

VI. Financial markets

Highlights

Conditions in global financial markets eased during the period under review, despite the tightening of monetary policy by the US Federal Reserve which began in June 2004. Even as short-term interest rates started to rise in the United States, long-term rates in the major markets fell, equity prices rose and credit spreads tightened. Many markets retreated in March and April 2005 owing to increased risk aversion and concerns about a pickup in inflation. Yet as of mid-May, bond and equity prices were still higher than when the Federal Reserve first began to raise rates.

Narrowing credit spreads and rising equity prices during much of the period suggested that investors in credit and equity markets were confident about corporate profits and the macroeconomic outlook. This confidence has been underpinned in recent years by significant improvements in fundamentals. In credit markets, structural changes that have facilitated hedging and promoted liquidity may also have contributed to the low level of spreads. Nevertheless, the willingness of investors to accept greater risk was a key source of support for credit and equity valuations. This willingness was in turn partly based on the persistence of an accommodative policy stance. Negative surprises in the US automobile sector contributed to a repricing of risk in credit markets in March and April.

The juxtaposition of low long-term yields with a seemingly robust economy and rising US policy rates was something of a puzzle – although yields did increase in the months prior to the first rate hike by the Federal Reserve. Taken at face value, the decline in long-term yields following the rate hike suggests that investors in government securities markets took a less sanguine view of fundamentals than credit and equity investors. Contained inflation expectations and diminished uncertainty about the course of monetary policy helped to keep yields down. More technical supply-demand factors may also have played a role. However, it is difficult to ascertain the relative importance of these various explanations for why yields remained so low.

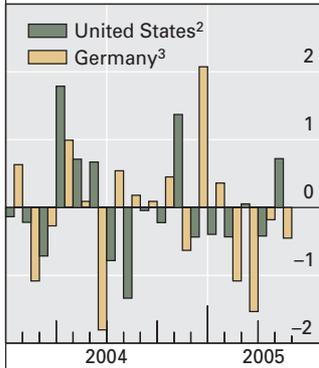
Yield curves and the low rate puzzle

The low and declining level of long-term yields in major markets following the turn of the US policy rate cycle surprised many market participants during the period under review. In contrast to previous periods of monetary tightening, when higher policy rates had been accompanied by higher long-term interest

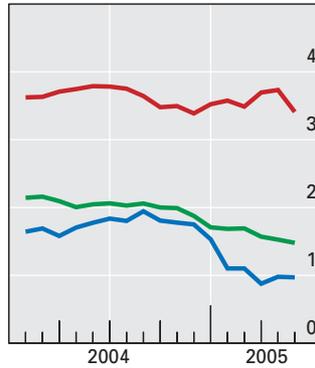
Low long-term yields despite policy rate hikes ...

Macroeconomic news

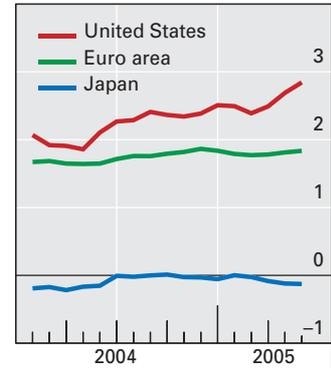
Macroeconomic surprises¹



Growth forecasts for 2005⁴



Inflation forecasts for 2005⁴



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

Sources: Bloomberg; © Consensus Economics; BIS calculations.

Graph VI.2

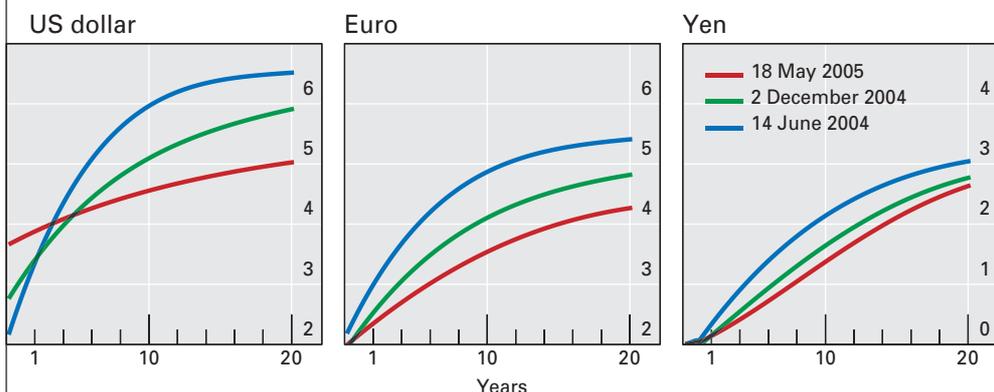
yen yields retreated further as macroeconomic news continued to disappoint in these economies. Between August 2004 and May 2005, the consensus forecast for GDP growth in the euro area in 2005 was revised downwards by a quarter, to 1.5%, and in Japan by half, to 1.0%. As a result, the differential between 10-year dollar and euro interest rates widened significantly, peaking at around 102 basis points in March 2005, the largest it had been since 1999.

Long-term yields bottomed out in mid-February 2005, as investors increasingly took the view that the market was due for a correction. This was particularly the case after the Federal Reserve Chairman termed the low levels a “conundrum”, and pressures on inflation and signs of greater corporate

A sell-off in early 2005 was of limited breadth and duration

Forward curves¹

In per cent



¹ Three-month forward rates derived from the Libor/swap curve.

Sources: Bloomberg; BIS calculations.

Graph VI.3

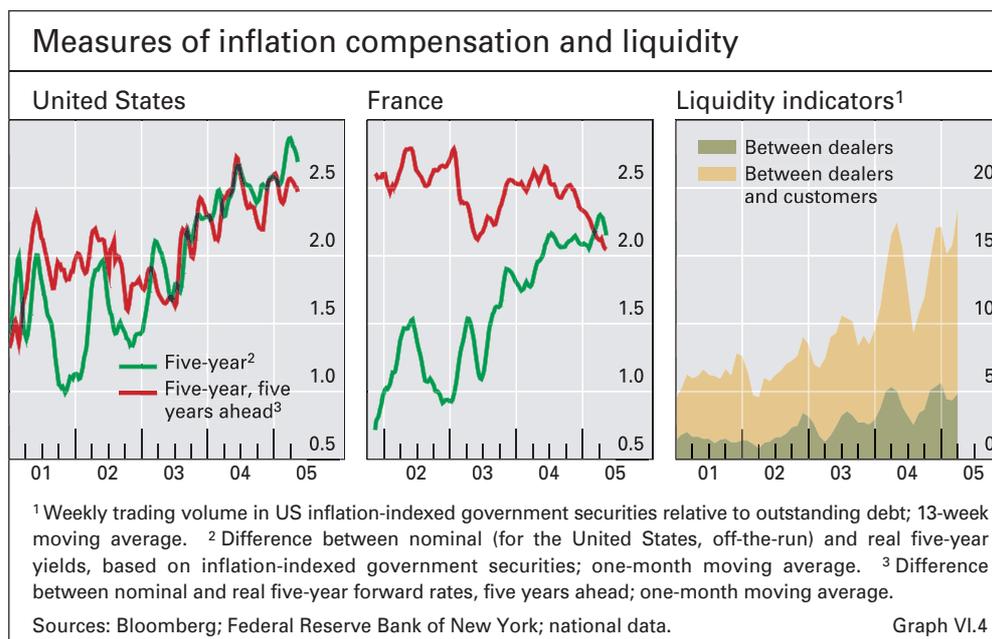
pricing power became more evident. From 9 February, 10-year Treasury yields rose by nearly 70 basis points in less than six weeks, and bund yields also picked up by around half of that amount. But this late winter sell-off was to prove much more limited than those in summer 2003 (which had resulted in a 130 basis point increase in 10-year yields) and spring 2004 (115 basis points). The breadth of the sell-off was also more limited; unlike in the earlier episodes, the Japanese market did not move markedly as yields on Treasuries rose. Disappointing economic data in April, including lacklustre payroll and retail sales reports, allowed Treasury yields to settle into a lower trading range, while bund yields hit new all-time lows in May (Graph VI.3).

Restrained inflation expectations

For most of the period, one factor contributing to the unusually moderate behaviour of nominal long-term rates was that long-term inflation expectations remained well under control. This was despite soaring oil prices and forecasts of robust economic growth in the United States. Evidence for this can be found in inflation-indexed securities, whose yield differential to nominal government securities provides a rough measure of the compensation required by investors for expected inflation. While the measure of inflation compensation on five-year bonds increased by around 20 basis points from mid-2004 to the end of April, the same measure for implicit five-year rates five years ahead declined by 12 basis points for US indexed securities, and even more markedly in the case of French euro-denominated inflation-linked bonds (Graph VI.4). Since the periods surrounding previous oil shocks, central banks have gained inflation fighting credibility in the minds of market participants.

Controlled inflation expectations were another factor dampening yields ...

Yields on inflation-indexed bonds incorporate liquidity premia, which can complicate the interpretation of inflation compensation measures. Nonetheless, recent increases in the turnover of US Treasury-indexed bonds suggest that



the depth and breadth of the market has improved considerably. The amount of turnover, relative to the stock of outstanding indexed debt, has grown steadily since 2000, both between primary dealers and other investors, and among primary dealers themselves (Graph VI.4, right-hand panel). Thus, while liquidity premia in inflation-indexed bonds may result in understated measures of inflation compensation, such biases are likely to have declined over time.

... but real rates also fell

At the same time, the yields on inflation-indexed bonds also indicate that a declining price of inflation compensation cannot be the whole explanation for the low level of long-term yields. Longer-term forward “real” rates also fell noticeably for both US and French indexed bonds, by around 80 and 50 basis points respectively from mid-2004.

Low volatilities and term premia

The decline in volatilities and term premia ...

Another frequently cited reason for low long-term yields during the period under review was a reduction in uncertainty about the economy in general, and the course of interest rates in particular. Lower uncertainty would normally result in lower term premia, which drive a wedge between short-term forward rates across maturities and the path of short rates expected by market participants. Indeed, both realised and implied volatilities on fixed rate contracts, already quite low by historical standards, fell further after the Federal Reserve began to raise rates. Many market analysts viewed the Federal Reserve’s clear communication of its intentions, including its unchanging signal that the pace of tightening would be “measured”, as contributing to this decline.

... has been most marked at the dollar short end ...

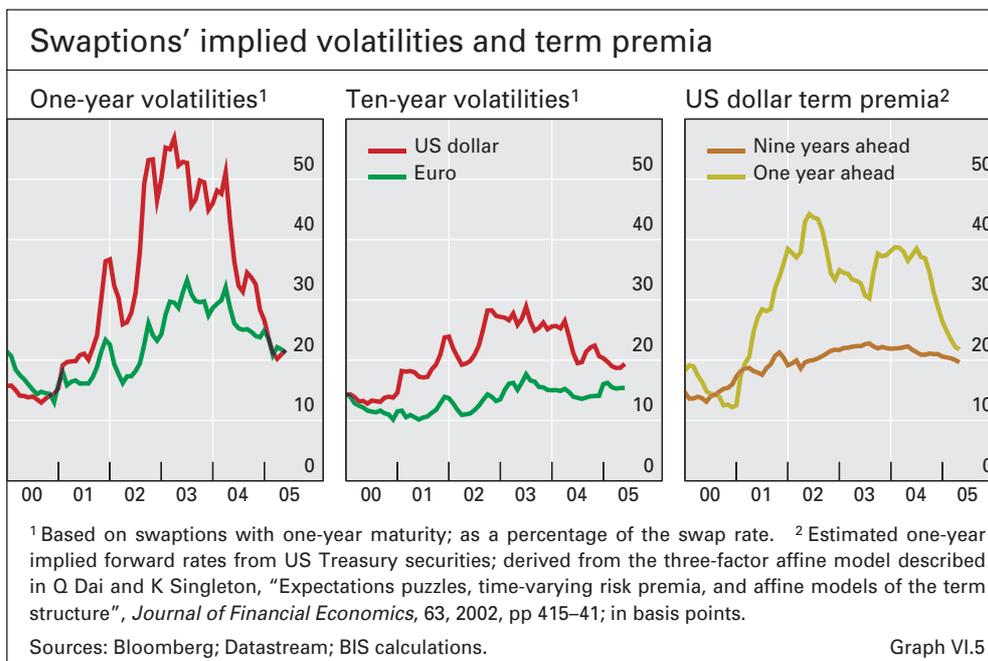
Consistent with this hypothesis, the principal decline in volatilities in developed fixed income markets since 2002 and 2003 has taken place at the short end of the curve. This is particularly noticeable in the implied volatilities from options on interest rate swaps (swaptions), the benchmark cost of funds for most global financial institutions (Graph VI.5, left-hand and centre panels). While the (annualised) implied volatilities on one-year US dollar swaps fell from 56.8% at their peak in 2003 to 21% at the end of April 2005, implied volatilities on 10-year dollar swap rates show much more muted peaks and troughs. (Volatilities in the euro swap market have followed a similar pattern, but at even lower levels.) Thus, the main source of volatility reduction in developed financial markets appears to have been short-term US dollar markets. Longer-term dollar and euro markets have remained relatively unaffected.

... consistent with reduced uncertainty about the course of monetary policy ...

There is indeed direct evidence that risk premia have declined principally at the short end. As estimated by a three-factor model of the yield curve, risk premia at the short end of the US Treasury curve appear to have fallen by nearly 25 basis points since early 2002 (Graph VI.5, right-hand panel). This is consistent with reduced uncertainty about the course of monetary policy over the near term. By contrast, the risk premium embedded in the one-year forward rate nine years ahead appears to have declined only marginally since late 2002, and stands at roughly 20 basis points.

... though unlikely to explain low rates at longer horizons

Thus, while declining volatilities and term premia may explain lower near-term forward rates, they appear not to explain the low forward rates that are currently apparent at long horizons. For instance, at the end of April 2005, forward short-term rates at the 10-year horizon were 4.8%. Given long-term



inflation expectations in the United States of around 2.5% and estimates of the real short-term interest rate consistent with stable inflation of 2.6–3.0%, the low level of forward rates at long horizons remains difficult to explain without much sharper declines in risk premia than those estimated.

Pension reforms and the demand for duration

In both the United States and the euro area, yield reductions were particularly pronounced at maturities beyond 10 years. Between mid-2004 and April 2005, the difference between the rate on the longest-maturity Treasury and the 10-year rate decreased by more than 50 basis points, while the 30- to 10-year bund spread narrowed by about half that much. In response, the French government launched a 50-year bond issue in March 2005 and other European governments also announced long-dated issues. However, the increased supply did little to dampen investor enthusiasm for ultra-long-dated securities. Even the widening of dollar term spreads that followed the surprise announcement in May this year that the US Treasury was considering reissuing the 30-year Treasury note after a five-year hiatus was relatively short-lived.

Many market participants cited prospective pension fund and accounting reforms as fuelling demand for long-dated paper. US Department of Labor proposals for pension reform announced in early January 2005 would significantly increase the interest rate volatility of duration mismatches, while plans for the Pension Benefit Guaranty Corporation to determine premiums on a risk-adjusted basis would raise their cost. In addition, independently initiated accounting reforms proposed a more timely recognition of duration mismatches in the financial statements of pension funds. It was felt that the combined impact of these measures, if enacted, would greatly increase the demand from US pension funds for long-maturity assets to counter duration mismatches. Similar reforms have been under discussion in various parts of

Yield declines were pronounced at very long maturities ...

... driven in part by prospective pension reforms

Europe, such as the introduction of international reporting standards and other pension reforms in the Netherlands and Sweden.

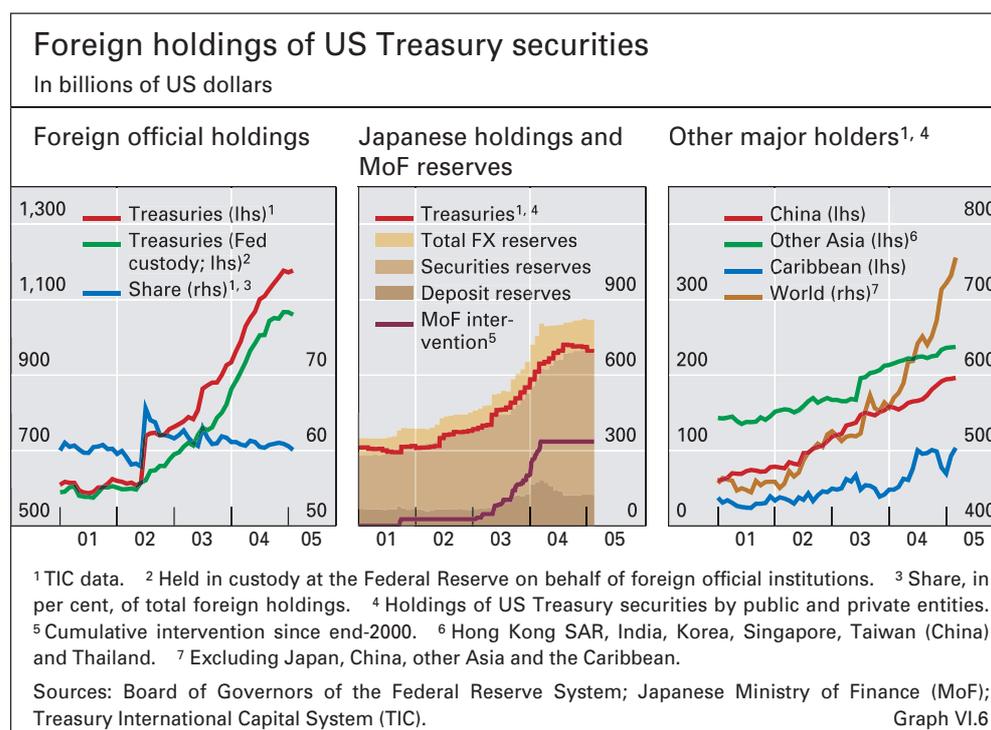
Recent historical experience elsewhere appears to justify the anticipation of a price impact of pension reforms on long-dated bonds, even prior to their actual implementation. The 1999 announcement of a review of pension regulations in the United Kingdom contributed to an inversion of the yield curve beyond 10 years that same year, although pension funds increased holdings of longer-duration fixed income instruments at the expense of equities only with a lag. In Denmark, where pension fund liabilities were marked to market starting in 2001, there was also a major impact on the pricing of long-dated bonds.

Reserve accumulation and the "Asian bid"

Asian authorities continued to accumulate reserves

Market participants have identified demand from Asian investors, in particular the recycling of foreign exchange reserves into US securities, as another potential contributor to the low level of yields in the United States. The efforts of Asian authorities to resist the appreciation of their currencies in the face of rising capital inflows led to the accumulation of an additional \$535 billion in Asian (including Japanese) reserves in 2004, pushing total Asian reserves to \$2.4 trillion. The source of this reserve growth shifted during the year from the Japanese Ministry of Finance, which ceased intervention operations, to central banks in other Asian economies. The recycling of a portion of these reserves contributed to the growth in total Asian holdings (both official and private) of US Treasury securities, which rose by an estimated \$219 billion in 2004, more than the increase in the rest of the world combined (Graph VI.6).

At the same time, the extent to which this strong Asian demand for US securities contributed to the low level of long-term yields in the United States

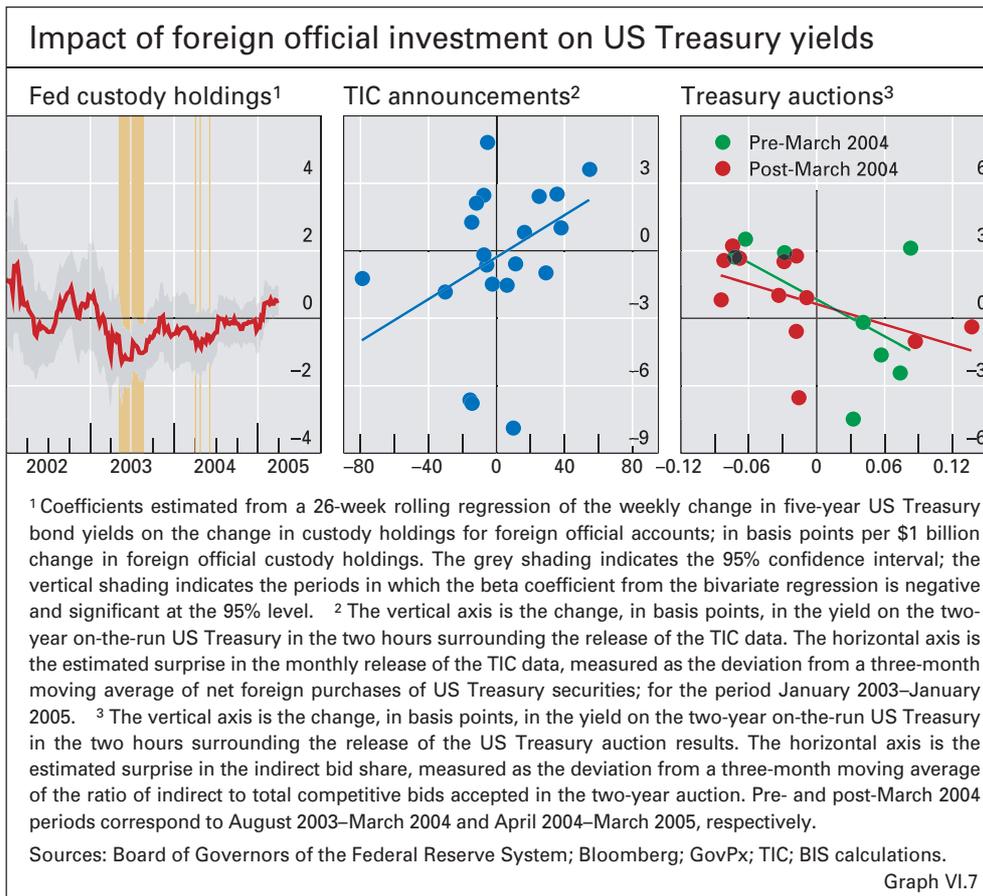


remains an open question. Some market participants have suggested that Asian purchases of US securities, particularly during the period of Japanese intervention, may have lowered yields by as much as 60 basis points, with estimates varying substantially depending on the maturity of the security, the time frame and the empirical methodology. However, a difficulty in empirically assessing this issue is the risk of falsely inferring a causal relationship; reserve managers may step up their purchases of US dollar assets *in response* to a decline in yields. This would be the case if intervention in support of the dollar seemed necessary following poor economic news from the United States, capital outflows to Asia and consequent upward pressure on Asian currencies.

It is plausible that Asian purchases of US securities affected US yields...

There is some evidence suggesting that any effect Asian purchases had on US yields waned even before the end of Japanese intervention in March 2004. A rolling regression of the weekly change in US Treasury yields on the weekly change in the stock of US securities held in custody at the Federal Reserve indicates that an association can be detected only intermittently (Graph VI.7, left-hand panel). The negative relationship for both five- and 10-year notes reached standard levels of statistical significance only between May and August 2003, fading out prior to March 2004. While this may indicate a weakened link between US yields and Asian purchases in 2004, it might also reflect the possibility that other Asian central banks channelled their investments into US securities in a less observable fashion.

... but the effects are difficult to identify in the data



Yields did not react to TIC surprises ...

There is scant evidence that the release of data which shed light on Asian purchases of US securities tended to move yields in a predictable way. Market participants closely follow the monthly Treasury International Capital (TIC) report, which aggregates net purchases of US Treasury securities by residents in individual countries, and provides an estimate of total foreign official holdings. Yet the Treasury market was unfazed by the relatively large \$22.5 billion surprise (based on a consensus forecast) in net foreign purchases in the November 2004 TIC report, and by the \$2.8 billion surprise in the December report. Looking further back, the TIC data release appears to have had little, if any, systematic impact on the US Treasury market: yields on two-year (or five-year) on-the-run US Treasuries did not seem to react negatively to estimated surprises in total net purchases (or foreign official purchases) of US securities over the past few years (Graph VI.7, centre panel).

... and reacted only marginally to indirect bid surprises

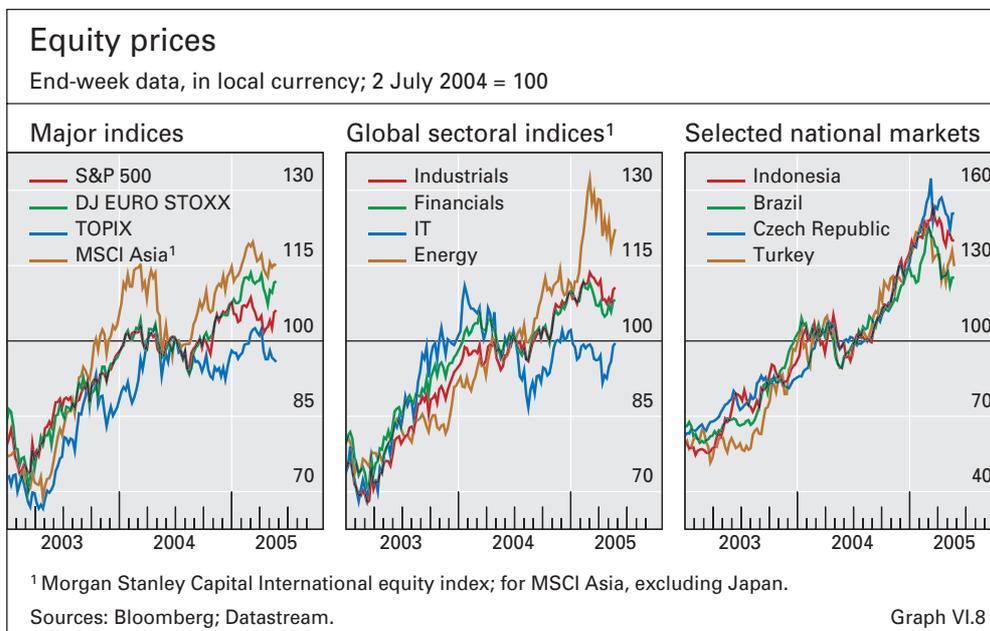
A similar exercise based on the announcement of the results of US Treasury auctions is equally inconclusive (Graph VI.7, right-hand panel). The indirect bid, ie the competitive bid for US Treasury securities that is placed by dealers on behalf of third parties, is often taken by market participants as a proxy for Asian central bank activity in the Treasury market. While it does appear that yields on on-the-run US Treasuries fall with a higher indirect bid share, this relationship is only marginally statistically significant for the two-year note, and is insignificant for the five-year note. Moreover, the effect seems considerably less pronounced after the cessation of Japanese intervention. Prior to March 2004, a 5 percentage point upward surprise in the indirect bid share – which averaged 40% over the May 2003 to March 2005 period – is associated with a 1.4 basis point fall in the yield on the on-the-run two-year note in the hours surrounding the release of the auction results. This result is slightly weaker when the role of other factors is taken into account, including the bid-to-cover ratio and the total auction size. After March 2004, this effect decreased to 0.8 basis points.

On balance, the above evidence suggests that any impact of Asian purchases on US yields weakened considerably following the period of Japanese intervention. However, such evidence should be interpreted with caution. The activity of other market participants, who possibly frontloaded purchases of US securities based on their expectations of trend Asian activity, may have clouded the direct relationship between yields and Asian purchases as proxied by Federal Reserve custody holdings. Moreover, the lack of a significant announcement effect may reflect inadequate measures of market expectations about the TIC report, and of the role of Asian central banks in the indirect bid in Treasury auctions. Finally, all of these estimates simply capture the marginal effect of purchases given the prevailing exchange rate regime. They cannot measure the impact that a combined change in exchange rate and portfolio allocation policies might have.

Equity markets and oil prices

Major equity markets rose only modestly ...

After rallying strongly in 2003, major equity markets rose only modestly during the period under review, with marked differences in growth rates across regions.



Markets in the euro area and Asia (excluding Japan) were the best performers, rising in local currency terms by 6.2% and 11.3%, respectively. By contrast, markets in the United States and Japan stagnated, with 1.4% and –4.9% growth, respectively, from mid-2004 to April 2005 (Graph VI.8). The best performing national markets included euro area acceding countries such as the Czech Republic and Hungary, Asian emerging markets such as India and Indonesia, and Latin American markets such as Brazil and Colombia, all of which recorded price increases of more than 20% in local currency terms. Among broad sectors, the energy industry unsurprisingly performed best, scoring a 20.9% return on a global basis, with industrials and financials also outperforming global indices at 5.7% and 4.4%, respectively; conversely, the technology sector suffered a negative return of –10%.

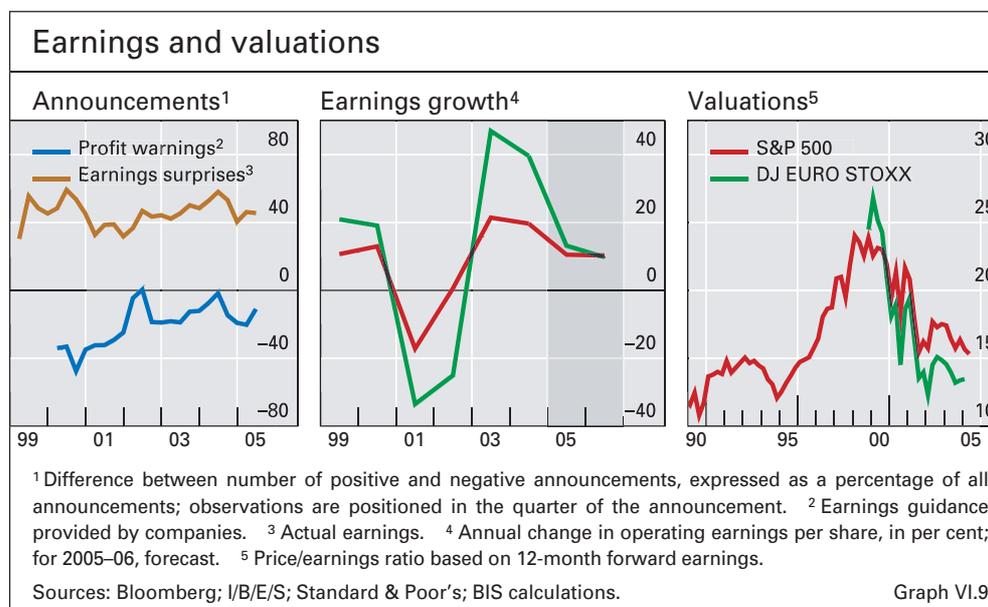
Robust earnings growth despite IT disappointments

Though down from the exceptional pace in 2002–03, earnings growth in both the United States and the euro area was still above 10% in 2004 and early 2005 (Graph VI.9). Earnings growth disappointed in late 2004, but the ratio of positive to negative earnings surprises for S&P 500 companies rebounded slightly in the first part of 2005. Profit warnings in early 2005 also showed improvement after a worsening in late 2004. To be sure, disappointing announcements by bellwether technology firms often drew attention, including in the summer of 2004 and early 2005. Even so, on balance, earnings announcements in the United States and euro area were respectable, with earnings of a number of major financial firms in particular coming in above expectations in the first quarter of the year.

... despite respectable earnings growth ...

Merger and acquisition activity and the prospect of corporate releveraging appeared to inject life into equity markets in early 2005. Several multibillion dollar mergers were announced in the United States in late January. In Europe, takeover speculation involving Italian banks provided positive support to market indices.

... and increased M&A activity



A stumble in March and April 2005

However, starting in March 2005, world equity markets stumbled. Macroeconomic news in the United States, in particular the disappointing retail sales, inflation and consumer sentiment numbers announced in April, appeared to weigh on global share prices. Consumer and business sentiment also turned down in Europe. In Japan, rising political tensions with China also contributed to deteriorating sentiment, including a 3.8% drop in the Nikkei 225 on 18 April, the sharpest drop in a single day since 10 May 2004.

Markets in the shadow of rising oil prices

Rising oil prices ...

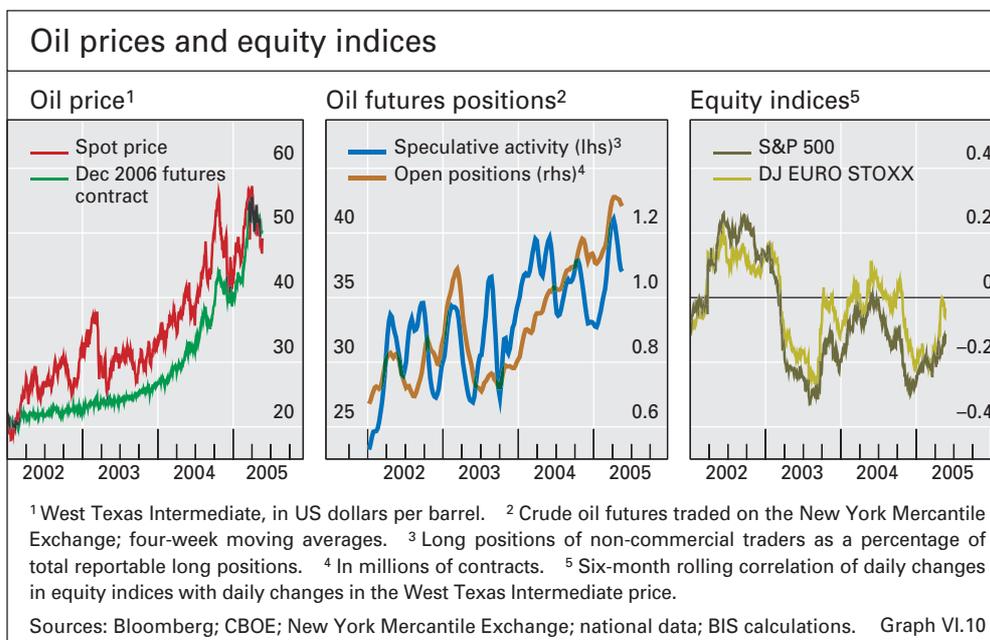
Growing demand in the face of short-term constraints on supply helped to push up oil prices, which in turn contributed to weakness in global equity markets over the period. By end-2004 the price of Brent crude had risen 34% over its end-2003 value, and another 32% by 31 March 2005. Long-term trends in the supply of and demand for oil, in particular the persistence of strong growth in large oil-consuming nations such as China and the low levels of excess capacity in the global oil industry, remained constant concerns (see Chapter III).

... marked by a burst of speculative activity ...

Speculative activity was often cited as a factor contributing to the most dramatic rise in oil prices in a decade. Data compiled by the US futures market regulator, the Commodity Futures Trading Commission, indicate that open positions – contracts entered into but not yet offset by a reversing trade or delivery – grew by more than 60% from late 2003 to end-March 2005. Moreover, non-commercial traders' share of long positions, though volatile, was significantly greater in 2004 (and the early part of 2005) than in both 2003 and 2002, consistent with the view that these traders substantially increased their activity in oil futures markets as oil prices rose (Graph VI.10). Even so, it is difficult to estimate the extent to which speculative activity in itself contributed to volatility in the market.

... weighed on equity markets

Sharply rising oil prices clearly weighed on equity valuations in developed markets. The six-month rolling correlations of daily changes in oil prices and



major equity indices in both the United States and Europe, which had turned sharply negative in early 2003 during the run-up in oil prices ahead of the Iraq war, turned significantly negative again in the second half of 2004 and into 2005, as oil prices and speculative activity rose. For the most part, market participants focused on the impact of higher oil prices on profit growth rather than on inflation per se. They apparently believed that, unlike the oil price shocks of the 1970s, the latest run-up in oil prices would not lead to an acceleration of inflation (see also Chapters II and IV).

Support from declining volatility and robust risk appetite

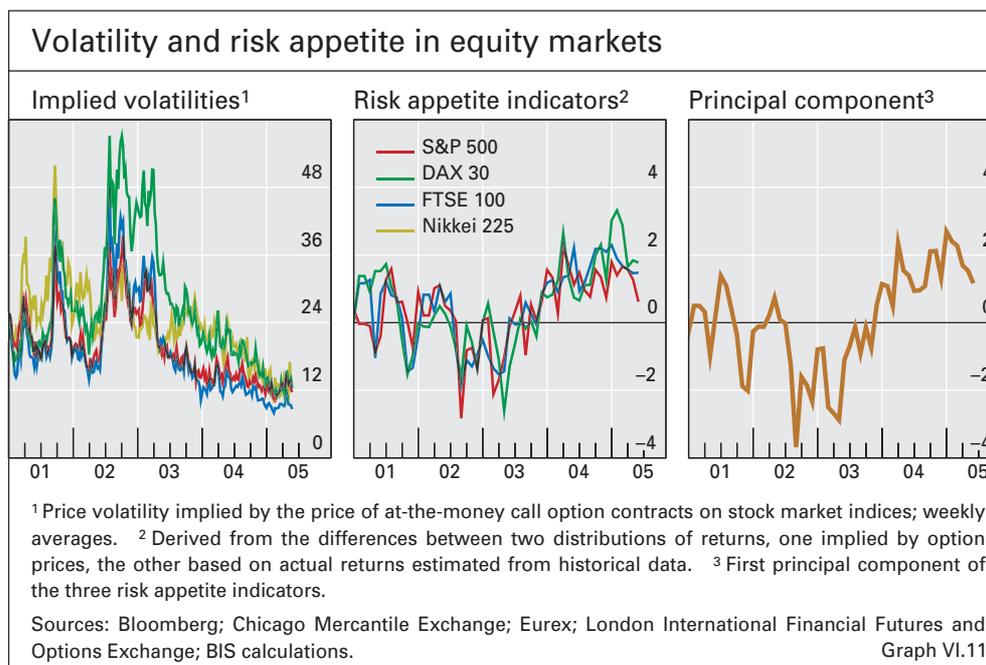
Declining risk premia, which encompass both the perception of risk and the appetite for risk, were a likely source of support for stock markets in the second half of 2004 and early 2005. Historical (and implied) volatilities on major equity market indices had fallen by early 2005 to their lowest levels in nearly 10 years. In addition, an estimate of risk appetite, derived both for different markets and globally from the pricing of equity index options and historical volatilities, edged up further during most of the period under review and remained well above its long-term average in early 2005 (Graph VI.11).

Declining risk premia reflected low volatilities and robust risk appetite ...

Swings in risk appetite in equity markets over the period appear to have been related, at least in part, to expectations regarding the Federal Reserve's willingness and ability to maintain a measured pace of rate rises. For instance, risk appetite dropped in January 2005 following the release of the minutes of the Federal Reserve meeting in December. The minutes led market participants to anticipate a faster pace of monetary policy tightening in the United States, though risk appetite recovered shortly thereafter.

The degree to which risk appetite influenced equity markets perhaps became clearest during the spring of 2005. It was then that developed country markets suffered significant losses despite earnings announcements which generally exceeded expectations. The combination of unprecedented difficulties

... though risk appetite fell back in spring 2005



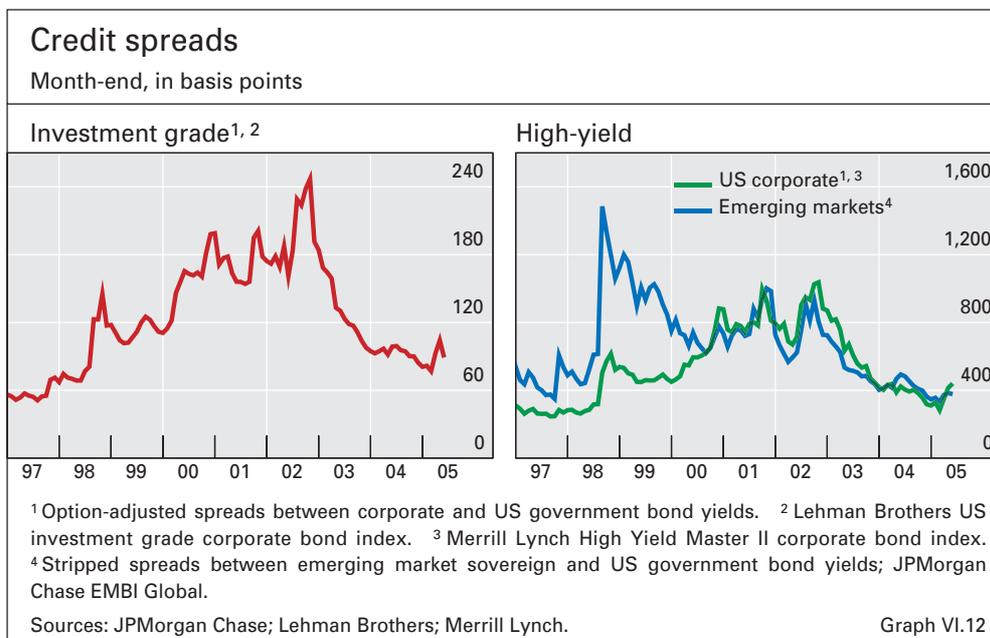
for major US automobile manufacturers, renewed corporate governance worries related to the insurance industry, and relatively weak macroeconomic data raised broader questions concerning the sustainability of earnings. While measures of historical volatility moved higher, implied volatility rose even further, and risk appetite dropped sharply in the United States, to levels last observed in February 2004.

The decline in equity markets in March and April, coupled with the continued strong growth of earnings, brought valuations closer to their historical average. In early 2004 valuations had looked somewhat stretched. However, by mid-May 2005 the price/earnings ratio, based on one-year forward earnings, had declined to 16 for the S&P 500 Index – not far above its 1985–95 average of 13 – and to 14 for the DJ EURO STOXX index (Graph VI.9). Forward earnings have in the past tended to be overly optimistic, and expectations for earnings growth in excess of 10% in 2005–06 – well above nominal GDP growth – could yet disappoint.

Loss of momentum in credit markets

The rally in credit markets that had begun in late 2002 continued in 2004 before reversing in March and April 2005. For much of the period under review, credit investors exhibited more confidence in the near-term outlook than equity investors. Spreads on all types of debt – corporate and sovereign, investment grade and high-yield, unsecured and asset-backed – tightened during the second half of 2004 and into the beginning of 2005 (Graph VI.12). By February 2005 corporate spreads had fallen close to their historical lows and emerging market spreads had dipped below theirs. Credit markets subsequently sold off as investors turned more risk-averse. In mid-May 2005, spreads on A-rated corporate bonds denominated in US dollars stood at 78 basis points, 14 basis

Spreads fell close to historical lows in early 2005



points above their February 2005 level, largely unchanged from their level a year earlier, and 33 basis points above their October 1997 low. In mid-May 2005, spreads on emerging market debt traded at 383 basis points, 38 basis points above their February 2005 level but well below their level of a year earlier and even their October 1997 low.

Credit quality: signs of peaking?

Credit investors' confidence was underpinned by a significant improvement in credit quality in 2004. In the major economies, the incidence of corporate defaults and credit rating downgrades – which in 2001 had been near historical highs – fell to levels last seen in 1997, at the peak of the previous credit cycle (Graph VI.13). Downgrades accounted for 54% of US corporate rating changes by Moody's in 2004, down from 83% in 2002 and similar to levels in 1998. In addition, the burden of interest payments on cash flows – a commonly referenced short-term predictor of corporate distress – declined to its lowest level for many years.

In emerging markets too, economic and financial conditions were stronger than they had been for years. While high commodity prices supported some countries, improvements in external positions, financial systems and fiscal and monetary policies made many emerging markets more resilient to shocks (see Chapter III). In 2004, sovereign rating upgrades outnumbered downgrades by a ratio of almost 5:1.

The general improvement in credit quality notwithstanding, some borrowers experienced difficulties. The troubles of US automobile manufacturers stand out, especially those of General Motors, one of the largest issuers in the US corporate bond market. A series of weak earnings reports and negative rating announcements, including a downgrade to below investment grade, caused General Motors' credit default swap (CDS) spreads to soar from approximately 200 basis points in mid-2004 to 280 basis points by year-end and over 900 basis

Significant improvements in credit quality ...

... but difficulties in some sectors, especially autos

points in April 2005. Other sectors in difficulty included insurance and pharmaceuticals, both of which faced increased scrutiny from US authorities following revelations of improper sales practices (on the insurance sector, see Chapter VII). Among sovereign borrowers, fiscal problems led rating agencies to downgrade the Philippines, while political uncertainty adversely affected Ukraine and Ecuador, among others.

For most of the period under review, such difficulties were regarded by investors as idiosyncratic events, not symptomatic of broader credit problems. However, starting in late 2004 developments increasingly suggested that corporate credit quality might be peaking. In the United States in particular, firms stepped up their borrowing (Graph VI.14). For 2004 as a whole, outstanding bank debt and commercial paper increased for the first time since 2000. In addition, US corporations' accumulation of cash and other liquid assets slowed in late 2004 from the exceptionally fast pace recorded in 2003 and the first half of 2004.

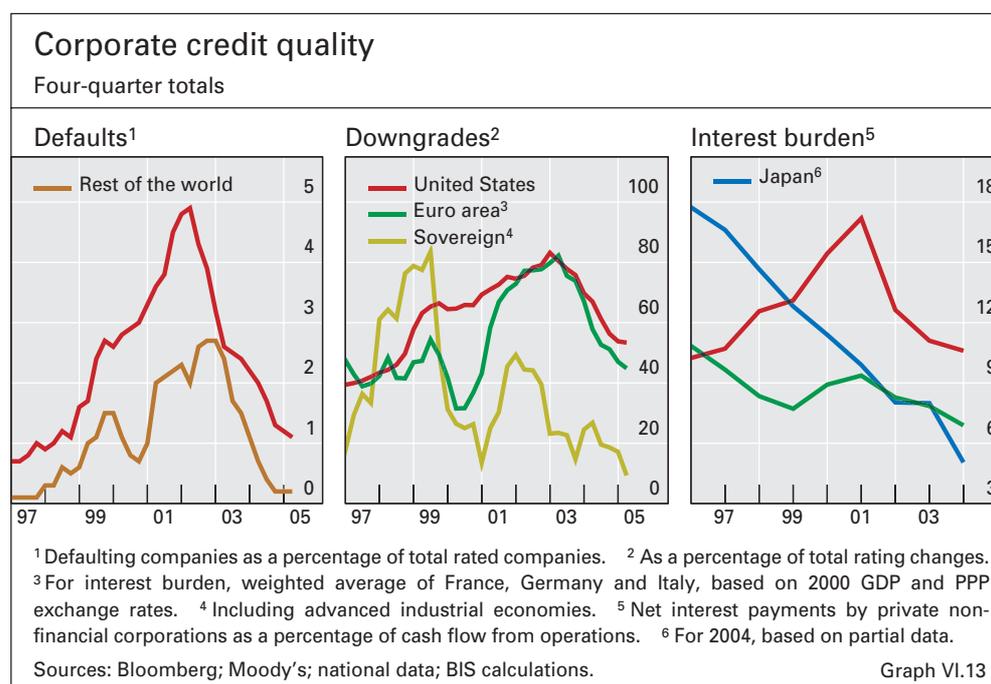
The apparent rise in US corporations' financing needs was driven in large part by an expansion of capital spending and acquisitions (and so was not necessarily detrimental to credit quality). Business investment in the United States picked up sharply in 2004 following three years of little change (see Chapter II). Mergers and acquisitions rebounded from their cyclical lows. Many of the deals were financed with equity or surplus cash, but a significant proportion relied on debt. The increase in capital spending and acquisitions coincided with a slowdown in profit growth, thereby limiting firms' ability to draw on internally generated funds.

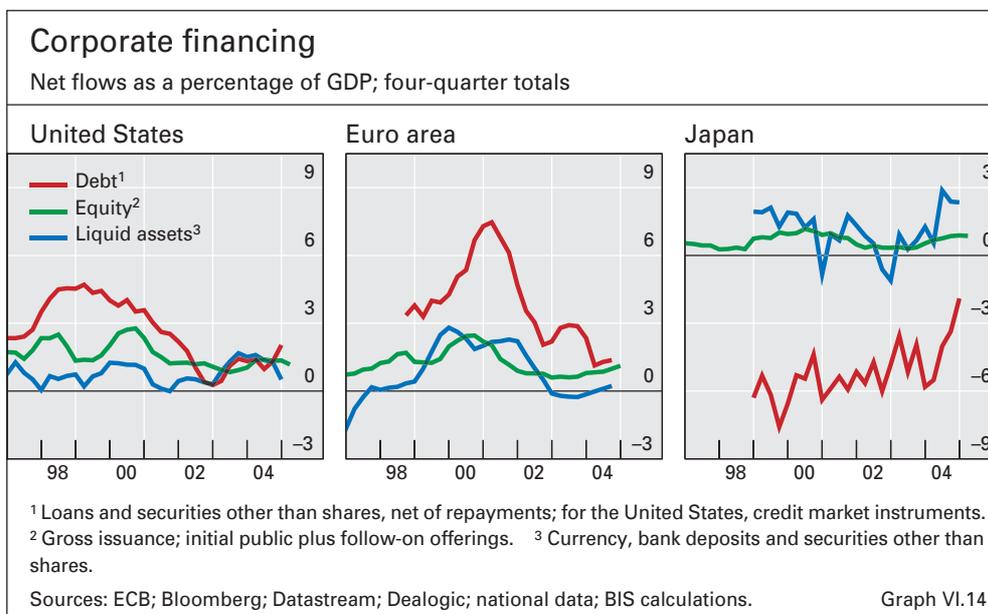
The financing needs of US corporations were further boosted by efforts to improve returns to shareholders. Many firms raised their dividend. Among S&P 500 companies, dividends per share rose by 12% in 2004, compared to an

Increase in US firms' financing needs ...

... driven by capital spending and acquisitions ...

... as well as shareholder-friendly actions





average annual increase of 3% over the previous decade. Some firms also began to re-leverage their balance sheets. Stock buybacks in 2004 topped their previous high, set in 2000. While the primary motivation for such buybacks was to offset employee stock options exercised during the year, a number of companies opted to operate with higher debt/equity ratios. Indeed, stock buybacks and dividend payouts were one of the main drivers of issuance in the corporate bond market in 2004, and leveraged or management buyouts accounted for a sizeable proportion of activity in the high-yield bond and syndicated loan markets.

In Europe, the need to continue to shore up balance sheets was more in evidence. To be sure, as in the United States, many large listed companies raised their dividends and announced plans to buy back their shares. Leveraged buyouts also increased, with private equity firms becoming more active in many European countries. However, in contrast to the United States, borrowing by the corporate sector slowed further in 2004, to its lowest level for years. Still weak capital spending coupled with double digit profit growth limited firms' need for external financing. In addition, changes in banks' lending practices may have prompted those firms which have historically relied on banks for funding – mainly unlisted small and medium-sized enterprises – to reduce their leverage. Finally, some firms turned to equity markets to raise new capital. While there were relatively few initial public offerings in 2004, listed companies raised record amounts through follow-on offerings, especially banks and telecoms companies.

Japanese companies continued their decade-long effort to strengthen their balance sheets. In 2004, earnings grew at their fastest pace for years. Rather than use higher cash flows solely to accelerate repayments, however, firms elected to increase their capital spending and build up their cash reserves. The pace of debt reduction thus slowed sharply in 2004, although repayments exceeded new borrowing for the ninth consecutive year.

Japanese firms reduced their debt for the ninth consecutive year

Shifts in risk aversion

With credit quality appearing stronger than it had for years, sovereign and corporate spreads were further influenced by investors' willingness to discount risks. Continuing a trend that had begun in 2003, for much of the period under review investors drove up the prices of risky or illiquid assets in their search for higher yields. However, in March 2005 event risk re-entered the investor's vocabulary. Following a profit warning by General Motors, credit markets in March and April gave up all of the gains made over the previous 12 months (Graph VI.15).

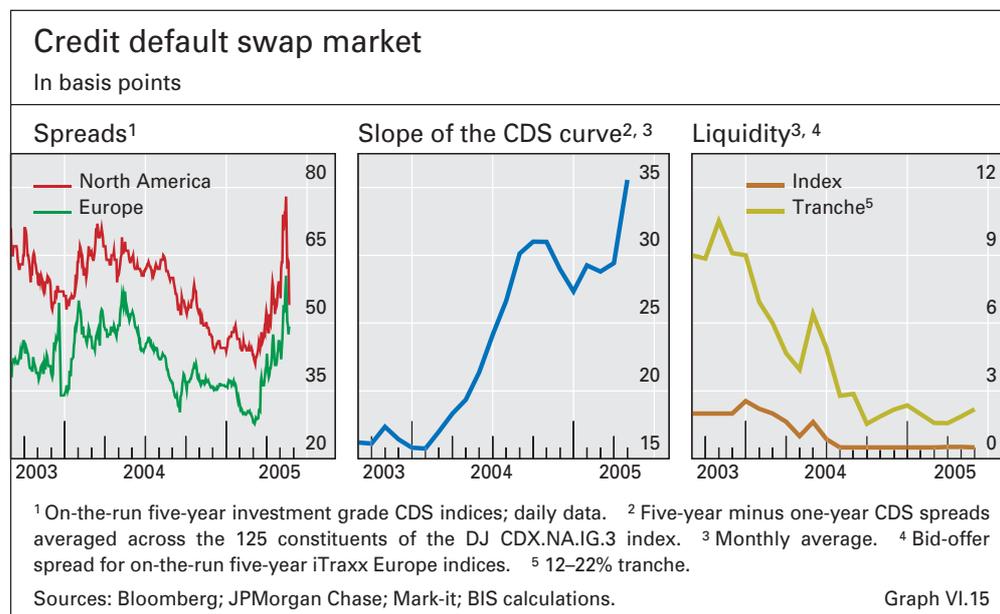
Risk aversion fell to new lows in late 2004

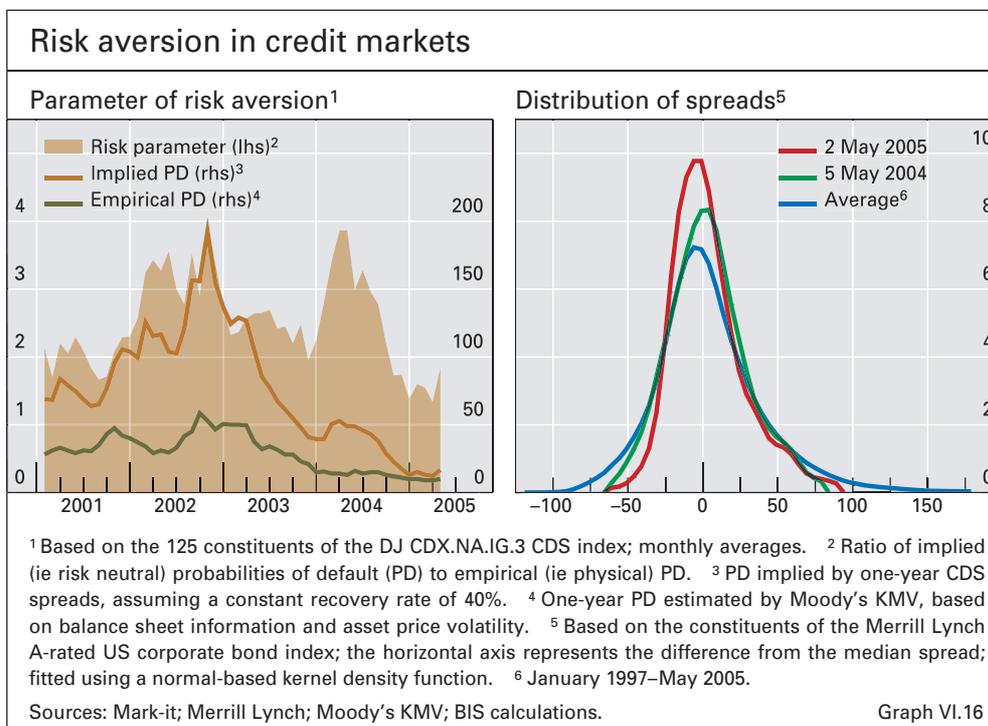
A comparison of changes in default probabilities and credit spreads shows how the risk premium demanded by investors has shifted over time. Default probabilities derived from credit spreads are conceptually equivalent to those derived from underlying balance sheet information multiplied by some parameter for risk aversion. An estimate of this parameter is plotted in the left-hand panel of Graph VI.16. Risk aversion in CDS markets appeared to peak in mid-2002, following the collapse of WorldCom. It declined sharply in late 2002 and throughout 2003 before rising temporarily in the first quarter of 2004, during the global sell-off in bond markets. In CDS markets, the estimated rise in risk aversion in early 2004 was exaggerated by the unwinding of leveraged trades. Risk aversion then fell to new lows in late 2004 but rebounded in March and April 2005.

Measures of discrimination in corporate bond markets yield a similar result. The narrowing of the distribution of credit spreads for issuers in a given rating class suggests that in early 2005 investors did not distinguish between issuers as clearly as they had previously (Graph VI.16, right-hand panel). Even after the sell-off in credit markets, A-rated spreads clustered together more closely than they had on average since 1997. The same was true for other rating categories.

Strong demand for assets offering a pickup in yield

Strong demand for assets offering a pickup in yield provides further, albeit rather indirect, evidence of investors' willingness to assume risk. Structured products, such as collateralised debt obligations (CDOs), were especially





popular (see below). The senior tranches of structured products are usually highly rated, often AAA, yet because of their complexity, illiquidity and risk-return characteristics they yield substantially more than comparably rated corporate bonds. Attracted by the steepness of the credit curve, investors also shifted into long-dated instruments. The term premium between five- and one-year CDS spreads declined in late 2004 before rebounding in April 2005, during the sell-off in credit markets (Graph VI.15).

Taking advantage of investors' receptiveness to innovative, higher-yielding structures, emerging market borrowers stepped up their issuance of local currency bonds. In August 2004, Uruguay became only the second sovereign rated below investment grade to issue a global bond denominated in its own currency (Argentina was the first, in 1997), and in November Colombia became the third. Brazilian firms soon followed with real-denominated global bonds. Such structures also help emerging market borrowers reduce their vulnerability to currency mismatches (see Chapter III).

One important reason for the decrease in the premium demanded by investors for bearing risk is the perceived strength of underlying economic conditions. Over long horizons, risk appetite tends to be procyclical, rising when fundamentals are seen to improve and falling when they deteriorate. For example, robust global growth supported the decline in risk aversion in 2004, while downward revisions to global growth forecasts probably amplified the sell-off in credit markets in March and April 2005.

Changes in the composition of market participants represent another possible proximate factor behind the decline in effective risk aversion. The growth of the CDO market and the consequent demand from CDO managers for riskier debt – the “structured credit bid” – may have changed the collective

Low risk aversion was supported by strong growth ...

... changes in the composition of market participants ...

risk preference of participants active in credit markets (see below). The growing presence of hedge funds in credit derivatives and structured finance markets may have had a similar impact (see Chapter VII).

... and low policy rates

Last but not least, the low level of policy rates in the major markets appears to have had an influence on investors' disposition towards risk. To the extent that low policy rates have cut the cost and increased the availability of financing, they may have reduced carrying costs and boosted collateral valuations. This in turn can lead to greater risk-taking. The influence of low policy rates also operates by interacting with other determinants of risk aversion, for example by facilitating leveraged trades. Furthermore, in the presence of psychological biases and institutional constraints, low interest rates may simply trigger a search for yield. As discussed in the *74th Annual Report*, many investors seem hesitant or even unable to adjust their nominal target rates of return in response to fundamental changes in market conditions. Faced with historically low nominal yields on highly rated government securities, investors may in recent years have taken on additional credit risk in an effort to sustain the nominal returns that they were able to achieve when interest rates were higher.

Credit spreads, event risk and policy rates

A further repricing of risk could be precipitated by event risk ...

To the extent that investors may have underpriced risk, credit markets could still be vulnerable to a more severe repricing than occurred between March and May 2005. One possible trigger could be event risk. As indicated by the events of March 2005, difficulties in a particular sector or even for a particular borrower can have market-wide consequences. The sell-off in credit markets that followed General Motors' profit warning evoked memories of 2002, when investors' experience with WorldCom made them wary of holding debt susceptible to being downgraded and sensitised them to the prevalence of corporate governance irregularities. Nevertheless, credit markets adjusted smoothly in early May to the eventual downgrade to below investment grade of Ford and General Motors, even though the amount of debt owed by the two car makers was far larger than that owed by WorldCom.

... or higher policy rates

Another possible trigger might be an unexpected increase in policy rates. Rate hikes to date have been widely anticipated. Consequently, any repositioning by investors has been accommodated with little disruption in credit markets. A larger than anticipated rise in policy rates might have less benign consequences. For example, it might result in sizeable declines in collateral valuations, which in turn could lead investors to retrench towards less risky assets. The unwinding of leveraged positions might exacerbate the sell-off in those markets in which hedge funds and other leveraged investors are active, such as the market for emerging market debt.

The consequences of such a repricing are hard to assess. They would in part depend on the underlying strength of the economy. In the absence of a significant and unexpected deterioration in fundamentals, underlying conditions might help to anchor expectations and so mitigate the impact of event risk. Similarly, the impact of higher policy rates on risk aversion and credit quality might be offset by robust economic growth. This is arguably less true for emerging market borrowers, who are unlikely to benefit as much as US

companies from the growth of the US economy. It would also depend on market factors that affect the amount and distribution of risk in the system. Uncertainties in this regard have been increased by fundamental structural changes in credit markets in recent years.

Structural changes in credit markets

Amongst the most significant developments in finance in recent years has been the emergence of new securities for transferring credit risk. Investors now have many new outlets for expressing credit views. Moreover, financial institutions, traditionally the primary holders of credit risk, are now able to hedge and manage risk in a more efficient manner. This has been facilitated, in particular, by the development of CDS-based products and CDOs.

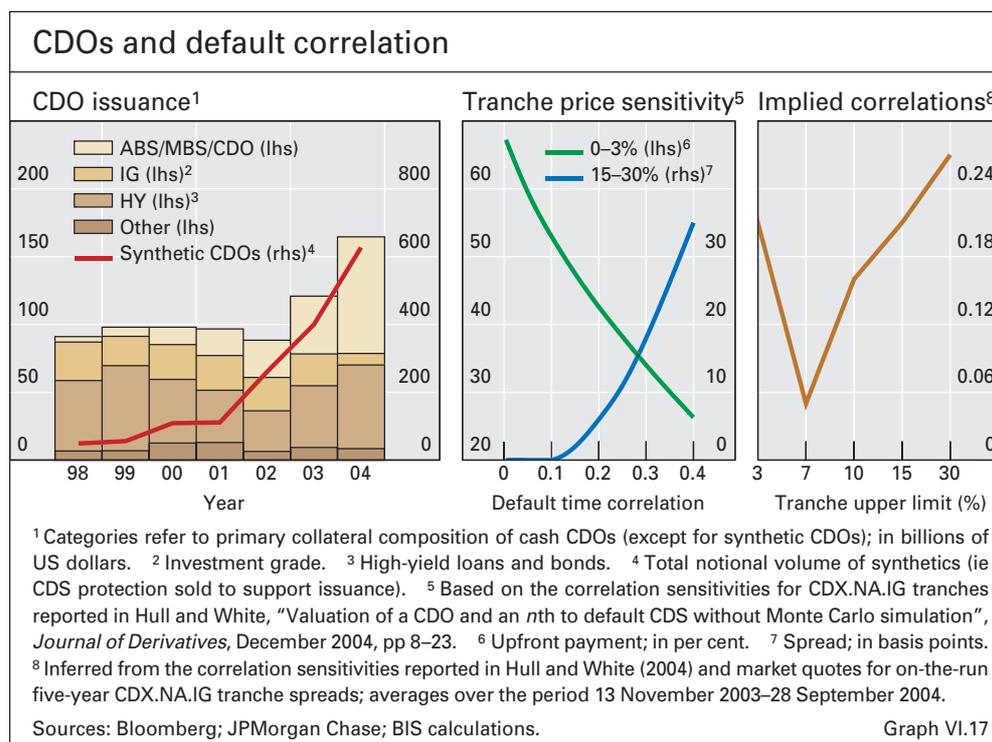
Exponential growth in the CDS market has been a key element of the transformation in credit, giving investors an accessible outlet for taking on exposure to or hedging the default risk on individual obligors. The notional amount outstanding on CDS contracts globally reached \$4.5 trillion at end-June 2004, up sixfold from end-June 2001. The main step forward in the CDS market during the period under review was the establishment of benchmark indices for single-name CDS spreads. Contracts linked to these indices are now widely traded, something that has not yet been achieved with traditional corporate bond indices. In addition, the indices serve as the basis for standardised derivatives, notably CDS index tranches (a type of synthetic CDO) and credit default swaptions.

The broader CDO market has also developed in new directions, allowing investors to customise their portfolios in increasingly sophisticated ways.

Significant changes in credit markets include ...

... the emergence of standardised CDS-based securities ...

... and new types of CDOs



Although precise figures are difficult to obtain, one estimate puts issuance in the cash CDO market during 2004 at roughly \$165 billion; synthetic issuance was estimated to be even larger, at \$673 billion (Graph VI.17). Much of the activity last year was driven by the search for yield, and was concentrated on tailor-made CDO tranches, structures with collateral pools consisting of high-yield loans and structured finance securities, and more highly leveraged products such as CDOs of CDOs (“CDO-squared”).

Even though these new credit markets are still relatively small in size, recent innovations have arguably transformed the trading and management of credit risk on a permanent basis.

Economic benefits of credit market innovations

Benefits of recent innovations:

Innovations in credit derivatives and structured credit have brought many benefits to the financial system. These include: improved opportunities for diversification and position-taking in specific types of credit risk, notably credit correlations; expansion of the investor base across the credit landscape and the associated integration of markets; and increased depth of trading (“market liquidity”) in credit markets. Each of these is considered in turn below.

better diversification opportunities ...

First, markets are becoming more complete, giving investors greater diversification opportunities. Market participants can now take on long or short credit exposures more easily through single-name or index swaps in the major economies and even in some smaller regions, across sectors and across the spectrum of credit quality. Leveraged credit instruments such as CDOs allow investors to assume exposures to different segments of a default loss distribution through the purchase of tranches referencing a pool of securities. Moreover, the range of collateral in CDOs has expanded significantly during the past two years. The emergence of structured credit instruments means that different tiers of a portfolio capital structure are now actively marketed.

In particular, CDO tranches offer a more direct means of managing credit risk correlations. By trading securities that are highly sensitive to correlations, investors can more easily alter their exposure to systematic default and recovery risk. The high degree of liquidity of CDS index tranches, in part stemming from their standardised format, means that these risks are now traded more efficiently. To show how investors can gain exposure to correlation, Graph VI.17 illustrates how the shape of the portfolio loss distribution and the value of different tranches can change with respect to default correlation. In general, higher default correlation tends to decrease the riskiness (increase the value) of a first-loss (“equity”) tranche, whereas highly rated (“super-senior”) tranches become more risky. Thus, investors can manage correlation risk by taking long or short positions in different tranches.

... greater market integration ...

Second, credit markets are becoming more integrated, both in terms of the investor base and with other asset classes. A broader array of investors are implicitly taking on exposures across the credit spectrum through structured credit products. Activity by hedge funds, which face few portfolio allocation constraints, has risen substantially. Moreover, alongside banks, insurance companies and hedge funds, other asset managers are increasingly seeking mandates to invest in CDS-based products and CDOs. Investors have also

started to employ more comprehensive strategies that bridge interest rate, credit and equity markets, and many trading desks have been reorganised to reflect this greater integration.

Third, these new instruments have increased liquidity in credit markets, including through the emergence of genuine two-way markets. Volumes have grown considerably and bid-offer spreads on CDS indices and index tranches have narrowed to very low levels. They are now under 1 basis point on the broad European investment grade index, and roughly 4 and 2 basis points on the junior mezzanine (3–6%) and super-senior (12–22%) tranches, respectively (Graph VI.15, right-hand panel). By contrast, the corporate bond market remains relatively illiquid, and supply has been particularly scarce during the past few years as a result of corporate deleveraging.

... and increased liquidity ...

Taken together, these beneficial effects on the credit market should lead to a general reduction in financial risk in the long run, and in particular to lower average credit spreads. Better diversification of portfolios should reduce single-name risk premia, and the increased depth and breadth of the market should lower liquidity premia. To be sure, the extent to which these effects have contributed to the recent low level of credit spreads is an open question. Even so, there is some evidence to suggest that the so-called structured credit bid, coming from the high demand for collateral by CDO arrangers, has indeed lowered spreads.

... leading to lower risk in the long run

Despite the many recent innovations, there remains ample room for further development of the markets. For instance, a futures market in credit remains elusive and trading in credit default swaptions – options to enter a CDS contract – has been relatively thin. The introduction of market fixings on CDS index swaps in March 2005 should help foster growth in these and other CDS-based derivatives markets.

Key areas of uncertainty

Along with the many benefits deriving from recent innovations come potential risks, particularly given the early stage of market development. Two areas of concern stand out: product complexity and market functioning under stress.

Despite progress, uncertainties remain, as ...

First, structured credit products are very complex securities and the risks involved might not be fully appreciated by all market participants. The covenants of many CDO contracts can be difficult to comprehend and deal complexity has posed many modelling challenges. Although efforts have been made to develop more realistic pricing models and risk management systems, many market participants are still building up their analytical capacity. One consequence is that rating agencies have played a key role in the development of the market. However, there is relatively little experience with the performance of ratings on CDOs, and rules of thumb employed by investors in using ratings on corporate bonds may be misleading when applied to highly leveraged structured instruments. Even at a more basic level, progress still needs to be made in understanding the nature of portfolio loss distributions, the risk profile of CDO tranches and their sensitivity to credit risk correlations. For instance, the “correlation smile” observed in the prices of CDS index tranches (Graph VI.17) suggests that standard portfolio risk models may be inadequate. These models

... structured products are highly complex and may contain hidden risks ...

assume that the links between all entities in the index are captured by a single correlation parameter, but in fact the spreads on different tranches imply different estimates of the correlation.

... and the robustness of these new markets has not been fully tested

Second, it remains to be seen how the CDS and CDO markets would handle a string of credit blow-ups or a sharp turn in the credit cycle. The strong credit conditions that have fostered the development of these markets may not continue into the future. One concern is the impact of highly leveraged positions on the balance sheets of financial institutions when markets turn. Another is the nature of the systemic role played by highly leveraged institutions such as hedge funds in affecting market liquidity; two-way markets could conceivably disappear as protection sellers exit at precisely those times when default insurance is needed most. In this regard, despite some indications of turmoil, the CDS and index tranche markets appeared to adjust in a mostly orderly fashion in response to recent events surrounding General Motors and Ford. Granted, the rating downgrades of these firms had been anticipated in credit markets for some time. Thus the events of spring 2005 might not be a true reflection of how these markets would function under stress.