic market. [2] Data for the third 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	Q3	Q4	Q1	Q2	Q3
Total announced issues	2,099.2	2,887.3	656.9	712.3	983.1	770.8	754.7
Bond issues	1,164.7	1,612.9	343.6	405.0	570.3	404.4	409.5
Note issues	934.5	1,274.4	313.3	307.3	412.8	366.4	345.2
Floating rate issues	602.4	963.8	241.2	257.6	338.0	307.8	302.9
Straight fixed rate issues	1,454.0	1,835.4	388.9	428.1	627.7	444.7	440.6
Equity-related issues[1]	42.8	88.1	26.8	26.6	17.4	18.3	11.2
US dollar	985.0	1,172.4	285.8	268.6	357.2	257.4	260.6
Euro	806.3	1,289.1	271.8	316.9	478.8	379.6	370.6
Yen	88.3	102.9	24.5	29.0	29.3	33.8	23.6
Other currencies	219.7	322.9	74.8	97.7	117.8	100.0	99.9
Developed countries	1,891.9	2,623.4	602.8	657.4	907.4	696.2	683.3
United States	648.2	739.6	184.7	173.7	249.4	167.8	172.5
Euro area	866.1	1,294.5	275.5	326.1	439.3	356.3	324.4
Japan	40.3	48.3	10.2	18.5	20.4	19.8	12.9
Offshore centres	22.1	31.6	6.2	11.0	7.1	7.8	13.8
Emerging markets	100.9	139.7	33.1	33.8	44.9	36.5	35.4
Financial institutions	1,631.6	2,281.0	536.2	593.8	788.4	604.3	633.9
Private	1,361.3	1,913.8	451.1	506.5	660.9	515.4	519.7
Public	270.3	367.2	85.1	87.3	127.5	88.9	114.1
Corporate issuers	211.5	271.2	67.0	68.8	62.0	72.3	62.6
Private	187.3	220.7	53.6	56.5	52.4	60.6	57.5
Public	24.2	50.5	13.4	12.3	9.5	11.7	5.1
Governments	171.8	242.6	39.0	39.6	109.1	63.9	36.1
International organisations	84.3	92.5	14.7	10.1	23.7	30.3	22.2
Completed issues	2,098.3	2,868.4	684.1	735.3	934.0	797.7	706.5
Memo: Repayments	*1,089.6*	*1,471.4*	*347.6*	*325.6*	*448.0*	*450.2*	*399.4*

[1] Convertible bonds and bonds with equity warrants.

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

repayments, totalled $325 billion, down from $352 billion in the second quarter (Table 3.1). This small decline reflects reduced activity by borrowers in the euro area, Japan and the emerging economies, which was not fully offset by increased borrowing by entities located in the United States and offshore centres. Patterns at the level of gross issuance were similar (Table 3.2). For the seventh quarter in a row, both net and gross issuance exceeded the respective figures for the year-earlier quarter. Preliminary data suggest that strong issuance continued in October 2004, with a recovery in gross borrowing by Europe and emerging Asia. Among emerging economies, the generally favourable financing conditions enabled infrequent borrowers to come to the market and facilitated a continuation in the recent trend towards longer maturities.

European issuance slows, but euro activity remains strong

European issuance declines …

Net issuance by borrowers in western European economies declined by 26%, from $295 billion in the second quarter to $220 billion in the third, reflecting both a decrease in new issuance and an increase in repayments. Most of this was accounted for by reduced issuance by borrowers in the euro area, particularly Italy and Spain. In part the slowdown was caused by reduced government borrowing, which is typically lower in the second half of the year. However, euro area corporations and financial institutions also cut net borrowing. Among non-financial corporates, net issuance fell from $16 billion in the second quarter to less than $3 billion in the third. Gross issuance by euro area corporates dropped to its lowest level since the fourth quarter of 2002, although this was partially offset by increased borrowing on domestic markets. In October 2004 however, preliminary data suggest a recovery of about 13% in gross issuance by euro area borrowers.

… but the euro's share is unchanged

Despite the decline in euro area issuance in the third quarter, the share of the euro in international securities market activity was essentially unchanged (Table 3.3). The euro was used in 48% of completed issues in the third quarter, compared with 49% in the second, while its share in issuance net of repayments fell from 63% to 61%. In part this reflects the persistence of a

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

In billions of US dollars

		2002	2003	2003		2004		
		Year	Year	Q3	Q4	Q1	Q2	Q3
United States	US dollar	291.4	215.5	75.8	75.4	102.9	–26.0	8.5
	Euro	39.8	47.5	14.1	14.5	13.6	21.5	16.2
	Pound sterling	2.3	11.7	1.8	7.2	3.5	5.1	10.7
	Yen	–6.2	–1.5	–1.7	0.8	1.3	1.5	0.8
	Other	1.2	1.0	0.4	–0.1	4.3	4.7	5.6
Euro area	US dollar	36.1	87.9	23.0	24.9	18.2	34.8	10.0
	Euro	416.5	646.1	97.8	180.8	191.9	159.0	116.5
	Pound sterling	18.4	17.5	3.5	5.4	6.6	15.6	5.4
	Yen	–16.1	–12.1	–3.2	0.4	1.5	3.3	0.5
	Other	24.2	29.4	3.6	12.1	13.7	3.3	6.7
Others	US dollar	90.9	165.2	43.6	49.3	53.9	47.4	45.3
	Euro	66.4	140.2	28.1	37.0	71.3	40.8	66.7
	Pound sterling	41.8	70.9	11.7	26.2	21.6	22.6	12.7
	Yen	–20.9	9.4	–2.0	10.6	2.5	10.7	3.1
	Other	24.6	43.6	7.1	14.6	14.3	7.5	15.9
Total	US dollar	418.4	468.6	142.4	149.5	175.0	56.1	63.8
	Euro	522.8	833.8	140.0	232.2	276.8	221.3	199.4
	Pound sterling	62.5	100.1	17.0	38.8	31.7	43.3	28.8
	Yen	–43.3	–4.3	–6.9	11.8	5.2	15.5	4.4
	Other	50.0	74.0	11.2	26.6	32.3	15.6	28.1

[1] Based on the nationality of the borrower.

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

relatively low level of US dollar-denominated issuance from entities located in the United States (see below). It also results from a greater use of the euro by borrowers outside the European Union, particularly financial institutions based in Switzerland and Australia.

Limited recovery of US issuance

While new financing on the international debt securities market by US entities rose in the third quarter compared with the second, it remained significantly below its levels of late 2003 and early 2004. Completed gross international securities issuance by US borrowers, at $240 billion, was essentially unchanged from the second to the third quarter. After adjusting for the cancellation of $20 billion in defaulted WorldCom debt in the second quarter,[1] net issuance expanded from $27 billion to $42 billion because of a decline in repayments. The net figure was roughly a third of the level of the first quarter of 2004, and well below the $69 billion average quarterly net issuance recorded in 2003.

US housing enterprises borrow less …

The slow pace of US issuance in the second and third quarters was due mainly to reduced international borrowing by the large housing enterprises, Fannie Mae and Freddie Mac. Gross issuance by these two institutions fell to $35 billion in the third quarter of 2004, compared with $63 billion in the second. On a net basis, combined issuance by the two was negative in the third quarter, with negative net issuance of $12 billion by Freddie Mac outweighing positive net issuance of $4 billion by Fannie Mae, compared with combined net issuance of $14 billion (almost all of it by Fannie Mae) in the second quarter. This slowdown in net international borrowing by the two institutions mirrors that in their net debt issuance in the US domestic market. The move to more measured balance sheet growth started well before Fannie Mae and its chief regulator reached an agreement in late September, in which Fannie undertook to increase its capital level over the coming months.

… while corporate issuance rises

Among US non-financial corporations, fund-raising on international markets continued at a healthy level in the third quarter. Net issuance rose to $8 billion from $5 billion (after the impact of the WorldCom cancellation is removed) in the second quarter and $4.5 billion in the first. Completed gross issuance jumped from $18 billion in the second quarter to $28 billion in the third, the largest amount since the second quarter of 2002. This echoed an increase in domestic gross issuance, from $121 billion in the second quarter to $161 billion in the third.

Speculative grade issuance robust

As in previous quarters, low-rated borrowers hastened to take advantage of favourable borrowing conditions, marked by narrow credit spreads and

[1] In the BIS securities statistics, the cancellation of defaulted debt is treated as an early repayment. As a result, Table 3.1 reports $6.8 billion in net issuance by US entities in the second quarter.

decreasing aggregate default rates, as well as investors' willingness to accept greater exposure to credit risk in an environment of low nominal yields on safer investments. Announced international issues by sub-investment grade borrowers in the developed countries reached nearly $13 billion in the third quarter, a record amount and a small increase over the previous quarter. As a result, their gross issuance in the first three quarters of 2004 already exceeds that for the whole of 2003 (Graph 3.1).

The high third quarter figure masks a slowdown in private sector issuance relative to the second quarter, since it includes $6 billion in euro- and US dollar-denominated debt issued in July as part of the German government's securitisation of its bilateral claims on Russia. However, the volume of announcements excluding this transaction, while less than announced issuance in the second quarter, exceeds both announced issuance in the first quarter and the average quarterly level of issuance for 2003.

In contrast to the first half of 2004, telecommunications and technology companies were relatively less active in the third quarter. The most prominent private sector issuer was Enterprise Products Partners of the United States, a natural gas transportation and storage company, which announced four US dollar issues totalling $2 billion at maturities ranging from three to 30 years in late September. As in previous quarters, leveraged buyouts also fuelled supply, such as a 10-year €335 million bond from Grohe of Germany in early September.

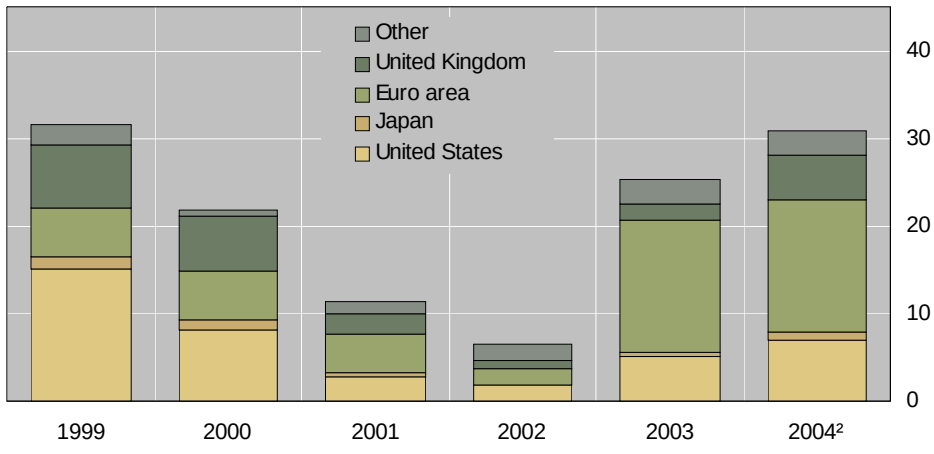
Stable interest rate environment supports fixed rate structures

US dollar borrowers move to fixed rates …

The share of announced US dollar-denominated non-convertible bond and note issues that used fixed rate structures rose to 72% in the third quarter, compared with 67% in the second and 66% in the first. This may have been a

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 through September 2004.

Sources: Dealogic; BIS. Graph 3.1

reflection of the more settled interest rate environment in the third quarter, when markets shifted from the expectation of a rapid pace of monetary tightening by the Federal Reserve to anticipating a more gradual approach (see the Overview on page 1). Investors, accordingly, were more willing to lock in current interest rate levels, rather than trying to gain exposure to possible increases in money market yields through floating rate investments. Borrowers, who generally have better access to swaps and other means for hedging interest rate movements than do investors, were happy to accommodate this shift.

… as do corporate borrowers in euros

The picture in the euro-denominated market is more complicated. Among non-financial corporate issuers in euros, the use of fixed rate structures in non-convertible bond and note issuance rose from 64% in the second quarter to 69% in the third. In the euro-denominated market as a whole, however, the fixed rate share fell to 47%, compared with 50% in the second quarter and 64% in the first. In part this resulted from a seasonal fall in borrowing by governments, which tend to issue predominantly fixed rate debt. It also reflected an increase in floating rate borrowing on the part of financial institutions, particularly public sector banks. For the past several years, euro area financial institutions have boosted their floating rate borrowing in the second half of the year; the reasons for this are unclear.

Investors remain receptive to emerging economies

Strong issuance by emerging market borrowers …

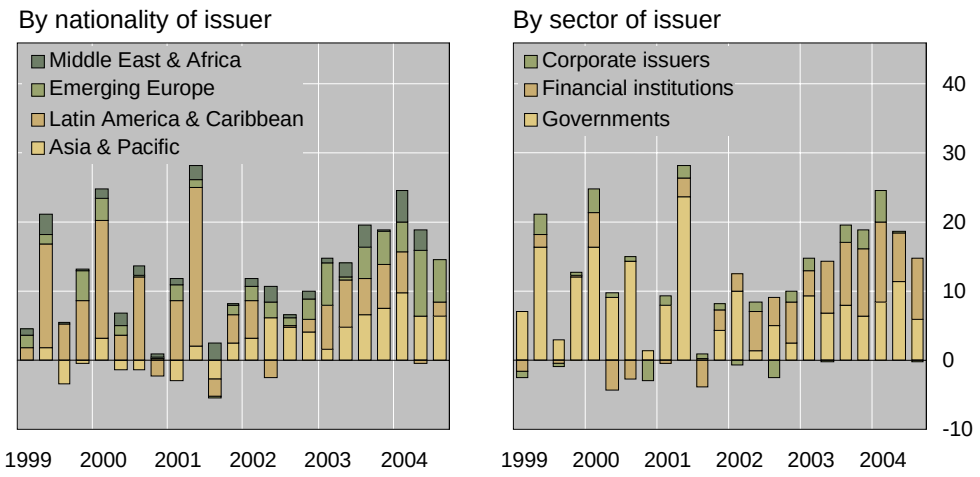
Backed by a gradual decline in credit spreads, which by the end of September had almost reached the historical lows seen in January 2004, fund-raising activity by emerging economies remained strong in the third quarter. With a total of $38.7 billion of announced new issues, gross issuance is on track to reach the record set in 1997.

New issues exceeded repayments by $14.5 billion, compared with $18.6 billion in the second quarter and a quarterly average of $16.9 billion in 2003 (Graph 3.2). The slowdown in net borrowing, however, was accompanied by narrow credit spreads and continued investor receptivity to low-rated issues. This suggests that the decline reflected not a loss of market access, but rather a reduced need for external finance, as most countries continued to enjoy stable current account and fiscal positions.

Borrowing in Asia was mostly driven by financial institutions. Supported to a large extent by Chinese and Korean public sector entities, net issuance by financial institutions amounted to $3.9 billion of the total of $6.4 billion. A few sovereign issuers also raised sizeable amounts. After an absence of over one year, the Republic of Korea launched a $1 billion 10-year bond in September. In view of the country's high level of foreign reserves, the issue reflected the government's intention of providing a pricing reference for other Korean borrowers rather than a need for foreign currency funding. The Republic of the Philippines, a more frequent participant in international debt securities markets, raised a total of $1.4 billion through issuance of two US dollar-denominated bonds and one denominated in euros. However, because of growing concern among investors about increasing government debt levels, the sovereign was

International debt securities issues by emerging market entities

Net issuance, in billions of US dollars



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

faced with higher funding costs than a year ago. A $300 million 10½-year bond, for example, was launched in September with an annual yield to maturity of 9.37%, equivalent to 497 basis points over a comparable US Treasury bond. By contrast, a similar placement made in October 2003 was priced at a spread of only 401 basis points. This increase stands out against the general narrowing trend in emerging market spreads; the JPMorgan EMBI Global spread, for example, fell from 442 to 418 basis points during the same period of time. With total issuance in 2004 so far amounting to $4.1 billion, the Republic of the Philippines is by far the region's busiest sovereign borrower.

... Russian financial institutions ...

In emerging Europe, net borrowing was for the most part fuelled by Russian financial institutions and by sovereigns. Despite the recent banking crisis and the troubles of the large oil company Yukos, Russian financial sector entities – mainly banks and finance vehicles associated with the oil, gas and mining industries – continued to be well received by investors. These borrowers accounted for $2.6 billion of the region's total net issuance of $6.1 billion. The strong presence of Russian financial institutions has been a regular feature of international debt securities markets for two years now. While sovereign issuers from emerging Europe were also present in the market, volumes did not reach the unusually high levels of the previous two quarters, when issuance had been stimulated by 10 countries' accession to the European Union on 1 May. The Republic of Turkey, the most active sovereign borrower from the region in recent years, continued to tap international debt securities markets. A recent upgrade by Standard & Poor's (to BB–), improved economic fundamentals, and investors encouraged by the prospect of future EU membership contributed to relatively low funding costs. In September, a €600 million five-year bond was launched with an annual yield to maturity of 5.75%, equivalent to a spread of a mere 238 basis points over a comparable German government bond as opposed to 680 basis points for a similar placement made in January 2003. Later the same month, a $1 billion 10½-year bond was brought to the market with a yield to maturity of 7.58%. At 333 basis

points over a comparable US Treasury bond, the bond was priced 117 basis points tighter than a similar instrument issued a year earlier. The Republic of Cyprus was also well received when it came to the market with a €500 million 10-year note in July. Benefiting from the country's newly acquired status as an EU member and the fact that its A2/A rating is one of the highest among the new entrants, the issue was priced in the region of only 20 basis points above a comparable German government bond. Another notable sovereign placement was made by Ukraine in the form of a $500 million five-year instrument.

… and Latin American governments

After turning negative in the second quarter, net issuance in Latin America was positive in the third. The increase from –$0.4 billion to $2.0 billion was driven by Mexican and Brazilian financial institutions and a handful of sovereign issuers. Corporate sector net borrowing in the region remained negative for the second consecutive quarter, as repayments – especially by Brazilian entities – continued to exceed new issuance. In a sign of investors' continued receptivity to a broad range of credits, the list of sovereign issuers included not just familiar names, such as Brazil and Mexico (each of which announced $2 billion in new issues), Venezuela ($1.5 billion) and Colombia ($500 million, tied to the Colombian peso), but also a number of infrequent borrowers. In July, the Government of Jamaica launched a €200 million bond with a maturity of eight years, the country's longest-maturity euro-denominated issue yet. With an annual yield to maturity of 11.1% at launch, roughly 700 basis points above a comparable German government issue, the bond offered investors a higher yield than that of other B-rated sovereign borrowers in the region such as Uruguay and Venezuela. Later the same month, the Oriental Republic of Uruguay issued a 7.4 billion Uruguayan peso ($250 million equivalent) bond tied to the US dollar, with a maturity of one and a half years. The Republic of Guatemala came to the market in late September with a $330 million 30-year bond, shortly after a similar placement of $286 million by the Republic of El Salvador.

Emerging market issuers extend maturity

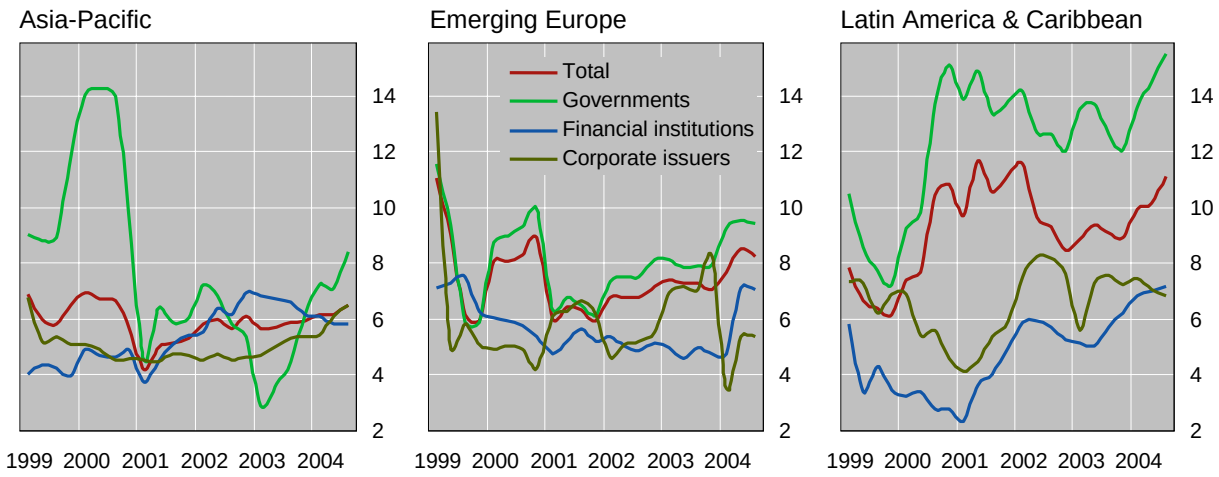
The favourable financing conditions that have prevailed through most of 2004 have enabled emerging market borrowers not only to raise significant amounts in international debt securities markets, but also to extend the maturity of their debt (Graph 3.3).

Emerging markets borrow at longer maturities …

Although the average maturity of emerging market international debt instruments peaked at 9.4 years in the first quarter of 2004, maturities during the second and third quarter remained high by the standards of the recent past. For the first three quarters of 2004 as a whole, announced issues – including money market instruments – by emerging market entities had an average maturity of 9.0 years, compared with 7.8 years in 2003 and 7.2 years in 2002. This extension of maturity has for the most part been fuelled by governments (mainly sovereign issuers). In the first three quarters of 2004, government placements had an average maturity of 12.2 years, compared with 9.8 years in 2003.

Average maturity of emerging market debt issues

In number of years; four-quarter moving average



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

… especially Latin American sovereigns

Increasing maturity can be observed across most regions and sectors. The most significant lengthening of maturity has occurred in Latin America, particularly among sovereign issuers. Several 30-year bonds have been successfully sold by Latin American sovereigns. As a result, the average maturity of Latin American government issues has gone up from 12.1 years last year to a record 16.5 years for the first three quarters of this year. In emerging Europe, an increase in maturity for all issuers over the same period from 7.0 years to 8.8 years was driven partly by sovereign issuers and partly by financial sector entities, predominantly Russian financial institutions associated with the oil and gas sectors. The rising trend in the Asia-Pacific region can for the most part be traced to longer-maturity borrowing by the Korean corporate sector and by the Republic of the Philippines.

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4. Derivatives markets

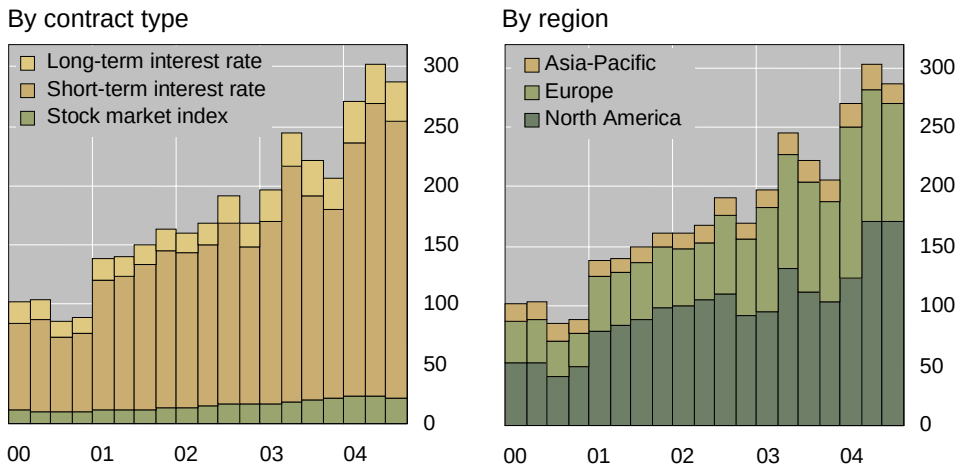
The aggregate turnover of exchange-traded financial derivatives contracts declined in the third quarter of 2004. The combined value of trading in interest rate, stock index and currency contracts amounted to $288 trillion, a 5% fall from the second quarter of the year (Graph 4.1). After remarkably strong activity in the first half of 2004, business appears to have paused for breath.

The decline in activity took place in all the risk categories, with the exception of currencies. The decline was probably driven in large part by a greater convergence of views about the likely path of monetary policy in the major economies after the first increase in US policy rates in June. The lack of disagreement limited the scope for trading.

Geographically, turnover was weak especially in Asia, where trading activity in stock market indices and interest rates dropped. Business contracted significantly in Europe as well, down by 11% for interest rate products alone. In the United States, activity in interest rate products was virtually stagnant while it saw a 4% decrease for stock indices.

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

Measured pace of rate hikes limits trading

Activity in fixed income contracts falls

The aggregate turnover of exchange-traded fixed income contracts fell by 5% in the third quarter of 2004 after two quarters of vigorous growth. The volume of transactions amounted to $266 trillion. The decline in activity on interest rate contracts came after the first increase in the US federal funds target rate in June. Not only did the rate increase confirm expectations, but the accompanying statement appeared to reassure market participants about the "measured pace" of future rate rises from the Federal Reserve.

The decline in fixed income turnover was fairly even across contracts. Trading in money market contracts, including those on eurodollar, Euribor and euroyen rates, fell by 5%, to $233 trillion; activity in bonds dropped by 3%, to $33 trillion (Graph 4.2).[1] The slowdown in activity occurred for both futures and options, with turnover falling by 3% and 11% (to $173 trillion and $59 trillion) respectively.

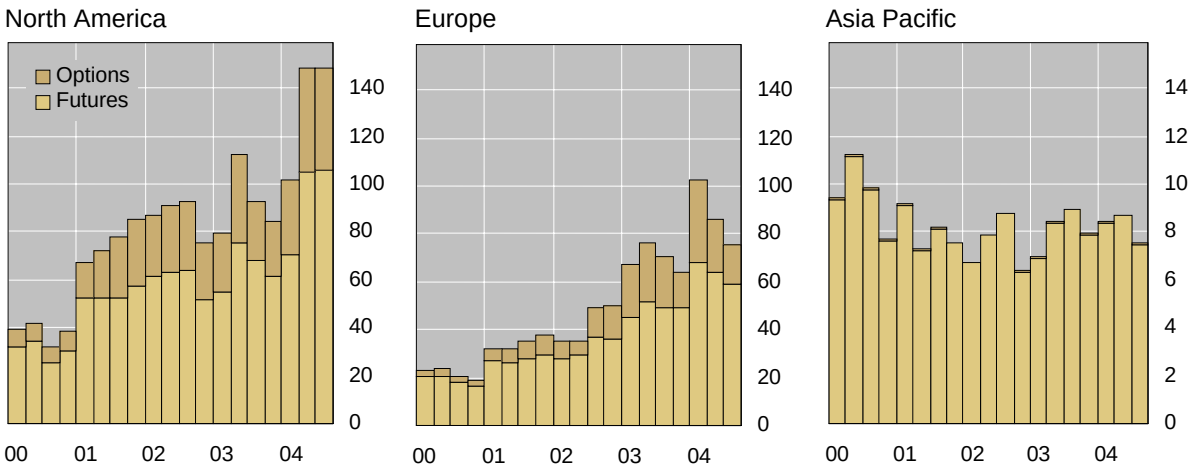
Activity did vary significantly across geographical regions, however. In the United States, it was rather flat, remaining close to $146 trillion overall, with both the futures and options segments stagnant after rapid growth the previous quarter (Graph 4.2). In Europe, business fell by 13%, to $75 trillion, mainly due to declining options on short-term rates. Thus, recorded activity in the United States was nearly twice that in Europe.

Declining volatilities may have played a role ...

The weakest months were the first two of the third quarter. In the United States, sluggish activity in July (–9%) was followed by a flat August and a pickup in September of 14%. Declining volatilities in the United States suggest that the fall in activity observed in the early summer was probably related to the

Turnover of short-term interest rate contracts

Quarterly contract turnover, in trillions of US dollars

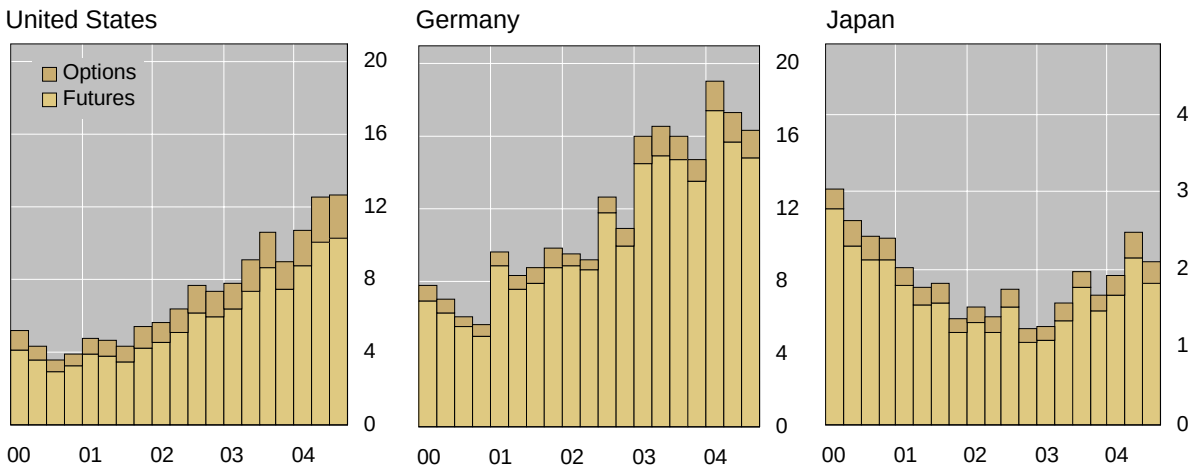


Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 4.2

[1] It is worth noting that the decline in activity was accompanied by an unwinding of open positions in short-term derivatives. Overall, the 5% fall in trading on short-term interest rate products coincided with a 9% fall in open interest, measured in terms of notional amounts. The phenomenon has been especially noticeable in the United States.

Turnover in government bond contracts

Quarterly contract turnover, in trillions of US dollars



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

above-mentioned communications of the Federal Reserve, as well as weaker than expected economic news which further reduced the likelihood of a precipitous hike in rates (see the Overview in the September 2004 *BIS Quarterly Review*). These developments lowered uncertainty about the future movements of short-term interest rates, and reduced position-taking.

... as well as increased consensus over monetary policy

The link between trading in interest rate derivatives and the degree of consensus over the course of monetary policy is particularly evident from trading in federal funds futures. From February to June, trading in federal funds futures had risen by 235%, reflecting the greater position-taking in the face of the divergent views ahead of the first official interest rate change by the Federal Reserve at the end of June. Transactions in federal funds futures then fell by 28% in July, reflecting a movement towards greater consensus. More muted swings in the same direction were evident on three-month eurodollar futures contracts over the same period.

European contracts also showed considerable monthly variation. In Europe, business was weak in the months of July and August, with volumes falling by 20% and 12%, respectively; however, they then rose by 40% in September, far more than the increase that might have been expected from seasonal patterns. Relatively stable implied volatilities of three-month rates in Europe suggest that the pickup in activity in September may have stemmed largely from liquidity trades rather than trades based on the availability of new information; in addition, the fact that the path of European short rates became more uncertain in relation to US short rates than it had been in the past may have boosted activity.[2]

[2] There has been a negative correlation between the changes in trading in US and European interest rate derivatives over the past few years, which has accompanied rising short-term volatility in the United States (see "Derivatives markets" in the September 2004 *BIS Quarterly Review*). By contrast, a positive correlation emerged last quarter just when the volatility gap narrowed.

Activity in long-term bond contracts was broadly similar to that in the short-term segment, with business virtually flat in the United States at $13 trillion, and down by 5% in Europe to around $17 trillion (Graph 4.3). Turnover, in both the United States and the euro area, was weak in July and then strong in the subsequent months. Activity in the United States was particularly robust in August, up by 35%, but less so in September, up by only 6%. By contrast, business in Europe was flat in August and then rose in September by a striking 47%, again far more than would be anticipated on the basis of seasonal factors alone.

Long-term bond contracts also stagnate ...

The increasing activity in the United States in the latter two months of the quarter for long-term interest rate derivatives may have reflected a divergence of volatilities on long- and short-term rates. The difference in volatilities, as measured from the prices of swaptions on five- and one-year swap rates with life to maturity of one year, have widened since August in the United States and since September in the euro area. The difference probably reflects the fact that weaker than expected economic news in the United States increased uncertainty (and divergences of opinion) on long- rather than short-term rates.

In the Asia-Pacific region, turnover contracted by 13% to $10 trillion. At 25%, the contraction was particularly sharp in Asia, with declines in short- and long-term futures turnover of 29% and 15%, respectively. Among Asian countries, the slowdown in business was especially marked in Singapore, where short-term contracts decreased by 47%, mainly due to a 56% fall in futures on three-month eurodollar instruments.[3] A decline in activity was also recorded in Japan, where short- and long-term contracts were down by 10% and 15%, respectively. Thus, business in Japanese interest rate contracts recorded its first slowdown of the year on a quarterly basis. This probably reflected, at least in part, diminished demand for positions hedging a possible exit from Japan's zero interest rate policy, given signs of a decelerating recovery.

... particularly in Asia

Australia bucked the trend of declining transactions in the Asia-Pacific region. Interest rate derivatives transactions in that country rose by 18%, mostly reflecting increases in short-term rate derivatives turnover, which was up by 21%.

Rising business in currency contracts

In sharp contrast to the decline in interest rate derivatives trading, turnover of exchange-traded currency derivatives amounted to $1.7 trillion in the third quarter of 2004, a 10% rise from the second quarter of the year. The increase in activity came especially from the United States, up 12%, and from Europe, up by 6%. The one exception to the pattern of increased FX derivatives trading was Asia, where activity contracted by 10%.

In terms of geographic location, currency derivatives remain strongly concentrated in US exchanges, which account for 90% of the market. Trading

Turnover is concentrated on US exchanges

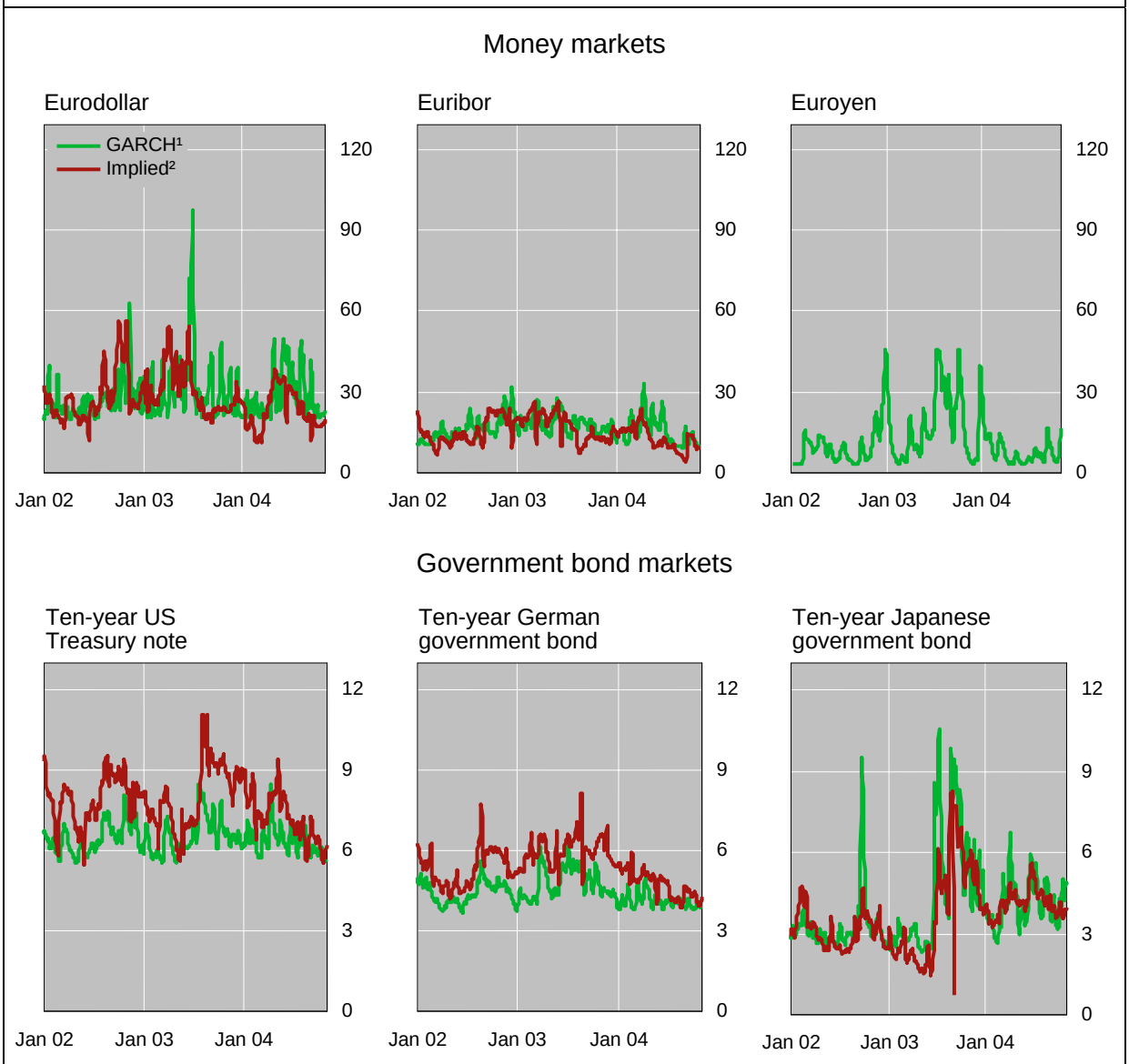
[3] These contracts are traded in Singapore under a Mutual Offset System Agreement with the Chicago Mercantile Exchange.

on both US and other exchanges is concentrated in futures, which make up fully 93% of overall exchange-traded currency derivatives.

Overall, the greater activity in the third quarter derived from strong business in the Canadian dollar, Swiss franc and sterling segments, where turnover expanded by about 20%. Transactions involving the euro remained unchanged, while those on the dollar grew by 4%. At the regional level, transactions involving the dollar increased noticeably on US exchanges, with turnover rising by 16%, while those based on the euro were nearly flat on both US and European exchanges. Futures contracts involving the dollar were particularly actively traded in Brazil, with volumes up by 68%. The increase in

Volatility of major fixed income rates

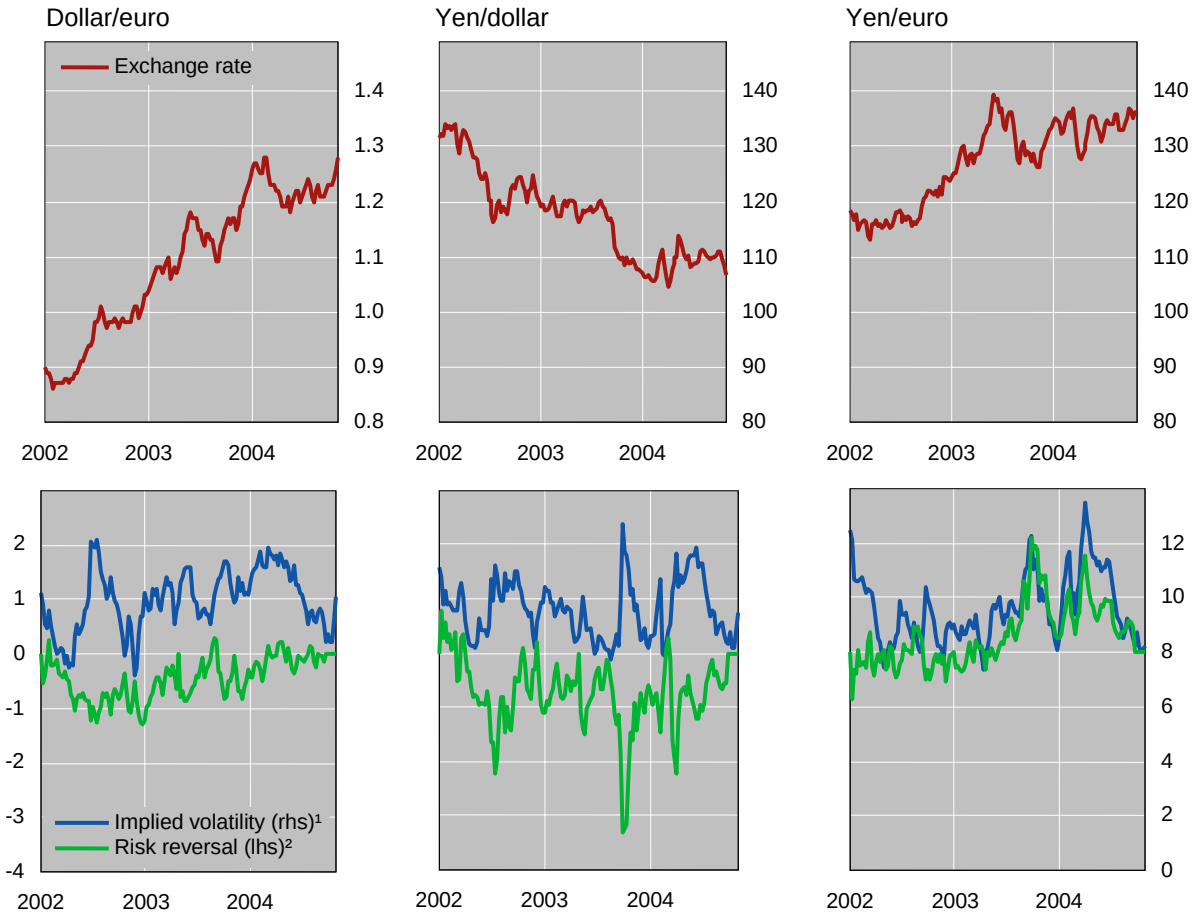
Five-day moving averages



[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

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

activity from the second to the third quarter was mostly concentrated in September; transactions during the first two months of the quarter were fairly subdued.

Higher volatility may have contributed to trading

The movements of market activity through the quarter, especially the peak recorded in September, probably resulted from the weakening of the dollar against the euro as well as the spike recorded by implied volatilities in that month (Graph 4.4). Clear trends as well as higher volatility in foreign exchange markets can lead to increased investment and hedging activity in these markets *(*see the special feature by Galati and Melvin on page 67 of this *Quarterly Review*). On the other hand, business was not obviously associated with expected changes in the bilateral rates of main currency pairs, which can also stimulate hedging activity. In fact, risk reversals remained in all cases very close to zero, indicative of a neutral view about the future development of dollar exchange rates. This contrasted markedly with the abrupt decline in the yen/dollar risk reversal measure during an episode of dollar depreciation last September (Graph 4.5).

Activity in Asian stock indices falls sharply

Stock index turnover declines worldwide

Global turnover in stock index contracts, which had stagnated in the second quarter after a prolonged period of growth, fell sharply by 11% in the third quarter to $21 trillion. Trading was particularly subdued in the Asia-Pacific region, dropping by 24% to $7 trillion. Meanwhile, transactions on North American marketplaces declined by 4% to $9 trillion, while on European exchanges they remained stable at around $4.8 trillion. Across European countries, trading was flat in Germany and in the United Kingdom, but fell sharply in France, Italy and Spain, by between 7 and 10%.

Lacklustre business in stock index derivatives reflected a variety of factors. The fall in activity recorded in Asia is probably related to ongoing investigations by Korean authorities concerning alleged bribery on derivatives trades which took place between 2001 and 2003. Trading in Asia is dominated by options on the Korea Stock Exchange's KOSPI 200 index, which make up 69% of total stock index derivatives in the region. In regions outside Asia, diminished trading probably reflected the stability of the underlying indices. Just as in the previous quarter, stagnant business mirrored unusually low market uncertainty, as measured by the volatility implied in index options. Indeed, implied volatilities, which were already close to historical lows in both the United States and the euro area at the end of the second quarter, continued to drop during the period.

Individual stock contracts also fall

The decrease in position-taking through equity derivatives can also be seen from contracts written on individual stocks (data on which are available only in terms of the number of contracts). After increasing for five consecutive quarters since the beginning of 2003, the number of contracts was down by 18% and 6% in the last two quarters. The decline in activity was sharper in Europe than in the United States, with the number of contracts falling in the last quarter by 14% and 5%, respectively; in Asia, business has grown by 4%.

Less trading in commodities

Activity in commodity markets also fell in the third quarter, with the number of contracts traded declining by 9%. Non-precious metals, agricultural products and precious metals were all down in turnover terms, by 23%, 17% and 12%, respectively.

Only energy derivatives trade more actively

The one exception to the general trend was energy derivatives, where turnover rose by 8%. The volatility of oil prices, as well as increased disagreement about their future course, probably led to greater use of oil derivatives for speculative and hedging purposes (see the Overview in the September 2004 *BIS Quarterly Review*). Geographically, the largest increases were in the United States (6%) and in Japan (13%). It is also worth noting that growth in non-precious metals derivatives trading fell significantly, by 9% in Europe, 14% in the United States and 36% in Asia. Changes in trading activity in these commodities tend to lead changes in coincident cyclical indicators; the lower trading activity may reflect the downward reassessment of future global growth that took place in the third quarter.

Activity in the OTC segment and measures of concentration

Fifty-two central banks and monetary authorities participated early this year in the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity. The survey was in two parts, the first on turnover in foreign exchange markets, and the second on notional amounts outstanding and gross market values of over-the-counter (OTC) derivatives, including foreign exchange, interest rate, equity, commodity and credit derivatives. The results of the second part are especially useful because they have been released in the format of the regular semiannual survey of positions in the global OTC derivatives market (but with more respondents and broader coverage of instruments than the seminannual survey). This box highlights some results from this survey, as well as some findings about concentration in the OTC derivatives market which were published in the same press release.[1]

Overall activity in the OTC market remained strong in the first half of 2004. The total notional amounts of outstanding contracts stood at $220 trillion at the end of June, a 12% increase over end-December 2003. Notional amounts were up by 16% for interest rates and by 10% for foreign exchange products. These two types of instruments accounted for 87% of overall notional amounts, standing at $165 and $27 trillion, respectively. Business was also buoyant for equity-related instruments, up by 19%. By contrast, outstanding amounts of commodities-related derivatives were down by 10%.

Gross market values, which provide a measure of the cost of replacement of outstanding contracts, fell by 8%, to $6.4 trillion. The vast majority of the cost of replacement, 62%, is concentrated in the interest rate segment, at $4.0 trillion. Across counterparties, the reduction in gross market values was sizeable in the case of reporting dealers, down by 14% to $2.3 trillion, and less so for other financial institutions, a category including mutual funds, hedge funds, small commercial banks and insurance companies, which was down by 5%.

Thanks to the broader coverage of the triennial survey, information is also available about developments in the credit derivatives market, a segment which is not typically surveyed at semiannual frequency. Notional amounts for such derivative instruments have recorded remarkable growth over the last three years. At end-June 2004 notional amounts were $4.5 trillion, more than six times the amount of three years ago. Most of the increase comes from the widespread use of credit default swaps (CDSs), spurred by the standardisation of contractual terms and the emergence of CDS indices and trading platforms.

The report on concentration measures reveals a number of stylised facts. First, the concentration in the main OTC derivatives markets either remained stable or increased slightly between end-1998 and mid-2004. Second, the concentration levels for the larger OTC derivatives markets (measured by outstanding notional amounts) have been lower and more stable than concentration levels in smaller markets. Third, the inter-dealer market for most types of derivatives contracts has a level of concentration similar to or slightly higher than that of the overall market.

Among the various components of interest rate derivative activity (the largest segment of the global OTC market), concentration levels decreased slightly in interest rate swaps denominated in US dollars, yen, sterling, Swiss francs and Canadian dollars, and remained unchanged for euro and Swedish krona swaps. For interest rate options, concentration was largely unchanged on US dollar-, euro- and sterling-denominated instruments, while it increased for instruments denominated in the other major currencies. Overall, forward and options markets continued to display higher levels of concentration than swap markets.

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[1] *Triennial and semiannual surveys on positions in the global over-the-counter (OTC) derivatives market at end-June 2004* and *Concentration measures for OTC derivatives markets from December 1998 to June 2004*, released on 6 December 2004. Measures of concentration for OTC derivatives were provided by counterparty, risk category and contract type, using data collected by central banks from the major global dealers in the OTC derivatives market. Global aggregates of the concentration data will be published by the BIS in the semiannual OTC derivatives statistics. The data-collecting central banks are: National Bank of Belgium, Bank of Canada, Bank of France, Deutsche Bundesbank, Bank of Italy, Bank of Japan, Netherlands Bank, Sveriges Riksbank, Swiss National Bank, Bank of England and Board of Governors of the Federal Reserve System.

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Assessing new perspectives on country risk[1]

We examine in a unified framework three recent perspectives on country risk: debt intolerance, original sin, and currency mismatches. We find statistical evidence supporting aspects of all three, though the strength of that support varies considerably across hypotheses and a number of open questions remain. Our evidence is consistent with the view that good domestic macroeconomic and structural policies hold the key to addressing country risk.

JEL classification: F30, G15.

In recent years, new perspectives on country risk have gained prominence under the rubrics of "debt intolerance", "original sin" and "currency mismatches". Debt intolerance posits that the debt/country risk trade-offs are worse for countries with a history of economic mismanagement. Original sin argues that countries less able to borrow in their own currency should be intrinsically riskier. Currency mismatches maintain that countries whose net worth is more sensitive to exchange rate depreciations should suffer higher costs in the event of a crisis.

These views are distinct, though not mutually exclusive. At the same time, their implications have only begun to be tested systematically. This special feature takes a further step in that direction on the basis of a widely used measure of country risk, namely sovereign ratings by the major rating agencies.

We improve on extant tests of new perspectives on country risk in two ways. First, we employ a better "benchmark" model of ratings determinants: thus we are able to control better for the other factors that affect country risk so as to identify the additional contribution of debt intolerance, original sin and currency mismatches to credit quality. Second, we employ better data, which allows us to extend and improve measures of original sin and currency mismatches. In particular, we draw further on the banking, securities and derivatives statistics of the Bank for International Settlements (BIS).

To anticipate our results, we find support for the hypothesis that debt intolerance, original sin and currency mismatches are all relevant in explaining

[1] The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS. We would like to thank Arturo Macias and Jhuvesh Sobrun for invaluable research assistance.

country risk, even after controlling for a wide array of other factors. By and large, variables identified with the corresponding perspectives are statistically significant predictors in ratings regressions. At the same time, the economic significance of these variables is in some cases more modest than suggested by previous research, and is less than that of a few of the more standard economic and structural variables. We also see our statistical results as supporting the view that sound *domestic* macroeconomic and structural policies hold the key to addressing country risk.

In the first section, we briefly discuss the selected perspectives on country risk. In the second, we lay out the framework used for testing the various hypotheses and contrast it with previous work. In the third, we present and discuss the empirical results. In the concluding section, we note some caveats and recommend areas for further research.

Three views of country risk

Debt intolerance

Debt intolerance stresses the impact of a history of economic mismanagement on debt capacity

"Debt intolerance", as introduced by Reinhart, Rogoff and Savastano (2003, hereafter RRS), refers to the inability of many emerging market economies to handle "overall debt levels that would seem quite manageable by the standards of the advanced industrial economies". RRS argue that the root cause of this reduced debt bearing capacity is a history of economic mismanagement. They pay particular attention to past episodes of very high inflation and actual defaults.

Why should history matter? A number of channels are possible. One is the inevitable inertia of institutions. It takes time to reform in a fundamental way. Under this interpretation, inflation history and past defaults should best be seen as symptoms of deeper institutional failings. Another is the fact that past crises may by themselves have long-lasting, debilitating effects on institutions. RRS note that they can weaken the financial system and undermine tax-raising capacity and long-term growth. Long memories on the part of investors, unwilling to concede the benefit of the doubt, could reinforce these objective channels: once bitten, twice shy. Finally, the high and highly sensitive borrowing costs associated with these various factors can, in turn, exacerbate vulnerabilities. RRS observe that, not surprisingly, because of inertia in these various weaknesses, countries that default tend to do so repeatedly, ie are "serial defaulters". They stress, however, that, over time, good policy should be able to overcome these shortcomings.

Original sin

Original sin stresses a country's inability to borrow abroad in its own currency

The term "original sin", by evoking the echoes of an event buried in the distant past, can superficially sound like "debt intolerance" to the uninitiated. In fact, it points to a different condition. The concept has evolved over time. The one we focus on here is "the inability of a country to borrow abroad in its own currency"

and, by extension, to hedge vis-à-vis non-residents[2, 3] (Eichengreen, Hausmann and Panizza (2003a, hereafter EHP)). Proponents of original sin argue that this condition heightens a country's vulnerability because it implies that exchange rate depreciations make it harder to service external debts. In turn, this reduces the willingness of non-residents to finance countries ex ante, makes that financing more sensitive to adverse economic conditions ex post, and limits policymakers' room for manoeuvre.

What can cause original sin? If original sin was caused by the same set of factors as debt intolerance, it would be just an additional symptom of past and current domestic institutional shortcomings. For instance, it is natural to think that a history of inflation and default could make foreign investors reluctant to hold debt, especially long-term debt, denominated in the currency of the borrower. In this case, the condition would reflect not so much an "original sin" as a "sin of a lifetime" (McCauley and Ho (2003)). Proponents, however, argue that original sin reflects primarily intrinsic characteristics of global financial markets and is, as such, largely beyond a country's own control or, at a minimum, that it would take considerably longer to address than other domestic structural shortcomings. In particular, EHP conjecture that, in the presence of transaction costs, diversification of global portfolios would not go beyond those few currencies that provide the highest diversification benefits, which they identify with those from the largest economies. Similarly, Flandreau and Sussman (2003) argue that original sin reflects a "secondary market liquidity premium" associated with all currencies but those of the largest economies. Historically, they stress, escaping original sin has required countries to emerge as leading economic powers.

Currency mismatches

Currency mismatches have often been confused with original sin, for good reason. A currency mismatch may be defined – as, for instance, most recently by Goldstein and Turner (2004, hereafter GT) – as "the sensitivity of net worth or of the present value of net income to changes in the exchange rate". If currency mismatches take the form of *net debt* positions in foreign currency, they can make countries vulnerable because large depreciations would make it harder for net borrowers to service foreign currency liabilities. Thus, currency mismatches are not intended to predict crisis; rather, they are seen as increasing the cost of a crisis in the event of a sudden large depreciation of the currency (ie they are a sort of "stress test").[4] At least since the Asian crisis, the

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[2] If foreigners are unwilling to hold claims in domestic currency, they should also be unwilling to be counterparts in hedging transactions with residents; see also Slavov (2003).

[3] An earlier version of the hypothesis covered the inability to borrow domestically long-term in domestic currency (Eichengreen and Hausmann (1999)). The considerable progress made by many emerging market countries in this area, however, has made it less interesting to test this version.

[4] For much the same reasons, one might also expect the vulnerability associated with the mismatches to be related to other structural factors of the economy.

potentially disruptive consequences of such balance sheet configurations have been widely recognised (eg Krugman (1999), FSF (2000)).

Since, according to original sin, it is primarily through net debt positions in foreign currency that the inability to borrow in domestic currency is expected to increase country risk, it is tempting to conclude that the two views are equivalent. In fact, there are at least two important differences between the two concepts. First, proponents of the currency mismatch hypothesis stress that there need be only a weak correlation between currency mismatches and the apparent inability to borrow abroad in domestic currency. Residents may accumulate assets, hedge or have (net) revenues denominated in foreign currency.[5] Second, the observation of limited borrowing in domestic currency may reflect unexploited possibilities due to distorted incentives for residents (eg the implicit guarantees associated with fixed, but ultimately unsustainable, exchange rate regimes) rather than unwillingness on the part of non-residents to provide such funding. Finally, and partly as a corollary, good domestic policies can largely overcome any residual inability to borrow or hedge and limit its unwelcome consequences. Flexible exchange rates and investments in the development of domestic currency bond markets and, more generally, of strong domestic institutions are cases in point. Many countries have followed this type of advice in recent years, strongly encouraged by the international community (eg FSF (2000), G7 (2003)).

Currency mismatches can have a low correlation with original sin measures

Testing views of country risk: the framework

The previous analysis suggests a straightforward way of testing the various views of country risk. First, choose a reliable measure of country risk. Then, see to what extent the various proxies of debt intolerance, original sin and currency mismatches help explain variations in that measure once a full set of possible determinants is included in the benchmark model of country risk. This will avoid the risk of finding spurious relationships between the proxies and the measure of country risk.

Extant work has so far fallen somewhat short of this description. For one, the measures of country risk have not been uniform, having included Institutional Investor ratings (RRS), S&P ratings (EHP) and actual crises (GT). In addition, the set of variables capturing other underlying determinants of country risk has been quite limited. For instance, RRS just include measures of historical mismanagement (high inflation and past defaults) together with debt, while EHP consider only a number of debt ratios, terms of trade and real

Past work has used a limited set of control variables

[5] Conceptually, there are two distinct sets of mismatches: (a) those involving a potential wealth transfer from residents to non-residents; and (b) those involving wealth transfers among residents. GT stress the importance of both, while at the same time recognising that some offsetting among residents can take place if public authorities draw on foreign exchange reserves to cushion adverse shocks. By contrast, EHP focus exclusively on the transfer vis-à-vis non-residents. In their empirical proxy for currency mismatches, GT have difficulties separating neatly the two sets of mismatches, given the data limitations.

exchange rate volatility.[6] Likewise, except for an initial attempt in EHP, the three basic hypotheses are not fully explored together.

In what follows, we seek to remedy these shortcomings. In the process, we also pay particular attention to the distinction between those factors that are amenable to domestic policy and those that are not.

The measure of country risk: credit ratings

Agency credit ratings are stable measures of country risk

As a measure of country risk, we rely on agency credit ratings. We do so for a number of reasons. First, although by their nature agency ratings are not necessarily the most accurate measures of the time variation in country risk, they provide a good benchmark with which to assess its cross-sectional distribution. In fact, two of the country risk hypotheses proposed – debt intolerance and original sin – relate more to this cross-sectional dimension, as time variation in the corresponding metrics is expected to be quite limited. Second, for current purposes, credit ratings are preferable to market spreads. Credit spreads are very volatile (influenced by extraneous factors such as time-varying appetite for risk) and available for too short a period. Third, credit ratings are still actively used by market participants as benchmarks for country risk assessments. Finally, using ratings facilitates comparisons with EHP and RRS as well as with previous work that has used ratings rather than ex post measures of risk, such as incidence of crises.[7] Of course, the disadvantage of using an ex ante measure of risk as opposed to an ex post one, such as crises themselves, is that the tests inevitably rely on the accuracy of the corresponding risk assessments (see below).

Among measures of ratings, for current purposes sovereign credit ratings of the major credit rating agencies are arguably superior to the country ratings published by Institutional Investor.[8] Institutional Investor ratings aggregate the

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[6] The methodologies also vary. In particular, RRS and EHP rely on formal econometric analysis. By contrast, partly because of lack of data, GT simply observe that, in a sample of large emerging market countries, those suffering financial crises have tended to have large negative values of a metric of currency mismatches in the run-up to and during the crises themselves.

[7] For example, see Cantor and Packer (1996), Ferri et al (1999), Jüttner and McCarthy (2003), Reisen (2003) and Moody's (2003b, 2004). In part because the rating of sovereign debt was a relatively late blooming area of the credit ratings industry, the use of the sovereign ratings of the major credit rating agencies to estimate country risk regressions dates back only to the mid-1990s. The original formulation of Cantor and Packer found that an OLS specification using only eight explanatory variables explained more than 90% of the cross-sectional variance in agency credit ratings for 49 countries. In particular, they found that per capita income, inflation, external debt, economic development, and default history were particularly strong predictors of foreign currency ratings.

[8] Clearly, since we are using sovereign credit ratings as a proxy for country risk, we are relying on a definition of country risk that focuses on the likelihood that the sovereign borrower will meet all of its debt obligations. The rating agencies also assign a general country ceiling that generally indicates the highest rating that is possible for all entities in that country; in practice, this ceiling is usually equivalent to the sovereign rating. Individual ratings that pierce the ceiling are possible, though unusual with the exception of structured finance (see Moody's (2001)). Country risk is often used more generally to refer to the likelihood of events changing business profits and asset valuations in a country. For an example of this sort of discussion of country risk, and evidence that it is priced in emerging market equity markets, see Erb et al (1996).

responses of major banks grading countries from 0 to 100 without specifying the underlying criteria. By contrast, the major agencies frequently publish lists of criteria that they considered when arriving at ratings. In addition, the agencies regularly review the correspondence of their ratings with default rates (eg Moody's (2003a)). And unlike the anonymous respondents to the survey, agencies stake their reputation on the accuracy of ratings assignments.

We rely on the average rating of Moody's and Standard & Poor's, rather than using a single rating, as in EHP. Research on the pricing of debt obligations suggests that bonds tend to be priced at the average of ratings when the ratings are split (Cantor et al (1997)).

Finally, we focus on foreign currency rather than local currency sovereign ratings. Local currency ratings are a relatively recent development and are not as widely available.[9] Table 1 lists the average rating through the estimation period for the countries included in the analysis.[10]

The benchmark model of country risk and the specific tests of debt intolerance, original sin and currency mismatches

A proper benchmark model of country ratings should consider a whole gamut of variables traditionally deemed relevant. The rating agencies themselves frequently provide guidance on the wide array of quantitative and qualitative factors they consider (eg Moody's (2004), Standard & Poor's (2004)). In Table 2, we list the more than 30 explanatory variables assessed in the regression analysis. For the most part, these variables reflect macroeconomic factors, including inflation and growth, the external debt burden, proxies for liquidity and the fiscal situation. In addition, they include measures that seek to capture deeper institutional factors, such as the corruption and political risk indices (eg Kaufmann et al (2003)). Generally, the expected relationship between these variables and country risk is straightforward and does not require elaboration. By contrast, a few words are called for when considering the specific hypotheses under examination.

We proxy for economic mismanagement using inflation and default history

Any test of the debt intolerance hypothesis should involve a test of the relevance of a history of mismanagement. Following RRS, we proxy this history through the percentage of years that a country has had inflation over 40% and through its default record. A strict interpretation of the hypothesis is that the impact of debt on county risk should be amplified by a bad default or inflation record *even after controlling for any independent impact of these variables on risk*. After all, the importance of a default history for ratings was already well established, conceptually and empirically, before the emergence of the debt intolerance hypothesis (Eaton (1996), Cantor and Packer (1996)). To test this strong version of the debt intolerance view, we follow RRS and include interactive variables which multiply our debt measures by the default and inflation record *in addition to* these two variables themselves.

[9] For a review of local currency sovereign ratings, see Kisselev and Packer (2004).

[10] In the regression analysis, ratings are recoded numerically with AAA (Aaa) equal to 17, AA+ (Aa1) equal to 16, and so on down to CCC+ (Caa1) equal to 1.

Foreign currency sovereign credit ratings

Average, 1996–2003

Country	Rating	Country	Rating	Country	Rating
Argentina	BB	Hong Kong SAR	A	Philippines	BB+
Australia	AA+	Hungary	BBB	Poland	BBB
Austria	AAA	Iceland	A+	Portugal	AA
Belgium	AA+	India	BB	Russia	BB–
Brazil	B+	Indonesia	BB	Singapore	AAA
Bulgaria	BB–	Ireland	AA+	Slovenia	A
Canada	AA+	Israel	A–	South Africa	BBB–
Chile	A–	Italy	AA	Spain	AA+
China	BBB	Japan	AA	Sweden	AA+
Colombia	BB+	Korea	A–	Switzerland	AAA
Croatia	BBB–	Lithuania	BBB	Taiwan, China	AA
Cyprus	A+	Malaysia	BBB+	Thailand	BBB
Czech Rep	A–	Mexico	BB+	Turkey	B
Denmark	AAA	Netherlands	AAA	United Kingdom	AAA
Finland	AA+	New Zealand	AA+	United States	AAA
France	AAA	Norway	AAA	Venezuela	B
Germany	AAA	Pakistan	B		
Greece	A–	Peru	BB–		

Note: Average of end-year mean foreign currency ratings of Moody's and Standard & Poor's. Ratings shown correspond to the notation used by Standard & Poor's. Ratings of countries less than CCC not included in sample. Not all countries have ratings for all years.

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

Should external or public sector debt be the relevant concept? In principle, external debt seems to be the most appropriate variable, as the main interest in debt intolerance is with external defaults. At the same time, in increasingly globalised markets, with large cross-border investments, the distinction between internal and external defaults is becoming harder to draw in practice. RRS themselves consider both variables, depending on the countries under examination. In what follows, we include the two separately for all countries, as EHP do.

Testing for the specific contribution of original sin and currency mismatches raises trickier issues. They relate to measurement and interpretation. We next consider these in turn.

Serious measurement problems arise with respect to both hypotheses. The reason is that statistics on the foreign exchange configuration of both on- and off-balance sheet exposures are extremely limited. For example, EHP use a range of measures of original sin based exclusively on the share of foreign exchange debt in subsets of on-balance sheet liabilities, drawing on BIS statistics (see the box on page 56). They exclude, in particular, all derivatives positions and hence hedging possibilities. The problems are even more severe for measures of currency mismatches, which necessarily call for more information about the nature and distribution of currency risk. GT develop some admittedly crude estimates, but are conscious of their shortcomings.

Explanatory variables

Categories	Variables	Unit	Source
Macroeconomic	Log per capita GDP[1]	$	
	Log inflation[1]	%	
	Real GDP growth (year on year)[1]	%	IIF, IMF, IFS,
	Investment/GDP	%	DRI, EIU
	Saving/GDP	%	
	Current account/GDP	%	
Debt burden	Net debt/GDP	%	
	External debt/exports[1]	%	
	Short-term external debt/FX reserves	%	IIF, IMF, IFS,
	Short-term external debt/total external debt	%	DRI, EIU
	Short-term external debt/GDP	%	
	FX reserves/imports	%	
Government finance	Public debt/GDP[1]	%	IIF, IMF, IFS,
	Fiscal balance/GDP	%	DRI, EIU
Political, socio-economic variables	Corruption[1, 2]	1–10 scale	TI
	Political risk[1, 2]	1–100 scale	ICRG
	Central bank independence	0–1 scale	CS
History	Dummy = 0 if no default in past 25 years	0,1 indicator	S&P
	Years since foreign currency default[1]	Years	S&P
	Percentage time over 40% inflation in past 25 years[1]	%	IFS
Size	Log real GDP	$ (constant)	IFS
	Log real GDP (PPP terms)[1]	$	WB
Financial development	Domestic credit to private sector/GDP	%	IFS
	Market capitalisation of stock market/GDP	%	DS, JPM
	Credit plus stock market capitalisation/GDP	%	DS, JPM
	FX derivatives turnover/GDP	%	BIS
	FX spot and derivatives turnover/GDP[1]	%	BIS
Original sin and mismatch variables	OSIN2, OSIN3 (see text for definitions)[1]		
	MISMATCH (see text for definition)[1]	%	BIS
	AECM (see text for definition)		

[1] Variable used in the final specification. [2] To facilitate interpretation of the regression coefficients, the indices of corruption and political risk from TI and ICRG, in which higher values correspond to lower corruption and lower political risk, have been multiplied by minus one.

Sources: BIS = Bank for International Settlements; CS = Cukierman et al (2002) and Syklos (2003); DRI = Data Resources Institute; DS = Datastream; EIU = Economic Intelligence Unit; ICRG = *International Country Risk Guide*; IFS = *International Financial Statistics* (IMF); IIF = Institute for International Finance; IMF = International Monetary Fund; JPM = JPMorgan Chase; S&P = Standard & Poor's; TI = Transparency International; WB = World Bank. Table 2

We improve on previous tests in two respects here. For one, we add explicitly various proxies for hedging possibilities based on the BIS foreign exchange and derivatives statistics. In particular, we assess the relevance of currency swaps and forwards as well as of the size of the overall FX market. We conjecture that they could matter on their own and/or modify the relevance of on-balance sheet proxies of original sin. In addition, we simply extend the GT measure of currency mismatches well beyond their sample of countries, from 22 to 52. As an additional check, we also follow EHP in creating a proxy

We use proxies for hedging possibilities from BIS data

measure for currency mismatches which can be derived for a much broader sample of countries, if required (see box).

One question of interpretation concerns the *channel* through which original sin is expected to work. Arguably, if original sin did not induce net debt positions in foreign currency (in this sense, "currency mismatches"), it would have limited impact on country risk. The exception, stressed by EHP, would be through any indirect costs incurred by the country in order to limit, hedge or offset currency exposures (lower returns on investments, any capital controls, etc). Thus, a finding that original sin mattered even in the presence of a proxy for currency mismatches would call for an empirical analysis of the link between original sin and those omitted costs. It might also point to the possibility of mismeasurement in the currency mismatch variable. In this article, however, we will not pursue these issues further.

A second set of questions of interpretation concerns the potential *causes* of original sin.

How far is original sin affected by a history of mismanagement?

First, it is worth considering how far original sin is explained, respectively, by country size or by proxies for a history of mismanagement and other institutional characteristics. This matters because of the different policy implications. Likewise, it is useful to explore how far original sin retains independent explanatory power for country risk once the influences of those policy-related factors on original sin are taken into account. This can be done by evaluating separately the impact on country risk of the part of original sin "explained" by the various factors and that of its residual unexplained component.[11]

Country size may have an independent impact on country risk

Second, the role of size merits particular attention, since neither of the two explanations provided to explain the link between country size and original sin seems fully satisfactory. For one, large countries may indeed be more diversified, but this does not imply that these diversification benefits are transferred to the respective currencies. Currency diversification depends on correlations *across* currencies as an asset class, and there is little reason to expect these correlations to be more than weakly related to diversification of income streams *within* given countries. Moreover, investors eagerly diversify across stock markets in emerging market countries on an unhedged basis. Likewise, borrowing heavily in a few currencies to exploit the liquidity of the respective underlying securities markets does not imply that hedging the corresponding exposures is impossible. Indeed, borrowing on a hedged basis is a very common strategy to reduce all-in borrowing costs. Thus, separate evidence of limited hedging possibilities is required to establish the relevance of original sin. Both of these arguments suggest that it may be worth considering country size as a potential determinant of country risk *in its own right*. Besides capturing diversification opportunities, a larger size could make a country less vulnerable to abrupt but small adjustments in global investors' portfolios and, in some cases, more likely to receive external support from the international community in the event of a crisis.

[11] This is done by including in the main regression only the residual of an auxiliary regression of original sin on the relevant explanatory variables, alongside those variables.

Measures of original sin and currency mismatch

We follow Eichengreen et al (2003b) in creating multiple measures of original sin using the international banking and securities data of the BIS. All the measures seek to quantify the ratio of debt issued in foreign currencies relative to the total outstanding. They differ, however, in terms of the aggregates considered and the assumptions made. Three measures are considered:

(1) OSIN1 = (1 – securities issued by country *i* in national currency *i* / securities issued by country *i*)

(2) OSIN2 = Max (securities and loans issued by country *i* in five major currencies / all securities and loans issued by country *i*, OSIN3)

(3) OSIN3 = Max (1 – (securities in currency *i* / securities issued by country *i*), 0)

As a "true" measure of original sin, each metric has its flaws owing to data limitations. For instance, while OSIN2 includes bank debt, OSIN1 and OSIN3 only cover securities. OSIN3 differs from OSIN1 because all debt issued in a country's currency is counted as local currency issuance regardless of the nationality of the issuer. This generally results in lower values for OSIN3 than OSIN1.[①] The strong point of OSIN2 is that it utilises not only the securities data, but also the international banking data of the BIS. However, because the banking data are not reported in all currencies, measures must implicitly rely on the assumption that all liabilities not denominated in the five major currencies are denominated in the local currency. Thus, to the extent that there are foreign currency liabilities in currencies other than the dollar, euro, yen, pound sterling and Swiss franc, they are counted as local currency denominated, which would tend to understate original sin.

For currency mismatches, we use the aggregate effective mismatch measures created by GT, in both their original and modified versions. GT calculate the original aggregate effective currency mismatches (AECM) proxy as follows. First, they calculate net foreign currency assets (NFCA) as the sum of the net foreign assets at central banks and banks plus the foreign currency (net) assets of non-banks held with BIS banks minus the international debt securities outstanding denominated in foreign currency. Then the foreign currency share of total debt (FC%TD) is calculated where the denominator is cross-border liabilities of non-banks and banks (to BIS banks) plus domestic credit to private entities plus international and domestic debt securities. AECM then equals NFCA times FC%TD divided by exports if net foreign currency assets are less than zero, and NFCA*FC%TD divided by imports if net foreign currency assets are greater than zero.[②] We also try an EHP measure of mismatches that multiplies original sin (in the results below, we use OSIN2) by (reserves – debt) / exports. They justify the measure as the one which is closest to GT's AECM based on the available data.

[①] For example, South Africa, which boasts significant issuance in its local currency by international organisations, has a much lower value of OSIN3 than OSIN1. EHP favour OSIN3 over OSIN1 since they posit that a country's ability to issue in its own currency should increase with the local currency issuance of non-nationals because of increased swaps and hedging possibilities. However, since the existence of underlying local currency bond obligations is not a necessary condition for parties to enter into currency swaps, it is not obvious that this more expansive measure of local currency activity should improve predictive ability. [②] The original version assumes that domestic credit and domestic bonds are all in domestic currency, but adjustments are made on a case by case basis to arrive at a modified AECM. See the authors' work for a discussion of some of the inevitable approximations and assumptions needed to calculate the proxy.

Original sin may be a consequence of a high country risk

Finally, it is worth considering the possibility that original sin may not be the cause, but rather the *consequence,* of country risk. In other words, countries may be unable to borrow in foreign currency *because* they are

perceived to be too risky, for whatever reason. This is consistent with the observation that international organisations, such as the World Bank, can in fact borrow in emerging market currencies.[12] It also squares with the fact that non-residents would tend to hedge only with highly creditworthy counterparties, normally market-making institutions. If such reverse causation was present, any explanatory power for country risk of the unexplained component of original sin as described above could be regarded as spurious, or at least viewed with some suspicion.[13]

Empirical results[14]

Our sample comprises 52 countries for which we have collected annual data from 1996 to 2003. We use panel data to exploit the information contained in the time variation and cross-sectional variation in the data. As a preliminary step, we report a correlation matrix of ratings and selected explanatory variables (Table 3). Country credit ratings are strongly correlated with a number of our explanatory variables, notably with per capita GDP (rho = 0.86), the corruption and political risk indices (–0.85 and –0.87, respectively), as well as years since default and inflation history (0.69 and –0.62). The original sin measures are also strongly correlated with country credit ratings. By contrast, the currency mismatch measures appear to have relatively little correlation with ratings, though the table does show that countries with higher measures of original sin tend to have negative mismatch.

The benchmark model: what matters?

Ratings are most sensitive to per capita GDP, political risk, and corruption

The benchmark model of ratings, which excludes the variables related directly to the debt intolerance, original sin and currency mismatch hypotheses, performs rather well (Table 4, regression 1). Measures of development (per capita GDP) and macroeconomic performance (inflation and GDP growth) have the expected sign and are statistically significant at standard confidence levels.[15] The qualitative variables proxying for political risk and corruption are

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[12] Eichengreen et al (2003c) actually use this observation to back up their claim of imperfections in global financial markets. They note that the fact that international financial institutions are able to hedge at a profit reflects underlying pent-up hedging demand by the residents of the country of the currency of issue. But the alternative explanation seems at least equally plausible.

[13] This is an instance of "simultaneity" bias. In principle, original sin could be instrumented with some other variable. However, we had difficulties thinking of variables that could be useful instruments while at the same time not being expected to have an independent influence on country risk. Further work could try to address this issue.

[14] For a further elaboration on a full set of results, see Borio and Packer (forthcoming). To check whether the fact that ratings are capped at AAA for highly rated countries might be affecting the results, we also estimated a censored tobit model. This, however, did not materially influence the findings. In addition, the key regressions were tested also with an additive dummy for the group of industrial countries. The dummy was not statistically significant and the results were not affected.

[15] We also tried foreign exchange reserves, normalised by imports, but this variable did not perform well.

Correlation matrix of selected variables					
	Variable				
	Foreign currency rating	OSIN2	OSIN3	AECM	MISMATCH
Log per capita GDP	0.861	–0.536	–0.516	–0.177	–0.233
Log inflation	–0.609	0.307	0.335	0.061	0.001
GDP growth	0.024	0.146	0.172	–0.159	0.006
Corruption perceptions index	–0.849	0.387	0.405	0.217	0.266
Political risk score	–0.866	0.501	0.532	0.218	0.191
Years since foreign currency default	0.685	–0.433	–0.408	–0.148	–0.040
Frequency of high inflation periods	–0.616	0.385	0.429	–0.089	–0.147
Foreign currency rating		–0.617	–0.620	–0.108	–0.049
OSIN2			0.854	–0.065	–0.276
OSIN3				–0.115	–0.328
AECM					0.732

Sources: IMF; World Bank; Transparency International; *International Country Risk Guide*; EIU; Datastream; Standard & Poor's. Table 3

also highly statistically significant, as are the historical variables of time since default and inflation history. In terms of economic significance, ratings appear to be most sensitive to per capita GDP, followed by political risk and corruption. Holding other variables constant, an "improvement" in the explanatory variable from the 25th to the 75th percentile results in an improvement in the average credit rating of 2.9, 1.7 and 1.4 notches for per capita GDP, political risk, and corruption, respectively. Similar improvements in the inflation history and default variables add 1 and 0.6 notches to the forecast credit rating.

Debt intolerance

Varying support for debt intolerance

The findings concerning debt intolerance depend on the precise interpretation of the hypothesis (Table 4, regressions 2–3). On the one hand, the previous results clearly show that a history of economic mismanagement does affect credit standing *generally*. Likewise, and importantly, public and external debt do matter more for emerging market countries than for industrial countries: in this sense, emerging market countries find it harder to sustain high levels of debt.[16] Correspondingly, debt variables are statistically significant and have the right sign only for emerging market countries, as indicated by the

[16] Moreover, this result indicates that there are other factors, not included in the regression, that would have to explain this difference.

coefficient on the interactive dummy for this group of countries.[17, 18] On the other hand, the strong version of the hypothesis is not generally supported by the data. Specifically, the dummies interacting debt with history do not systematically add explanatory power to the regression.[19] In other words, a history of mismanagement does not appear to make country risk more sensitive to debt *per se.*

Original sin and currency mismatches

Proxies for original sin are found to contribute to explaining country risk ratings, even after controlling for the above factors (Table 4, regression 5). The best performing proxy is the one that considers the composition of bank debt and securities together (OSIN2).[20] Taken at face value, the estimates indicate that holding other variables constant, a country going from having all to none of its external debt denominated in foreign currency would have its rating upgraded by slightly less than one whole letter grade (three notches). This is less than the five notches sometimes found in previous work (EHP, Eichengreen et al (2003b)).

Importance of original sin is reduced by inclusion of size ...

At the same time, the inclusion of country size in the regression results in a further decline in the importance of original sin (Table 4, regression 6). The corresponding coefficient falls to two notches. Country size, measured in the best fitting model by GDP in purchasing power parity terms, is modestly significant in an economic sense: an increase from the 25th to the 75th sample percentiles in size, holding other variables constant, would increase the rating by around one third of a rating notch.

Currency mismatches, too, appear to have explanatory power in addition to the previous variables. This is true regardless of whether they are measured by the GT metric or the EHP proxy (Table 4, regressions 7–8). For instance, the results suggest that an improvement from the 25th to the 75th percentile in the currency mismatch proxies leads to improvements in country ratings of 0.1 and 0.5 notches, respectively.

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[17] Of course, more generally *even if the sensitivity of ratings to debt was similar to that of industrial countries* (similar coefficient in the regression), emerging market countries would exhibit a *lower* debt capacity. This reflects the fact that they tend to have a lower per capita income, a worse history of economic mismanagement and greater structural domestic weaknesses. In this general sense, they would also be "intolerant to debt".

[18] Although in some of the next regressions these interactive group dummies for government and external debt may be individually statistically insignificant, they are always jointly significant.

[19] These results also hold if two completely separate regressions are estimated for industrial and emerging market countries, thereby not forcing all differences between the two to operate through the interactive dummies.

[20] The substitution of either OSIN1 or OSIN3 for OSIN2 reduced the explanatory power of the overall model and the size of the coefficients on the corresponding variables, although they remained statistically significant. At the same time, the overall pattern of the results did not change. In the remainder of the paper, we limit our analysis to the OSIN2 metric.

Foreign currency sovereign ratings regressions

Explanatory variable	Specification								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log per capita GDP	1.49* (10.35)	1.40* (9.74)	1.25* (8.63)	1.29* (9.31)	1.33* (9.59)	1.31* (9.54)	1.45* (10.41)	1.45* (10.53)	1.31* (9.56)
Log inflation	–0.48* (5.31)	–0.49* (5.64)	–0.52* (5.38)	–0.50* (6.02)	–0.47* (5.66)	–0.45* (5.48)	–0.42* (5.06)	–0.42* (5.14)	–0.44* (5.32)
GDP growth	0.06* (2.01)	0.07* (2.33)	0.08* (2.46)	0.09* (3.01)	0.08* (2.83)	0.09* (3.10)	0.08* (2.95)	0.08* (2.98)	0.10* (3.14)
Corruption perceptions index	–0.31* (4.85)	–0.34* (5.33)	–0.36* (5.84)	–0.44* (6.79)	–0.45* (7.14)	–0.45* (7.35)	–0.46* (7.46)	–0.44* (7.11)	–0.47* (7.38)
Political risk score	–0.10* (7.92)	–0.07* (4.59)	–0.07* (4.45)	–0.06* (4.07)	–0.06* (4.49)	–0.07* (4.86)	–0.07* (4.91)	–0.07* (4.92)	–0.08* (5.90)
Years since foreign currency default	0.05* (4.66)	0.03* (3.22)	0.01 (0.70)	0.03* (3.17)	0.03* (2.97)	0.04* (3.36)	0.03* (3.10)	0.04* (3.36)	0.04* (3.54)
Frequency of high-inflation periods	–5.76* (11.82)	–4.81* 7.49)	–7.70* (5.18)	–4.33* (7.20)	–4.31* (7.32)	–4.11* (6.96)	–4.44* (7.36)	–4.25* (6.99)	–4.48* (7.58)
Public debt/GDP		0.005 (1.68)	0.006 (1.62)	–0.004 (1.03)	–0.004 (1.07)	–0.002 (0.54)	–0.000 (0.05)	0.000 (0.26)	–0.002 (0.61)
External debt/exports		0.001* (4.00)	0.002* (4.27)	0.000 (1.16)	–0.000 (0.11)	0.000 (0.90)	0.001* (2.07)	0.000 (0.43)	0.000 (1.11)
Public debt/GDP (developing countries)		–0.012* (3.04)	–0.050* (2.52)	–0.002 (0.55)	–0.003 (0.75)	–0.006 (1.30)	–0.009 (1.88)	–0.010* (2.40)	–0.006 (1.42)
External debt/exports (developing countries)		–0.004* (2.48)	–0.003 (0.48)	–0.003* (2.26)	–0.003 (1.91)	–0.003 (1.93)	–0.002 (1.07)	–0.000 (0.34)	–0.003 (1.89)
PubDebt/GDP* years since default			0.001 (1.83)						
ExtDebt/GDP* years since default			–0.000 (0.22)						
PubDebt/GDP* high inf			0.051 (1.79)						
ExtDebt/GDP* high inf			–0.000 (0.02)						
OSIN2				–2.43* (6.10)	–1.98* (5.24)	–1.64* (4.25)	–0.72 (1.62)	–1.11* (2.52)	–1.66* (4.36)
Size (log GDP)_					0.18* (3.58)	0.17* (3.61)	0.16* (3.39)	0.10* (2.05)	0.18* (3.68)
AECM						0.01* (2.85)			0.01* (3.01)
MISMATCH							0.57* (5.20)	0.70* (6.80))	
MISMATCH* {(FX spot and derivatives)/GDP}								–0.07* (5.70)	
Adjusted R-squared	0.922	0.941	0.943	0.948	0.950	0.951	0.953	0.954	0.951

Note: The dependent variable is defined as the average credit rating of Moody's and Standard & Poor's (which takes the numerical form as described on page 52). Year dummy variables are included in the regressions but the coefficients are not reported. Absolute T-statistic in parentheses, based on White heteroskedasticity-consistent standard errors. * = significant at least at the 5% level. Regression 9 is estimated with the same variables as regression 6, except for the substitution of the forecast error from regression 4 in Table 5 for OSIN2. The interactive debt variables in regression 3 are calculated for developing countries only, and are zero otherwise. AECM and MISMATCH are defined so that positive values are associated with net asset positions in foreign currency.

Sources: IMF; World Bank; Transparency International; *International Country Risk Guide*; EIU; Datastream; Standard & Poor's.

Table 4

... and currency mismatches

In addition, the inclusion of the proxies for currency mismatches also takes away part of the explanatory power from the original sin variables. In fact, when the EHP mismatch measure is included, the coefficient on OSIN2 falls to less than one notch and is no longer significant at the standard confidence levels.[21]

Hedging may influence the impact of mismatch proxies

Measures of hedging possibilities do not alter this picture much. For instance, interacting original sin with total FX and derivatives transactions in a currency (standardised by GDP) does appear to reduce the influence of original sin, but the finding is not statistically significant (not shown). At the same time, the proxy for hedging opportunities seems to complement the effect of one mismatch variable, as reported in regression 8 of Table 4. These results suggest that measures of off-balance sheet hedging should be refined further.

Structural weakness matters more than country size

What about the determinants of original sin? Interestingly, there is evidence that both history of mismanagement and other proxies for structural weaknesses (the political risk index) have an explanatory power that exceeds that of size itself (Table 5). On their own, the two sets of more policy-related variables account for over 20% of the sample variation in OSIN2 and, together, for around one third.[22] By contrast, size explains some 13%. This result is consistent with the view that original sin may be significantly affected by bad

Original sin regressions

Explanatory variable	Specification					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	2.44* (17.13)	1.09* (24.69)	2.17* (15.61)	1.93* (18.81)	1.35* (19.88)	2.72* (19.24)
Corruption perceptions index	–0.02* (2.45)		–0.03* (3.56)			–0.01 (1.22)
Political risk score	0.03* (9.45)		0.02* (9.01)	0.02* (10.32)		0.02* (8.71)
Years since foreign currency default		–0.01* (6.86)	–0.00 (1.29)	–0.00 (0.93)		–0.00 (0.60)
Frequency of high-inflation periods		0.68* (6.27)	0.62* (5.30)	0.61* (5.35)		0.43* (5.01)
Size (log GDP)_					–0.09* (6.98)	–0.10* (10.56)
Adjusted R-squared	0.267	0.220	0.336	0.313	0.131	0.494

Note: Estimated by tobit (censored normal) regressions. Absolute z-statistic in parentheses, based on Huber-White standard errors and covariance. * = significant at the 5% level.

Sources: IMF; World Bank; Transparency International; *International Country Risk Guide*; EIU; Datastream; Standard & Poor's. Table 5

[21] We did not test more finely for the possibility that the influence of currency mismatches could be dependent on other characteristics of the country concerned (eg the credibility of a pegged exchange rate regime). This is left to further work.

[22] The corruption index, however, has the wrong sign (regressions 1 and 3). This is why regression 4 and subsequent analysis will exclude it.

past domestic policies and, as a corollary, that sound policies can help overcome it.[23]

Based on these purely statistical results, what is the explanatory power of original sin for country risk that is truly independent of the previous policy-related variables? As noted, this can be tested by including the unexplained residual of an auxiliary regression of OSIN2 on the variables of interest in the original regression for country risk alongside these variables. By implication, the coefficients on high-inflation history, political risk and corruption increase markedly. Meanwhile, the coefficient on original sin implies that a move from the 25% to the 75% percentile in the forecast error now yields less than a 0.2 notch impact on the country credit rating, versus a much larger impact in the original specification.[24]

Conclusion

On the basis of their ability to explain sovereign ratings, in this article we have found evidence supporting a number of perspectives on country risk that have recently come to prominence – debt intolerance, original sin and currency mismatches. At the same time, a number of qualifications on the strength of that support and open questions remain.

First, traditional economic and structural determinants still account for the lion's share in variation in country risk as measured by sovereign credit ratings. These include, in particular, per capita GDP, measures of corruption and political risk, and proxies for a history of economic mismanagement.

Second, there is evidence for debt intolerance, although it depends on the precise interpretation of the hypothesis. Debt does matter more for the ratings of emerging market countries than for their industrial counterparts. And, as noted, a history of mismanagement, approximated by past defaults and episodes of very high inflation, does affect ratings considerably. Overall, emerging market countries do exhibit a lower debt capacity. But a history of mismanagement does not appear to influence systematically the sensitivity of country risk measures to debt levels.

Third, proxies for original sin appear to matter for country risk, although their relevance emerges as noticeably smaller than in previous econometric research. Moreover, there is evidence that the ability to obtain foreign funding in domestic currency is significantly affected by a history of mismanagement and by socio-economic structural weaknesses, as proxied by past episodes of high inflation and political risk, rather than by country size alone. This purely statistical finding is consistent with the view that original sin can be influenced by good domestic policies. It is also consistent with the progress made by

[23] This qualifies the results by EHP and Eichengreen et al (2003b), which do not test for the relationship between original sin and the proxies for economic mismanagement and structural weaknesses employed here. At the same time, their "size" variable is also defined differently, so that the results are not fully comparable at this stage.

[24] The actual size of the coefficient changes only marginally, but since the variation in the independent variable is much smaller (the residual of the auxiliary regression rather than OSIN2 itself), so is the relevance of this variable in explaining the variation in country risk.

individual countries in developing domestic bond markets and hedging opportunities, through a mixture of sound macroeconomic and structural policies.

Fourth, explicit proxies for currency mismatches do matter and they tend to reduce the explanatory power of original sin proxies. At the same time, variables designed to capture hedging possibilities play only a marginal role. These results leave a puzzle unanswered. If, as noted, the main influence of original sin on countries' vulnerabilities operates through balance sheet mismatches, why do proxies for original sin often remain relevant even once measures of mismatches are included in the analysis? A number of possible explanations could be suggested (see eg EHP). However, we suspect that the difficulties faced in measuring mismatches correctly owing to data limitations can play a significant role.

These results suggest that a number of issues deserve further attention. These include, in particular, the range of factors that affect the residual apparent differences in country risk assessments as between the loosely grouped industrial and emerging market countries and the determinants of the extent of foreign financing in domestic currency. In the absence of the development of better statistics on foreign exchange exposures, however, the answers to some of these questions may remain elusive.

A further important caveat to our analysis is that it applies only to risk assessments rather than to ex post measures of risk, such as crises. Variables that help to explain credit ratings need not be good ex ante predictors of crises. In fact, to some extent, financial crises are more likely to occur when market monitors such as rating agencies underweight or mismeasure factors that turn out to be important ex post. For instance, it is possible that rating agencies may have misjudged the importance of currency mismatches and/or had inadequate estimates of currency mismatches prior to financial crises during the sample period.[25] But these issues, too, are better left to future research.

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[25] For a recent analysis based on ex post measures, see Manasse et al (2003).

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Why has FX trading surged? Explaining the 2004 triennial survey[1]

The 2004 survey shows a surge in traditional foreign exchange trading. This seems to have been driven by momentum trading and carry trades in a global search for yield on the part of institutional investors and leveraged players as well as by hedging activity.

JEL classification: F31, C42.

The 2004 Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity showed a surge in activity in traditional foreign exchange markets.[2] Average daily turnover amounted to $1.9 trillion in April 2004, a rise of 57% at current exchange rates and 36% at constant exchange rates (Table 1).[3] This increase more than reversed the fall in global trading volumes between 1998 and 2001.[4]

Turnover rose across instruments and types of counterparty. Trading between banks and financial customers increased markedly, pushing its share in total turnover up from 28% to 33% (Table 2).[5] Interbank activity also increased between 2001 and 2004, although its share continued to fall, from 59% in 2001 to 53% in 2004. This is much lower than the 64% share of the interbank market in the mid-1990s. For its part, the share of trading between banks and non-financial customers edged up slightly to 14%.[6]

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[1] The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS or the Arizona State University. We thank Paola Gallardo, Andrew Jameson, Michela Scatigna, Jhuvesh Sobrun and Karsten von Kleist for research assistance.

[2] The survey was conducted in April this year by 52 central banks and monetary authorities. They collected data on turnover in traditional foreign exchange markets – spot, outright forwards and foreign exchange swaps – and in over-the-counter currency and interest rate derivatives.

[3] The substantial depreciation of the dollar between 2001 and early 2004 explains the large gap between turnover at current and constant exchange rates.

[4] Most market participants had expected turnover to increase (BIS (2004)).

[5] The triennial survey statistics refer to reporting offices rather than banking organisations.

[6] While global turnover and the composition of counterparties changed substantially, the currency composition and the geographical distribution of turnover remained stable.

Some of the forces that were important in understanding changes in turnover in the past continue to have an impact today, although new factors have emerged as more important in explaining the recent increase in turnover. Between 1998 and 2001, foreign exchange market activity declined markedly, arguably because of the advent of the euro, the consolidation in the banking industry, the growth of electronic broking, mergers in the corporate sector, and the events of 1998, characterised by higher risk aversion and a global withdrawal of liquidity. Trends that continue today include consolidation in the banking sector and the growth of electronic broking. Yet these factors are viewed as being relatively less important in 2004 than in 2001.[7]

The surge in market activity between 2001 and 2004 was probably due to several related factors. First, the presence of clear trends and higher volatility in foreign exchange markets led to investments in currencies that experienced a persistent trend of appreciation. These factors also induced an increase in hedging activity, which further supported currency trades. Second, interest differentials encouraged investments in high interest rate currencies financed by short positions in low interest rate currencies if the target currencies, like the Australian dollar, tended to appreciate against the funding currencies, like the US dollar. Such strategies fed back into prices and supported persistence of runs or long swings in exchange rates. In addition, in the context of a global search for yield, so-called "real money managers"[8] and leveraged investors became increasingly interested in foreign exchange as an asset class alternative to equity and fixed income. This special feature analyses the influence of these factors in more detail.

Global foreign exchange market turnover[1]

Daily averages in April, in billions of US dollars

	1989	1992	1995	1998	2001	2004
Spot transactions	317	394	494	568	387	621
Outright forwards	27	58	97	128	131	208
Foreign exchange swaps	190	324	546	734	656	944
Estimated gaps in reporting	56	44	53	60	26	107
Total "traditional" turnover	590	820	1,190	1,490	1,200	1,880
Memo:						
Turnover at April 2004 exchange rates[2]	*650*	*840*	*1,120*	*1,590*	*1,380*	*1,880*

[1] Adjusted for local and cross-border double-counting. [2] Non-US dollar legs of foreign currency transactions were converted into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2004 exchange rates. Table 1

[7] For instance, the market share of electronic broking appears to have remained fairly stable since the 2001 survey.

[8] The term "real money managers" refers to those who invest their own money and includes pension funds, insurance companies and corporate treasurers. Leveraged investors, such as hedge funds, borrow a substantial amount of the money they invest.

Reported foreign exchange market turnover by counterparty[1]

Daily averages in April, in billions of US dollars and per cent

	1995		1998		2001		2004	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Total[2]	1,137	100	1,430	100	1,174	100	1,773	100
With reporting dealers	728	64	908	64	689	59	936	53
With other financial institutions	230	20	279	20	329	28	585	33
With non-financial customers	179	16	242	17	156	13	252	14
Local	526	46	657	46	499	43	674	38
Cross-border	613	54	772	54	674	57	1,099	62

[1] Adjusted for local and cross-border double-counting. [2] Excludes the estimated gaps in reporting included in Table 1.

Table 2

Strategies

The global search for yield favours two key strategies

The surge of activity between banks and financial customers could be a manifestation of the broad search for yield that has characterised financial markets in recent years (BIS (2004)). In their search for yield, both "real money managers" and leveraged players followed two key strategies that targeted the same currencies: one based on interest rate differentials and the other on trends in exchange rates. Extended periods of exchange rate appreciation by higher-yielding currencies in the 2001–04 period attracted investors playing both types of strategies. In the first half of 2004, such strategies ceased to be profitable as the dollar depreciation ended and exchange rates traded in a narrow range without trend.

Carry trades exploiting forward bias ...

The first strategy exploited the forward bias by investing in high-yielding currencies. A popular form of this investment strategy among leveraged players and real money managers was the so-called "carry trade". In a carry trade, an investor borrows in a low interest rate currency, such as the US dollar, and then takes a long position in a higher interest rate currency, such as the Australian dollar, betting that the exchange rate will not change so as to offset the interest rate differential. While the dollar depreciated and the interest rate differential persisted, such investment strategies were profitable and a likely factor contributing to turnover growth. Reportedly, the three main funding currencies were the US dollar, the yen and the Swiss franc. The main recipients of the borrowed funds included sterling and the Australian and New Zealand dollars, as well as a number of emerging market currencies. This is consistent with a strong increase in turnover in the Australian and New Zealand dollars: by 98% and 152%, respectively. An example of the carry trade link for an important target currency is provided in Graph 1. The graph illustrates the link between the Australian dollar/US dollar interest differential,

the exchange rate and foreign exchange turnover. As the interest differential widened, the Australian dollar appreciated in value and turnover rose steeply.

... and momentum trading exploiting runs

The second strategy involved momentum trading, where investors took large positions in currencies aimed at exploiting long swings or "runs" in exchange rates. Such trades added support to the ongoing trends. Following the April 2001 survey, there was a strong pattern of dollar depreciation as the price of a dollar in different major currencies fell steadily until early spring 2004. Dollar depreciation ranged from about 15%, against the Canadian dollar and Japanese yen, to more than 30% against the Australian dollar.

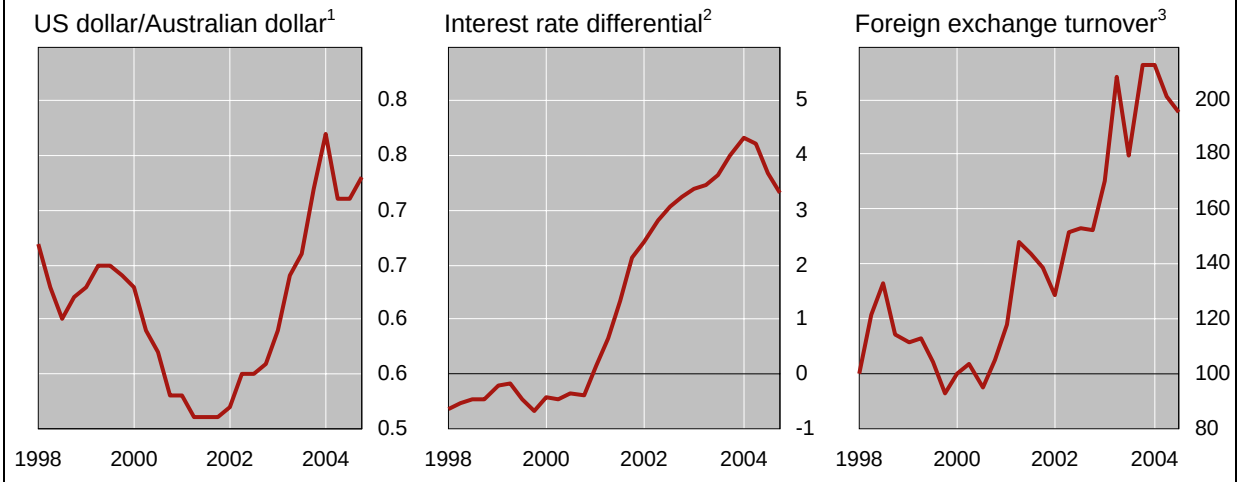
Statistical evidence

To test the hypothesis that interest differentials and exchange rate trends may have played an important role in explaining the growth of turnover, we conducted a statistical analysis using the major traded currencies and 1992–2004 survey data. The results show that turnover growth rises with increases in the interest differentials of major currencies against the US dollar and with the magnitude of exchange rate changes against the US dollar in the year prior to each survey.[9]

Growth in hedging activity

Beyond the position-taking related to profit opportunities associated with exchange rate trends, such runs may also be associated with growth in hedging-related turnover. Multinational firms face greater incentives to hedge in

Exchange rate trends, interest differentials and turnover for Australia

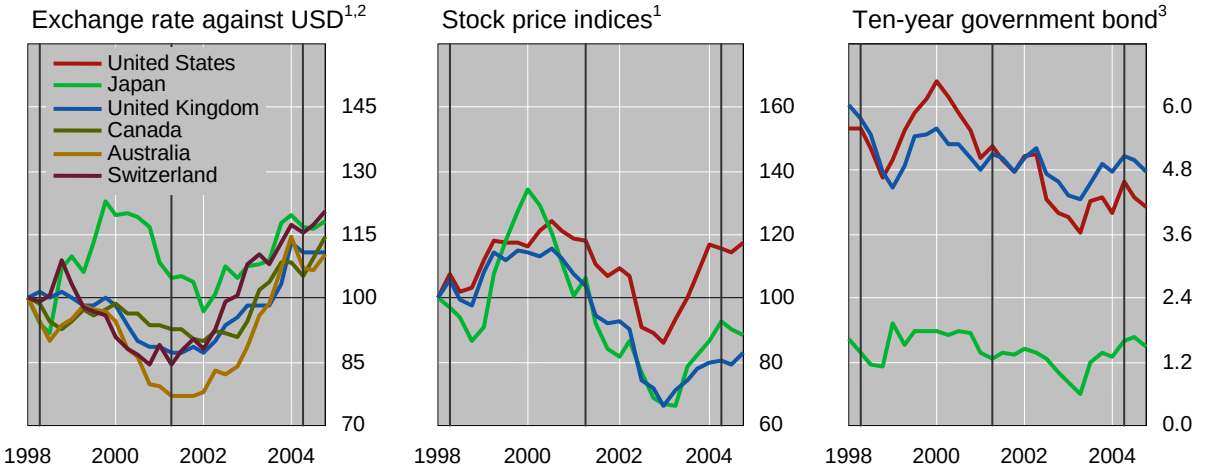


[1] An increase indicates a depreciation of the US dollar. [2] Three-month Australian dollar Libor minus US dollar Libor. [3] Indexed to first quarter 1998 = 100; in Australian dollars at annual rate.

Sources: Australian Financial Markets Association; Bloomberg; BIS calculations. Graph 1

[9] A regression analysis was conducted using time series data over the 1992–2004 surveys pooled across the following currencies: Australian dollar, Canadian dollar, euro, pound sterling, Japanese yen and Swiss franc. A pooled time series, cross section regression was estimated with the percentage growth in turnover between surveys as the dependent variable and with two independent variables: the interest differential of each currency versus the US dollar over each survey period, and the percentage change in the US dollar price of each currency over the year prior to each survey. White heteroskedasticity-consistent standard errors were estimated. Coefficient estimates were as follows: interest differential, 0.042 (p-value = 0.00); exchange rate change, 0.796 (p-value = 0.01). Adjusted R-squared = 0.41. Statistical analysis also reveals a link between turnover and lagged volatility, but turnover appears to be more strongly related to interest differentials and large swings in exchange rates.

Foreign exchange, stock and bond prices



Note: Vertical lines in April 1998, 2001 and 2004 indicate monthly surveys.

[1] Indexed to first quarter 1998 = 100. [2] An increase indicates a depreciation of the US dollar. [3] An increase indicates falling bond yields.

Sources: Bloomberg; national data; BIS calculations. Graph 2

the face of long swings in currencies in order to minimise losses associated with currency positions. For instance, the European exporter invoicing in dollars in the midst of a long run of dollar depreciation has an incentive to hedge against further depreciation. The activities of banks and currency overlay managers (COMs) in providing hedging services have also contributed to turnover growth. The growth in outright forwards between 2001 and 2004, as reported in Table 1, could reflect heightened interest in hedging.

Attractiveness of FX compared to stocks and bonds

In their search for yield, investors' interest in currencies as an asset class was reinforced by disappointing yields associated with equity and bond markets. A comparison of returns in stock and bond markets with those experienced by foreign exchange reveals a contrasting picture. As returns on stocks and bonds waned, investors found currency strategies to be quite profitable over the 2001–04 period. Graph 2 plots data since the 1998 survey for exchange rates, stock prices and bond yields. Following the 2001 survey, there was a long run of dollar depreciation that was actively exploited by investors. However, both stocks and bonds presented less attractive investment opportunities. It can be seen that, in general, equity markets were falling well into 2003 before beginning an upward run that lasted less than a year. Bond yields were low and fairly flat over the period. So the strong trend in the foreign exchange market offered an attractive alternative to stocks and bonds.

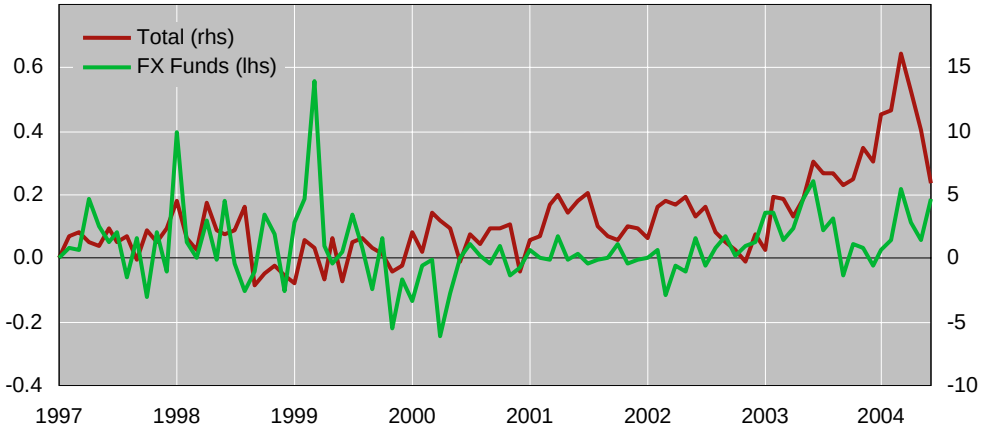
Market players

Key role of trading between banks and financial customers

The strategies described above suggested a surge in trading between banks and financial customers. Such activity grew by 78% between 2001 and 2004 (Table 2). According to market participants, it involved a wide range of financial players: institutional investors (such as pension funds and insurance

Total flows into hedge funds

In billions of US dollars



Source: Hedge Fund Research. Graph 3

companies), hedge funds, commodity trading advisers (CTAs), proprietary trading desks of large commercial banks and COMs.

Institutional investors continue to be very active

The increase in activity by institutional investors seemed to reflect both structural and conjunctural factors. Pension funds, insurance companies, mutual funds and other institutional investors have played an increasingly important role in financial markets in general, and in FX markets in particular, since the early 2000s.[10] In some countries, investment offshore by investment funds has been following a strong upward trend. In Australia, for example, superannuation funds raised the proportion of their assets held offshore from around 15% in the late 1980s to close to 30% in 2002 (Battellino (2002)). This may explain in part the 65% increase in turnover in Australian dollars, raising its share of global turnover by 2 percentage points. In several countries, changes to pension fund regulations have relaxed restrictions on foreign exchange exposures,[11] opening the way to sizeable purchases of foreign assets by domestic investors.

Increasing role of hedge funds ...

Hedge funds have grown markedly over the 2001–04 period in terms of both number and overall size (see Graph 3).[12] Market commentary indicates that both momentum players, who exploit trends in asset prices, and macro funds, which typically take directional positions in the light of more fundamental factors influencing currency markets, played an important role.[13] These trends are in contrast with the previous three-year period, when market sources had suggested a reduction in the number and activity of hedge funds in FX markets,

[10] See CGFS (2001) for an analysis of institutional investors' activity in financial markets and Galati (2001) for a discussion of their weight in the 2001 survey.

[11] For instance in Sweden in 2000 (BIS (2003)).

[12] One difference between the players that are currently active and those dominant in the 1990s is that the newly active hedge funds are typically much smaller and have a shorter horizon.

[13] For a discussion of the different investment strategies followed by the hedge fund community, see Tsatsaronis (2000).

and in particular of macro hedge funds, following the collapse of LTCM and the withdrawal from the market of Tiger and Quantum.

... CTAs ...

According to market reports, the rise in trading between banks and financial customers observed between 2001 and 2004 was also due to the increasing activity in foreign exchange markets of CTAs. CTAs were originally companies that advised clients on purchases of futures contracts, typically for bonds and equities. However, over time they have come to behave like other types of fund managers and in recent years have also become active in FX markets. To give an idea of their size, a market analyst suggests that in 2003 a large CTA would have an estimated $3–5 billion of assets, with very low leverage. This compares to some $7–10 billion of overall assets, and high leverage, for a large hedge fund. CTAs are currently viewed as being mostly trend followers, like momentum players, and typically have a very short investment horizon, ranging from intraday to one week.

... and COMs

COMs also contributed to the fast growth in turnover between banks and financial customers.[14] Currency overlay is the process by which investors manage their foreign exchange positions more actively and manage their currency exposures separately. COMs treat foreign exchange as a separate asset class. Their growing importance appears to reflect both an increase in underlying investment demand and the fact that COMs' financial models have become more accepted by the industry.

Conclusion

Investors' interest in FX markets may not last

The 2001–04 period was marked by interest differentials and extended trends in exchange rates that encouraged speculative strategies as well as greater hedging activity. Both contributed to the observed increase in foreign exchange turnover between 2001 and 2004. More recently, the lack of a trend in exchange rates may have been working in the opposite direction. The recent losses experienced by those using trend-following strategies have led to shifts into other investment vehicles. Market observers remark that macro hedge funds may have begun to shift away from currencies towards commodities or domestic short-/long-term interest rate carry trades. In addition, should US interest rates rise further, this could reduce the attractiveness of carry trade strategies and hence turnover in the foreign exchange market. So while the evidence supports the relative attractiveness of foreign exchange as an asset class, the level of investor interest in currencies is not certain to persist in the future.

From a longer-term perspective, some factors associated with the surprising drop in foreign exchange turnover reported in the 2001 survey continue to exercise an influence today – in particular, bank consolidation and the growth of electronic broking in the interbank market. Table 3 reports the number of banks accounting for 75% of turnover in major economies for the last four surveys. It is clear that the pattern of consolidation continues. While

[14] Market analysts estimate assets under management at the few dominant COMs (eg Putnam, Pareto and JPMorgan) at around $25–30 billion in 2003.

Concentration in the banking industry

Number of banks covering 75%[1]

	1995	1998	2001	2004
United Kingdom	20[2]	24	17	16
United States	20[3]	20	13	11
Japan	24	19	17	11
Singapore	25	23	18	11
Germany	10	9	5	4
Switzerland	5	7	6	5
Hong Kong SAR	13–22[4]	26	14	11

[1] For 2004, upper bound subject to revision. [2] 68%. [3] 70%. [4] Depending on the market segment. Table 3

these factors work to reduce turnover, there are also trends in the industry that may affect turnover. One such factor is Continuous Linked Settlement (CLS), which started operating in 2002, and whose market share has reportedly increased steadily. Another is multibank electronic trading platforms aimed at bank customers – such as FX Connect, Currenex and FXall – that increase efficiency and lower the cost of implementing investment strategies for non-bank customers. As seen in the recent survey period, these long-term structural factors may be overwhelmed by short-term currency trading incentives such as exchange rate trends and interest differentials.

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The syndicated loan market: structure, development and implications[1]

The syndicated loan market allows a more efficient geographical and institutional sharing of risk. Large US and European banks originate loans for emerging market borrowers and allocate them to local banks. Euro area banks have expanded pan-European lending and have found funding outside the euro area.

JEL classification: G100, G200.

Syndicated loans are credits granted by a group of banks to a borrower. They are hybrid instruments combining features of relationship lending and publicly traded debt. They allow the sharing of credit risk between various financial institutions without the disclosure and marketing burden that bond issuers face. Syndicated credits are a very significant source of international financing, with signings of international syndicated loan facilities accounting for no less than a third of all international financing, including bond, commercial paper and equity issues (Graph 1).

This special feature presents a historical review of the development of this increasingly global market and describes its functioning, focusing on participants, pricing mechanisms, primary origination and secondary trading. It also gauges its degree of geographical integration. We find that large US and European banks tend to originate loans for emerging market borrowers and allocate them to local banks. Euro area banks seem to have expanded pan-European lending and have found funding outside the euro area.

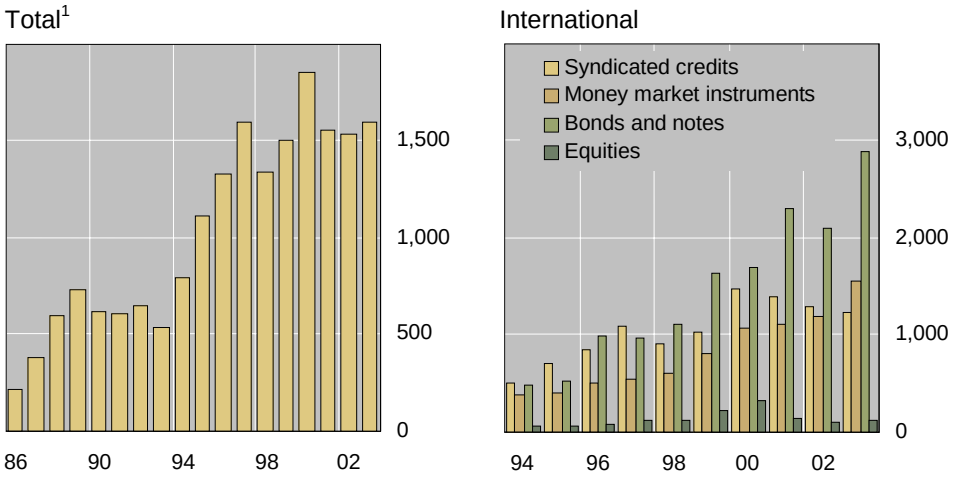
Development of the market

The evolution of syndicated lending can be divided into three phases. Credit syndications first developed in the 1970s as a sovereign business. On the eve of the sovereign default by Mexico in 1982, most of developing countries' debt consisted of syndicated loans. The payment difficulties experienced by many emerging market borrowers in the 1980s resulted in the restructuring of

[1] The views expressed in this article are those of the author and do not necessarily reflect those of the BIS. I would like to thank Claudio Borio, Már Gudmundsson, Eli Remolona and Kostas Tsatsaronis for their comments, Denis Pêtre for help with database programming, and Angelika Donaubauer for excellent research assistance.

Syndicated lending since the 1980s

Gross signings, in billions of US dollars



[1] Of international and domestic syndicated credit facilities.

Sources: Dealogic Loanware; *Euromoney*; BIS. Graph 1

Mexican debt into Brady bonds in 1989. That conversion process catalysed a shift in patterns for emerging market borrowers towards bond financing, resulting in a contraction in syndicated lending business. Since the early 1990s, however, the market for syndicated credits has experienced a revival and has progressively become the biggest corporate finance market in the United States. It was also the largest source of underwriting revenue for lenders in the late 1990s (Madan et al (1999)).

The first phase of expansion began in the 1970s. Between 1971 and 1982, medium-term syndicated loans were widely used to channel foreign capital to the developing countries of Africa, Asia and especially Latin America. Syndication allowed smaller financial institutions to acquire emerging market exposure without having to establish a local presence. Syndicated lending to emerging market borrowers grew from small amounts in the early 1970s to $46 billion in 1982, steadily displacing bilateral lending.

Lending came to an abrupt halt in August 1982, after Mexico suspended interest payments on its sovereign debt, soon followed by other countries including Brazil, Argentina, Venezuela and the Philippines. Lending volumes reached their lowest point at $9 billion in 1985. In 1987, Citibank wrote down a large proportion of its emerging market loans and several large US banks followed suit. That move catalysed the negotiation of a plan, initiated by US Treasury Secretary Nicholas Brady, which resulted in creditors exchanging their emerging market syndicated loans for Brady bonds, eponymous debt securities whose interest payments and principal benefited from varying degrees of collateralisation on US Treasuries.

Born as a sovereign business …

The Brady plan provided a new impetus to the syndicated loan market. By the beginning of the 1990s, banks, which had suffered severe losses in the debt crisis, started applying more sophisticated risk pricing to syndicated lending (relying in part on techniques initially developed in the corporate bond

market). They also started to make wider use of covenants, triggers which linked pricing explicitly to corporate events such as changes in ratings and debt servicing. While banks became more sophisticated, more data became available on the performance of loans, contributing to the development of a secondary market which gradually attracted non-bank financial firms, such as pension funds and insurance firms. Eventually, guarantees and unfunded[2] risk transfer techniques such as synthetic securitisation enabled banks to buy protection against credit risk while keeping the loans on the balance sheet. The advent of these new risk management techniques enabled a wider circle of financial institutions to lend on the market, including those whose credit limits and lending strategies would not have allowed them to participate beforehand. Partly, lenders saw syndicated loans as a loss-leader for selling more lucrative investment banking and other services. More importantly, in addition to borrowers from emerging markets, corporations in industrialised countries developed an appetite for syndicated loans. They saw them as a useful, flexible source of funds that could be arranged quickly and relied upon to complement other sources of external financing such as equities or bonds.

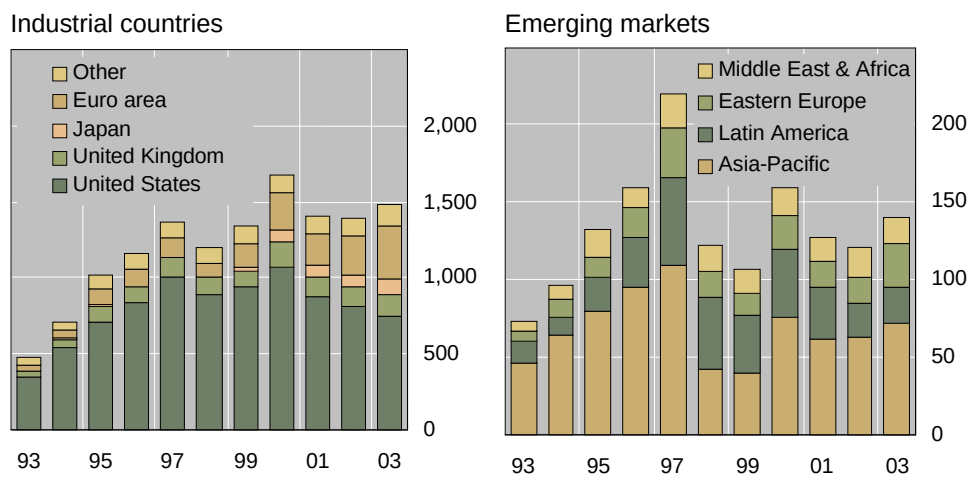
... the syndicated loan market has been booming in recent years

As a result of these developments, syndicated lending has grown strongly from the beginning of the 1990s to date. Signings of new loans – including domestic facilities – totalled $1.6 trillion in 2003, more than three times the 1993 amount. Borrowers from emerging markets and industrialised countries alike have been tapping the market, with the former accounting for 16% of business and, for the latter, an equal split between the United States and western Europe (Graph 2). Syndicated lending in Japan reportedly makes up just a small – albeit growing – fraction of total domestic bank lending, not least because of the traditional importance of "main banks" for corporations.

Global activity is driven by US and western European borrowers

Syndicated lending by nationality of borrower

Gross signings, in billions of US dollars



Source: Dealogic Loanware.

Graph 2

[2] In an unfunded risk transfer, such as a credit default swap, the risk-taker does not provide upfront funding in the transaction but is faced with obligations depending on the evolution of the borrower's creditworthiness.

Syndicated credits have thus become a very significant source of financing. The international market[3] accounts for about a third of all international financing, including bond, commercial paper and equity issues. The proportion of merger-, acquisition- and buyout-related loans represented 13% of the total volume in 2003, against 7% in 1993. Following a spate of privatisations in emerging markets, banks, utilities, and transportation and mining companies[4] have started to displace sovereigns as the major borrowers from these regions (Robinson (1996)).[5]

A hybrid between relationship lending and disintermediated debt

In a syndicated loan, two or more banks agree jointly to make a loan to a borrower. Every syndicate member has a separate claim on the debtor, although there is a single loan agreement contract. The creditors can be divided into two groups. The first group consists of senior syndicate members and is led by one or several lenders, typically acting as mandated arrangers, arrangers, lead managers or agents.[6] These senior banks are appointed by the borrower to bring together the syndicate of banks prepared to lend money at the terms specified by the loan. The syndicate is formed around the arrangers – often the borrower's relationship banks – who retain a portion of the loan and look for junior participants. The junior banks, typically bearing manager or participant titles, form the second group of creditors. Their number and identity may vary according to the size, complexity and pricing of the loan as well as the willingness of the borrower to increase the range of its banking relationships.

A hybrid instrument …

Thus, syndicated credits lie somewhere between relationship loans and disintermediated debt (Dennis and Mullineaux (2000)). Box 1 below shows, in decreasing order of seniority, the banks that participated in a simple syndicate structure to grant a loan to Starwood Hotels & Resorts Worldwide, Inc in 2001.

Senior banks may have several reasons for arranging a syndication. It can be a means of avoiding excessive single-name exposure, in compliance with regulatory limits on risk concentration, while maintaining a relationship with the borrower. Or it can be a means to earn fees, which helps diversify their income. In essence, arranging a syndicated loan allows them to meet borrowers' demand for loan commitments without having to bear the market and credit risk alone.

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[3] An international syndicated loan is defined in the statistics compiled by the BIS as a facility for which there is at least one lender present in the syndicate whose nationality is different from that of the borrower.

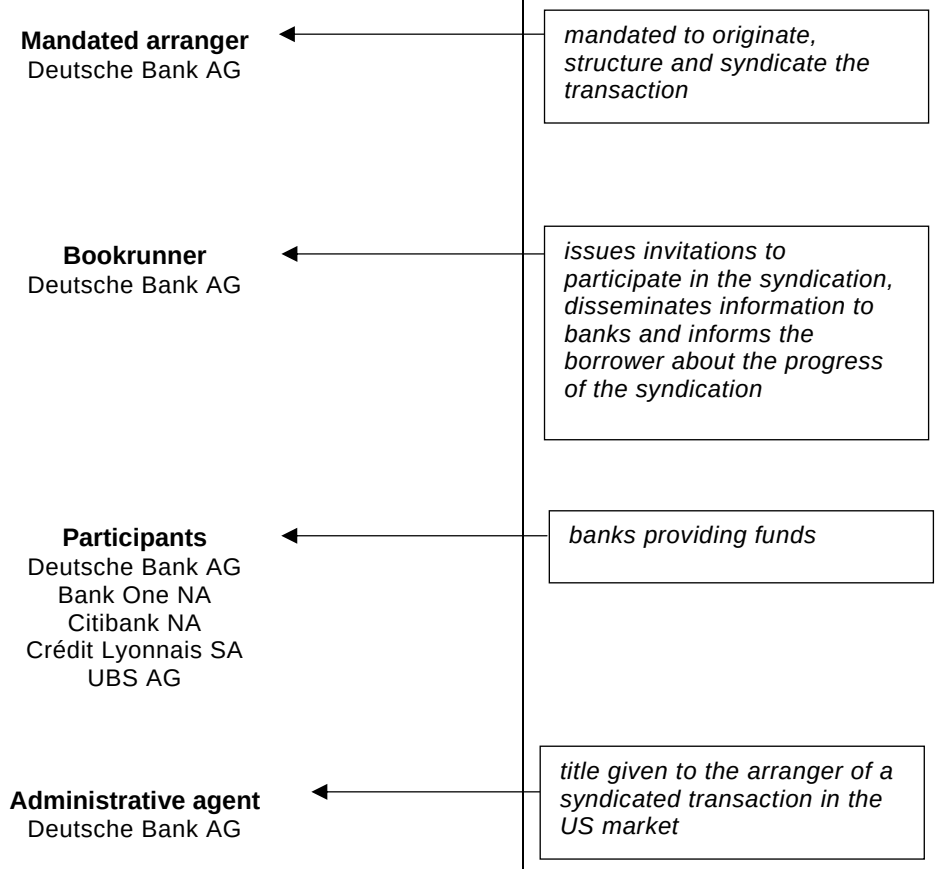
[4] Syndicated loans are widely used to fund projects in these sectors, in industrial and emerging market countries alike. A feature article on page 91 of this *BIS Quarterly Review* explores the nature of credit risk in project finance.

[5] Interestingly, for most of the 1990s, emerging market borrowers were granted longer-maturity loans, five years on average, than industrialised country ones (three–four years).

[6] These bank roles, enumerated here in decreasing order of seniority, involve an active role in determining the syndicate composition, negotiating the pricing and administering the facility.

Example of a simple syndicate structure: Starwood

Starwood Hotels & Resorts Worldwide, Inc
$250 million
Two-year term loan, signed 30 May 2001
Loan purpose: General corporate
Pricing: Margin: Libor + 125.00 bp; commitment fee: 17.50 bp



Source: Dealogic. Box 1

... with senior arrangers and junior participants

For junior banks, participating in a syndicated loan may be advantageous for several reasons. These banks may be motivated by a lack of origination capability in certain types of transactions, geographical areas or industrial sectors, or indeed a desire to cut down on origination costs. While junior participating banks typically earn just a margin and no fees, they may also hope that in return for their involvement, the client will reward them later with

more profitable business, such as treasury management, corporate finance or advisory work (Allen (1990)).[7]

Pricing structure: spreads and fees

As well as earning a spread over a floating rate benchmark (typically Libor) on the portion of the loan that is drawn, banks in the syndicate receive various fees (Allen (1990), Table 1). The arranger[8] and other members of the lead management team generally earn some form of upfront fee in exchange for putting the deal together. This is often called a *praecipium* or *arrangement fee*. The underwriters similarly earn an *underwriting fee* for guaranteeing the

Lenders earn fees according to seniority ...

Structure of fees in a syndicated loan

Fee	Type	Remarks
Arrangement fee	Front-end	Also called *praecipium.* Received and retained by the lead arrangers in return for putting the deal together
Legal fee	Front-end	Remuneration of the legal adviser
Underwriting fee	Front-end	Price of the commitment to obtain financing during the first level of syndication
Participation fee	Front-end	Received by the senior participants
Facility fee	Per annum	Payable to banks in return for providing the facility, whether it is used or not
Commitment fee	Per annum, charged on undrawn part	Paid as long as the facility is not used, to compensate the lender for tying up the capital corresponding to the commitment
Utilisation fee	Per annum, charged on drawn part	Boosts the lender's yield; enables the borrower to announce a lower spread to the market than what is actually being paid, as the utilisation fee does not always need to be publicised
Agency fee	Per annum	Remuneration of the agent bank's services
Conduit fee	Front-end	Remuneration of the *conduit bank*[1]
Prepayment fee	One-off if prepayment	Penalty for prepayment

[1] The institution through which payments are channelled with a view to avoiding payment of withholding tax. One important consideration for borrowers consenting to their loans being traded on the secondary market is avoiding withholding tax in the country where the acquirer of the loan is domiciled.

Source: Compiled by author. Table 1

[7] In practice, though, these rewards fail to materialise in a systematic manner. Indeed, anecdotal evidence for the United States suggests that, for this reason, smaller players have withdrawn from the market lately and have stopped extending syndicated loans as a loss-leader.

[8] For this discussion, it has to be recalled that the same bank can act in various capacities in a syndicate. For instance, the arranger bank can also act as an underwriter and/or allocate a small portion of the loan to itself and therefore also be a junior participant.

... as remuneration for their services ...

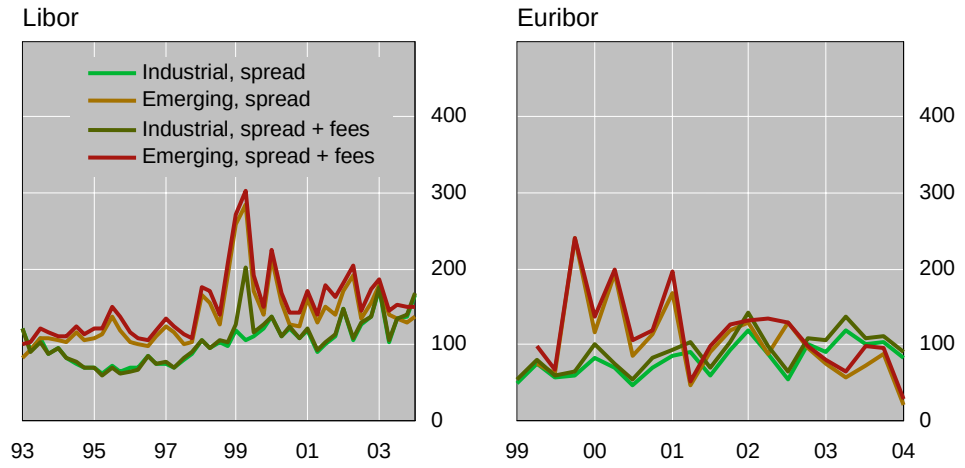
availability of funds. Other participants (those at least on the "manager" and "co-manager" level) may expect to receive a *participation fee* for agreeing to join the facility, with the actual size of the fee generally varying with the size of the commitment. The most junior syndicate members typically only earn the spread over the reference yield. Once the credit is established and as long as it is not drawn, the syndicate members often receive an annual *commitment* or *facility fee* proportional to their commitment (largely to compensate for the cost of regulatory capital that needs to be set aside against the commitment). As soon as the facility is drawn, the borrower may have to pay a per annum *utilisation fee* on the drawn portion. The agent bank typically earns an *agency fee*, usually payable annually, to cover the costs of administering the loan. Loans sometimes incorporate a penalty clause, whereby the borrower agrees to pay a *prepayment fee* or otherwise compensate the lenders in the event that it reimburses any drawn amounts prior to the specified term. Box 1 above provides an example of a simple fee structure under which Starwood Hotels & Resorts Worldwide, Inc has had to pay a commitment fee in addition to the margin.

... or in connection with specific loan events

At an aggregate level, the relative size of spreads and fees differs systematically in conjunction with a number of factors. Fees are more significant for Euribor-based than for Libor-based loans. Moreover, for industrialised market borrowers, the share of fees in the total loan cost is higher than for emerging market ones. Arguably this could be related to the sectoral composition of borrowers in these segments. Non-sovereign entities, more prevalent in industrialised countries, may have a keener interest, for tax or market disclosure reasons, in incurring a larger part of the total loan cost in the form of fees rather than spreads. However, the total cost (spreads, front-

Spreads and fees[1]

In basis points

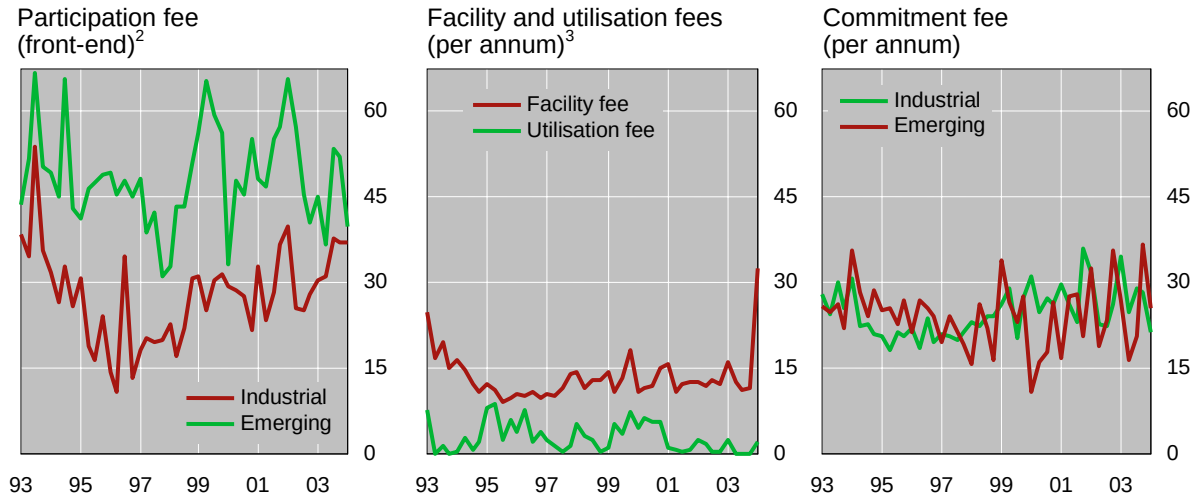


[1] Quarterly averages weighted by facility amounts. Front-end fees have been annualised over the lifetime of each facility and added to annual fees.

Source: Dealogic Loanware. Graph 3

Breakdown of fees[1]

In basis points



[1] Quarterly averages weighted by facility amounts. [2] Not annualised. [3] Industrialised country borrowers only.

Source: Dealogic Loanware. Graph 4

end and annual fees)[9] of loans granted to emerging market borrowers is higher than that of facilities extended to industrialised countries (Graphs 3 and 4). There is also more variance in commitment fees on emerging market facilities. In sum, lenders seem to demand additional compensation for the higher and more variable credit risk in emerging markets, in the form of both spreads and fees.

Spreads and fees are not the only compensation that lenders can demand in return for assuming risk. Guarantees, collateral and loan covenants offer the possibility of explicitly linking pricing to corporate events (rating changes, debt servicing). Collateralisation and guarantees are more often used for emerging market borrowers (Table 2), while covenants are much more widely used for

Non-price components in the remuneration of risk

Share of syndicated loans with covenants, collateral and guarantees, in per cent, by nationality of borrower

	Covenants		Collateral		Guarantees	
	Emerging	Industrialised	Emerging	Industrialised	Emerging	Industrialised
1993–96	0	16	40	15	31	7
1997–2000	2	24	49	16	22	4
2001–04[1]	3	19	37	13	21	4

[1] First quarter only for 2004.

Source: Dealogic Loanware. Table 2

[9] One should note that the fees shown in Graphs 3 and 4 are not directly comparable. In Graph 3, for the purposes of comparability with spreads, annual and front-end fees are added together by annualising the latter over the whole maturity of the facility, assuming full and immediate drawdown. Graph 4, on the other hand, shows annual and front-end fees separately without annualising the latter.

borrowers in industrialised countries (possibly because such terms are easier to enforce there).

Primary and secondary markets: sharing versus transferring risk

While commercial banks dominate the primary market, both at the senior arranger and at the junior funds provider levels, other institutions have made inroads over time. Globally, there are virtually no non-commercial banks or non-banks among the top 200 institutions that have around 90% market share.

Commercial banks still dominate the primary market

However, investment banks have benefited from the revival of syndicated lending in the 1990s. They have taken advantage of their expertise as bond underwriters and of the increasing integration of bank lending and disintermediated debt markets[10] to arrange loan syndications. Besides the greater involvement of investment banks, there is also growing participation by multilateral agencies such as the International Finance Corporation or the Inter-American Development Bank.[11]

Increased role of the secondary market

Syndicated credits are increasingly traded on secondary markets. The standardisation of documentation for loan trading, initiated by professional bodies such as the Loan Market Association (in Europe) and the Asia Pacific Loan Market Association, has contributed to improved liquidity on these markets. A measure of the tradability of loans on the secondary market is the prevalence of transferability clauses, which allow the transfer of the claim to another creditor.[12] The US market has generated the highest share of transferable loans (25% of total loans between 1993 and 2003), followed by the European marketplace (10%). The secondary market is commonly perceived to consist of three segments: par/near par, leveraged (or high-yield) and distressed. Most of the liquidity can be found in the distressed segment. Loans to large corporate borrowers also tend to be actively traded.

Secondary market participants and strategies: market-makers ...

Participants in the secondary market can be divided into three categories: market-makers, active traders and occasional sellers/investors. The market-makers (or two-way traders) are typically larger commercial and investment banks, committing capital to create liquidity and taking outright positions. Institutions actively engaged in primary loan origination have an advantage in trading on the secondary market, not least because of their acquired skill in accessing and understanding loan documentation.

... active traders ...

Active traders are mainly investment and commercial banks, specialist distressed debt traders and so-called “vulture funds” (institutional investors actively focused on distressed

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[10] For instance, it is very common nowadays for a medium-term loan provided by a syndicate to be refinanced by a bond at, or before, the loan’s stated maturity. Similarly, US commercial paper programmes are frequently backed by a syndicated letter of credit.

[11] This provides an opportunity for risk-sharing between public and private sector investors. It usually takes the form of syndicated loans granted by multilateral agencies with tranches reserved for private sector bank lenders.

[12] Transferability is determined by consent of the borrower as stated in the original loan agreement. Some borrowers do not allow loans to be traded on the secondary market as they want to preserve their banking relationships.

debt). Non-financial corporations and other institutional investors such as insurance companies also trade, but to a lesser extent. As a growing number of financial institutions establish loan portfolio management departments, there appears to be increasing attention paid to relative value trades. Discrepancies in yield/return between loans and other instruments such as credit derivatives, equities and bonds are arbitraged away (Coffey (2000), Pennacchi (2003)). Lastly, occasional participants are present on the market either as sellers of loans to manage capacity on their balance sheet or as investors which take and hold positions. Sellers of risk can remove loans from their balance sheets in order to meet regulatory constraints, hedge risk, or manage their exposure and liquidity.[13] US banks, whose outstanding syndicated loan commitments are regularly monitored by the Federal Reserve Board, appear to have been relatively successful in transferring some of their syndicated credits, including up to one quarter of their problem loans, to non-bank investors (Table 3). Buyers of loans on the secondary market can acquire exposure to sectors or countries, especially when they do not have the critical size to do so on the primary market.[14]

... and occasional participants

While growing, secondary trading volumes remain relatively modest compared to the total volume of syndicated credits arranged on the primary market. The biggest secondary market for loan trading is the United States, where the volume of such trading amounted to $145 billion in 2003. This is equivalent to 19% of new originations on the primary market that year and to 9% of outstanding syndicated loan commitments. In Europe, trading amounted to $46 billion in 2003 (or 11% of primary market volume), soaring by more than 50% compared to the previous year (Graph 5).

Secondary trading is still relatively thin ...

Distressed loans continued to represent a sizeable fraction of total secondary trading in the United States, and gained in importance in Europe.

US syndicated credits[1]

	Share of total credits[2]			*Memo:*	Percentage classified[3]			
	US banks	Foreign banking organisations	Non-banks	*Total credits ($ bn)*	US banks	Foreign banking organisations	Non-banks	Total credits
2000	48	45	7	*1,951*	2.8	2.6	10.2	3.2
2001	46	46	8	*2,050*	5.1	4.7	14.6	5.7
2002	45	45	10	*1,871*	6.4	7.3	23.0	8.4
2003	45	44	11	*1,644*	5.8	9.0	24.4	9.3

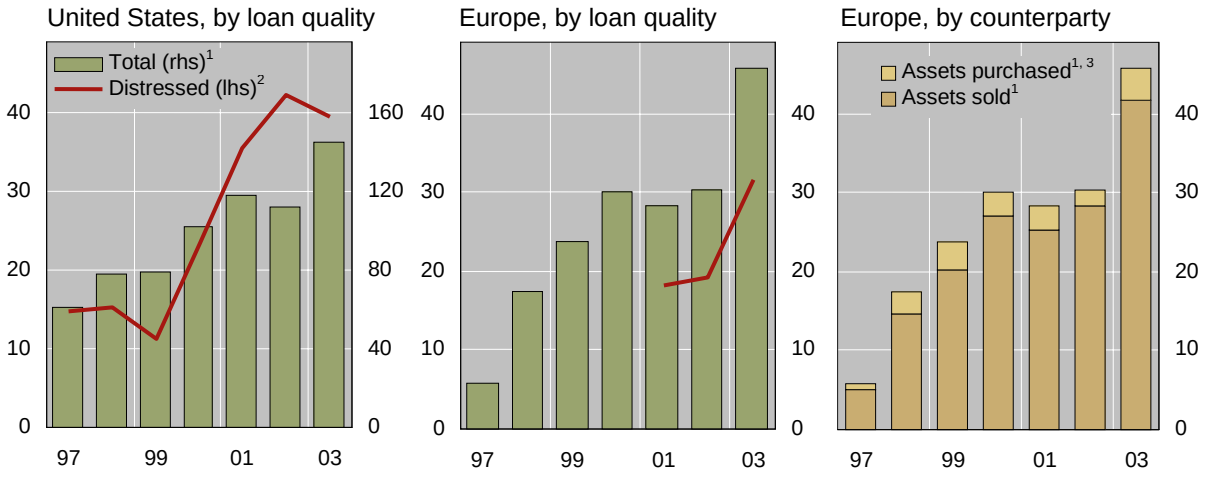
[1] Includes both outstanding loans and undrawn commitments. [2] Dollar volume of credits held by each group of institutions as a percentage of the total dollar volume of credits. [3] Dollar volume of credits classified "substandard", "doubtful" or "loss" by examiners as a percentage of the total dollar volume of credits.

Source: Board of Governors of the Federal Reserve System. Table 3

[13] The seller banks often enhance their fee income by arranging new loans to roll over facilities they had previously granted to borrowers. They may sell old facilities on the secondary market to manage capacity on their balance sheet, which is required to hold some of the new loans.

[14] For example, minimum participation amounts on the primary market may exceed the bank's credit limits.

US and European secondary markets for syndicated credits



[1] In billions of US dollars. [2] As a percentage of total loan trading. For Europe, distressed and leveraged. [3] From non-LMA members.

Sources: Loan Market Association (LMA); Loan Pricing Corporation. Graph 5

Admittedly, this to some extent reflects higher levels of corporate distress in Europe. But as the investment grade segment matures, it is also indicative of sustained investor appetite and of the market's improved ability to absorb a larger share of below par loans (BIS (2004)).

... especially in Asia

In the Asia-Pacific region, secondary volumes are still a tiny fraction of those in the United States and Europe, with only six or seven banks running dedicated desks in Hong Kong SAR, and no non-bank participants. In 1998, the Asian secondary market was exceptionally active. That year, large blocks of loan portfolios changed hands as Japanese banks restructured their distressed loan portfolios.[15] Trading was more subdued in subsequent years,[16] although banks' interest appears to have recently been rekindled by the secondary prices of loans, which have decreased less than those of collateralised debt obligations and bonds.[17]

Geographical integration of the market

As financial markets are becoming more integrated geographically, a question is how this process manifests itself in syndicated lending in the form of cross-border deals. To answer this question, we examine the nationality composition of syndicates on the primary market, where information is readily available

[15] Banks tend to trade blocks of loans when they restructure whole portfolios. In normal times, loan by loan trading is more common.

[16] Nonetheless, Japanese banks have recently been very active in transferring loans on the Japanese secondary market. According to a quarterly survey conducted by the Bank of Japan, for the financial year April 2003–March 2004, such transfers totalled ¥11 trillion, 38% of which were non-performing loans. This was followed in the second quarter of 2004 by unusually weak secondary market activity by historical standards.

[17] According to practitioners, major international banks with an Asian presence are among the main sellers of loans, while demand comes from Taiwanese and Chinese banks.

about individual participants. We first perform this exercise at a global level and then within the euro area, in order to assess any impact from the introduction of the single currency.

Table 4 shows the degree of international integration of syndicated loan markets, measured by the share of loans arranged or provided by banks of the same country or region as the borrower. At the senior arranger level, the nationality composition is calculated based on the number of deals, and at a junior participant level based on the dollar amounts provided by individual financial institutions. A number of findings stand out.

First, unsurprisingly, there appears to be relatively little penetration by foreign lenders in the market for loans to Japanese, euro area and US borrowers. The senior arranger and junior funds provider banks in loan facilities

International integration of the market

By borrower nationality	% of deals[1] where the arranger is of the same nationality[2] as the borrower (based on number of deals)		% of funds[1] provided by banks of the same nationality[2] as the borrower (based on USD amounts)	
	1993–98	1999–2004[3]	1993–98	1999–2004[3]
Main countries and regions				
United States	74	70	61	62
Euro area[4]	59	72	71	67
United Kingdom	58	43	35	42
Other western Europe	37	26	36	25
Japan	62	84	63	87
Other industrialised economies	67	65	61	57
Asia-Pacific	29	37	34	51
Eastern Europe	9	12	10	13
Latin America/Caribbean	5	7	6	8
Middle East & Africa	15	20	22	28
Offshore	54	36	44	31
Euro area countries				
Austria	5	42	33	42
Belgium	17	22	31	16
Finland	26	13	16	9
France	48	50	45	46
Germany	43	46	57	44
Greece	7	29	8	24
Ireland	20	18	16	14
Italy	34	53	39	48
Luxembourg	10	8	30	7
Netherlands	24	29	28	25
Portugal	31	27	30	23
Spain	64	51	64	49
Euro area[5]	39	42	43	38

[1] Calculated also including purely domestic deals. [2] From the same region, where regions are shown. [3] For 2004, first quarter only. [4] Borrower from any euro area country, arranger/provider from any euro area country. [5] Borrower from same euro area country as arranger/provider, euro area average.

Sources: Dealogic Loanware; author's calculations. Table 4

Integration in industrial countries ...

set up for these borrowers are often from the borrowers' own country, with the share of deals arranged or of funds provided by foreign institutions rarely exceeding 30%.[18]

Second, foreign banks appear more present (with shares often in excess of 60%) in syndicates set up for European borrowers from outside the euro area and, in particular, the United Kingdom. It is interesting to note that Japanese borrowers tend to pay higher fees on average than UK borrowers, whose market is characterised by more foreign bank penetration. This may suggest that the market is more contestable in the United Kingdom.

Third, with the possible exception of Asia, syndicates put together for emerging market borrowers tend to be dominated by foreign lenders. Interestingly, for all emerging market borrowers, but especially in the Middle East and Africa and Asia-Pacific regions, "domestic" banks (ie from the same geographical area as the borrower) are more present as junior funds providers than as senior arrangers. It would appear typical for a major international bank to arrange the syndication and then allocate the credit to regional lenders.[19] Given that the presence of a reputable major foreign arranger has a "certification effect" for banks which are ranked lower in the syndicate, this makes cross-border investment in a junior funds provider capacity easier than the provision of screening and monitoring services as a senior arranger.

... and emerging markets

Finally, the advent of the euro appears to have led to some integration in the pan-European syndicated loan market, especially at the arranger level. The first two columns of Table 4 show that within the euro area, the percentage of loans arranged by banks from the same country as the borrower is about the same before and after 1999 (39% versus 42%).[20] Meanwhile, the overall share of euro area arrangers rose from 59% to 72%, suggesting that euro area banks have been arranging a higher share of loans for borrowers from euro area countries other than their own.[21] At the same time, the additional credits arranged at a pan-European level seem to have been funded largely by banks from outside the euro area, since the share of euro area banks among junior funds providers has remained relatively stable (last two columns of Table 4). This could reflect a greater balance sheet capacity outside the euro area.

Some pan-European integration

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[18] For US borrowers, the statement about low foreign penetration should be balanced by the relatively high share – approximately 45% since 2000 – of total syndicated credits held by foreign banking organisations, after allowing for transfers on the secondary market (Table 3).

[19] For more background and an extension of the analysis to bond markets, see McCauley et al (2002).

[20] While the euro is widely used as a currency of denomination for European (including eastern European) borrowers, the US dollar is still the currency of choice for syndicated lending worldwide (US dollar facilities represented 62% of total syndicated lending in 2003, while the euro accounted for 21%, and the pound sterling and the Japanese yen for 6% each).

[21] In a study of the bond underwriting market, Santos and Tsatsaronis (2003) show that the elimination of market segmentation associated with the single European currency failed to result in an intensification of the business links between borrowers and bond underwriters from the euro area. It must be stressed, though, that bond underwriting and syndicated loan markets are quite different, as bonds are sold to institutional investors and loans mainly to other banks.

Conclusion

This special feature has presented a historical review of the development of the market for syndicated loans, and has shown how this type of lending, which started essentially as a sovereign business in the 1970s, evolved over the 1990s to become one of the main sources of funding for corporate borrowers.

The syndicated loan market has advantages for junior and senior lenders. It provides an opportunity to senior banks to earn fees from their expertise in risk origination and manage their balance sheet exposures. It allows junior lenders to acquire new exposures without incurring screening costs in countries or sectors where they may not have the required expertise or established presence. Primary loan syndications and the associated secondary market therefore allow a more efficient geographical and institutional sharing of risk origination and risk-taking. For instance, loan syndications for emerging market borrowers tend to be originated by large US and European banks, which subsequently allocate the risk to local banks. Euro area banks have strengthened their pan-European loan origination activities since the advent of the single currency and have found funding for the resulting risk outside the euro area.

However, we find that the geographical integration of the market appears to vary among regions, as reflected in varying degrees of international penetration. While these differences could also be related to disparities in the sizes of national markets, further research is needed to improve our understanding of market contestability by assessing whether they are systematically related to differences in loan pricing, especially fees.

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The nature of credit risk in project finance[1]

In project finance, credit risk tends to be relatively high at project inception and to diminish over the life of the project. Hence, longer-maturity loans would be cheaper than shorter-term credits.

JEL classification: F34, G12, G28, G32.

For decades, project finance has been the preferred form of financing for large-scale infrastructure projects worldwide. Several studies have emphasised its critical importance, especially for emerging economies, focusing on the link between infrastructure investment and economic growth. Over the last few years, however, episodes of financial turmoil in emerging markets, the difficulties encountered by the telecommunications and energy sectors and the financial failure of several high-profile projects[2] have led many to rethink the risks involved in project financing.

The question whether longer maturities are a source of risk per se is crucial to understanding the distinctive nature of credit risk in project finance. Large-scale capital-intensive projects usually require substantial investments up front and only generate revenues to cover their costs in the long term. Therefore, matching the time profile of debt service and project revenue cash flows implies that on average project finance loans have much longer maturities than other syndicated loans.[3]

This special feature argues that a number of key characteristics of project finance, including high leverage and non-recourse debt, have direct implications for the term structure of credit risk for this asset class. In particular, a comparative econometric analysis of ex ante credit spreads in the international syndicated loan market suggests that longer-maturity project finance loans are

[1] I would like to thank Claudio Borio, Blaise Gadanecz, Már Gudmundsson, Eli Remolona and Kostas Tsatsaronis for their comments, and Angelika Donaubauer and Petra Hofer (Dealogic) for their help with the data. The views expressed in this article are those of the author and do not necessarily reflect those of the BIS.

[2] Three spectacular recent financial failures are the Channel Tunnel linking France and the United Kingdom, the EuroDisney theme park outside Paris and the Dabhol power project in India.

[3] The average maturity of project finance loans in the Dealogic Loanware database is 8.6 years, against only 4.8 years for syndicated loans in general.

not necessarily perceived by lenders as riskier compared to shorter-term credits. This contrasts with other forms of debt, where credit risk is found to increase with maturity, ceteris paribus.

Financing high-profile infrastructure projects not only requires lenders to commit for long maturities, but also makes them particularly exposed to the risk of political interference by host governments. Therefore, project lenders are making increasing use of political risk guarantees, especially in emerging economies. This special feature also provides a cross-country assessment of the role of guarantees against political risk and finds that commercial lenders are more likely to commit for longer maturities in emerging economies if they obtain explicit or implicit guarantees from multilateral development banks or export credit agencies. This is shown to further reduce project finance spreads observed at the long end of the maturity spectrum.

After a brief review of the history and growth of project finance, the second section illustrates the specific challenges involved in financing large-scale capital-intensive projects, while the third section explains how project finance structures are designed to best address those risks. The core of the analysis, in the fourth and fifth sections, shows how the particular characteristics of credit risk in project finance are consistent with the hump-shaped term structure of loan spreads observed ex ante for this asset class. The conclusion summarises the main findings and draws some policy implications.

Recent developments in the project finance market

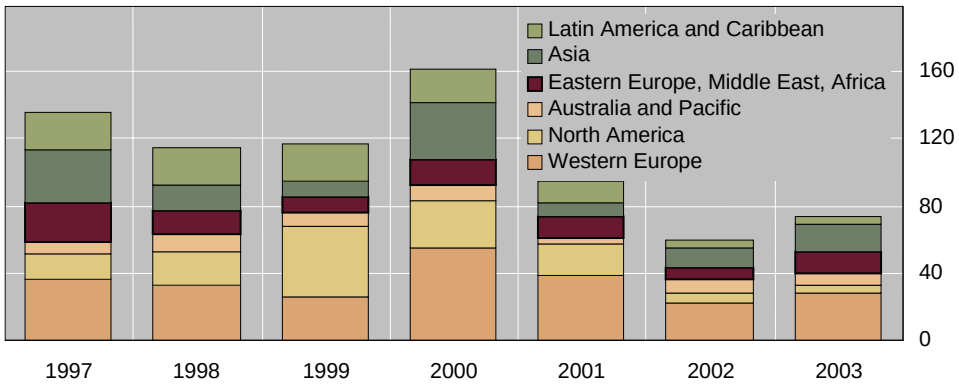
Project finance involves a public or private sector sponsor investing in a single-purpose asset through a legally independent entity. It typically relies on non-recourse debt, for which repayment depends primarily on the cash flows generated by the asset being financed.

A global market emerged in the 1990s ...

Since the 1990s, project finance has become an increasingly diversified business worldwide. Its geographical and sectoral reach has grown

Project finance global lending by region

In billions of US dollars



Note: The amounts shown refer to new bank loan commitments for project finance by year and region.

Source: Dealogic ProjectWare database. Graph 1

considerably, following widespread privatisation and deregulation of key industrial sectors around the world.

… with its ups and downs …

In the years following the East Asian crisis (1998–99), financial turmoil in emerging markets led to a global reallocation of investors' portfolios from developing to industrialised countries. New investments, notably in north America and western Europe, more than offset the capital flight from emerging economies, such that total global lending for project finance rebounded from a two-year slump, reaching a record high in 2000 (Graph 1).

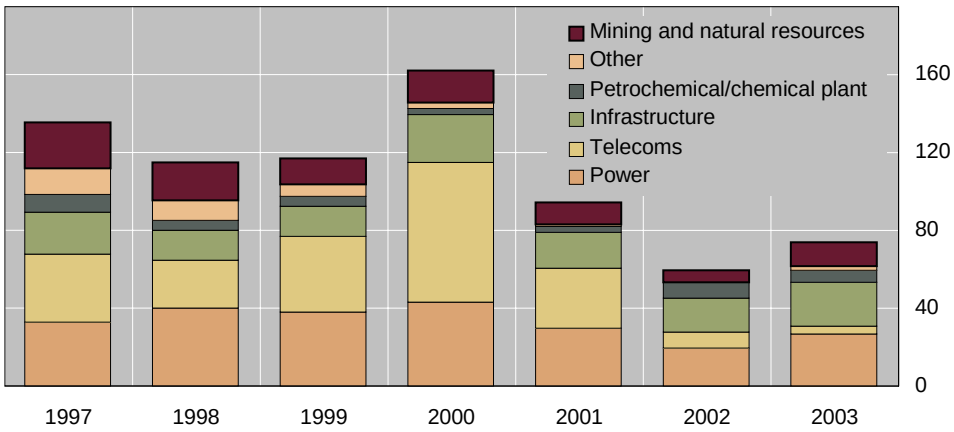
Since 2001, the general economic slowdown and industry-specific risks in the telecoms and power sectors have led to a substantial decline in project finance lending worldwide (Graph 2). The power sector has been particularly hurt by accounting irregularities and high volatility in energy prices: the debt ratings of 10 of the leading power companies fell from an average of BBB+ in 2001 to B– in 2003. Telecoms firms have been penalised for sustaining onerous investments in new technologies (like fibre-optic transmission or third-generation mobile licences in Europe) that have not yet generated the expected returns. Over 60 telecoms companies filed for bankruptcy between 2001 and 2002 as overcapacity led to price wars and customer volumes failed to live up to overoptimistic projections.

… but continued importance

Despite the recent downturn, the long-term need for infrastructure financing in both industrialised and developing countries remains very high. In the United States alone, between 1,300 and 1,900 new electricity generating plants need to be built in order to meet growing demand over the next two decades (National Energy Policy Development Group (2001)). For developing countries, an annual investment of $120 billion would be required in the electricity sector until 2010 (International Energy Agency (2003)).

Project finance global lending by sector

In billions of US dollars



Note: The amounts shown refer to new bank loan commitments for project finance by year and sector.

Source: Dealogic ProjectWare database. Graph 2

The main challenges of financing large-scale projects

Projects like power plants, toll roads or airports share a number of characteristics that make their financing particularly challenging.

First, they require large indivisible investments in a single-purpose asset. In most industrial sectors where project finance is used, such as oil and gas and petrochemicals, over 50% of the total value of projects consists of investments exceeding $1 billion.

Second, projects usually undergo two main phases (construction and operation) characterised by quite different risks and cash flow patterns. Construction primarily involves technological and environmental risks, whereas operation is exposed to market risk (fluctuations in the prices of inputs or outputs) and political risk, among other factors.[4] Most of the capital expenditures are concentrated in the initial construction phase, with revenues instead starting to accrue only after the project has begun operation.

Third, the success of large projects depends on the joint effort of several related parties (from the construction company to the input supplier, from the host government to the off-taker[5]) so that coordination failures, conflicts of interest and free-riding of any project participant can have significant costs. Moreover, managers have substantial discretion in allocating the usually large free cash flows generated by the project operation, which can potentially lead to opportunistic behaviour and inefficient investments.

The key characteristics of project financing structures

A number of typical characteristics of project financing structures are designed to handle the risks illustrated above.

Coping with agency problems by means of …

In project finance, several long-term contracts such as construction, supply, off-take and concession agreements, along with a variety of joint-ownership structures, are used to align incentives and deter opportunistic behaviour by any party involved in the project. The project company operates at the centre of an extensive network of contractual relationships, which attempt to allocate a variety of project risks to those parties best suited to appraise and control them: for example, construction risk is borne by the contractor and the risk of insufficient demand for the project output by the off-taker (Graph 3).

… a network of contracts …

Project finance aims to strike a balance between the need for sharing the risk of sizeable investments among multiple investors and, at the same time, the importance of effectively monitoring managerial actions and ensuring a coordinated effort by all project-related parties.

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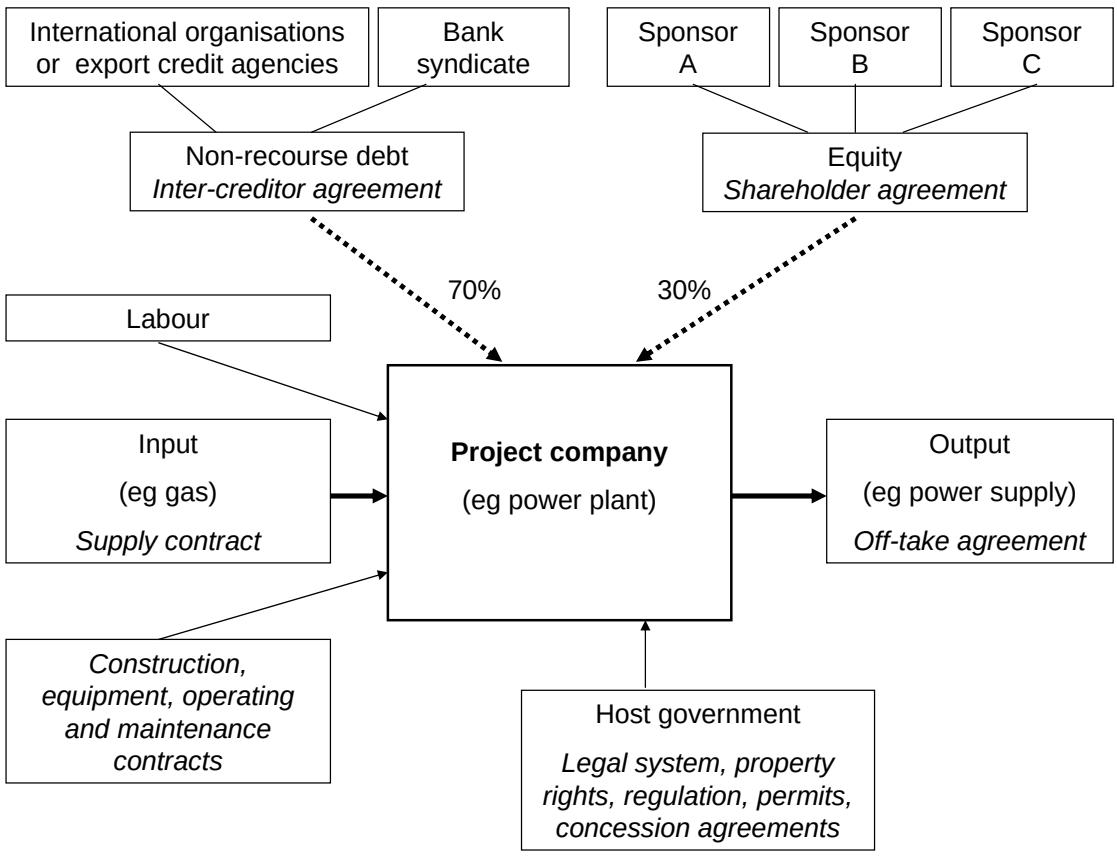
[4] Hainz and Kleimeier (2003) identify three broad categories of "political risk". The first category includes the risks of expropriation, currency convertibility and transferability, and political violence, including war, sabotage or terrorism. The second category covers risks of unanticipated changes in regulations or failure by the government to implement tariff adjustments because of political considerations. The third category includes quasi-commercial risks arising when the project is facing state-owned suppliers or customers, whose ability or willingness to fulfil their contractual obligations towards the project is questionable.

[5] The off-taker commits to purchase the project output under a long-term purchase (or off-take) agreement.

Typical project finance structure



Note: A typical project company is financed with limited or non-recourse debt (70%) and sponsors' equity (30%). It buys labour, equipment and other inputs in order to produce a tangible output (energy, infrastructure, etc). The host government provides the legal framework necessary for the project to operate.

Source: Adapted from Esty (2003). Graph 3

Large-scale projects might be too big for any single company to finance on its own. On the other hand, widely fragmented equity or debt financing in the capital markets would help to diversify risks among a larger investors' base, but might make it difficult to control managerial discretion in the allocation of free cash flows, avoiding wasteful expenditures. In project finance, instead, equity is held by a small number of "sponsors" and debt is usually provided by a syndicate of a limited number of banks. Concentrated debt and equity ownership enhances project monitoring by capital providers and makes it easier to enforce project-specific governance rules for the purpose of avoiding conflicts of interest or sub-optimal investments.

… close monitoring of managerial discretion …

The use of non-recourse debt in project finance further contributes to limiting managerial discretion by tying project revenues to large debt repayments, which reduces the amount of free cash flows.

… and non-recourse debt …

Moreover, non-recourse debt and separate incorporation of the project company make it possible to achieve much higher leverage ratios than sponsors could otherwise sustain on their own balance sheets. In fact, despite some variability across sectors, the mean and median debt-to-total capitalisation ratios

for all project-financed investments in the 1990s were around 70%. Non-recourse debt can generally be deconsolidated, and therefore does not increase the sponsors' on-balance sheet leverage or cost of funding. From the perspective of the sponsors, non-recourse debt can also reduce the potential for *risk contamination*. In fact, even if the project were to fail, this would not jeopardise the financial integrity of the sponsors' core businesses.

… and with the lack of diversification by means of …

One drawback of non-recourse debt, however, is that it exposes lenders to project-specific risks that are difficult to diversify. In order to cope with the asset specificity of credit risk in project finance, lenders are making increasing use of innovative risk-sharing structures, alternative sources of credit protection and new capital market instruments to broaden the investors' base.

… hybrid risk-sharing structures …

Hybrid structures between project and corporate finance are being developed, where lenders do not have recourse to the sponsors, but the idiosyncratic risks specific to individual projects are diversified away by financing a portfolio of assets as opposed to single ventures. Public-private partnerships are becoming more and more common as hybrid structures, with private financiers taking on construction and operating risks while host governments cover market risks.

… political risk guarantees …

There is also increasing interest in various forms of credit protection. These include explicit or implicit political risk guarantees,[6] credit derivatives and new insurance products against macroeconomic risks such as currency devaluations. Likewise, the use of *real options* in project finance has been growing across various industries.[7] Examples include: refineries changing the mix of outputs among heating oil, diesel, unleaded gasoline and petrochemicals depending on their individual sale prices; real estate developers focusing on multipurpose buildings that can be easily reconfigured to benefit from changes in real estate prices.

… securitisation and new capital market instruments

Finally, in order to share the risk of project financing among a larger pool of participants, banks have recently started to securitise project loans, thereby creating a new asset class for institutional investors. Collateralised debt obligations as well as open-ended funds have been launched to attract higher liquidity to project finance.[8]

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[6] The explicit guarantee is a formal insurance contract against specific political risk events (transfer and convertibility, expropriation, host government changing regulation, war, etc) provided also by some commercial insurers. The "implicit guarantee" instead works as follows. The financing is typically divided into tranches, one of which is underwritten by the agency. The borrower cannot default on any tranche without defaulting on the agency tranche as well. The agency represents a G10 government or supranational development bank with a recognised preferred creditor status. Defaulting on the agency has additional political and financial costs that the host country would not want to incur since agencies are usually lenders of last resort for host countries in financial distress.

[7] Analogous to *financial options*, ie derivative securities which give the holder the right but not the obligation to trade in an underlying security, *real options* provide management with the flexibility to take a certain course of action or strategy, without the "obligation" to take it (in both cases options are exercised only if deemed convenient ex post).

[8] Among the new capital market instruments used for project financing: *revenue bonds* and *future-flow securitisations* are debt securities backed by an identifiable future stream of revenues generated by an asset; *compartment funds* offer to different types of investors shares with different levels of subordination and are dedicated to make equity investments.

The term structure of credit spreads in project finance

The term structure of spreads is affected by …

The specific risks involved in funding large-scale projects and the key characteristics of project financing structures illustrated in the previous sections (in particular high leverage and non-recourse debt) have important implications for the term structure of credit spreads for this asset class.

… high leverage ratios …

First, based on the widely used framework for pricing risky debt originally proposed by Merton (1974), we should expect to observe a hump-shaped term structure of credit spreads for highly leveraged obligors (Graph 4). In this approach, the default risk underlying credit spreads is primarily driven by two components: (1) the degree of firm indebtedness or leverage and (2) the uncertainty about the value of the firm's assets at maturity. Given Merton's assumption of decreasing leverage ratios over time, postponing the maturity date reduces the probability that the value of the assets will be below the default boundary when repayment is due. On the other hand, a longer maturity also increases the uncertainty about the future value of the firm's assets. For obligors that already start with low leverage levels, this second component dominates, so that the observed term structure is monotonically upward-sloping. For highly leveraged obligors, instead, the increase in default risk due to higher asset volatility will be strongly felt by debt holders at short maturities, but as maturity further increases, the first component will rapidly take over, thanks to the greater margin for risk reduction due to declining leverage. This leads to a hump-shaped term structure of credit spreads for highly leveraged obligors.[9]

… timing and uncertainty of project cash flows …

Second, despite the extensive network of security arrangements illustrated in Graph 3, the credit risk of non-recourse debt remains ultimately tied to the timing of project cash flows. In fact, projects which are financially viable in the long run might face cash shortages in the short term. Ceteris paribus, obtaining credit at longer maturities implies smaller amortising debt repayments due in the early stages of the project. This would help to relax the project company's liquidity constraints, thus reducing the risk of default. As a consequence, long-term project finance loans should be perceived as being less risky than shorter-term credits.

Third, the credit risk of non-recourse debt might be affected not only by the timing but also by the uncertainty of project cash flows and how the latter evolves over the project's advancement stages. In fact, successful completion of the construction and setup phases can significantly reduce residual sources of uncertainty for a project's financial viability. Arguably, extending loan maturities for any additional year after the scheduled time for the project to be completely operational might drive up ex ante risk premia but only at a decreasing rate.[10]

… and political risk guarantees

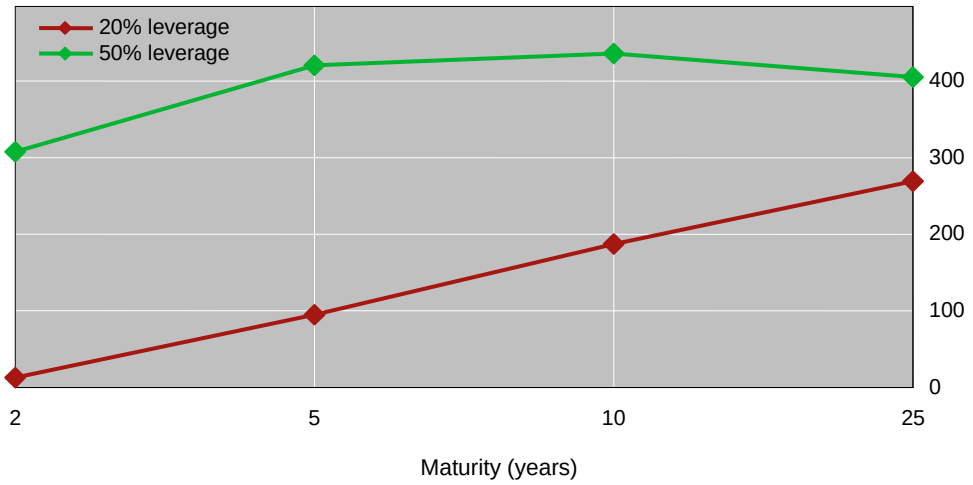
Finally, the term structure of credit spreads observed in project finance is likely to be affected by the higher exposure of large infrastructure projects to political risk and by the availability of political risk insurance for long-term project finance loans. While long maturities and political risk represent in principle

[9] With leverage ratios approaching 100%, the second component completely dominates and the term structure becomes downward-sloping.

[10] This is consistent with the hypothesis of sequential resolution of uncertainty in Wilson (1982).

Term structure of credit spreads

In basis points



Note: Volatility of firm's asset value is set at 20% per unit of time. Leverage is defined as the ratio of debt to the current market value of the assets, where debt is valued at the riskless rate.

Source: Merton (1974). Graph 4

separate sources of uncertainty, commercial lenders are often willing to commit for longer maturities in emerging economies only if they obtain explicit or implicit guarantees from multilateral development banks or export credit agencies. As political risk guarantees are most often associated with longer maturities,[11] lenders should not necessarily perceive political-risk-insured long-term loans as being riskier than uninsured short-term loans, ceteris paribus.

A comparative analysis of credit spreads in the international syndicated loan market

As argued above, several peculiar characteristics of project finance would imply that the term structure of credit spreads for this asset class need not be monotonically increasing as observed for other forms of financing. This section will attempt to substantiate this claim empirically.

Project finance spreads exhibit a hump-shaped term structure

Graph 5 illustrates the pricing of a few representative loans for projects both in industrialised and in emerging economies, which have received funding in tranches with different maturities. The general pattern shown in the graph suggests that the term structure of loan spreads in project finance may be hump-shaped.

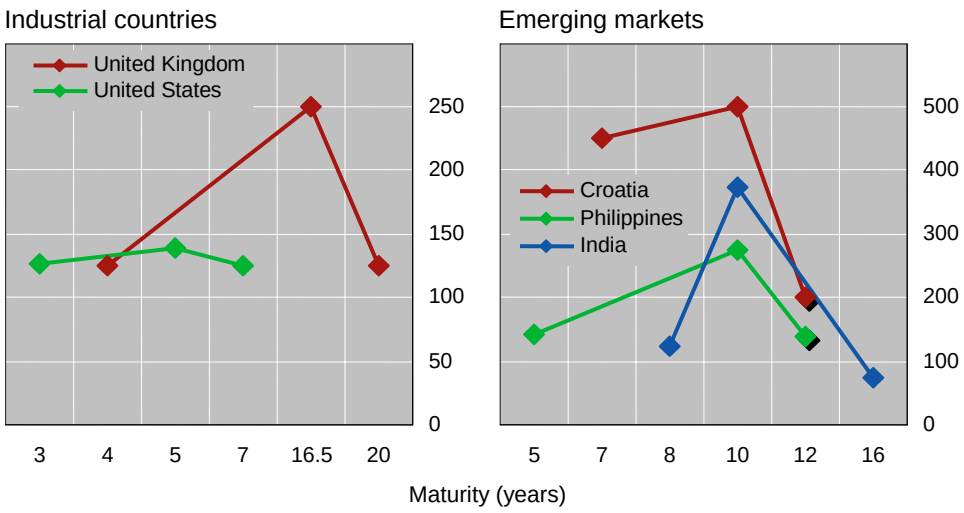
In order to test this hypothesis, the ex ante credit spreads over Libor for a large sample of loans[12] are extracted from the Loanware database compiled by Dealogic, a primary market information provider on syndicated credit facilities.

[11] For example, the World Bank has launched a programme of partial credit guarantees that cover only against default events occurring in the later years of a loan. This encourages private lenders to lengthen the maturity of their loans.

[12] International syndicated bank loans accounted for about 80% of total project finance debt flows over the period 1997–2003 (source: Thomson Financial).

Term structure of loan spreads in project finance

Spread over Libor, in basis points



Note: The connected diamonds represent different loans to the same project. Five representative projects are illustrated from both industrial and emerging economies. The shaded points indicate coverage by political risk guarantee.

Source: Dealogic ProjectWare database. Graph 5

They are regressed on several micro characteristics of the loans (such as amount, maturity, third-party guarantees, borrower business sectors, etc) along with several control variables including the macroeconomic conditions (eg real GDP growth, inflation and current account balance) prevailing in the country of the borrower at the time of signing the loan, plus global macroeconomic factors (such as world interest rates and the EMBI index).

Estimated coefficients for loan maturity and its logarithmic transformation reported in Table 1 suggest that the relationship between ex ante spread and maturity for project finance loans is indeed hump-shaped,[13] while for all other loans it appears instead monotonically increasing.[14] This result applies to industrialised as well as emerging economies and is found to be robust to a large number of sensitivity tests.[15]

Agency guarantees mitigate political risk in emerging markets …

The regressions in Table 1 also control for the impact on loan spreads of political risk and political risk guarantees. Political risk is proxied by the corruption index provided by Transparency International.[16] Results suggest that while corruption is not a significant problem for project finance in industrialised

[13] At short maturities, the positive logarithmic term prevails and accounts for the upward-sloping part of the term structure. As maturity increases, the negative linear term dominates and explains the downward-sloping section of the term structure.

[14] The corresponding estimated coefficient on "log maturity" in Table 1 is not statistically significant. The same result is found using alternative non-linear functions of maturity (eg quadratic or square root).

[15] Including tests for endogeneity and sample selection as well as robustness checks for the range of maturities analysed, repayment schedules, bond ratings, loan covenants and fixed vs floating rates. See Sorge and Gadanecz (2004) for more details.

[16] In the reported regression, a higher score on the index indicates a higher degree of corruption in the political system of the host country.

Microeconomic determinants of loan spreads			
Dependent variable: spread	Project finance loans		Other loans
	Industrialised countries	Emerging markets	
Maturity	–5.258**	–5.039*	7.066**
Log maturity	52.426**	33.184**	–0.761
Corruption index	–0.792	19.340**	13.339**
Agency guarantees	11.872	–58.324**	–48.147**
Number of observations	331	687	12,393
Adjusted R^2	0.259	0.337	0.329

Note: Only regressors of interest are shown. * and ** indicate statistical significance at the 5% and 1% confidence levels, respectively.

Source: Sorge and Gadanecz (2004). Table 1

countries, lenders financing projects in emerging markets systematically charge a higher premium on borrowers from countries characterised by a higher political risk. However, this risk appears to be effectively mitigated by the involvement of multilateral development banks or export credit agencies. In fact, Table 1 shows that loans with political risk guarantees from these agencies are priced on average about 50 basis points cheaper, ceteris paribus.

… and allow longer maturities

The evidence also suggests that the availability of agency guarantees effectively lengthens maturities of project finance loans in emerging markets. However, even taking this effect into account through the inclusion in the regressions in Table 1 of an interaction term between maturity and agency guarantees, the estimated relationship between spread and maturity for project finance loans remains hump-shaped.[17] This is consistent with the hypothesis that, while it is true that lenders especially use political risk guarantees for longer-term loans, the observed hump-shaped term structure of credit spreads may be due to more fundamental characteristics of project finance.

Conclusion

This special feature has analysed the peculiar nature of credit risk in project finance. Two main findings have emerged, based on the analysis of some key trends and characteristics of this market. First, unlike other forms of debt, project finance loans appear to exhibit a hump-shaped term structure of credit spreads. Second, political risk and political risk guarantees have a significant impact on credit spreads for project finance loans in emerging economies.

These results need to be taken with some caution. In the absence of project-specific ratings, the analysis relies on a number of micro- and macroeconomic risk characteristics that are admittedly imperfect proxies for the credit quality of individual projects. Moreover, loan spreads at origination are only ex ante measures of credit risk. In the future, the development of a

[17] See Sorge and Gadanecz (2004) for more details.

secondary market for project finance loans would allow more light to be shed on the time profile of credit risk for this asset class.

A deeper understanding of the risks involved in project finance and their evolution over time is important for both practitioners and policymakers. In particular, further research in this area might help in the implementation of risk-sensitive capital requirements providing market participants with the incentives for a prudent and, at the same time, efficient allocation of resources across asset classes. This is particularly relevant, given the predominant role of internationally active banks in project finance and the fundamental contribution of project finance to economic growth, especially in emerging economies.

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

Following its release towards the end of June, the new capital adequacy framework (Basel II) remained centre stage in the ensuing months as the focus shifted from endorsement to implementation. More generally, various aspects of vulnerabilities in the international financial system and the associated challenges were the dominant theme of the period under review. Table 1 provides a selective chronological overview of the most recent initiatives.

Basel Committee on Banking Supervision

BCBS issues revised paper on interest rate risk management and supervision …

In July, the Basel Committee on Banking Supervision (BCBS) issued a revised version of a 1997 paper on the principles for the management of interest rate risk. Entitled *Principles for the management and supervision of interest rate risk*, the revised paper is designed to be fully consistent with the Pillar 2 approach to interest rate risk in the banking book under the new capital adequacy framework, which sets out the details for adopting more risk-sensitive minimum capital requirements for banking organisations.

… and a document on implementation aspects of Basel II

The Committee also published the discussion document *Implementation of Basel II: practical considerations*, reflecting its long-held view that the release alone of Basel II is not the end of, but rather an important milestone in an ongoing effort to encourage the process of international convergence of capital standards. With the publication of this document, the Committee recognises that, while the new framework was designed to address global issues, moving towards its adoption in the immediate future may not be the main priority for many supervisors in non-G10 countries. Indeed, given national resource and other constraints, there may be more immediate regulatory concerns that need to be dealt with before Basel II compliance in order to strengthen the respective financial systems.[1] Despite this, a large number of the national supervisors not represented in the Committee have already begun to tackle implementation issues and, in order to advance this process, last year the BCBS convened a working group with a mandate to provide practical pointers to supervisors for

[1] The IMF and World Bank indicated that future financial sector assessments will not be based on Basel II if a country has not elected to implement it, but rather on the performance relative to the chosen standards.

Main initiatives by Basel-based committees and other bodies

Press releases and publications over the period under review

Body	Initiative	Thematic focus	Release date
BCBS	Implementation of Basel II: practical considerations	• Cost and benefits of national implementation • Pillar-specific implementation • Changes to legal and regulatory framework	July 2004
	Principles for the management and supervision of interest rate risk	• Source of interest rate risk • Sound practices, policies and procedures • Internal controls, disclosure and supervision	
	Capital treatment of certain items under international financial reporting standards (IFRS)	• Impact on regulatory capital	
	Thirteenth International Conference of Banking Supervisors (ICBS)	• Pledge for deeper cooperation	September 2004
Joint Forum[1]	Outsourcing guidance to the financial sector	• Guiding principles, current trends • Regulatory developments, key risk	August 2004
	Report on credit risk transfer (CRT)	• Degree of risk transfer achieved by instruments/transactions • Agents' understanding of risks involved • Concentration risk due to CRT	October 2004
FSF	Twelfth meeting and progress report	• Financial system vulnerabilities • Financial sector regulation • Issues relating to prior concerns	September 2004

[1] The Joint Forum was established in 1996 under the aegis of the Basel Committee on Banking Supervision (BCBS), the International Organization of Securities Commissions (IOSCO) and the International Association of Insurance Supervisors (IAIS).

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

the transition to the new framework. Not intended to be an interpretation of Basel II, the document summarises the discussion of the working group and offers suggestions that can be adapted in different jurisdictions.

BCBS advises no adjustment to measurement of capital due to IFRS

In a similar vein, following an earlier discussion of the potential impact of the implementation of international financial reporting standards (IFRS) on regulatory capital and whether this measure should be adjusted accordingly, the BCBS announced that, for the time being, it does not plan to encourage national supervisors to make adjustments to the existing capital adequacy framework, including the definition of capital.

Banking supervisors from 120 countries promise closer cooperation

At the 13th International Conference of Banking Supervisors (ICBS) in Madrid in late September, banking supervisors from over 120 countries pledged deeper cooperation to fortify the stability of the financial system and to encourage improvements in banks' management of risk. They discussed the implementation of the new international framework for bank capital

requirements as well as current issues in accounting. Specific emphasis was given to the need to reinforce the infrastructure for banking and supervision by applying the principles behind Basel II. The event aims to promote cooperation among national authorities in the supervision of internationally active banking organisations. It has been held biennially since 1979 and this year was organised jointly by the Bank of Spain and the BCBS.

Joint Forum

Joint Forum releases two reports, dealing with various aspects of outsourcing …

In August, the Joint Forum released a report entitled *Outsourcing in financial services*, recognising the global trend of internationally active financial services businesses increasingly relying on third parties to perform activities they would have previously undertaken themselves. The report examines the growth and other stylised facts of outsourcing and outlines the potential associated risks to individual firms in particular and the financial sector in general. It also presents a set of best practice principles for entities engaged in outsourcing activities, providing a minimum benchmark against which to gauge individual outsourcing efforts. The Joint Forum developed these principles in conjunction with the International Organization of Securities Commissions (IOSCO), which is producing a specific set of principles for the securities industry. The Joint Forum and the International Association of Insurance Supervisors (IAIS) will consider whether additional guidance on outsourcing for the banking and insurance sectors is necessary.

… and the impact of credit risk transfer on financial stability

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

Financial Stability Forum

FSF reviews vulnerabilities in the global financial system …

In September, the Financial Stability Forum (FSF) held its 12th meeting in Washington DC. The topics addressed fell into six broad categories: potential vulnerabilities in the international financial system; international financial sector standards; credit risk transfer; reinsurance; offshore financial centres (OFCs); and financial reporting.

With regard to *vulnerabilities in the international financial system*, there was broad consensus that the macroeconomic backdrop for financial markets had generally improved since the Forum's March meeting. Several previous downside risks had become less pronounced, and the resilience of key financial systems to shocks had increased further. Nonetheless, the FSF saw little room for complacency and discussed several areas meriting close

monitoring in the period ahead, including: the potential impact of removing policy stimulus; the possible effect of sustained high oil prices on growth and inflation; continuing fiscal and external imbalances in several countries; ongoing uncertainties about the trajectory of the Chinese economy; and the resilience of emerging market economies to these developments. Members also reviewed financial sector vulnerabilities. They noted strengthened levels of capital in the financial system and discussed potential sources of heightened market volatility and impairment of market liquidity. The Forum also discussed the impact of rising inflows to hedge funds on market functioning and on the risk profile of financial institutions, and the progress made to date to strengthen business continuity arrangements in key financial centres.

... encourages work on financial sector standards ...

On the issue of *financial sector standards*, ways of improving implementation in the banking, securities and insurance sectors were considered, based on the experience from the joint IMF/World Bank Financial Sector Assessment Program (FSAP).[2] Members discussed the treatment of preconditions for sound supervision and regulation, the consistency of implementation methodology, cross-sector and cross-border regulation, regulatory and corporate governance, and public disclosure. They concluded that these matters merited further attention from international standard setters, working with the international financial institutions.

... discusses initiatives on offshore financial centres ...

On *offshore financial centres* (OFCs), the Forum reviewed work in various international forums, notably the BCBS, the IMF, IOSCO and the Offshore Group of Banking Supervisors, to improve information sharing and cross-border cooperation between on- and offshore authorities on supervisory and regulatory matters. Cooperation and information sharing had generally improved, but problems continued to surround information exchange in connection with investigations involving violations of securities laws. The Forum concluded that further progress was necessary and that tools should be developed, based on objective criteria and due process, to recognise and catalyse improvements, drawing on assessments of OFCs by the IMF and IOSCO.

... and reports on developments on international accounting standards

Members were also informed of the latest developments in the area of *international accounting standards*, including future plans of the International Accounting Standards Board (IASB) and discussions on convergence between the IASB and the US Financial Accounting Standards Board.[3] As for *audit quality and auditor oversight*, members were concerned about delays to the establishment of the public interest oversight board to oversee IFAC's standard-setting activities and urged its speedy formation.

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[2] The FSAP is increasingly emerging as a global standard for national authorities and plays a key role in the new regular reporting framework on financial stability adopted by many central banks. See for instance the Reserve Bank of New Zealand's Financial Stability Report (www.rbnz.govt.nz/banking/fsr_oct2004.pdf) for a recent example of how the FSAP is used to benchmark national efforts.

[3] Subsequent to the Forum's main meeting, an October roundtable organised jointly by the FSF, the International Federation of Accountants (IFAC) and the IASB considered issues arising in the implementation of new IFRS in 2005.