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1. Overview: inflation outlook unnerves investors

A deterioration in the outlook for inflation unnerved investors around the world in September and October. Upward pressure on consumer prices, resulting in part from high energy prices, prompted central bankers in the United States and the euro area to signal that monetary policy might need to be tightened to contain inflation expectations. Consequently, investors revised upwards their expectations regarding future policy rates. This led to higher bond yields in the major markets. Nevertheless, long-term yields remained low compared to their 2004 highs.

The prospect of a faster pace of monetary tightening contributed to a sharp drop in equity prices around the world in early October. But they rebounded strongly in November, boosted by signs of still robust growth in the United States as well as announcements of mergers, share buybacks and dividend increases. Japan outperformed most other equity markets throughout this period. There, an incipient recovery in domestic demand heightened the prospect of an end to years of deflation.

While emerging market spreads moved in tandem with equity markets, corporate spreads appeared to decouple. In contrast to equity and emerging markets, corporate bond markets never fully recovered from the sell-off earlier in 2005. And in November spreads widened even as equities rallied. This divergence largely reflected concerns about the impact that the growing number of shareholder-friendly actions might have on corporate credit quality.

Investors revise upwards their policy rate expectations

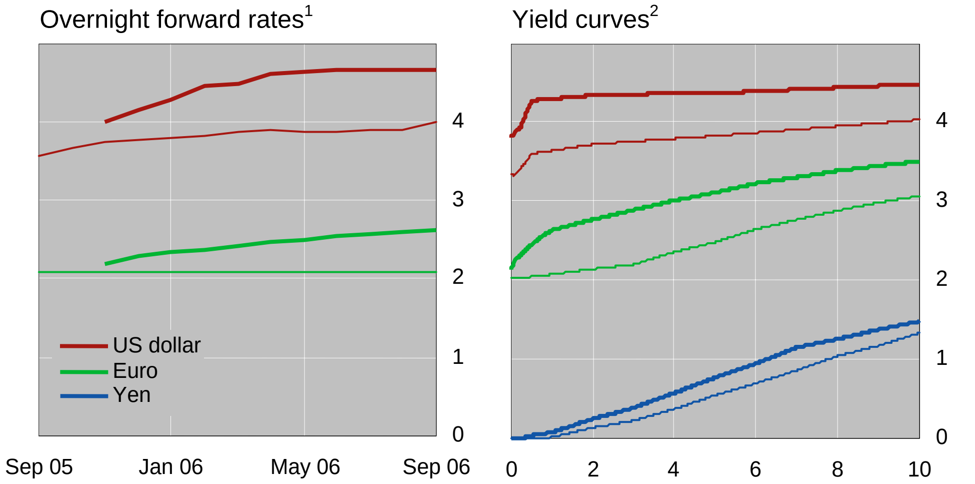
Long-term yields rise steadily …

Long-term interest rates rose steadily in many markets in September and October. Between 1 September and 23 November, yields on 10-year government bonds in the United States and Germany rose by about 45 basis points, and in Japan by 15 basis points (Graph 1.1). This followed a decline in yields in August, which in some markets had taken long-term rates close to their cyclical low (Graph 1.2).

Yields retreated slightly in November, and at the end of the month it was still unclear whether the recent rise in yields would prove as ephemeral as previous increases. Since June 2004, when the monetary tightening cycle in the United States began, increases in long-term yields have tended to be quickly followed by equally large, if not larger, declines. US dollar yields came

Term structure of interest rates

In per cent



Note: Thick lines refer to 23 November 2005; thin lines to 1 September 2005.

[1] For the US dollar, 30-day federal fund futures; for the euro, EONIA forwards. [2] For euro maturities below 12 months, Euribor repo rate; for all other maturities, nominal government bond yields.

Sources: Bloomberg; ICAP; BIS calculations. Graph 1.1

close to breaking out of the range in which they have been trading for the past year. They rose to almost 4.7% on 4 November, only 20 basis points below their June 2004 high, before falling back. Bund yields, by contrast, remained below even their levels in early 2005. JGB yields briefly climbed above 1.6% in early November, their highest mark since September 2004.

… on the back of higher expected policy rates

In September and October, two-year yields rose almost as much as longer-term yields (Graph 1.1). This suggests that the increase in longer-term yields mainly reflected upward revisions to interest rates over the near term. Whereas in early September investors had expected the US Federal Reserve to pause at 4%, by November investors were looking for the Fed to raise rates to at least 4.75% by mid-2006. In the euro area, the ECB had been expected to leave rates unchanged in 2006, but by November investors were expecting 50 basis points of tightening by mid-2006. In Japan, investors attached a high probability to an end to the zero interest rate policy by late 2006.

Stronger domestic demand in Japan

A series of positive macroeconomic surprises contributed to the changed expectations regarding policy rates. Especially in Japan, investors focused on accumulating evidence of a recovery in domestic demand. Alone among the major economies, analysts' forecasts for Japanese economic growth were revised up significantly in the third quarter (Graph 1.3). The improving outlook put upward pressure on government yields.

In the euro area too, the economic outlook brightened. For example, in September and October the German IFO and ZEW business confidence surveys were stronger than expected. As a result, US macroeconomic news was a less important driver of euro yields than it has been at times in the past. Supported by the improving outlook, euro yields were unchanged between 4 and 23 November, whereas long-term dollar yields declined by about 20 basis points over the same period.

Impact of hurricanes is limited

In the United States, hurricanes had a smaller impact on economic growth than initially foreseen. The expected pause in rate hikes that had been priced in when Hurricane Katrina made landfall in late August was gradually reversed in September. In late September, Hurricane Rita wrought less damage than had first been feared. A much stronger than expected non-farm payrolls report on 7 October confirmed the resilience of the economy. Yet, the report elicited a weaker reaction than normal in bond markets. In fact, US dollar yields declined slightly on that day even though the surprise exceeded 100,000 jobs. This suggests that bond investors attached less importance to labour market conditions than they had earlier in the recovery.

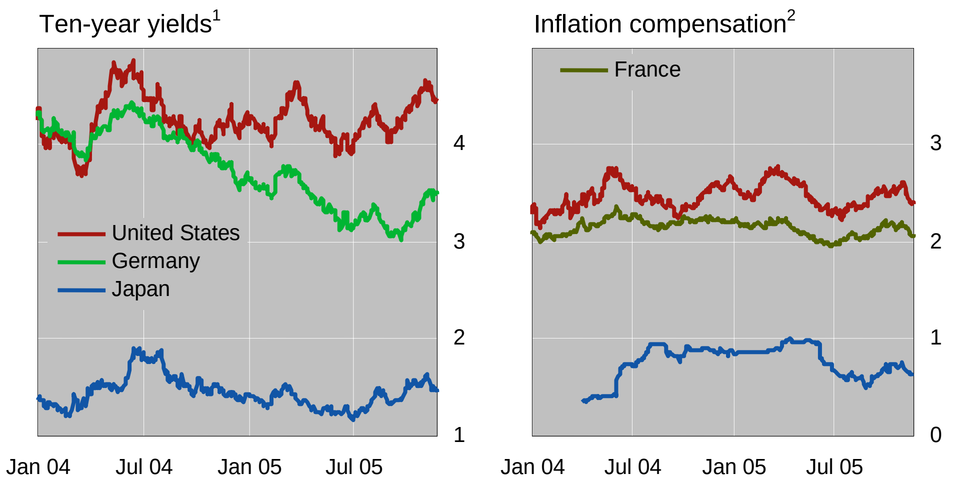
Concerns over inflationary pressures

Instead, the potential for rising energy costs to add to inflationary pressures was a key focus of investors' attention. While oil prices came down from the record highs reached in late August during Hurricane Katrina, in September they remained about 30% above their year-earlier levels. The increase in the prices of refined products was even larger. Such increases contributed to higher inflation expectations. In the United States especially, analysts' short-term forecasts of inflation moved noticeably higher in September and October (Graph 1.3). Households' longer-term inflation expectations also rose. So too did measures of inflation compensation derived from nominal and real bond yields (Graph 1.2).

Central bank officials, in particular those in the United States and the euro area, were quick to warn that monetary policy might need to be tightened further to contain inflation expectations. This put additional upward pressure on yields. For example, the ECB Governing Council's caution that "strong vigilance" was warranted with regard to inflationary pressures contributed to a marked rise in bund yields when released in the ECB monthly bulletin on 13 October.

Bond yields and inflation compensation

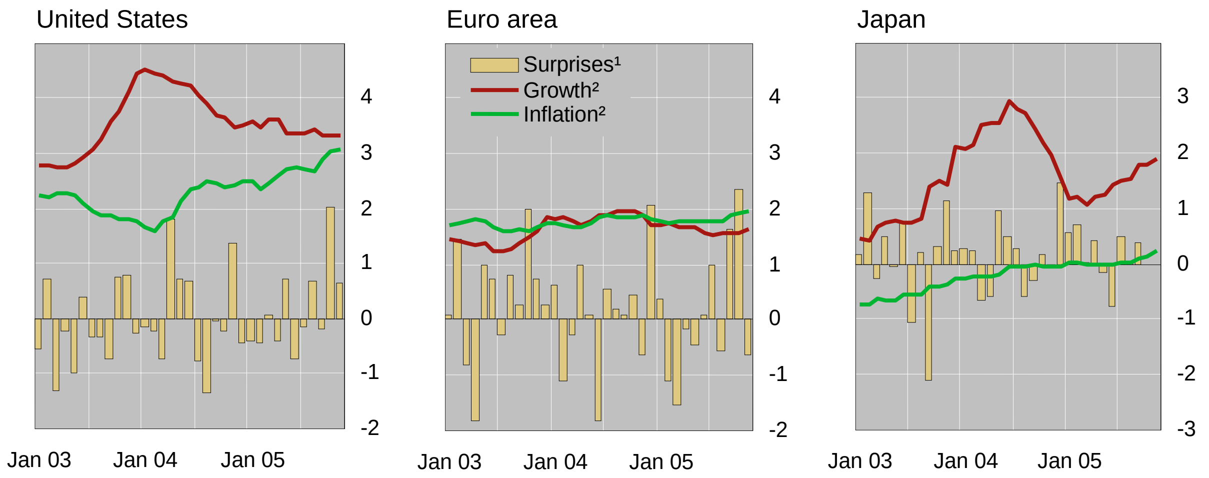
In per cent



[1] Nominal government yields. [2] Nominal minus real 10-year bond yields.

Sources: Barclays Capital; Bloomberg; national data. Graph 1.2

Macroeconomic news



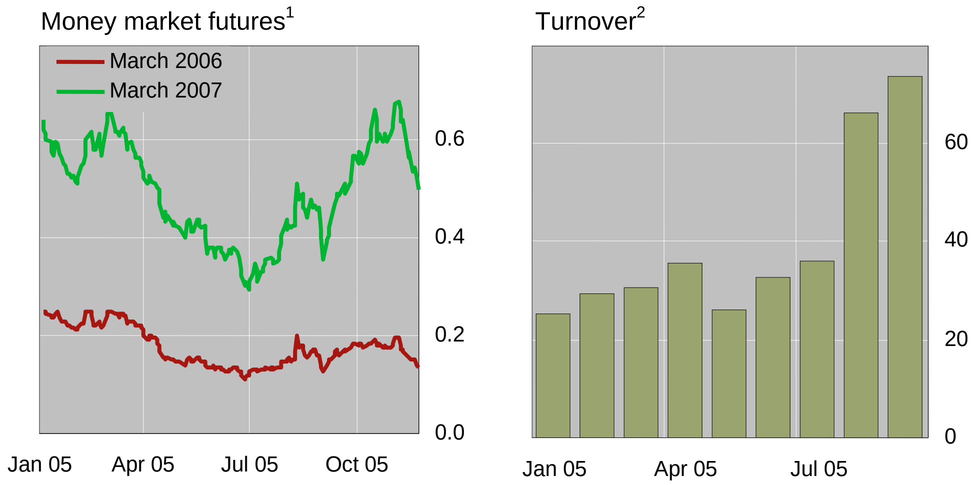
[1] Difference between actual data and consensus forecasts, normalised by the mean and standard deviation of past surprises; observations are positioned in the month in which the actual data were released; for the United States, weighted average of the ISM survey, non-farm payrolls, retail sales and producer price and consumer price announcements; for the euro area, survey of the business climate in Germany compiled by the Institut für Wirtschaftsforschung (Ifo); for Japan, weighted average of the industrial production and machinery orders survey. [2] Rolling 12-month forecast, calculated as a weighted average of annual forecasts published by Consensus Economics; observations are positioned in the month in which the forecast was made; percentage change over the previous year.

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

In Japan, firming expectations of an increase in prices next year heightened attention on when, and how, the Bank of Japan might exit from its current unconventional policy stance. Indeed, trading in yen money market futures increased markedly starting in August, as uncertainty about the course of policy rates grew (Graph 1.4). Statements by Bank of Japan officials in September and October helped to guide expectations, so that money market rates remained unchanged even as bond yields went up. The statements were interpreted as indicating that the zero interest rate policy would not be

Change in Bank of Japan policy not perceived to be imminent

Japanese money markets



[1] Three-month euroyen futures rates, in per cent. [2] Average daily turnover of short-term yen interest rate futures on the Tokyo International Financial Futures Exchange; in millions of contracts.

Sources: Bloomberg; FOW TRADEdata; Futures Industry Association; BIS. Graph 1.4

discontinued until at least the next fiscal year: the implied yield on the three-month yen futures expiring at the end of March 2007 moved up by around 25 basis points between early September and mid-October, whereas the same futures expiring at the end of the current fiscal year in March 2006 barely budged.

Equity markets shrug off rate increases

Initially, equity markets seemed little affected by the prospect of higher policy rates. With the notable exception of the United States, in September many markets rose to their highest level in several years (Graph 1.5). Markets stumbled in October, owing in part to concerns about higher policy rates. But they rebounded in November to levels close to, or in Japan well above, their September highs. On 18 November the TOPIX closed at its highest level since mid-2000, and the S&P 500 its highest since mid-2001.

Concerns over prospective Federal Reserve tightening

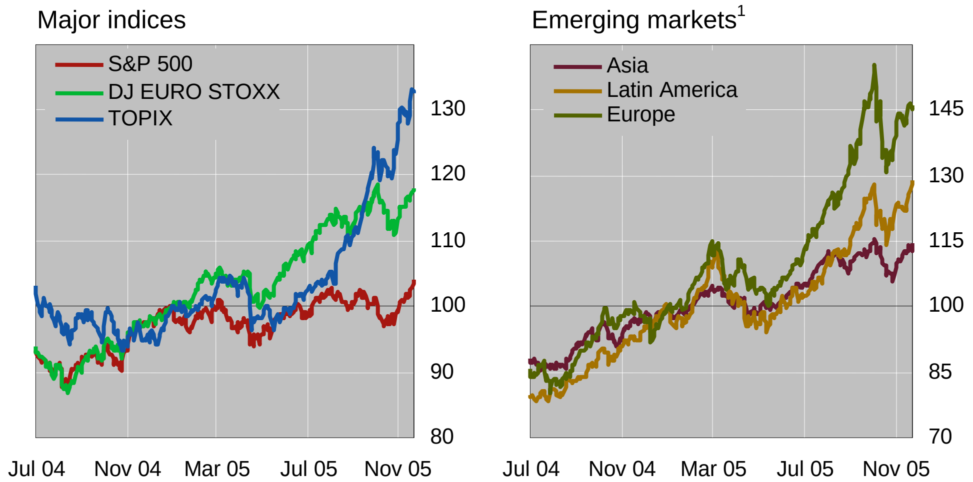
During September, upward revisions to earnings forecasts, underpinned by signs of robust economic growth, appeared to propel markets higher (Graph 1.6). In the first half of October, however, ebullience turned into concern, and equity markets worldwide fell markedly. The trigger for the sell-off was a speech given by the President of the Federal Reserve Bank of Dallas on 4 October, which noted that inflation was “near the upper end of the Fed’s tolerance zone”. The observation had little impact on bond markets, which already in September had priced in the possibility of a much higher than previously expected increase in policy rates to contain inflation. But it contributed to a 1% drop in the S&P 500 Index on 4 October. When Asian and European markets opened the next day, they also dropped sharply.

Unusually high volatility …

In subsequent weeks, equity markets exhibited unusual volatility. Implied volatility rose in October, in some markets to its highest level in a year (Graph 1.7). This partly reflected a decline in investors’ appetite for risk. The

Equity prices

In local currency; 31 December 2004 = 100

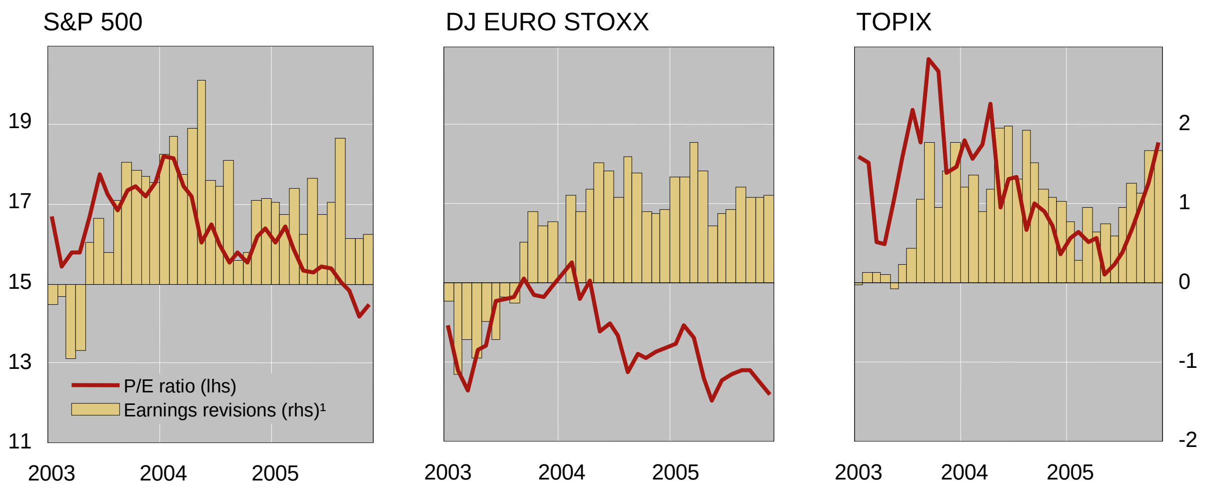


[1] Morgan Stanley Capital International equity indices.

Sources: Bloomberg; Datastream. Graph 1.5

Earnings expectations and equity market valuations

Based on 12-month forward earnings



[1] Diffusion index of monthly revisions in 12-month forward earnings per share, calculated as the percentage of companies for which analysts revised upwards their earnings forecast plus half of the percentage of companies for which analysts left their forecast unchanged; to adjust for analysts' systematic overestimation of earnings, the mean of the diffusion index over the 2000–02 period (S&P 500 = 43.8; DJ EURO STOXX = 40.8; TOPIX = 45.9) was subtracted from each monthly observation.

Sources: I/B/E/S; BIS calculations. Graph 1.6

prices of equity index options on the S&P 500, DAX 30 and FTSE 100, and their relation to realised volatility, suggest that the common component of risk appetite in the US, German and UK markets had reached its lowest levels of the year in October.

… reflects uncertainty about outlook

The rise in implied volatility also reflected growing uncertainty about the economic outlook. Many markets experienced large price swings in October. Indeed, for the S&P 500, five of the 10 largest moves in 2005 occurred in October alone. The swings were sometimes driven by macroeconomic news, such as a weaker than expected ISM survey of US non-manufacturing activity on 5 October. At other times earnings news dominated, with most companies reporting better than expected profits. At still other times, markets seemed to be focusing on political news, including the appointment on 24 October of a new chairman of the US Federal Reserve.

Eventually, the accumulation of signs that growth in the United States was still robust helped to calm investors. On 28 October, third quarter US GDP growth came in stronger than expected, leading to a 1.7% increase in the S&P 500. The following (trading) day, euro area markets posted their largest daily increase so far this year, rising by 2.2%. The rally continued into November, supported by announcements of higher dividends and share buybacks, as well as more mergers and acquisitions (see below). By mid-November, US and euro area equity markets had regained most of their early October losses.

Japanese markets outperform …

Japanese markets greatly outperformed most other markets. The TOPIX rose by 20% between 1 September and 18 November. By contrast, the S&P 500 and the DJ EURO STOXX were up by only 2% and 4%, respectively, over the same period. As in the bond markets in Japan, equity investors focused on the steadily improving macroeconomic outlook. The largest daily increase in the TOPIX, of 2.5%, occurred on 11 October, due in part to a better than expected machinery orders report. Political developments were also a key focus of attention. Voters' overwhelming support for the prime minister in Japanese parliamentary elections held on 11 September was perceived as facilitating further economic reform. Earnings news also impressed investors. Since early 2005, analysts have raised their earnings forecasts for a steadily increasing number of Japanese companies (Graph 1.6). This contrasts sharply with the United States, where fewer companies' earnings forecasts were revised upwards in September and October than in the first half of 2005.

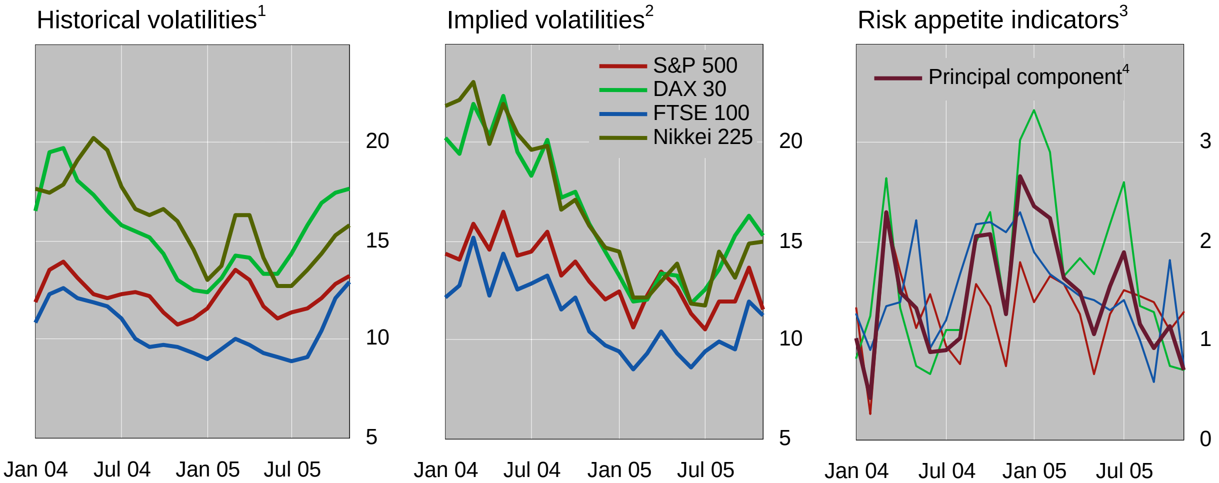
... supported by foreign investors ...

In Japan, the increase in forecast earnings was outpaced by that in equity prices. As a result, price/earnings (P/E) multiples rose to their highest level since mid-2004. Whereas US and euro area equity market valuations have trended downwards in 2005, Japanese valuations have moved upwards. The exuberance of foreign investors partly explains the increase in Japanese equity market valuations, as Japan has been the favourite destination of global equity investors for much of the year.

... yet the yen weakens

In stark contrast with previous upswings in the Japanese equity market over the past six years, the 2005 bull market in Japan has coincided with a broad-based decline of the yen, which weakened to two-year lows against the US dollar in November. Part of this was due to Japanese investors sharply stepping up their overseas securities investments, suggesting to some observers that Japanese investors were less averse to currency risk than previously. Another likely reason for yen weakness was the much less pronounced increase in expected monetary tightening in Japan compared to the other developed markets, as described above. There were also anecdotal reports of a surge of carry trades undertaken by hedge funds contributing to yen weakness, where investors funded long dollar positions through short positions in low interest rate currencies, most notably the yen.

Volatility and risk appetite in equity markets



[1] Annualised conditional volatility from an asymmetric GARCH(1,1) model, estimated over the period January 1996–November 2005; monthly averages; in per cent. [2] Volatility implied by the price of at-the-money call option contracts on stock market indices; monthly averages; in per cent. [3] Derived from the differences between two distributions of returns, one implied by option prices, the other based on actual returns estimated from historical data. [4] First principal component of risk appetite indicators estimated for the S&P 500, DAX 30 and FTSE 100.

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

Graph 1.7

Emerging markets prove surprisingly resilient

Upward revisions to the expected path of policy rates had a surprisingly muted impact on the prices of emerging market assets. In recent years investors' willingness to take on additional risk in an effort to sustain the nominal returns they were able to achieve when interest rates were higher has helped to drive emerging market asset prices up. This willingness seemed to remain intact despite the significant increase in short- and long-term US interest rates in September and October.

Near record inflows into emerging markets

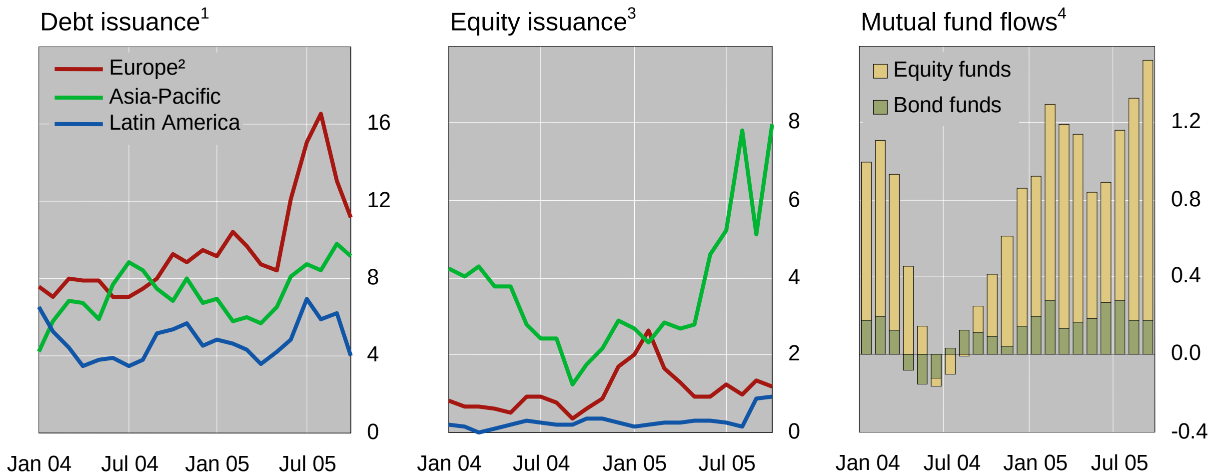
Emerging markets benefited from near record inflows of foreign portfolio investment in the third quarter of 2005 (Graph 1.8). These had helped to push many equity markets to their highest level in years and sovereign bond spreads to their lowest level ever. Between end-June and end-September, emerging equity markets had risen by 12% in local currency terms and the EMBI Global (excluding Argentina) had tightened by 60 basis points, to 229 basis points (Graph 1.9).

October sell-off proves limited

While emerging markets fell sharply in October, the sell-off proved to be mild compared to the price declines earlier in 2005 or in April-May 2004. Between 4 October and 28 October, eastern European equity markets declined by 13% in local currency terms and Asian equity markets by 9% (Graph 1.5). The prices of international sovereign bonds also dropped over this period: the EMBI Global widened by as much as 30 basis points (Graph 1.9). Many emerging market currencies too depreciated against the US dollar, especially higher-yielding currencies such as the Brazilian real and the South African rand. However, as concerns about slowing US growth eased, emerging markets bounced back strongly from their late October lows. By late November, equity and bond prices had returned to their end-September highs.

Portfolio flows to emerging markets

In billions of US dollars

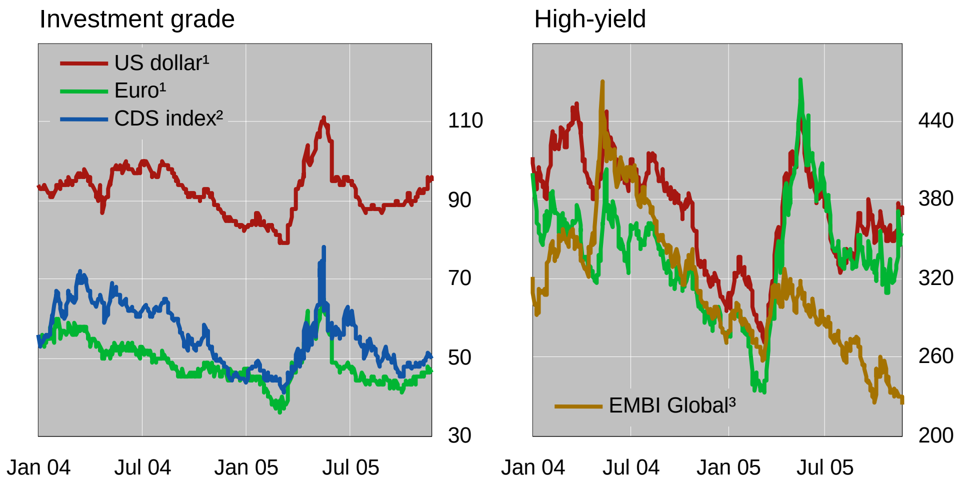


[1] Announced issuance of international bonds and notes plus signings of syndicated loans, three-month moving average. [2] Including Africa and the Middle East. [3] Announced issuance of equities marketed internationally, three-month moving average. [4] Net new cash flows into dedicated emerging market mutual funds registered in the United States, including net exchanges.

Sources: Bloomberg; Dealogic Bondware; Dealogic Loanware; Investment Company Institute; BIS calculations. Graph 1.8

Credit spreads

In basis points



[1] Merrill Lynch corporate bond indices; option-adjusted spread over government bond yields. [2] Five-year on-the-run DJ CDX North American investment grade index. [3] Sovereign stripped spread over government bond yields; JPMorgan Chase emerging market bond indices; adjusted for Argentina.

Sources: JPMorgan Chase; Merrill Lynch. Graph 1.9

During the sell-off in October, investors appeared to pay little heed to the strength of local conditions. Fundamentals in most emerging markets gave little cause for added concern. Indeed, credit rating upgrades of emerging market borrowers continued to exceed downgrades. Brazil and Russia were among those upgraded, to Ba3 and Baa2, respectively, by Moody's in October. One possible reason why the positive outlook failed to moderate the sell-off was that emerging market valuations seemed high even before factoring in the impact of higher interest rates on global growth.

Favourable financing conditions

Despite the weakening of demand for emerging market assets in October, new borrowing in international bond and loan markets remained well above last year's level (Graph 1.8). To be sure, some borrowers scaled back or postponed planned bond issues, especially Latin American borrowers. But for most borrowers, financing conditions remained favourable even at the peak of the sell-off. Indeed, in late October, Vietnam was able to issue its first ever international bond, at tighter spreads and in larger volumes than initially announced.

Chinese companies are active issuers

Issuance by emerging market residents in international equity markets also continued at a record-breaking pace. Chinese companies have been especially active, raising over $20 billion in the first 10 months of 2005. This was almost as much as all other emerging market issuers combined. In October, China Construction Bank became the first of China's four largest banks to list its shares abroad. At $8 billion, it was the largest ever initial public offering (IPO) by a bank, and the largest IPO globally since 2001. China is following the example of other emerging markets and gradually opening up its banking system to foreign competition and investment (see the special feature on page 69).

Credit markets decouple

Corporate debt markets seemed to diverge from other markets. After rallying together with equity prices in 2003 and 2004, in recent months credit spreads have shown signs of decoupling. Even as long-term yields rose and equity markets fell, corporate credit default swap (CDS) and bond spreads remained more or less unchanged in October (Graph 1.9). In November, spreads inched wider despite the rebound in equity markets.

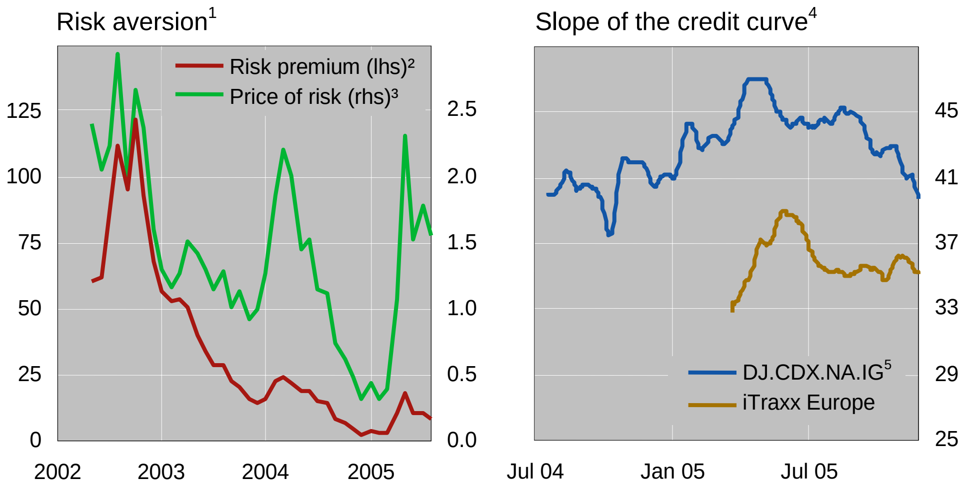
Corporate spreads drift higher …

Credit markets were not immune from shifts in investor confidence. In August, corporate spreads had already started to drift higher, several weeks before other asset prices had begun to decline. Indeed, unlike equity markets and emerging market debt prices, which had rallied to new highs in September, corporate bond markets had not fully recouped the losses recorded earlier in 2005. In the US dollar market, investment grade corporate bond spreads stood at 87 basis points at the end of July, 10 basis points higher than their mid-March low. They subsequently widened by around 5 basis points over the next four months.

… as risk appetite remains subdued

The asynchronous movements in equity prices and credit spreads, and the failure of corporate bond markets to recoup their earlier losses, largely reflected credit investors' greater sensitivity to event risk in the wake of developments earlier in 2005, including the downgrade of General Motors. While the strong rebound in demand for collateralised debt obligations (CDOs) in the second half of 2005 suggests that investors' appetite for risk remained high, it had weakened somewhat compared to late 2004 or early 2005. The left-hand panel of Graph 1.10 plots the compensation investors demand for bearing default risk (see the special feature on page 55). According to this measure, investors' appetite for risk never fully recovered from the turmoil in credit markets between March and May 2005.

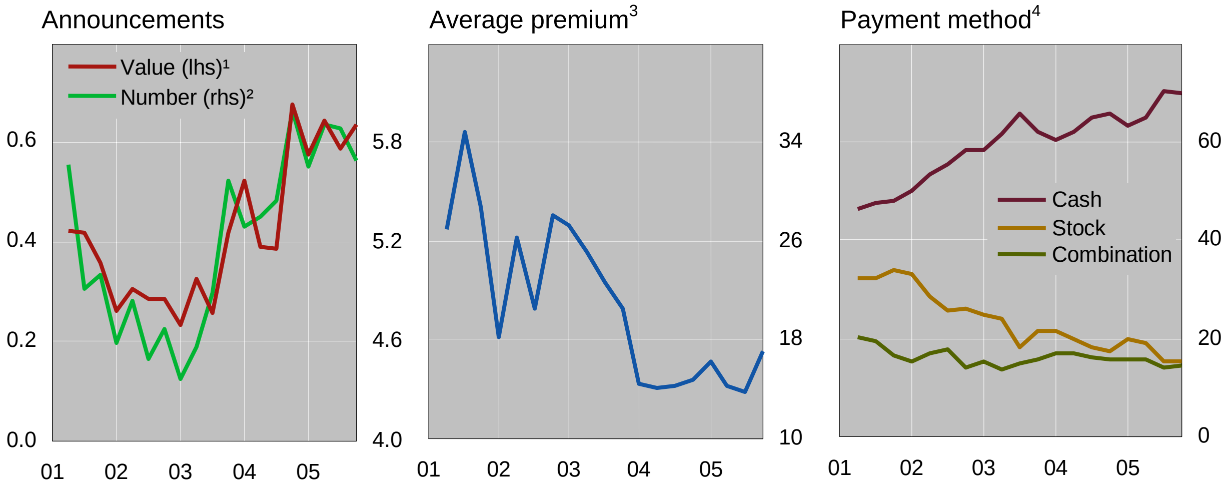
CDS markets



[1] Based on one-year spreads and default probabilities for the 125 constituents of the DJ.CDX.NA.IG.4 index. [2] CDS index spreads less expected losses, in basis points; expected losses are based on Moody's KMV's Expected Default Frequencies (EDFs) and a recovery rate of 40%. [3] Estimated as the ratio of risk neutral to physical probabilities of default. [4] Ten-year minus three-year spreads for the on-the-run indices; 10-day moving average, in basis points. [5] North American investment grade index.

Sources: JPMorgan Chase; Markit; Merrill Lynch; Moody's KMV; BIS calculations. Graph 1.10

Global mergers and acquisitions



[1] In trillions of US dollars. [2] In thousands. [3] Premium over the equity price on the day the deal was announced, in per cent. [4] As a percentage of the total value of announced deals.

Source: Bloomberg. Graph 1.11

The growing number of companies announcing shareholder-friendly actions seemingly served as an ongoing reminder of the downside risk inherent in credit instruments. Companies are increasingly looking to acquisitions as a way to maintain their earnings growth. Mergers and acquisitions (M&A) announced between January and October 2005 were up by about 35% over the same period in 2004 (Graph 1.11). Acquisitions are not necessarily detrimental to the interests of creditors. Creditors can take some comfort from the fact that a large share of the deals announced this year have been financed using cash. While such deals might increase leverage, historically they have tended to give a bigger boost to earnings than deals financed using equities. Furthermore, the premium over the target company's equity price remains well below the premium paid by companies in 2000, during the last major wave of mergers.

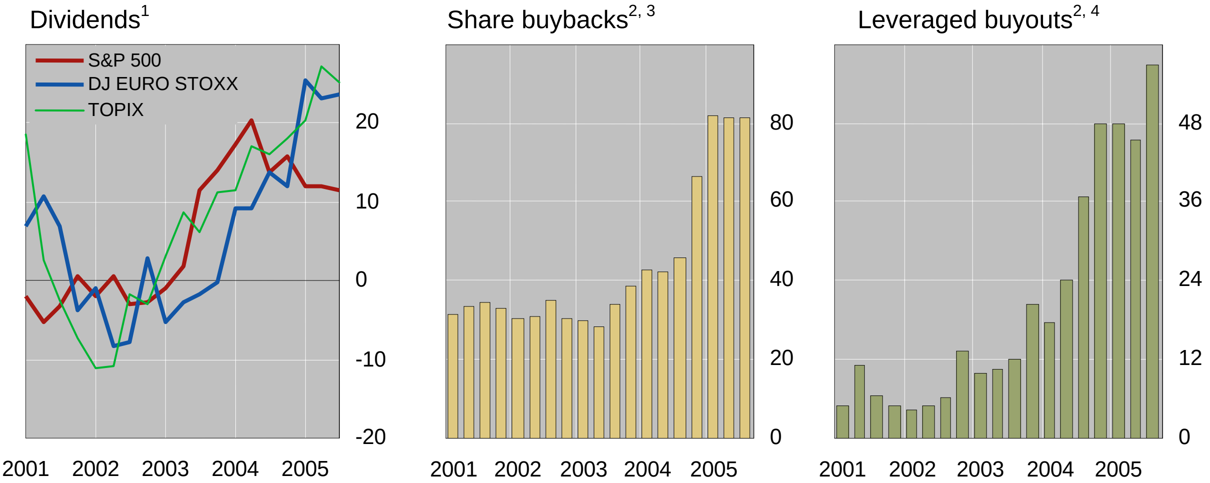
Shareholder-friendly changes in capital structure

More worrying for creditors are changes in firms' capital structure. Financing for leveraged buyouts almost doubled over the first three quarters of 2005 compared to the same period in 2004 (Graph 1.12). Moreover, according to Standard & Poor's, debt/earnings ratios in such buyouts were at their highest level in many years. Furthermore, in the United States, share buybacks are well above their 2004 high. And dividends have been rising at double digit rates in the major markets.

US auto sector a source of concern

The US auto sector remained a source of concern to credit investors. Delphi, the largest US auto parts supplier and former General Motors subsidiary, filed for bankruptcy in October. This triggered a further downgrade of GM, owing to extensive links between the two companies. Moreover, the default by Delphi led to downgrades of a large number of CDOs. As recently as December 2004, Delphi had been rated investment grade, and so it had been referenced in a broader range of CDOs than is typical for lower-rated borrowers. Despite this chain reaction, credit markets adjusted smoothly to the default. The adjustment was facilitated by initiatives to improve the functioning

Shareholder-friendly actions



[1] Year-over-year change, in per cent. [2] In billions of US dollars. [3] S&P 500 companies. [4] Signings of syndicated loans to finance leveraged buyouts and management buyouts.

Sources: I/B/E/S; Standard & Poor's; Loanware; BIS calculations. Graph 1.12

of the CDS market, including cash settlement of index contracts (see "Derivatives markets" on page 43).

Credit markets also reacted calmly to Hurricane Katrina, despite it being the most costly natural disaster ever recorded (see the box on page 13). Several insurers and reinsurers saw their credit default swap spreads increase noticeably in the weeks after Katrina hit. Spreads widened again in late September, before Hurricane Rita made landfall. Yet, many insurance companies' spreads had widened by even more during the sell-off in credit markets earlier in 2005.

Gradual increase in defaults anticipated

Notwithstanding such surprises and the trend towards shareholder-friendly actions, investors appeared to remain confident in the outlook for credit quality. In recent months short-term CDS spreads for US companies have moved up relative to long-term spreads, indicating that investors turned less optimistic (Graph 1.10). Yet, the slope remains as steep as in 2004, suggesting that investors do not expect credit fundamentals to worsen markedly over the near term. This view is consistent with most analysts' projections. For example, while Moody's forecasts that the (global) speculative grade default rate will increase going forward, the increase is expected to be gradual, rising from the cyclical low of 1.8% in mid-2005 to slightly more than 3% in a year's time. Moreover, the default rate is expected to remain well below its 1990s average of 4.8%.

Impact of Hurricane Katrina on the reinsurance industry

Ingo Fender and Philip Wooldridge

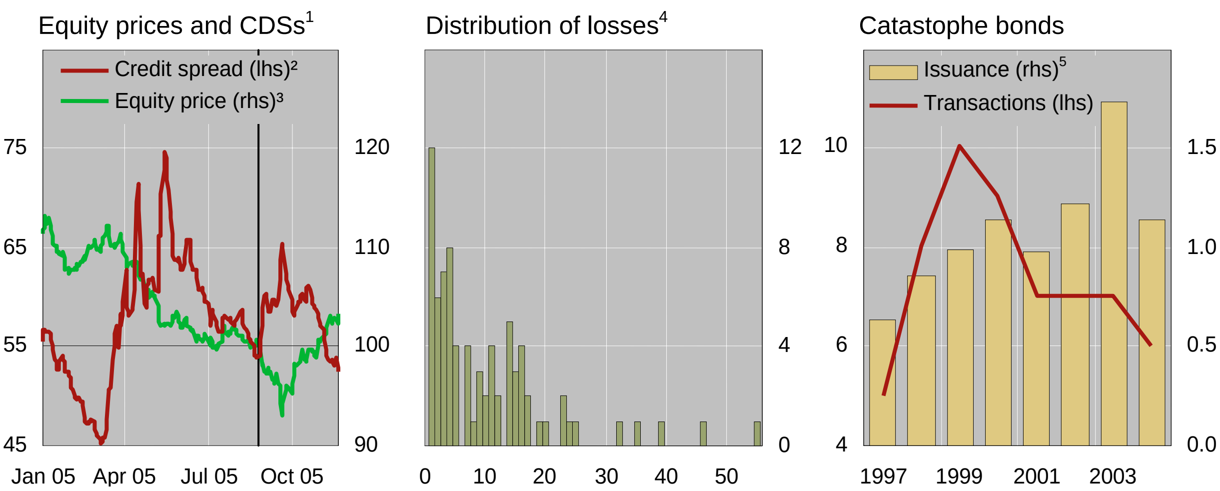
Hurricane Katrina, which struck the Gulf Coast of the United States in late August 2005 and decimated the city of New Orleans, is likely to be the most expensive natural catastrophe ever. Insured losses are estimated to be as high as $60 billion. This is more than double the previous record loss, incurred following Hurricane Andrew in 1992. Because of the size and nature of the catastrophe, the reinsurance industry is likely to bear a larger proportion, as much as 50%, of total insured losses arising from Katrina than of those inflicted by earlier disasters. Despite the enormity of the losses, investors at no point expected Hurricane Katrina to lead to serious financial difficulties. While reinsurers' credit default swaps tended to widen in September, the widening was less pronounced than during the sell-off in credit markets earlier in 2005 (left-hand panel of the graph below). Moreover, spreads tightened again in October. The equity prices of reinsurers also quickly rebounded.

Reinsurers help to support the stability of the financial system. Through the provision of insurance for insurers, the reinsurance sector absorbs shocks that might otherwise undermine the solvency of primary insurers. In particular, they facilitate the diversification of risks. Through their investment activities they also contribute to market liquidity, especially in markets for risk transfer. Problems in the reinsurance sector, therefore, could have significant spillover effects on other sectors, either through outright failures or via rating downgrades, which could force them to withdraw from non-core business activities.

The resilience of the reinsurance sector in the face of Hurricane Katrina can be attributed in large part to its strong capital base. Following the terrorist attacks in the United States in September 2001, insurance premiums increased substantially, especially those covering catastrophic risks. This helped many reinsurers to rebuild their capital base, the sufficiency of which had been called into question by the attacks. Strong growth in premiums also attracted the interest of new private equity investors. Hedge funds were among those which provided seed capital for startup reinsurers, with CIG Re and Glacier Re being recent examples.

According to reinsurance statistics collected by the International Association of Insurance Supervisors (IAIS), reinsurers held capital of $244 billion at end-2003. Therefore, losses from Hurricane Katrina will not impact the solvency of the industry as a whole. However, losses as a percentage of capital are estimated to be large for some individual reinsurers, triggering recapitalisation needs and the possibility of rating downgrades (centre panel of the graph below).

Impact of Hurricane Katrina



[1] The vertical line indicates the landfall date of Hurricane Katrina (29 August). [2] Weighted average of the five-year CDS spreads of Swiss Re, Munich Re and ACE (denominated in US dollars), with modified restructuring clauses, in basis points. [3] Reinsurance sector relative to the global share index; 29 August 2005 = 100. [4] Estimated losses incurred by 78 insurance and reinsurance companies arising from Hurricane Katrina; the share of shareholders' funds lost (x–axis, in per cent) is plotted against the number of companies (y–axis). [5] In billions of US dollars.

Sources: Benfield Group; Datastream; Guy Carpenter; Markit; Swiss Re; BIS calculations.

Indeed, some reinsurers have already taken steps to replenish their capital. The willingness of investors to recapitalise these entities suggests that they remain confident in reinsurers' capacity to model and price the risk of natural disasters. However, concerns over risk modelling capabilities and increasing loss frequencies could still lead to changed rating criteria and downgrades over the medium term.

Capital markets' direct contribution to absorbing Katrina-related losses will be limited. This is despite efforts, following Hurricane Andrew, to promote the use of instruments such as catastrophe (CAT) bonds and options to spread catastrophic risks more broadly. CAT bonds outstanding totalled less than $5 billion in mid-2005, and US Gulf Coast hurricane exposure accounted for only a small fraction of this amount. One factor behind the market's somewhat disappointing development is that the trade-off between basis risk and moral hazard limits the usefulness of CAT bonds in comparison to outright reinsurance. The latter avoids basis risk through contractual features tailored to the needs of the entity seeking to transfer risk, but this adds to the complexity of the contract and so increases monitoring costs. Standardised contracts, in turn, minimise moral hazard by conditioning payments on prespecified regional or industry-wide loss levels, but increase basis risk for the entity seeking to transfer risk.