VI. Financial markets

Highlights

Conditions in the major financial markets remained calm and accommodative for much of 2005 and early 2006, reflecting the surprisingly strong performance of the world economy and still abundant liquidity. The tightening of monetary policy in the advanced industrial countries resulted only gradually in higher long-term yields. During most of the period under review, higher interest rates had little discernible impact on the prices of other assets, although in mid-May 2006 a reassessment of risks led to increased volatility and sharp falls in equity and emerging markets.

Equity prices and credit spreads, in Japan and Europe especially, benefited from upward revisions to the growth outlook in 2005 and early 2006. Robust economic activity in the face of flattening yield curves led many market participants to conclude that the information content of the slope of the yield curve might have diminished, and that factors other than the long-term growth outlook might be weighing on long-term yields.

Another source of support for equity markets was changes in firms' capital structure. Last year saw an impressive pickup in dividend payouts, share buybacks and mergers and acquisitions. Credit spreads remained stable despite signs that the releveraging of the corporate sector had begun. Investors' high appetite for risk helped to keep spreads down. This was especially evident in emerging markets, where the tightening of spreads in 2005 and early 2006 appeared to proceed more rapidly than the improvement, admittedly sizeable, in fundamentals.

Long-term yields remained low

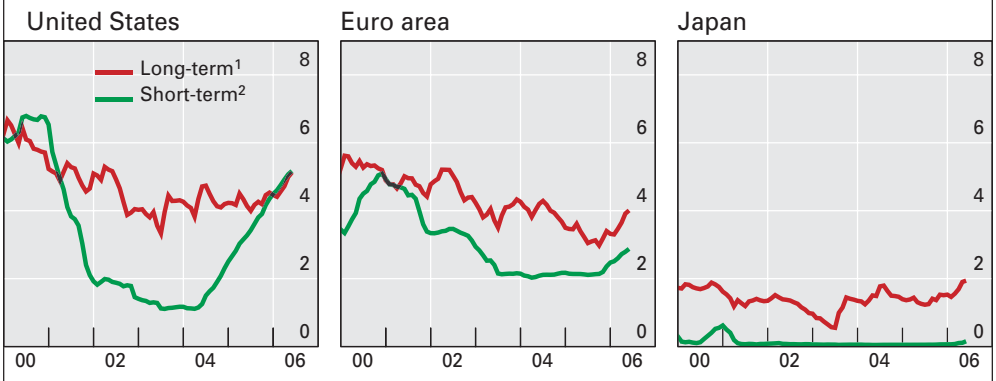
Long-term bond yields continued to trade at low levels ...

Government bond yields in developed countries continued to trade at remarkably low levels during 2005. This was so despite the ongoing US rate hikes by the Federal Reserve, signs of an imminent tightening of monetary policy in the euro area and increased speculation about the end of quantitative easing in Japan (see Chapter IV).

... before an early 2006 sell-off

Long-term yields in the G3 finally rose steadily from mid-January 2006 (Graph VI.1). At the time, concerns dissipated about possible weakness in the growth outlook and expectations were revised upwards regarding the pace and amplitude of prospective monetary tightening. Indeed, 2006 growth forecasts were scaled up for the euro area in the first quarter of the year, and quite sharply so for Japan (Graph VI.2). Increasingly hawkish rhetoric from the G3 central banks lent further momentum to the sell-off in bonds. From 18 January to 19 May, 10-year US Treasury and German bund rates rose by around 80 basis points, and Japanese government bond yields by around 50.

Interest rates



[1] Ten-year government bond yield; for the euro area, German bund. [2] Three-month interbank offered rate.

Sources: Bloomberg; national data. Graph VI.1

Flattening yield curves in the United States and the euro area

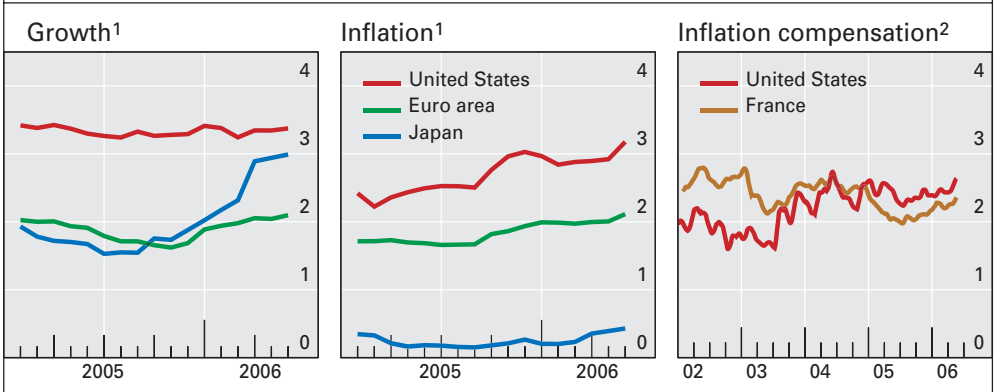
Yield curve flattening not taken as signalling a slowdown

Rising policy rates and low long-term bond yields resulted in a marked flattening of the US yield curve during much of the period under review. In the past, an inversion of the yield curve had proved to be a relatively robust indicator of an imminent recession or sharp slowdown (see Chapter IV). This time, however, most market participants interpreted the negative slope of the US term structure not as a sign of a macroeconomic slowdown but as the result of independent factors weighing on long-term yields (see below). From around 30 basis points at end-June 2005, the spread between two-year and 10-year rates declined to close to zero by early January 2006.

Hurricane Katrina's impact was temporary

Factors related to the growth outlook that did lower US yields were only temporary. These included, notably, Hurricane Katrina in late August. At that time, two-year rates declined by nearly 40 basis points over the course of three days, and longer-term rates by around half as much, as market participants

Forecasts for 2006 and inflation compensation measures

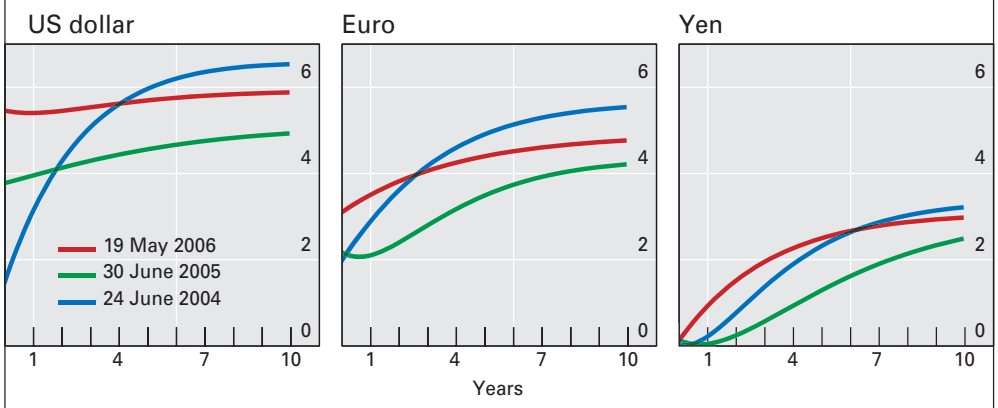


[1] Observations are positioned at the end of the month in which the forecast was made; change over the previous year, in per cent. [2] Difference between nominal and real five-year forward rates, five years ahead; 20-day moving average.

Sources: © Consensus Economics; BIS calculations. Graph VI.2

Forward curves[1]

In per cent



[1] Instantaneous forward rates derived from the Libor/swap curve.

Sources: Bloomberg; BIS calculations. Graph VI.3

revised sharply downwards their assessment of the likelihood of rate increases by the Federal Reserve. However, as the hurricane had a much smaller impact on growth and the resulting policy stance than initially foreseen, within a month rates on both the long and short end were back where they had been before the storm.

A flattening of the term structure was observed in other markets as well, but was by no means universal. For instance, the yield curve flattened in the euro area in 2005, though continuing low policy rates prevented it from inverting (Graph VI.3). In Japan, by contrast, the curvature of the term structure increased, as policy rates remained close to zero but medium-term rates rose in line with accumulating evidence that deflationary pressures were ebbing and speculation that a tightening cycle would be well under way in a few years' time.

Subdued inflation expectations

Inflation expectations stayed low despite rising energy prices

Long-term yields remained low in 2005 in part due to long-term inflation expectations. These were contained despite the generally good economic growth and continuing increase in energy prices during the period under review. To be sure, in the wake of Hurricane Katrina and sharp rises in the prices of refined petroleum products in autumn 2005, analysts' short-term forecasts of inflation moved noticeably higher, particularly in the United States (Graph VI.2). However, measures of inflation compensation derived from nominal and real forward bond yields remained subdued at longer maturities, in part reflecting the continued high credibility of monetary policy (see Chapter IV).

Real rates rose more than compensation for inflation in early 2006

Even when nominal yields rose markedly in early 2006, shifts in inflation expectations were not the dominant factor. Comparing the yields on nominal and inflation-indexed Treasury securities, nearly two thirds of the increase in US 10-year nominal yields between mid-January and mid-May can be accounted for by higher real rates, rather than higher inflation compensation.

In the case of the euro area, nearly nine tenths of the rise in 10-year nominal yields in early 2006 was due to increased real rates.

The rather limited effect of changing inflation expectations on long-term yields is also confirmed by other pieces of evidence. In particular, on a high-frequency basis, unexpected price index readings tended to have less of an impact on long-term yields than other data "surprises". For instance, the largest single daily increase in US 10-year yields (14 basis points) followed an unexpectedly upbeat report on manufacturing released by the Institute for Supply Management in combination with signs of improving consumer confidence on 1 July 2005. Similarly, some of the largest downward daily moves in yields tended to be associated with negative growth surprises.

Low volatilities and term premia

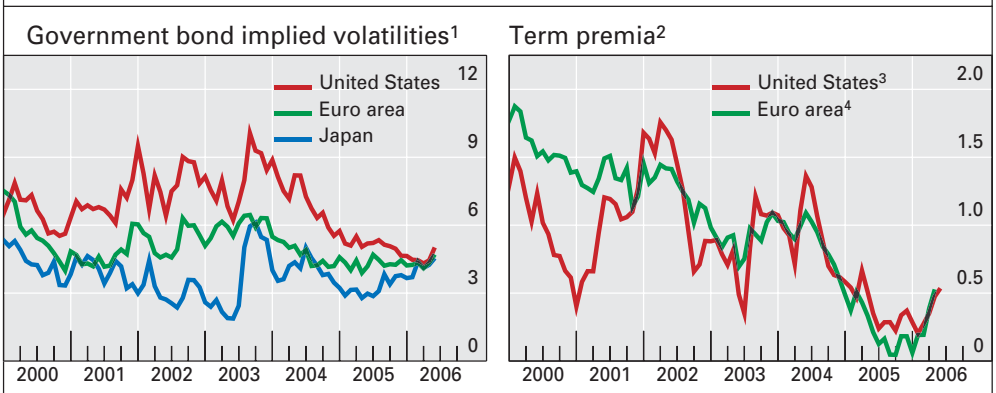
Lower term premia may explain flattening curves

Low long-term yields and flattening curves may also have reflected lower risk premia for holding long-term instruments. Yield curves at a given point in time incorporate risk premia – often referred to as term premia – that drive a wedge between forward rates across maturities and the path of short rates expected by market participants. A decline in these premia might capture either reduced perceptions of risk about the longer-term course of short rates or an increased appetite on the part of investors to bear that risk, or both.

There is indeed some prima facie evidence consistent with a role for decreasing term premia over the past few years. Not least, implied volatilities on long-term rates have generally been declining since mid-2003, and by early 2006 were at very low levels for the United States and the euro area, in line with observed movements in historical volatility over the period (Graph VI.4). An exception was Japan, where both realised and implied volatilities increased modestly starting in 2005, along with expectations of higher economic growth

Implied volatilities and term premium estimates

Monthly averages, in per cent



[1] Price volatility implied by the price of at-the-money call options on 10-year government bond futures contracts. [2] Estimated for 10-year zero coupon Treasuries in the United States and swap rates in the euro area. [3] Based on calculations in D H Kim and J H Wright, "An arbitrage-free three-factor term structure model and the recent behavior of long-term yields and distant-horizon forward rates", Federal Reserve Board, Washington DC, August 2005. [4] Based on calculations in T Werner, "An affine term structure model estimated with survey data", mimeo, ECB, April 2006.

Sources: ECB; Federal Reserve Board; Bloomberg. Graph VI.4

and the associated end of quantitative easing. Even there, however, both still remained well below the levels reached during the sharp bond market sell-off of 2003.

Modern models of the term structure of interest rates offer techniques to distinguish the component in bond yields due to term premia from that due to expectations about future short-term interest rates. Updated estimates from a recent study published by the Federal Reserve Board suggest that term premia on 10-year US dollar bonds declined by around 100 basis points between the time the Federal Reserve began to raise rates in mid-2004 and the end of 2005 (Graph VI.4). This was followed by only a modest correction in early 2006. A similar study at the ECB estimates a decline in term premia for 10-year euro rates of a roughly similar magnitude. Both studies find term premia decreases to be more pronounced for longer maturities, and thus consistent with curve flattening observed over the period. Admittedly, estimates of term premia have their limitations, including great uncertainty about their accuracy, and high sensitivity of the estimates to sample size and time period. Even so, most other studies also suggest that some decline in term premia has taken place over the last few years.

Lower term premia may reflect improved fundamentals or structural factors

Term premia might have declined due to greater perceived stability in macroeconomic fundamentals, such as inflation and growth, and thus lower perceived risks in holding long-dated securities. The decline in historical volatility for longer-term interest rates, mentioned above, is consistent with a moderation in risks. Greater transparency and credibility of monetary policy, particularly to the extent this reflects permanent changes in operating procedures, may well have been an important part of the story.

Structural demand factors might also have played a role. These include purchases of long-term bonds by pension funds and insurance companies, as well as the build-up of reserves by central banks in East Asia and several oil-exporting countries. The degree to which demand factors such as these might be contributing to low long-term rates has important implications for the conduct of monetary policy (see Chapter IV).

Institutional demand factors: pension funds and insurance companies

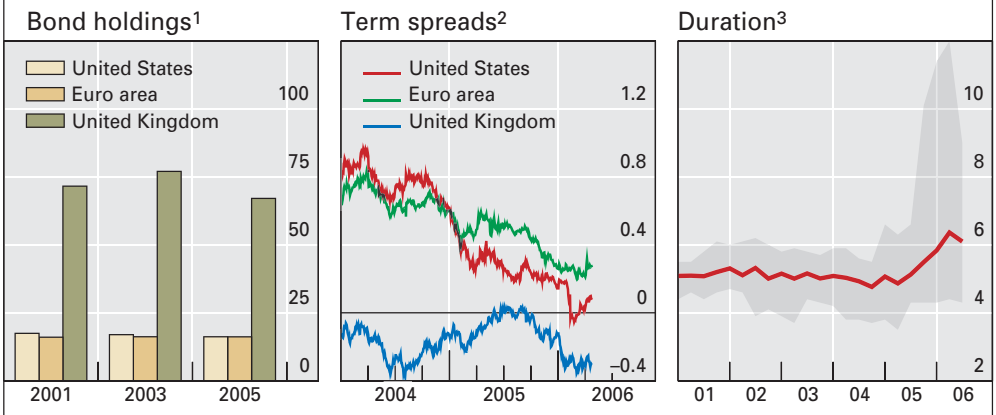
Asset-liability management ...

Advances in risk management and changes in the accounting and regulatory frameworks in many countries have encouraged pension funds and insurance companies to reduce the duration mismatch between their assets and liabilities (see Chapter VII) over the past few years.

... has weighed on long-term sterling yields ...

Although the size of the bond holdings of pension funds and insurance companies relative to the total amount of bonds outstanding has remained strikingly stable (Graph VI.5, left-hand panel), the decline in the spread between 30-year bonds and 10-year bonds in many advanced economies suggests that the composition of these portfolios may have shifted towards longer-dated assets (Graph VI.5, centre panel). This shift appears to have been particularly large in the United Kingdom, where term spreads have been negative for some time. This is consistent with reports that strict minimum funding requirements and the implementation of the accounting standard FRS 17 have resulted in large purchases of very long-term bonds by UK pension funds as yields have declined, triggering further declines in yields.

Pension funds and bond spreads



[1] As a percentage of total bonds outstanding. [2] Thirty- minus 10-year yield. [3] Average duration of the assets of Dutch pension funds, in years. The shaded area represents 90% of the actual distribution.

Sources: Netherlands Bank; Bloomberg; national data; BIS calculations. Graph VI.5

... but has had less evident effect elsewhere

Nevertheless, it is not clear how far the UK experience can be generalised to other countries, given remaining differences in the regulatory and accounting frameworks as well as in the funding levels of pension funds. In the Netherlands, for instance, the average pension fund increased the duration of its assets from five to six and a half years after reforms were enacted in autumn 2004 (Graph VI.5, right-hand panel), although there was substantial variation across funds. Some funds almost doubled the duration of their assets, while others left it almost unchanged. This may be related to the fact that funding levels of the Dutch pension sector tend to be well above the mandatory floor, which gives funds considerable flexibility in managing their interest rate risk.

There were also signs during the period under review that the trend towards a more market-oriented framework might have been losing some momentum. A postponement of full implementation of the Dutch pension reform to 2007 may have contributed to a modest decline of half a year in the average duration of pension fund assets in that country. In the United States, a reform of minimum funding requirements was passed by Congress in late 2005. However, the reform was considerably less strict than the initial proposal, and may have contributed to a rebound of the spread between 30- and 10-year Treasuries in early 2006, as traders who had speculated on additional buying pressure from pension funds reportedly unwound their positions in long-term bonds. Also limiting the incentives for pension funds to purchase long-term bonds in early 2006 were increases in equity prices and bond yields, which at least temporarily improved the funding position of many pension funds.

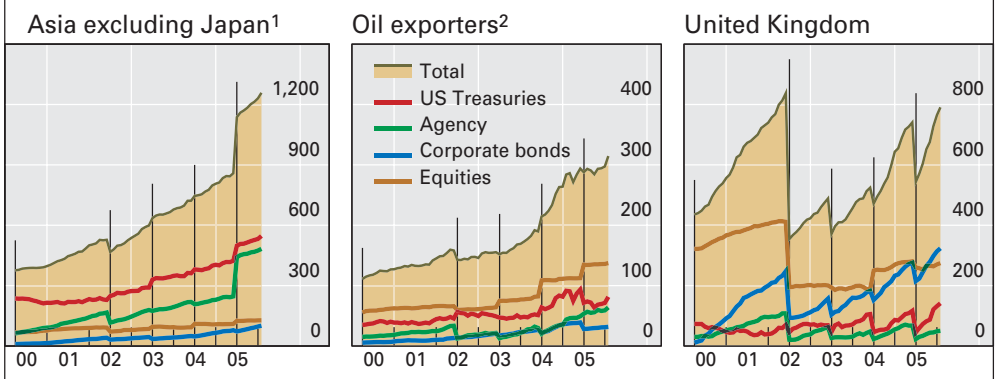
Foreign demand factors: Asian reserves and petrodollars

Demand for US securities fuelled by Asian surpluses ...

Strong foreign demand for US securities is another reason frequently cited for declining term premia in the United States. Foreign governments and central banks – particularly from Asia – have continued to channel funds into US

Investment in long-term US securities

Outstanding stocks, in billions of US dollars



Note: Estimated from TIC benchmark surveys and cumulative net purchases. The vertical lines indicate the dates of benchmark surveys.

[1] China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan (China) and Thailand. [2] Estimate based on net purchases by residents of Mexico, Norway, Russia, Venezuela and those countries classified in the TIC data as "Other Asia".

Sources: US Treasury; BIS calculations. Graph VI.6

Treasuries and other US quasi-government securities, largely as a result of intervention in the foreign exchange markets. Indeed, there is ample anecdotal evidence that financial markets respond to news that might signal changes in official preferences for US dollar securities. For example, 10-year dollar yields rose by nearly 10 basis points within a few hours of the announcement of the renminbi revaluation on 21 July 2005, as speculators anticipated significantly lower demand for US securities.

Even though the accumulation of reserves by Japan slowed considerably in 2005, China and other major emerging economies in Asia-Pacific continued to experience strong reserve growth well into 2006 (see Chapter V). Much of this was invested in US securities. As shown in the left-hand panel of Graph VI.6, preliminary data based on the US TIC survey indicate that holdings of US long-term securities by residents (both official and private) of Asian countries (excluding Japan) grew strongly in 2005. The combined holdings of these investors increased to an estimated $1.25 trillion by early 2006, from just over $800 billion at end-2004.

... and the recycling of oil revenues

The reinvestment of export revenues by oil-exporting countries has also been cited as a source of demand for US securities. Estimated net oil revenues for the major oil exporters (OPEC members plus Mexico, Norway and Russia) reached $676 billion in 2005, and are forecast at almost $750 billion for 2006. A portion of these revenues has been directly invested in US securities. Estimates based on the TIC data indicate that oil exporters channelled roughly 20%, or $200 billion, of their cumulative oil revenues between June 2002 and June 2005 ($1.2 trillion) into short- and long-term US securities. While the accumulation of US long-term securities grew strongly until 2004, it rose by only $33 billion in 2005, or 8% of cumulative oil revenues during the year.

The estimates of investment in US dollar securities by Asian investors and oil-exporting countries discussed above, however, almost certainly underestimate

Investment is routed through the United Kingdom

their total exposure. These investors often purchase securities via third parties in London or other financial centres outside the United States. To be sure, the TIC benchmark surveys attempt to reallocate these third-party purchases to the residence of the ultimate purchaser. This usually results in large drops in the estimated holdings of US long-term securities by residents of the United Kingdom and, at times, jumps in the estimated holdings of Asian investors (Graph VI.6). However, these investors' exposure to US securities may be even larger than that estimated in the benchmark surveys to the extent that they place funds in hedge funds or other investment vehicles which invest in US securities.

Equity markets shrugged off rate increases

Rising equity prices ...

The rally in global equity markets which had begun in early 2003 continued apace during most of the period under review. After a modest performance in 2004, markets around the world posted double digit gains in 2005. Many markets rose still further in the early part of 2006 before falling back in mid-May. The largest increases were recorded in emerging markets. Eastern European markets rose by 55% in local currency terms in 2005 and a further 15% over the first five months of 2006, notwithstanding a sharp fall in mid-May (Graph VI.7). In major markets, too, prices soared. Japanese equity markets jumped by 44% in 2005 before price increases moderated in the early part of 2006. The US market underperformed most others, rising by only 4% between early 2005 and mid-May 2006.

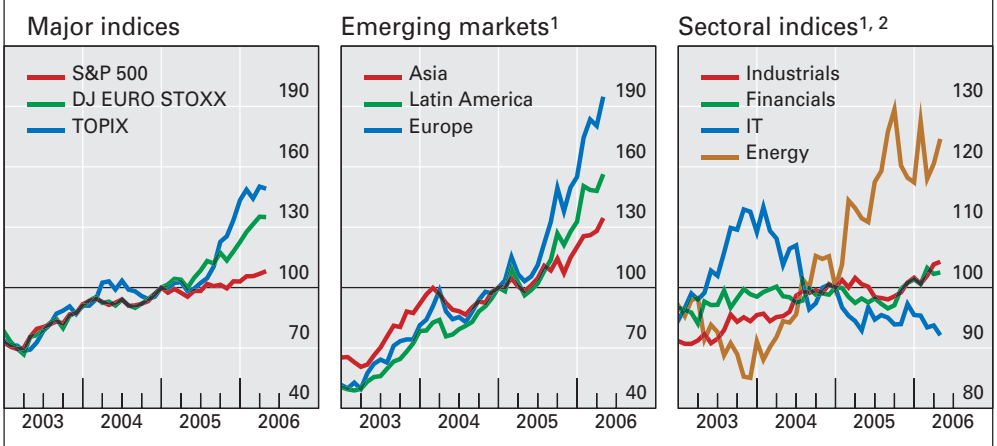
Macroeconomic outlook underpinned equity gains

... reflecting robust economic growth

The rise in equity prices was underpinned by the unexpectedly robust performance of the world economy (see Chapter II). In Japan and the euro area, the improved economic outlook prompted investors to revise upwards

Equity prices

End-month data, in local currency; end-December 2004 = 100



[1] Morgan Stanley Capital International equity indices. [2] Relative to the MSCI World composite index.

Sources: Bloomberg; Datastream. Graph VI.7

their earnings expectations. Additional impetus was provided in Japan by hopes of structural reform and the widespread view that the banks' non-performing loan problems had largely been resolved. In emerging markets, too, earnings forecasts were revised upwards. In many emerging markets, investor confidence was bolstered by high commodity prices. Indeed, the highest equity price gains were recorded by oil exporters such as Russia, where prices have more than doubled over the past year.

Low correlation of capital flows and returns

Rising emerging market equity prices coincided with massive inflows of foreign capital (see Chapter III). However, there was no clear relationship between the size of foreign portfolio investment and stock market performance during the period, across either regions or countries. The cross-sectional correlation between portfolio investment flows and monthly local currency returns was close to zero, irrespective of whether inflows are measured in absolute terms or as a proportion of the host country's market capitalisation. A possible reason for this weak relationship is that ample demand for emerging market equities met high supply. Consistent with this explanation, corporations in emerging Asia announced international equity issues totalling $57 billion in 2005, up from $34 billion in the previous year.

In the United States, macroeconomic conditions were less supportive of equity prices than elsewhere. Solid economic growth had been widely anticipated and so was already incorporated into valuations. The tightening of monetary policy probably contributed to the underperformance of US equities, although its impact was mitigated by the fact that the tightening had been largely anticipated and that higher policy rates only gradually fed through to higher long-term yields. Unusually severe hurricanes on the US Gulf coast unsettled markets in September 2005, but prices rebounded when it became clear that the impact on US economic growth was only transitory.

Releveraging and mergers accelerated

Changes in firms' capital structure were another source of support for equity markets. Whereas between 2001 and 2004 firms had directed their cash flows towards strengthening their balance sheets, more recently they shifted their focus to returning cash to shareholders through dividend payouts, share buybacks and acquisitions. In 2004-05, dividends paid by S&P 500 companies increased at their fastest rate in more than a decade. Share buybacks increased faster still; S&P 500 companies spent almost $350 billion purchasing their own shares in 2005 (Graph VI.8). As a result of buybacks and acquisitions, the total amount of equity retired by US firms reached a record high of $300 billion in 2005.

Dividends and share buybacks increased ...

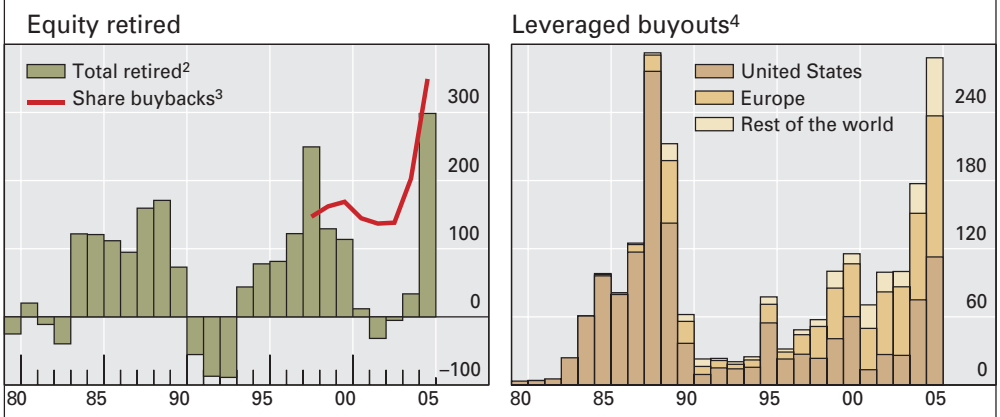
European and Japanese companies raised their dividends even more rapidly than US firms. The high rates of dividend growth may have helped to underpin investors' confidence by signalling that management expected high rates of earnings growth to be maintained. European and Japanese firms also engaged in share buybacks, although not on the same scale as their US counterparts.

... as firms releveraged

In addition to their signalling effect, higher dividends and share buybacks supported equity prices by releveraging companies' balance sheets. To the

Shareholder-friendly actions

In billions of constant US dollars[1]



[1] Nominal amounts, converted to constant 2005 dollars using the US GDP deflator. [2] US corporations, net of new equity issued. [3] Gross buybacks by S&P 500 companies. [4] Announced value of all deals, including net debt; based on the date of the announcement and the residency of the target firm.

Sources: Standard & Poor's; Thomson Financial SDC Platinum; national data; BIS calculations. Graph VI.8

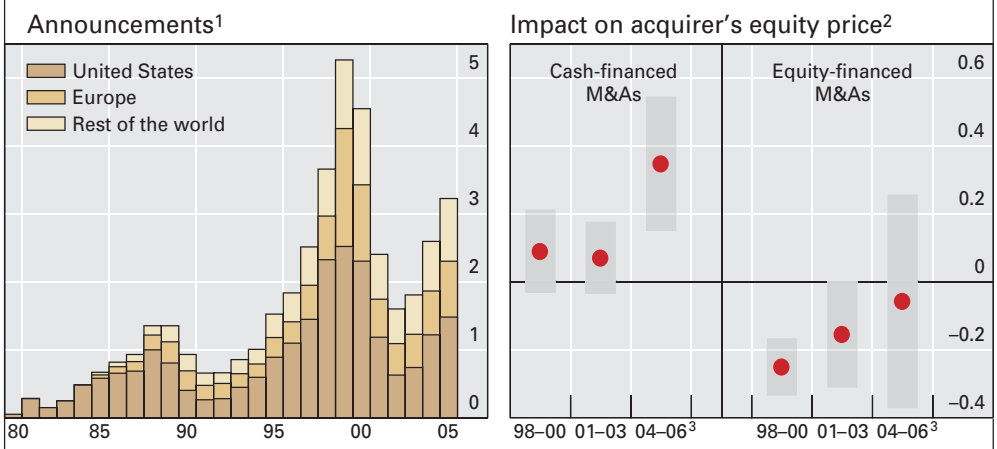
extent that dividends and share repurchases increase a firm's debt/equity ratio, they boost returns on equity. Prior to 2004, the majority of shares repurchased by companies were reissued to employees exercising stock options. Therefore, they had no impact on firms' capital structure. Increasingly, however, firms have used buybacks to reduce their share count and return cash to shareholders. Similarly, the payment of special dividends has become a popular way for private equity investors to recoup their investment. In the past, private equity investors had typically sold their stake in a company through an initial public offering (IPO) of shares. Investor demand for IPOs, however, was relatively weak in 2005: returns on the first day of trading were about 10%, compared to over 20% on average since 1990. Accordingly, private equity investors turned to debt markets to fund large dividend payments out of the retained earnings of their ventures (see Chapter VII).

LBOs rose to their highest level since the 1980s

Releveraging was further boosted by a surge in leveraged buyouts (LBOs). Debt-financed takeover bids by private equity investors soared in 2005 to levels not seen since the LBO wave in the late 1980s (Graph VI.8). In contrast to the 1980s, the recent increase in buyout activity was not limited to the United States; more than half of all deals involved non-US targets, mainly in Europe but also in Asia. Especially notable was the surge in LBOs in Germany and Japan, where obstacles to changes in corporate control, such as cross-shareholdings among firms, have gradually been removed. For example, whereas in 1992 about 50% of all shares listed in Japan were held by related companies, by 2004 that percentage had halved.

The pickup in LBO activity was part of a larger increase in mergers and acquisitions (M&As). Acquisitions totalling $3.2 trillion were announced in 2005, up almost 30% from 2004 and the highest level since 2000 (Graph VI.9). LBOs accounted for about 9% of all deals, much higher than in 2000, albeit far below the peak of 22% in 1988. The increase in M&As was broadly spread around the

Mergers and acquisitions



[1] Announced value of all deals, including net debt, in trillions of constant 2005 US dollars; based on the date of the announcement and the residency of the target firm. [2] Average abnormal change, in per cent, in the equity price of acquiring companies over the three-day window around the announcement; the shaded areas represent 95% confidence bands. Based on a sample of 4,251 deals involving US companies. [3] Ending in February 2006.

Sources: Bloomberg; Thomson Financial SDC Platinum; BIS calculations. Graph VI.9

globe. Slightly less than half of all deals involved US targets, and another quarter were European targets. Companies based in emerging markets were more active than ever before, buying firms in major and other emerging markets.

Surge in M&As boosted equity prices ...

Equity investors responded more positively to the latest wave of deal-making than they had to previous ones. In 2005, both the target's and the acquirer's share prices tended to increase following the announcement of a takeover. This contrasts with historical experience, namely that any gains in shareholder value resulting from mergers were captured mainly by the shareholders of the target company.

The relatively positive reaction of investors partly reflected the smaller share of deals financed in whole or in part with equity. In the United States, about 30% of recent deals were paid for with shares, compared to about 70% during the previous M&A boom in 1998–2000. In Europe and Asia, the proportion of deals paid for with shares was even lower. The right-hand panel of Graph VI.9 plots the average "abnormal" return for the stock price of acquiring companies on the day an acquisition is announced, ie the return after controlling for the stock's sensitivity to market-wide price movements. Mergers financed with cash consistently perform better than mergers financed with equity: the abnormal return is higher in any given period. This seems to be because the tendency to overpay for the target is lessened when mergers are financed with cash.

... even those of acquiring companies

More strikingly, for both cash- and equity-financed deals, abnormal returns for the equity price of acquiring firms were higher in 2004–06 than in previous years; investors were more receptive than they had been in the past to all types of acquisitions. In 1998–2000 abnormal returns on cash deals were about zero and on equity deals were significantly negative. By contrast, in

2004–06 abnormal returns on cash deals were significantly positive and on equity deals were about zero.

Conflicting signals about valuations

By some measures, valuations were not unusually high

One possible explanation for investors' more positive view of acquisitions is that market valuations seemed low by some, albeit not all, measures. In markets around the world, recent price increases have been outpaced by upward revisions to earnings forecasts. The S&P 500 was trading at 15 times short-term earnings forecasts in 2005, slightly below its 1988–2004 average of 16 (Graph VI.10). Euro area markets were trading at 13, compared to their historical average of 16. In emerging equity markets, too, price/earnings (P/E) multiples were well below their earlier levels. Therefore, the risk of overpaying for acquisitions might have been perceived to be lower than in the past.

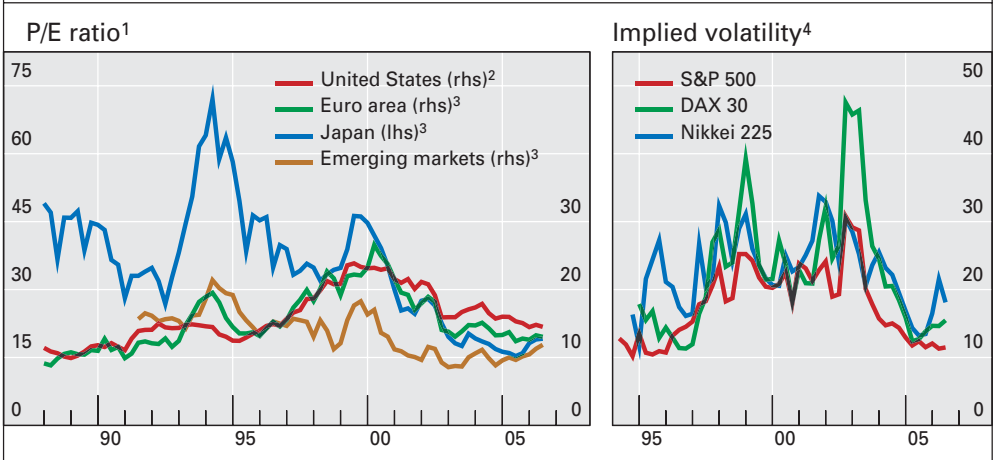
Implied volatility stayed low ...

In most markets, investors seemed comfortable with valuations and the outlook for returns. Implied volatility in equity index options remained very low. For example, for the S&P 500 it fluctuated around 12% for much of 2005 and the early part of 2006, close to the previous lows reached in 1995 (Graph VI.10). The most noticeable increase during the period occurred in mid-May 2006, when stock markets around the world fell sharply.

Of course, there were exceptions. In Japan, P/E ratios increased sharply in the second half of 2005, from 15 to 19, as prices soared. In addition, volatility as implied by options on the Nikkei index more than doubled between June and December 2005, from around 10% to 25%, suggesting that uncertainty about the future direction of equity prices rose in tandem with valuations. In Middle Eastern markets, local investors flush with oil revenues drove valuations to spectacular highs. Even after prices had plummeted by about 40% over the first five months of 2006, P/E ratios in Saudi Arabia and Dubai still exceeded 20.

Valuations and volatility in equity markets

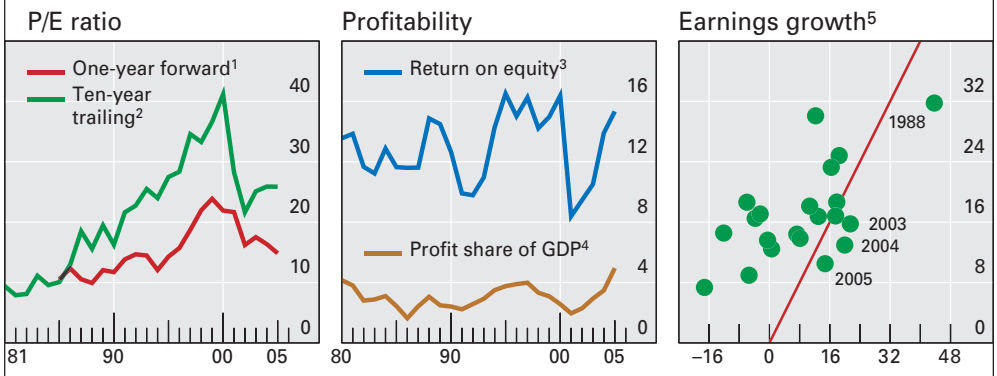
Quarterly averages



[1] Based on consensus forecasts of one-year-ahead operating earnings. [2] S&P 500. [3] MSCI index. [4] Derived from the price of at-the-money call option contracts on stock market indices.

Sources: I/B/E/S; Morgan Stanley Capital International; national data. Graph VI.10

US valuations and earnings



[1] Based on consensus forecasts of one-year-ahead operating earnings; S&P 500. [2] Market value of US corporate equities as a percentage of GDP divided by a 10-year trailing average of corporate profits after tax as a percentage of GDP. [3] For S&P 500 companies; calculated as reported earnings per share divided by the book value of equity. [4] Profits of domestic corporations, after tax. [5] Comparison of analysts' one-year-ahead forecasts of earnings growth (y-axis) and actual growth (x-axis); S&P 500 companies. The red line shows where actual equals forecast growth.

Sources: I/B/E/S; Standard & Poor's; national data; BIS calculations. Graph VI.11

These exceptions aside, it is unclear whether investors' apparent confidence in the outlook for market returns reflected a heightened willingness to bear risks or perceptions of continued low risks; both factors influence measures of implied volatility. For much of the past year, estimates of risk appetite in equity markets, derived by comparing the distribution of expected returns implied by option prices with the distribution of historical returns, were relatively high. However, if investors' appetite for equity risk was high, then it is puzzling why valuations appeared to remain relatively low.

... perhaps because of heightened risk appetite

One possible answer to this puzzle is that valuations were in fact higher than indicated by multiples based on short-term earnings forecasts. In 2005, returns on equity and profits as a share of GDP were close to their historical highs, at least in the United States (Graph VI.11). If profitability were to revert to some longer-term trend, then equities would look expensive. Taking a 10-year trailing average of earnings to smooth out cyclical variation, P/E multiples for US equities in late 2005 were well above their long-term average: about 26, compared to 19 over the 1962–2005 period.

Analysts seemed pessimistic about the strength of earnings

There are signs that analysts were more sceptical than in the past about the sustainability of short-term gains in profitability. The right-hand panel of Graph VI.11 plots analysts' one-year-ahead forecasts of the growth of operating earnings against the actual growth of earnings for the S&P 500 over the past 20 years. In only four years out of the past 20 did actual earnings growth exceed forecast growth – and three of those years were the period 2003–05. In other words, analysts who have historically been overly optimistic about the strength of corporate earnings have, since 2003, been overly pessimistic. If this pessimism were shared by investors, it would be consistent with expectations that profitability will eventually revert to its longer-term trend.

Looking forward, some scepticism about the strength of earnings would appear to be justified. The downside risks to the outlook for corporate earnings

seem larger in 2006 than in previous years. For example, higher interest rates and tight labour markets could dampen profit growth, in the United States and Europe especially (see Chapter II). That being said, earnings growth again exceeded expectations in the first quarter of 2006.

Credit markets proved resilient

Despite the accelerated pace of leveraged buyouts and other shareholder-friendly actions, corporate bond and credit default swap spreads in 2005 and early 2006 stayed close to their cyclical lows (Graph VI.12). The long rally in credit markets came to an end in the second quarter of 2005, when a series of negative corporate announcements, including the downgrade of General Motors and Ford to below investment grade, triggered a modest sell-off. While corporate spreads never fully recovered from the sell-off, they did not move sharply wider either. Spreads on investment grade corporate debt inched higher in late 2005 and early 2006 to levels comparable to those reached during the sell-off. Yet, at 83 basis points in mid-May 2006, spreads on A-rated corporate bonds denominated in US dollars were still within 20 basis points of their cyclical low. Meanwhile, spreads on speculative grade corporate bonds were more than 100 basis points below their May 2005 high and only 40 basis points above their March 2005 low.

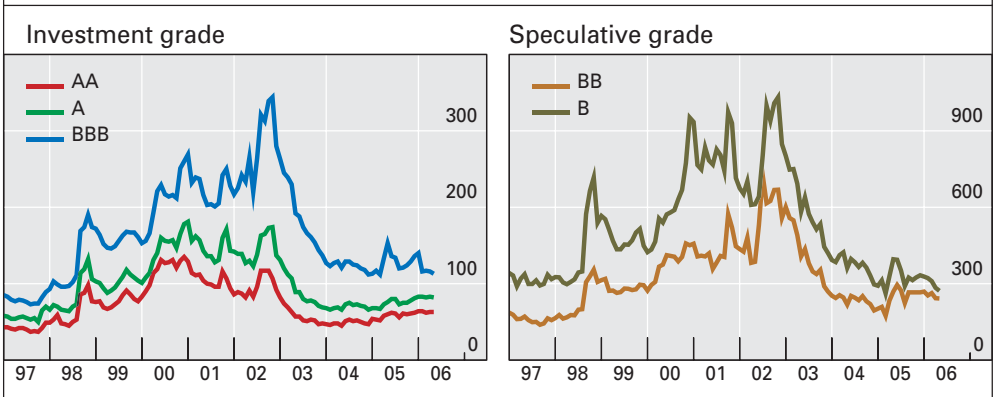
Investment grade spreads inched higher

Some companies did face markedly higher financing costs. The troubles of US automobile firms worsened in 2005, as they struggled both to contain legacy costs arising from pension and health insurance schemes and to adapt their business strategy to increasing competition. Following a brief rally in mid-2005, Ford and General Motors saw their spreads widen in late 2005 to levels well above those at the peak of the earlier sell-off. So, too, did US auto suppliers such as Delphi and Dana, both of which eventually declared bankruptcy. Almost 5% of rated auto firms defaulted in 2005, a higher share than in any other sector.

Troubles of auto companies

Corporate bond spreads

Month-end, in basis points[1]



[1] Option-adjusted spreads over government bond yields; Merrill Lynch US dollar corporate bond indices.

Sources: Bloomberg; Merrill Lynch. Graph VI.12

In addition, creditors repriced the debt of companies targeted in leveraged buyouts or otherwise under pressure to releverage. For example, credit default swaps on US forest products firm Georgia-Pacific jumped by about 250 basis points in mid-November 2005 following a bid to buy out existing shareholders. Investors seemed especially sensitive to the possibility of releveraging by investment grade issuers, given that such issuers are by definition in a better position than speculative grade ones to service additional debt.

Divergent appetites for different risks

Investors' appetite for credit event risk declined ...

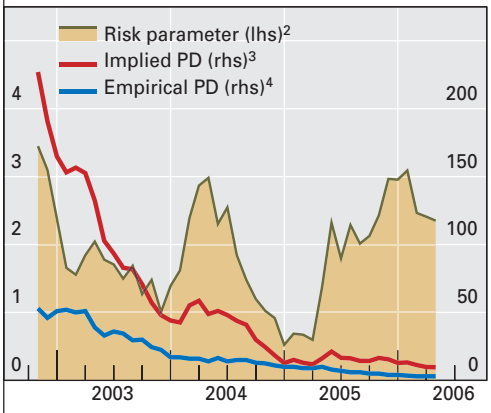
It was this greater sensitivity to credit event risk that lay behind the modest widening of investment grade credit spreads. Investors seemed worried about the impact of dividend increases, share buybacks, mergers and leveraged buyouts on individual companies. Yet, at the same time, they seemed unfazed about the impact of such activities on the creditworthiness of the corporate sector as a whole.

Investors' appetite for credit risk apparently never quite recovered from the turmoil in corporate bond and credit default swap (CDS) markets in the second quarter of 2005. An estimate of risk appetite in credit markets is plotted in the left-hand panel of Graph VI.13. This estimate corresponds to the ratio of default probabilities derived from credit spreads to those derived from underlying balance sheet information, for a sample of investment grade companies. It suggests that the compensation demanded by investors for bearing credit risk rose noticeably in April and May 2005 – albeit from an exceptionally low level – and remained relatively high thereafter.

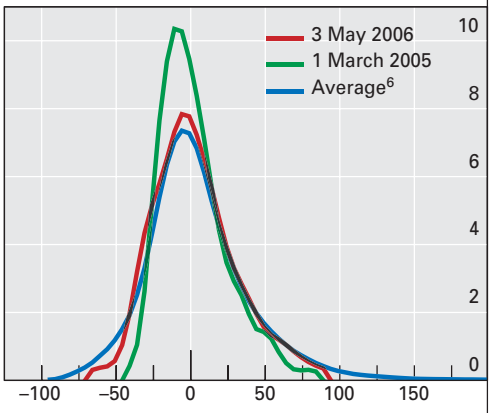
Measures of discrimination in corporate bond markets show a similar reversal. The right-hand panel of Graph VI.13 illustrates the distribution of

Risk appetite in credit markets

Price of default risk[1]



Distribution of bond spreads[5]



[1] Based on the constituents of the DJ CDX.NA.IG CDS index; monthly averages. [2] Ratio of implied (ie risk neutral) probabilities of default (PD) to empirical (ie physical) PD. [3] PD implied by one-year CDS spreads, assuming a constant recovery rate of 40%. [4] One-year PD estimated by Moody's KMV, based on balance sheet information and asset price volatility. [5] Based on the constituents of the Merrill Lynch A-rated US corporate bond index; the horizontal axis represents the difference from the median spread; fitted using a normal-based kernel density function. [6] January 1997–May 2006.

Sources: Mark-it; Merrill Lynch; Moody's KMV; BIS calculations. Graph VI.13

A-rated corporate bond spreads. Spreads were clustered together very closely in March 2005, before the sell-off. They have since become more dispersed, and in April 2006 the distribution of spreads was close to its long-term average.

... even as their appetite for systematic risk was unchanged

Strictly speaking, the indicators plotted in Graph VI.13 combine two different types of risk premia: compensation for bearing systematic risk and compensation for bearing credit event risk. The former is driven largely by changes in macroeconomic conditions. The latter, also known as jump-to-default risk, reflects aversion to uncertainty about the timing and severity of default losses on individual credit exposures. In equity markets, investors tend not to demand compensation for bearing such idiosyncratic risks because, in a well diversified portfolio, the variability of some assets will be offset by that of others. In credit markets, by contrast, premia for seemingly firm-specific risks appear to account for a significant proportion of credit spreads. This may be because events at one firm have a contagion effect by signalling an increase in default risk at other firms. Alternatively, it may be because corporate bond portfolios are inherently difficult to diversify.

While it is difficult to decompose the estimated risk premium, anecdotal evidence suggests that the increase in 2005 and early 2006 was more likely to have been driven by a weaker appetite for credit event risk than by a change in investors' appetite for systematic risk. First, equity market indicators, such as implied volatilities, do not suggest a decline in investors' appetite for systematic risk (see above). In principle, appetite for such risk should be similar across asset classes, given its dependency on economy-wide developments.

Investment grade and high-yield spreads moved in opposite directions

Second, spread movements across different rating categories are suggestive of a divergence in investors' appetite for different types of risk. As the credit quality of a bond declines, its return behaves increasingly like an equity return. Therefore, systematic risk tends to explain a larger proportion of returns on high-yield bonds than on high-grade bonds. Consistent with a weak appetite for credit event risk and a high appetite for systematic risk, speculative grade corporate bonds have outperformed investment grade bonds over the past year. In the first quarter of 2006, high-yield spreads tightened by about 40 basis points even as investment grade spreads remained unchanged (Graph VI.12). Moreover, investment grade firms have come under increasing pressure from creditors to include change of control covenants in their bond issues, to limit losses to existing bondholders in the event of a leveraged buyout. At the same time, private equity funds have raised substantial amounts on favourable terms to finance such buyouts (see Chapter VII).

Corporate balance sheets remained strong

The divergence in investors' appetite for different types of risk reflects, at least in part, the strength of corporate balance sheets at the current juncture. The accelerated pace of shareholder-friendly actions slowed the improvement in corporate credit quality in 2005, but it did not reverse it.

Corporate leverage ratios were low in the United States and Japan ...

In the United States, the ratio of net debt to cash flows declined in 2005 to its lowest level since the mid-1990s (Graph VI.14). This was despite a sharp pickup in borrowing by non-financial corporations, partly driven by investment and working capital needs, but also to finance acquisitions. In aggregate,

however, this additional debt was more than offset by the exceptionally rapid growth of earnings. Furthermore, US companies continued to add to their cash reserves, although at a slower pace than in previous years.

... and less so in the euro area

Euro area firms were slower than US firms to rebuild their balance sheets; in 2005 leverage ratios were still close to their cyclical highs. Nevertheless, the ratio of net debt to cash flows declined in 2005 for the second consecutive year. As in the United States, profit growth underpinned the decline. German firms in particular were able to raise their profit margins despite the modest pace of economic growth. By contrast, Italian firms struggled to maintain their profit margins.

In Japan, leverage ratios declined to their lowest levels in over two decades. In contrast to previous years, when debt reduction had been the main driver of declines in the net debt/cash flow ratio, an acceleration in the growth rate of earnings was responsible for most of the decline in 2005. This acceleration was driven by domestically oriented firms, whose profits were boosted by the recovery in domestic demand. Debt repayments again exceeded new borrowing, but by the smallest margin since the mid-1990s. More and more firms elected to increase capital spending or build up their cash reserves instead of further paying down their debt.

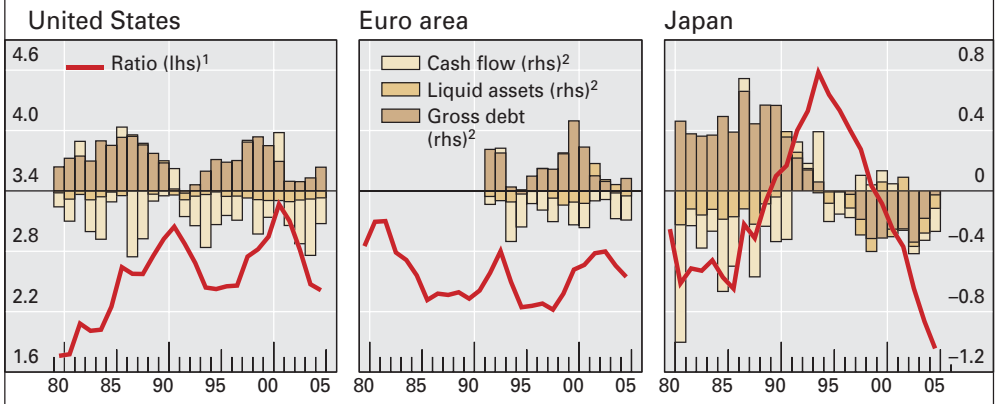
Downgrades edged higher

Looking forward, indications of pressure on corporate credit quality are emerging. As mentioned earlier, corporate borrowing is accelerating. Furthermore, downgrades of non-financial corporations edged upwards as a percentage of all rating actions in 2005, not only in the United States but also in Europe and Japan (Graph VI.15).

Nevertheless, owing to the strength of balance sheets for the corporate sector as a whole, most market participants expect the turn in the credit cycle

Corporate leverage

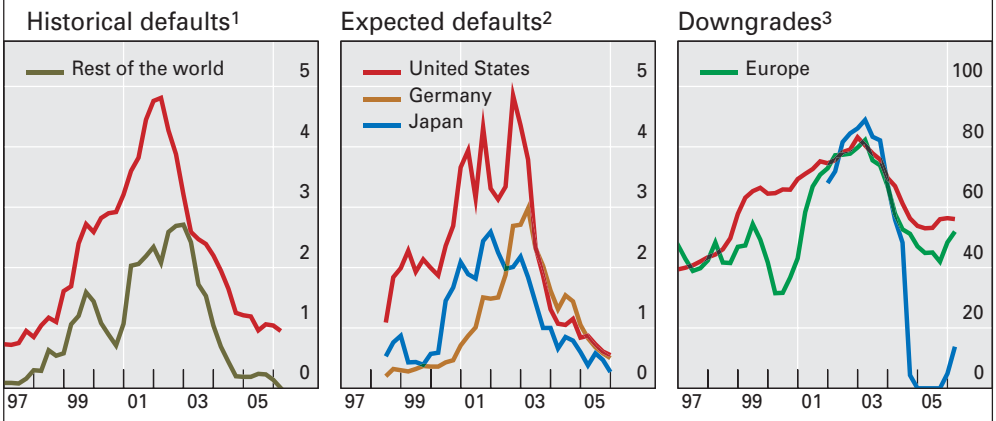
Decomposition of changes in the net debt/cash flow ratio



[1] Gross debt (loans and debt securities) minus liquid assets (currency, deposits and debt securities), as a ratio of cash flows. Cash flows are approximated as earnings before interest, taxes, depreciation and amortisation adjusted for the impact of inflation on inventories; for the euro area, weighted average of France, Germany and Italy based on 2000 GDP and PPP exchange rates. [2] Decomposition of changes in the ratio of net debt to cash flows into the partial impact of changes in gross debt, changes in liquid assets and changes in cash flows.

Sources: National data; BIS calculations. Graph VI.14

Outlook for corporate credit quality



[1] Number of issuers in default, as a percentage of total rated issuers; 12-month trailing average. [2] Expected Default Frequency (EDF™) over a one-year horizon; median for non-financial corporations; in per cent. [3] As a percentage of all rating changes by Moody's; 12-month trailing average.

Sources: Moody's; Moody's KMV; BIS calculations. Graph VI.15

to be gradual. Indeed, for the past year default rates have defied most analysts' expectations of an increase and instead edged downwards. Fewer rated issuers defaulted in the year to March 2006 than at any time since mid-1997 (Graph VI.15). Moreover, forward-looking estimates of default rates, calculated by Moody's KMV based on balance sheet information and equity price volatility, remained near their cyclical lows in early 2006.

Vulnerability of credit markets to a repricing

Credit conditions could be undermined by global imbalances ...

If the credit cycle were to turn more quickly than presently expected, it could lead to a rapid deterioration in corporate financing conditions. This would be especially so in the event that the adjustment of existing macroeconomic imbalances, such as the US current account deficit, resulted in weaker economic growth (see Chapter II).

... an accelerated pace of releveraging ...

Even if growth remains robust, credit quality and therefore credit conditions could be undermined by an accelerated pace of releveraging. M&A activity continued to increase in the early months of 2006. LBOs became ever larger and more leveraged. And it remained unclear what firms intended to do with the substantial amount of cash they have accumulated in recent years: invest it in profitable projects or return it to shareholders.

... or developments in structured finance markets

Developments in the market for structured products represent a further vulnerability for credit conditions. Mortgage- and asset-backed securities markets are among the largest, fastest-growing segments of global securities markets. Moreover, recent years have seen a tremendous increase in the range of new products and securitisation techniques. However, the performance of many of these new products has yet to be tested during an economic downturn. In the event that investors incur losses on these products in excess of what they anticipate, it could trigger a repricing of risk across all markets.

One source of unanticipated losses could be modelling errors. The pricing of structured products depends on quantitative models to a far greater extent

than does the pricing of corporate bonds. These models often incorporate assumptions to simplify calculations. While these assumptions might have seemingly benign consequences for estimates of expected losses when market conditions are favourable, they could have costly consequences should conditions deteriorate.

Unanticipated losses could also arise from shortcomings in risk management. While expected losses are similar for like-rated corporate bonds and structured products, uncertainty about the size and severity of losses is greater for structured products. For example, the concentration of exposures can have a significant impact on the distribution of structured products' possible outcomes. Credit ratings do not capture the full distribution, and so over-reliance on rating agency assessments could lead holders of structured credit products to underestimate the risks to which they are exposed. The credit ratings of structured finance securities tend to change less frequently than those of corporate securities, but when they are downgraded they fall further. According to Moody's, the magnitude of downgrades averaged almost four notches for structured finance securities over the 1984–2004 period, compared to less than two for corporate securities.

Changing structure of US MBS markets ...

To illustrate the vulnerabilities posed by structured products, consider the US mortgage-backed securities (MBS) market. It is the largest bond market in the world, with outstandings of close to $6 trillion at the end of 2005, equivalent to almost 50% of US GDP. Growth in recent years has been driven by the securitisation of mortgage loans to borrowers not classified as prime; about 40% of MBS issuance in 2005 was backed by such loans, up from 10% in the late 1990s. Pricing of mortgage pools is often based on the average credit score (ie rating) of the underlying credits. Due to the non-linear relationship between default rates and credit scores, the default probability associated with the average credit score tends to underpredict the average default probability calculated from the full distribution of scores. Losses from such underprediction are not likely to be large in buoyant housing markets, but may increase sharply in weaker markets. As a result, MBS investors may find themselves exposed to losses in excess of what they had expected.

... complicates risk management

Furthermore, whereas historically the prepayment risk embedded in US MBSs was influenced mainly by changes in interest rates, the prepayment risk embedded in mortgage loans to rapidly growing borrower classes has become increasingly sensitive to changes in the credit score of the borrower and changes in house prices. For example, as house prices rise, the loan-to-value ratio falls and so a borrower might choose to refinance in order to benefit from lower mortgage costs. This further complicates the assessment and management of the risks to which MBS holders are exposed.

Emerging market spreads at historical lows

Asset prices across emerging markets made impressive gains in 2005 and into 2006, even as monetary conditions tightened in several major developed countries. The rally which started in mid-year pushed spreads on sovereign bonds to historical lows, beyond the levels reached in 1997, prior to the Asian

financial crisis. This reduction in spreads was concentrated on bonds with the highest yields, continuing the trend evident for the past few years.

Low spreads reflect the improvement in fundamentals ...

Investors' enthusiasm for emerging market assets stemmed in part from perceptions about the strength of fundamentals. Improvements in recent years in external positions, financial systems and fiscal and monetary policies have made many emerging markets more resilient to shocks, thereby reducing the risks associated with emerging market investments (see Chapter III). Indeed, in 2005, sovereign rating upgrades by Moody's outnumbered downgrades by a ratio of about 3:1.

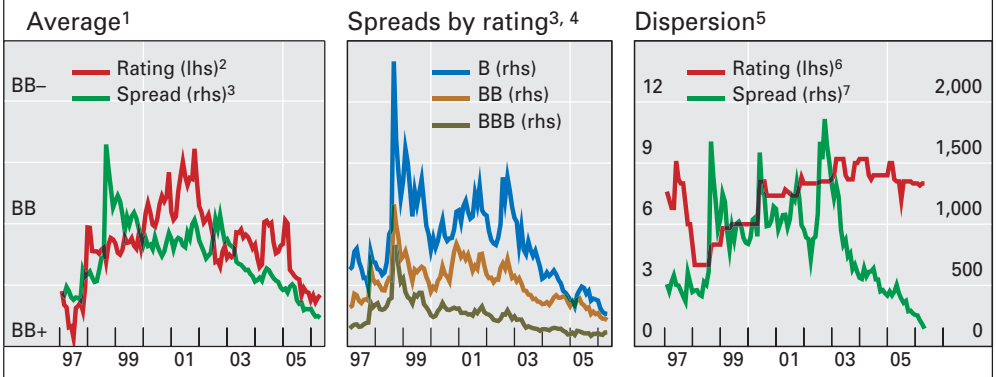
... and investor risk appetite

At the same time, spreads on emerging market bonds appear to be somewhat lower than fundamentals, if measured by sovereign credit ratings, would suggest. The JPMorgan Chase EMBI Global Diversified index of sovereign spreads fell below 200 basis points in March and April 2006, about 100 basis points below the previous record low reached in mid-1997, before widening somewhat in May. Yet sovereign credit quality, as measured by credit ratings, was not as high as it had been in 1997, notwithstanding the significant improvement since 2001. Even within individual rating classes, spreads in early 2006 tightened beyond their previous lows in 1997 (Graph VI.16, left-hand and centre panels).

The dispersion of spreads relative to ratings also suggests that demand for emerging market assets might be leading investors to discriminate less among borrowers than in the recent past. In early 2006, while sovereign spreads clustered together more closely than ever before, sovereign ratings remained widely dispersed, implying that there were significant differences in the creditworthiness of the borrowers in the index not captured in the distribution of spreads (Graph VI.16, right-hand panel).

Emerging market bond spreads and credit ratings

Month-end data



[1] Average rating is calculated using the same weights for individual sovereigns as applied to the spread. [2] Credit rating for all constituents of the JPMorgan Chase EMBI Global Diversified (EMBIGD) index; based on long-term foreign currency ratings from Standard & Poor's. [3] Sovereign stripped spread over US Treasury yields, in basis points; prior to 1998, the index spread is approximated using data for individual sovereigns. [4] Trimmed average spread for B, BB and BBB-rated constituents of the EMBIGD; the highest and lowest spreads on any given date are excluded from the average. [5] Difference between 90th and 10th percentiles. [6] In number of notches. [7] In basis points.

Sources: Datastream; JPMorgan Chase; Standard & Poor's; BIS calculations. Graph VI.16

An alternative view of the discrepancies in the mean and variation of ratings relative to spreads is that they simply reflect changes in the criteria used by the agencies to assign ratings. Since the Asian financial crisis, rating agencies are widely reported to have placed more emphasis on liquidity risk and the strength of financial systems, which may have led them to become effectively stricter in their assignment of ratings. If so, the divergence between ratings and spreads does not necessarily mean that the market's assessment of fundamentals in emerging markets is more optimistic compared with the past.

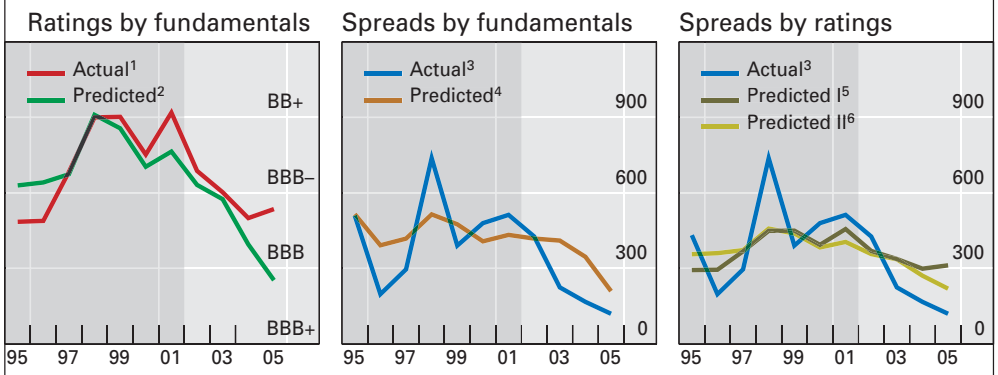
Methodological changes by rating agencies ...

There is some statistical evidence to suggest that rating criteria may indeed have tightened. Graph VI.17 shows the (average) actual ratings and (average) predicted ratings based on a panel regression of sovereign ratings on a set of economic variables for a relatively large sample of emerging market economies. The model predicts average ratings of foreign currency sovereign debt quite well during the 1995–2001 period. However, predicted ratings in the out-of-sample window, 2002–05, tend to be higher than actual average ratings during this period. For the entire sample of countries, the model suggests that, by 2005, the average rating on foreign currency sovereign debt would have approached BBB, about one notch higher than the actual average level, closer to BBB–. At the same time, different model specifications yield less clear results. For example, if those countries that maintained an investment grade rating throughout the 1995–2005 period are excluded from the regression, the difference in actual and predicted ratings is no longer evident.

... may mask the improvement in fundamentals

Even taking such a tightening of rating criteria at face value, the change would not be sufficient to account for the whole of the spread compression. The

Predicting sovereign ratings and spreads



Note: The shaded area indicates the regression window.

[1] Ratings on foreign currency sovereign bonds for a sample of emerging economies; average across rating agencies and countries. [2] Using a regression of actual ratings on a set of economic fundamentals in the 1995–2001 period, comprising external debt as a percentage of GDP, foreign exchange reserves as a percentage of short-term external debt, government debt as a percentage of revenue, currency mismatches, current account balance as a percentage of GDP, IMF loan positions outstanding, GDP and GDP per capita (in nominal US dollars), political risk indicator, ICRG corruption index and the number of years since the last default year. [3] Constructed from representative benchmark US dollar-denominated sovereign bonds; average of daily data in December. [4] Using a regression of spreads on the fundamentals listed in footnote 2. [5] Using a regression of spreads on actual ratings. [6] Using a regression of spreads on predicted ratings generated from a panel regression of actual ratings on the fundamentals listed in footnote 2.

Sources: IMF; World Bank; Datastream; Fitch IBCA; International Country Risk Guide; Moody's; Standard & Poor's; Transparency International; national data; BIS calculations. Graph VI.17

centre panel of Graph VI.17 links spreads to fundamentals directly, bypassing ratings. Predicted spreads in the 2002–05 period are higher – by about 90 basis points at the end of 2005 – than average actual spreads across the sample of countries. Yet, as shown in the right-hand panel, changes in criteria used by rating agencies account for, at most, around half of this.

On balance, comparisons of emerging market spreads across time and with credit ratings suggest that both an improvement in fundamentals – perhaps beyond what is reflected in sovereign ratings – and an increase in investors' appetite for risk have helped to drive spreads to their current low levels. To the extent that, by early 2006, spreads had tightened beyond levels indicated by economic fundamentals, this suggests that emerging markets were becoming more vulnerable to a repricing.