

## Overview: markets rebound after sell-off

Global financial markets quickly recovered following a sell-off in late February and early March 2007, and valuations in many asset classes headed for new highs. In this environment, government bond yields in major industrialised economies rose between late February and the beginning of June. Euro yields increased the most as the outlook for economic growth in the euro area improved further. US yields were slower to display a sustained rise, reflecting investors' gradual upward adjustment of the US economic outlook, which gathered pace only towards the end of the period under review. In addition to the effects of perceived improvements in growth prospects, increasing term premia contributed to the rise in bond yields.

The rally in global equity markets continued during the period, despite the broad market repricing in late February and early March. Although brief, the bout of turbulence lifted implied volatilities in most markets from their near historical lows. Nonetheless, the major US and European equity indices quickly recovered, reaching fresh six-year highs by mid-April. In contrast, the rally in Japanese equity markets, which had started in November 2006, stalled during the period under review.

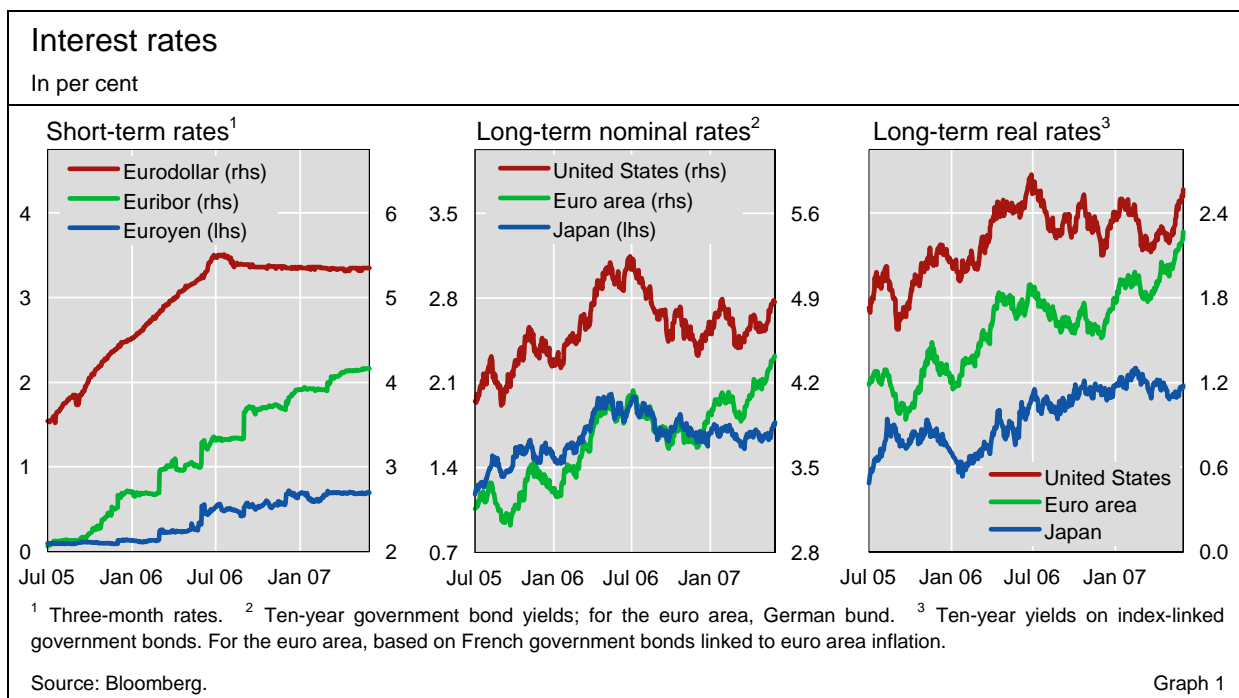
Credit markets were somewhat slower to recover from the sell-off than equities. By end-May, however, US dollar and euro credit markets had more than recouped their losses, with high-yield credit spreads touching new lows in some markets. While the spillover from the problems in the US subprime housing market was thought to be limited, investors remained concerned about the effect that further problems might have in some CDO markets.

In emerging markets, spreads tightened to new lows and equity prices climbed further during the period under review. While good economic performance contributed to these favourable developments, high risk tolerance among market participants may also have played an important role. Compared to US corporate spreads, emerging market spreads of similar credit rating continued to trade at tighter levels.

### Strong growth expectations lift euro bond yields

Government bond yields in the G3 economies rose between late February and the beginning of June 2007, with euro area long-term yields displaying the most pronounced increases (Graph 1, centre panel). On 27 February, global

Euro area bond yields rise the most ...



financial markets suffered a sell-off which continued for a number of days thereafter, and which brought about significant declines in government bond yields. As the market jitters faded, bond yields soon recovered. Between 26 February and 1 June, yields on 10-year US government bonds rose by about 30 basis points to 4.90%, while Japanese 10-year yields increased by 10 basis points to above 1.75%. In the euro area, 10-year yields rose by some 40 basis points, bringing them to around 4.45%. In money markets, meanwhile, US and Japanese short-term rates remained broadly stable, while euro area rates rose as the ECB continued to hike policy rates and expectations of future rates shifted upwards as well (Graph 1, left-hand panel).

The sustained upward pressure on euro area yields was consistent with investors' perceptions of the strength of the euro area economy, which continued to steam ahead at an above average pace. Thus, the rise in euro area nominal yields between late February and the beginning of June was largely accounted for by increasing real yields (Graph 1, right-hand panel). Against this backdrop, market analysts continued to revise upwards their expectations of 2007 GDP growth (Graph 2, left-hand panel).

... as the euro area economy strengthens further

In the United States, continued signs of a slowdown in economic activity weighed on bond yields initially during the period under review. The market sell-off in late February and early March resulted in sharper declines in US bond yields than in other major markets. This was in line with investors' view of a particularly vulnerable US economy in an environment of falling prices of risky assets and persistent worries related to the weak housing market. While many of these fears subsequently subsided and markets recovered, yields were slow to increase above their pre-sell-off levels, as investors remained uncertain about the outlook. Analysts' forecasts for 2007 GDP growth in the United States were again revised downwards, following a brief period of increases at the beginning of the year (Graph 2, left-hand panel). Nonetheless,

Concerns about the US economy weigh on yields initially ...

... but an improving outlook eventually raises yields

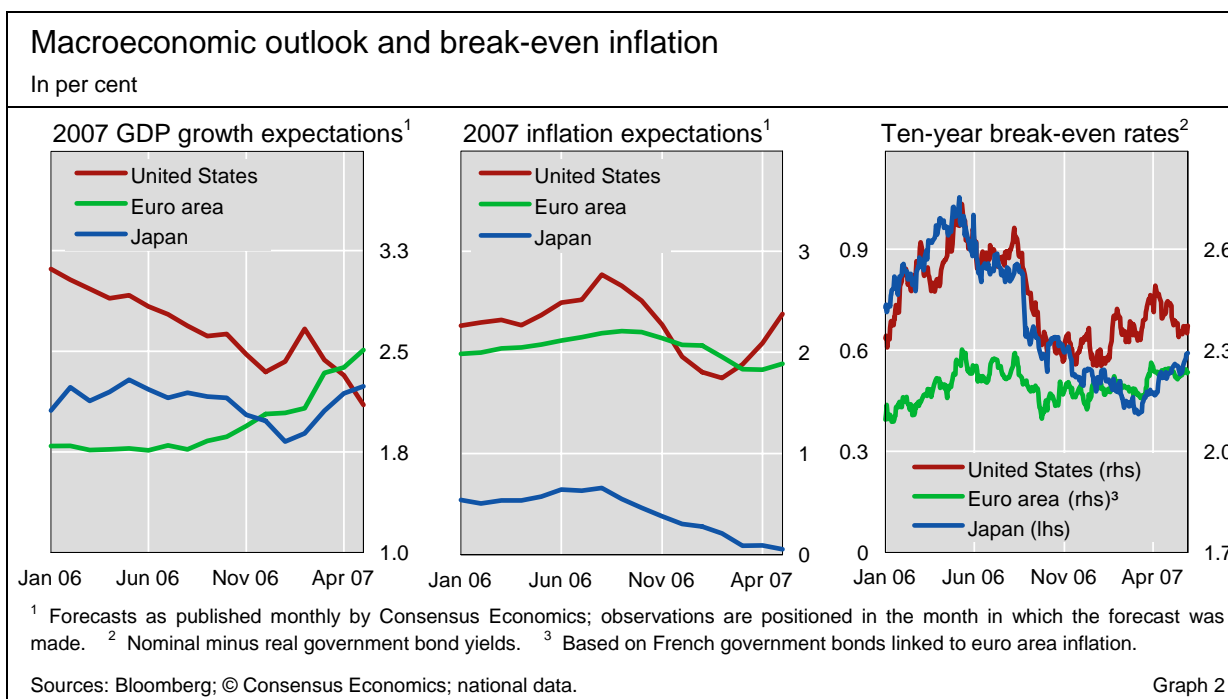
in the second half of May, bond yields rose as the release of stronger than expected employment data and other favourable economic indicators induced renewed optimism among investors concerning the US economy. The 10-year US real yield largely mirrored developments in corresponding nominal bond yields in the period under review (Graph 1, right-hand panel).

Break-even inflation rates remain steady ...

During the past three months, bond prices seemed little affected by the outlook for inflation, as inflation expectations remained steady in the euro area and Japan, and despite signs at times that markets expected upward price pressures to persist in the United States. US headline inflation figures remained elevated, notwithstanding questions about the strength of the economy and signs of a moderation in core inflation in the recent past. Survey forecasts for 2007 US inflation rose from March to May, as the weakening of the dollar and a rebound in oil prices seemed to result in expectations of persisting inflationary pressures (Graph 2, centre panel). In this environment, the 10-year break-even inflation rate remained relatively unaffected (Graph 2, right-hand panel). The euro area and Japan also saw steady long-term break-even rates, as survey expectations of near-term inflation remained stable.

... as expectations of Fed rate cuts are scaled back ...

In line with the perceived outlook for inflation, on balance investors seemed to revise their expectations for US monetary policy towards a tighter stance than previously anticipated. While the Federal Reserve had for some time been expected to cut interest rates during 2007, by the beginning of June such expectations had faded almost completely (Graph 3, left-hand panel). Signs of a more robust US economy in the second half of May boosted this shift in policy expectations. Changes to the expected policy rate trajectory seemed to play an important role for developments in US bond yields as well. The two largest daily increases in the 10-year yield during the period under review occurred on days when stronger than foreseen employment reports



were released, which reduced the perceived likelihood of near-term interest rate cuts.

Revisions to monetary policy expectations among investors also affected bond yields in the euro area and Japan. Expectations that monetary policy in the euro area would turn out to be tighter than previously anticipated added to the upward pressure on bond yields. The ECB raised policy rates by 25 basis points in early March, and investors expected this move to be followed up by another tightening in June. Moreover, expectations for policy rates further ahead were revised upwards (Graph 3, centre panel). In Japan, markets continued to expect monetary policy to be normalised gradually, despite subdued price pressures, with the next rate hike foreseen for the autumn. However, the expected pace of adjustment, was revised downwards to some extent between late February and the beginning of June (Graph 3, right-hand panel).

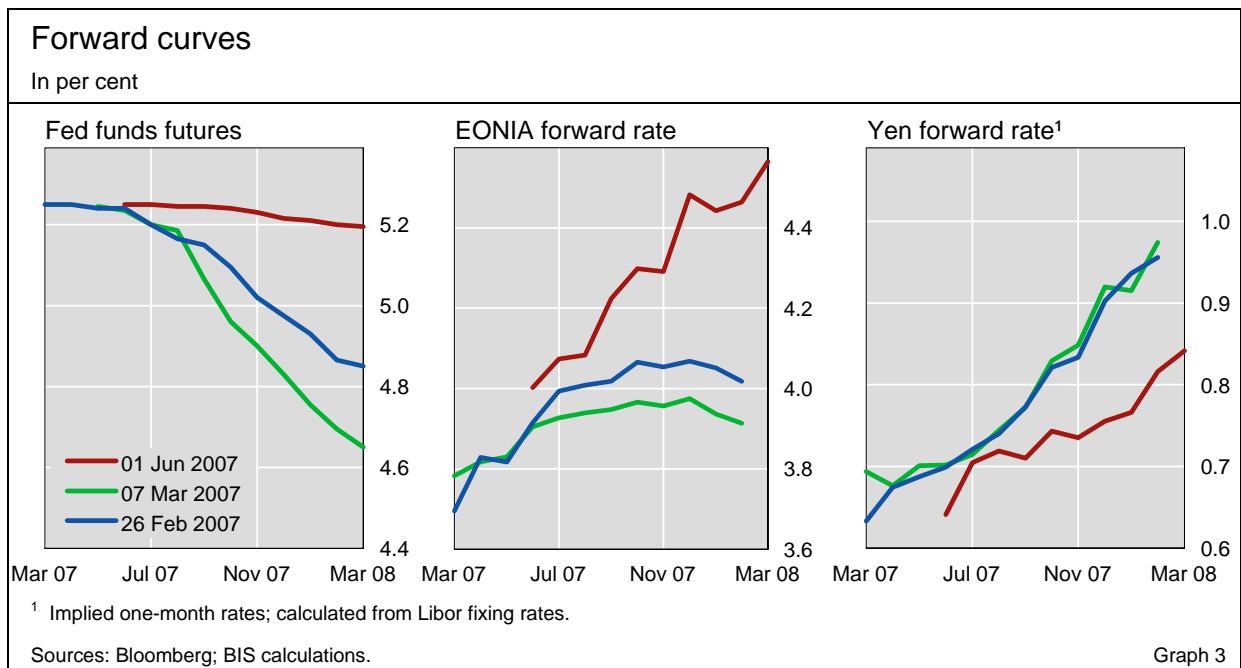
... and the ECB is expected to tighten further

While the macroeconomic outlook accounted for part of the observed movements in US and euro area yields during the period under review, fluctuations in estimated term premia seemed to contribute importantly as well. Between end-February and end-May, the estimated 10-year US term premium rose by 25 basis points, while the corresponding euro premium increased by 30 basis points (Graph 4, left-hand panel). This suggests that a significant part of recent changes in nominal long-term bond yields was due to changes in investors' perceptions about risks driving yield movements, or to shifts in the price attached to such risks.

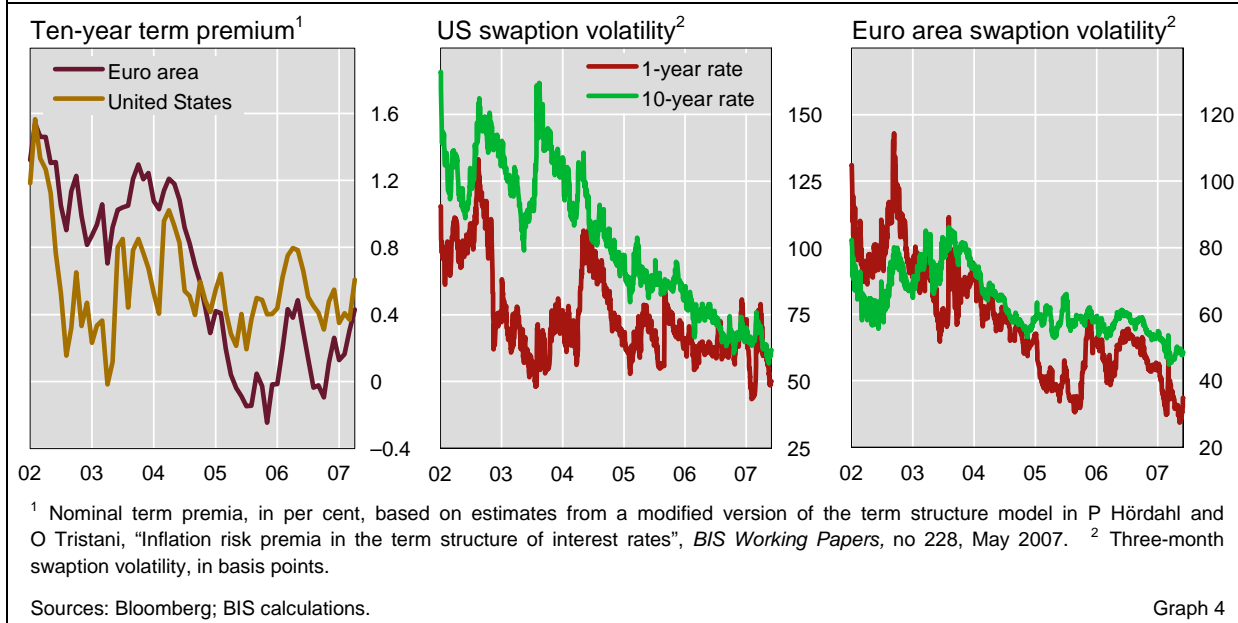
Term premia rise in the United States and euro area ...

Implied swaption volatilities in the United States and euro area remained at historically very low levels (Graph 4, centre and right-hand panels). While the February–March sell-off prompted some increases in implied volatility, especially for short maturities, these effects faded in the following weeks. In particular, short-term swaption volatilities on one-year euro swap rates quickly began to fall again, and reached new lows by mid-May. The implied volatility on

... while swaption volatilities remain low



## Term premia and swaption volatilities



comparable US swaption contracts had also declined to levels not seen in recent years before the sell-off. However, US short-term swaption volatilities were somewhat slower to resume a downward path, and had not fully reverted to their pre-sell-off lows by 1 June.

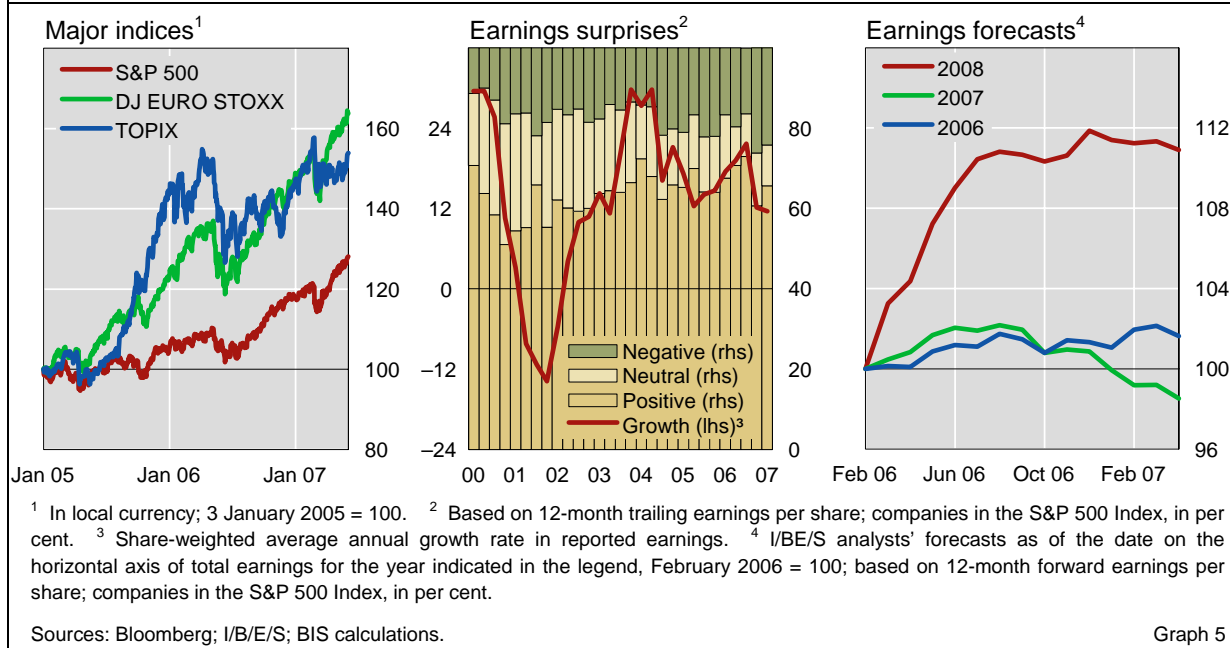
These differing developments in euro swaption volatilities compared to US contracts might have reflected contrasting perceptions about the degree of uncertainty associated with near-term moves in short-term interest rates and hence monetary policy. It is conceivable that the market became relatively more uncertain about the outlook for US interest rates in the wake of the sell-off. At the same time, investors may have felt that short-term euro interest rates remained unlikely to deviate substantially from expectations, given the robustness of real economic conditions and the signals conveyed by euro area monetary policymakers. Meanwhile, implied swaption volatilities for 10-year interest rates remained low for both US and euro rates, in line with expectations of low volatility in long-term interest rates and their macroeconomic determinants.

## Equity market rally weathers turbulence

Equity markets in the United States and Europe continued their upward trajectory during the period under review, despite a brief period of market turbulence in late February. Between end-February (just prior to the sell-off) and late May, the S&P 500 was up by 6%, and hit a historical high of 1,530 on 30 May. Similarly, the DJ EURO STOXX index rose by 6%, and reached a new six-year high during the period (Graph 5). By contrast, Japanese equity markets, which had rallied strongly to mid-February, struggled to find their footing.

The market sell-off, which started in China on 27 February, had a significant, if temporary, effect on global equity markets. While concrete

## Equity markets and corporate earnings



triggers seemed to be absent, an allusion to the possibility of a recession in comments by the former chairman of the Federal Reserve, and a particularly weak US durable goods orders number, were cited by market participants as factors which cast doubt on the sustainability of growth in the United States. The Chinese equity market sold off 9% on the day (see the emerging markets section below), but was quick to recover. By contrast, the S&P 500 Index sold off 5.2%, and European and Japanese equity markets fell 6% and 8% respectively, over the next four days. Implied volatility in equity markets in the United States and Europe jumped during the sell-off, and remained elevated for a few weeks (Graph 6, left-hand panel). Volatility had subsequently abated by mid-May in both markets, but remained above the lows reached in mid-February.

In the background, a slowdown in corporate earnings growth seemed to add to investors' unease about equity market valuations. Corporate earnings growth in the United States in the fourth quarter of 2006 was 12% (share-weighted basis), down significantly from the 20% average in the first three quarters. In the first quarter of 2007, two thirds of reporting companies beat analysts' expectations, although these expectations had to some extent been revised downwards in recent months (Graph 5, right-hand panel). In Europe, the expected growth in earnings per share in 2007 for companies in the DJ STOXX 600 index was only 6% in late May, compared to 15% growth in 2006.

Market-based indicators suggest that changes in investors' willingness to bear risk also contributed to the market repricing in late February. As equity investors become less tolerant of risk, they attach less value to the possibility of receiving high payoffs than to that of avoiding low payoffs. Thus, differences in the statistical distribution of actual equity returns and expected returns implied by options prices can be used to construct a rough indicator of investors' risk appetite (Graph 6, right-hand panel). This indicator dipped in March to its lowest level since

Slower corporate earnings growth ...

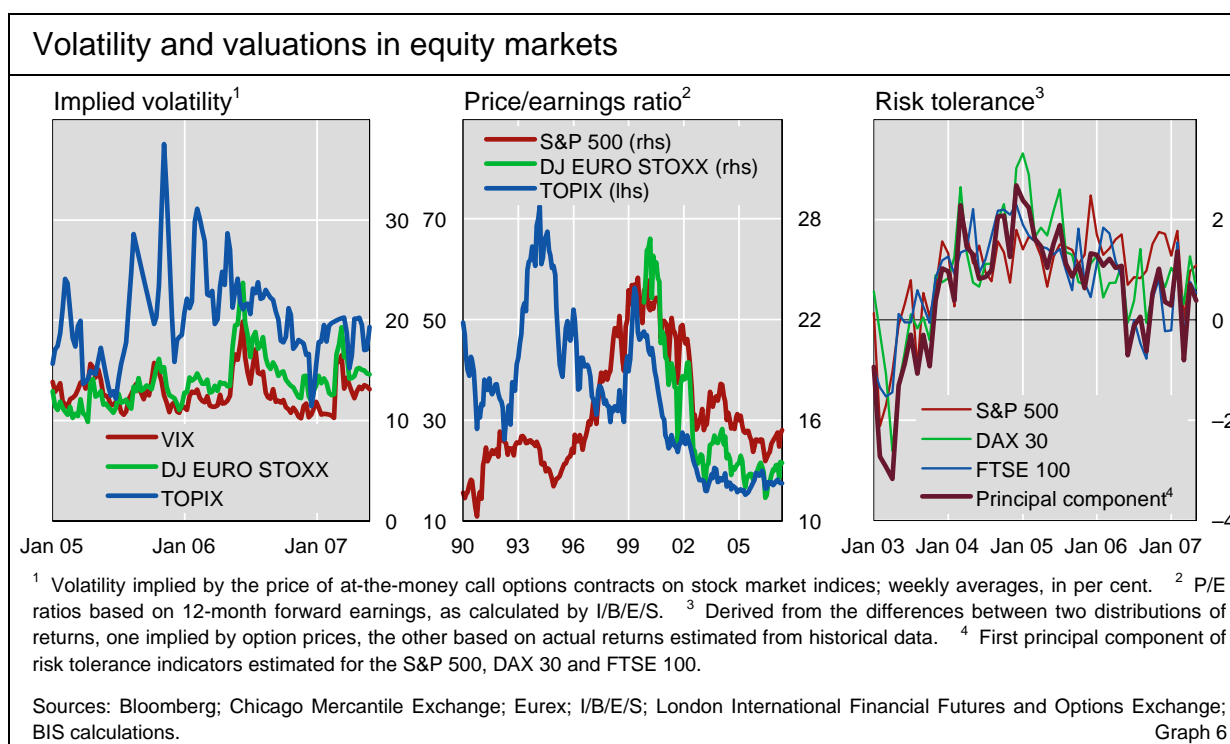
late 2003. While risk tolerance recovered somewhat in April and May, it remained lower than the overall average level evident since early 2005.

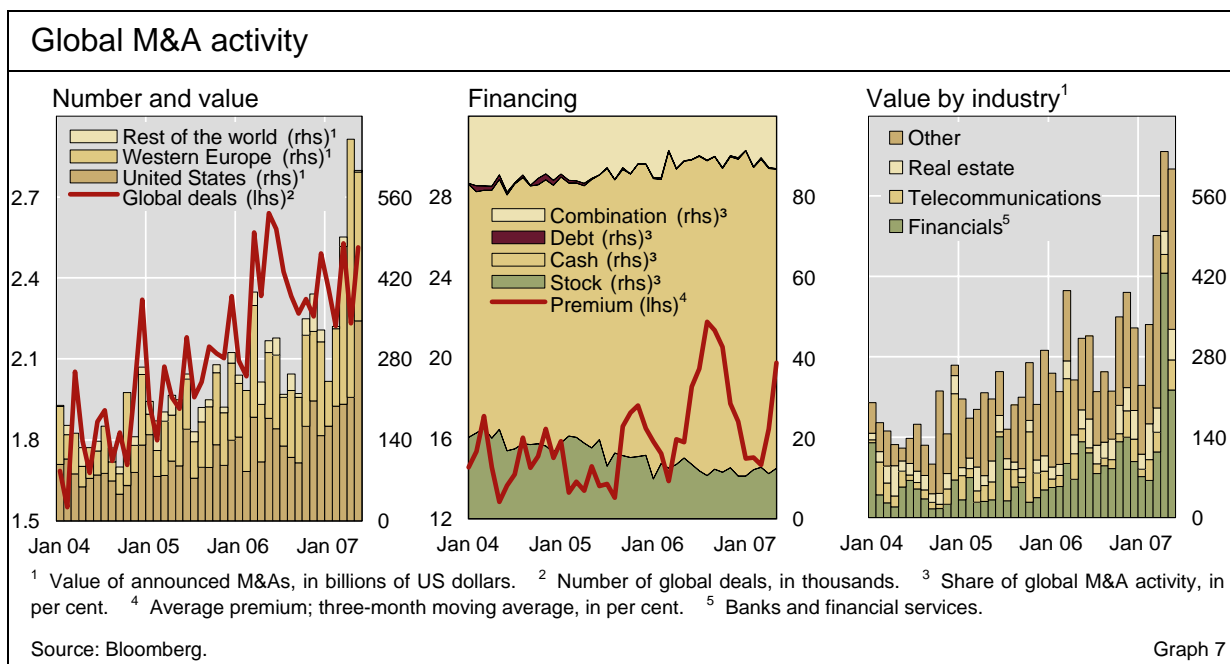
... and rallying equity prices ...

By end-May, equity markets in the United States and Europe had more than recouped the losses sustained during the February sell-off. The S&P 500 finished March just shy of its pre-sell-off level, as did the DJ EURO STOXX index. By early May, both indices had reached six-year highs, with the S&P 500 closing above 1,500 on 3 May for the first time since 2000. These advances occurred in spite of discouraging news about the state of the US housing market, which at times depressed equity markets (see below). For example, an announcement by the Mortgage Bankers Association on 13 March that the delinquency rate for borrowers with prime credit ratings was the highest in four years (2.6% in the fourth quarter of 2006) contributed to a large drop in bank and financial shares which pushed the S&P 500 index down by 2% on the day. But markets later reacted positively to the Fed's decision to hold rates steady on 21 March and, more importantly, the softer reference to the likelihood of future rate hikes in the accompanying statement.

... contribute to an uptick in P/E ratios

Unlike in early 2000, valuations in equity markets during the current rally have remained low by historical standards. Prior to the collapse in equity prices in 2000, price/earnings ratios (based on 12-month forward earnings) for companies in both the S&P 500 and the DJ EURO STOXX had risen to well above 20. They subsequently trended downwards during the bust, and bottomed out in mid-2006 at 14 and 11 respectively. P/E ratios have risen nowhere near as much during the recent rally, as generally strong earnings growth since 2005 has kept pace with the rise in equity prices. However, they have moved higher in recent months, exacerbated by the downward revisions in earnings forecasts (Graph 6, centre panel).





In contrast to the United States and Europe, the rally in Japanese equity markets, which had started in November 2006, stalled during the period under review. The TOPIX index peaked in late February at 1,817 and ended the period down by more than 3%. At times, depreciation of the yen and news supporting the expectation of sustained US growth helped boost the share prices of Japanese exporters. However, concerns that corporate earnings would be weaker than forecast seemed to discourage equity investors.

The global boom in merger and acquisition (M&A) and leveraged buyout (LBO) activity continued unabated in the period under review, providing support for the rally in equity markets. The total value of announced M&A deals in the United States in 2007, at \$1.1 trillion to end-May, was the strongest five-month period on record (Graph 7). Activity in Europe was also strong during this period, at just over \$1 trillion, with particularly heavy activity in the banking and financial services sectors. For example, the announced \$91 billion bid by Barclays for ABN AMRO on 23 April – which, if completed, would be the largest financial services deal on record – contributed to the spike in announced global activity in April. In previous M&A booms, deals financed with equity have tended to depress the acquiring firm’s stock price, and any gains in shareholder value were captured mainly by the shareholders of the target company (see *BIS 76th Annual Report*, Chapter VI). In the current boom, however, equity financing of M&A deals has been on the low side, at 12% of the total volume in the first quarter of 2007 compared to an average of more than 50% in the 1998–2000 M&A boom. Instead, companies have been taking on more debt to finance deals; total signings of syndicated loans for LBOs surged to \$82.3 billion in the United States in the first quarter of 2007, almost double the amount in the previous quarter.

LBO-related loan signings surge in first quarter



## Credit markets slower to recover

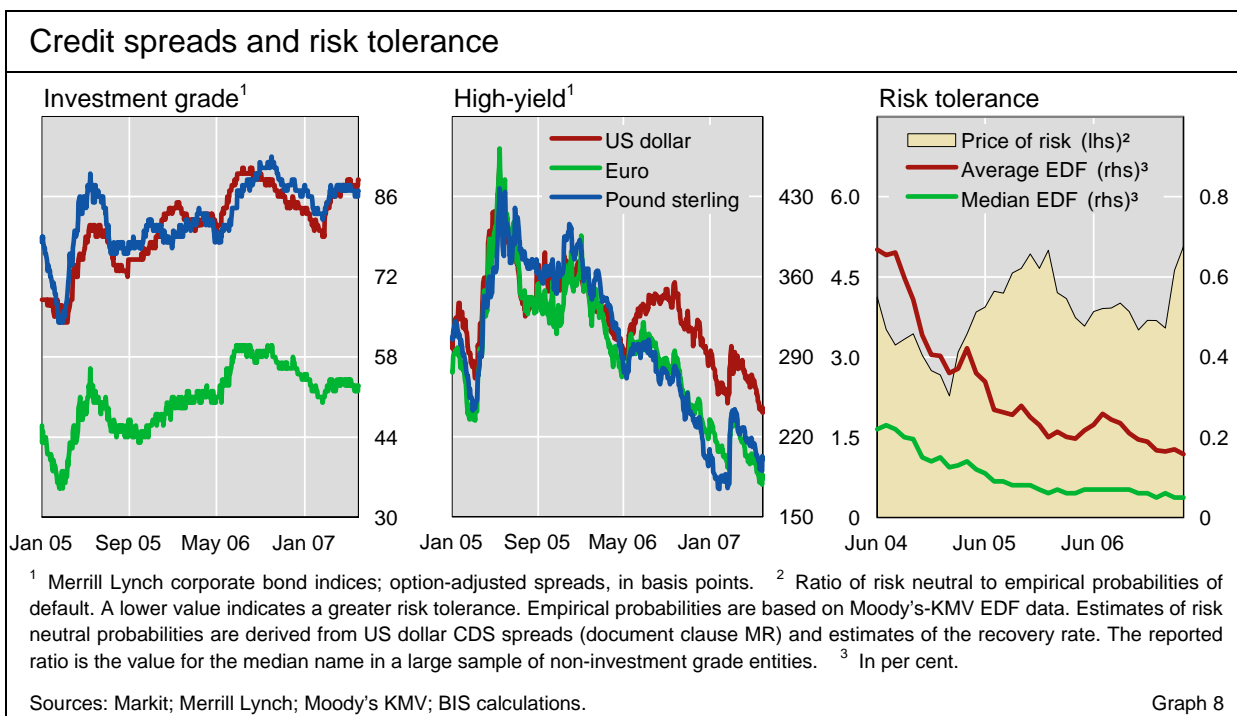
Credit markets also recovered from the bout of market turbulence in late February and early March, but were somewhat slower to do so than equities. While investment grade credits were only marginally affected, with spreads widening by a few basis points, US and European high-yield credit indices widened by more than 40 basis points from their historical lows in the two weeks following the sell-off (Graph 8). Whereas equity markets had largely recouped their losses by the end of March, it was not until mid-May that euro high-yield credit spreads had returned to their mid-February lows. High-yield spreads in the US dollar market took somewhat longer, hitting their pre-sell-off level only in late May.

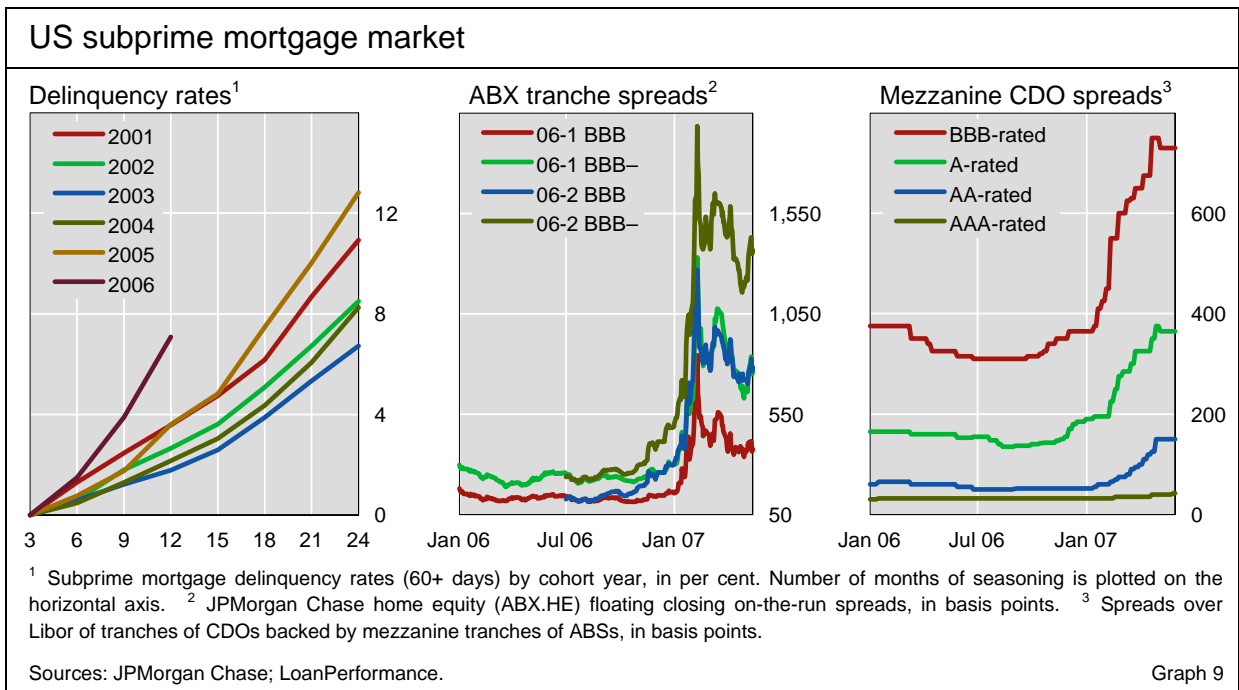
As in equity markets, the repricing in credit markets in February and March seemed in part to reflect changes in investors' tolerance for risk. A rough estimate of the price of a "unit" of risk in a particular credit market segment is the ratio of default probabilities derived from credit spreads to model-based estimates of default risk, such as Moody's-KMV estimated default frequencies (EDFs). This measure of the price of credit risk rose sharply in March and April as credit default swap (CDS) premia remained above their February lows, even as EDFs continued to move slowly downwards (Graph 8, right-hand panel). Indeed, the median EDF for the sample of names used in this analysis hit cyclical lows in April in both the US dollar and the euro markets, at 0.05% and 0.04% respectively.

In the background, problems in the US subprime mortgage market may have unsettled investors, contributing to uncertainty and the bout of market turbulence. Delinquency rates on subprime loans, which had hovered near 11% for much of 2004 and 2005, reached 13% by end-2006, with much of the increase occurring in the fourth quarter. Moreover, problems seem to be concentrated in the most recent vintages of loans, those extended in 2005 and 2006 (Graph 9, left-hand

Risk tolerance falls in March and April

Problems in the US mortgage market ...





panel). On the one hand, it could be supposed that the broader risks will be limited because of the relatively small size of the subprime sector. Subprime and Alt-A loans (or loans to borrowers who do not merit prime status) combined comprise roughly 14% of total US mortgage loans outstanding at end-2006. On the other hand, rising delinquencies had already induced a series of bankruptcies of subprime lenders, and there was a significant widening as from November 2006 of spreads on non-investment grade tranches of home equity collateralised debt obligations (CDOs) (Graph 9, centre panel).

These spreads narrowed somewhat between late February and end-May as the direct consequences of the problems in the subprime sector became clearer. However, investors also became increasingly concerned about the effect that a continued deterioration might have on valuations of CDOs backed by asset-backed securities (ABSs). Exactly where in the CDO market the risks posed by subprime and Alt-A mortgages are concentrated is difficult to measure. Estimates based on commercially available data on individual CDO deals suggest that ABSs (of all types) account for about one third of the total collateral backing cash CDOs. Industry estimates suggest that, of these, exposure to subprime mortgages is substantial. Spreads on tranches of CDOs backed by mezzanine tranches of ABSs moved significantly wider in late January 2007, signalling that investors placed a higher probability on a significant deterioration in the underlying collateral pool (Graph 9, right-hand panel).

... affect CDO valuations

Spreads on high-yield corporate credits resumed their downward trajectory in mid-April, as investors were apparently reassured by the better than expected earnings season in the United States and the generally upbeat macro news in Europe. Despite the surge in M&A activity and LBO-related loan signings in the first quarter, high-yield spreads in both the US dollar and euro markets ended the period a few basis points below their mid-February lows. That said, not all credit markets have returned to the pre-sell-off levels. In

contrast to the cash markets, indices of US dollar and euro non-investment grade CDS spreads finished the period noticeably wider than in mid-February.

Synthetic CDO issuance surges in first quarter

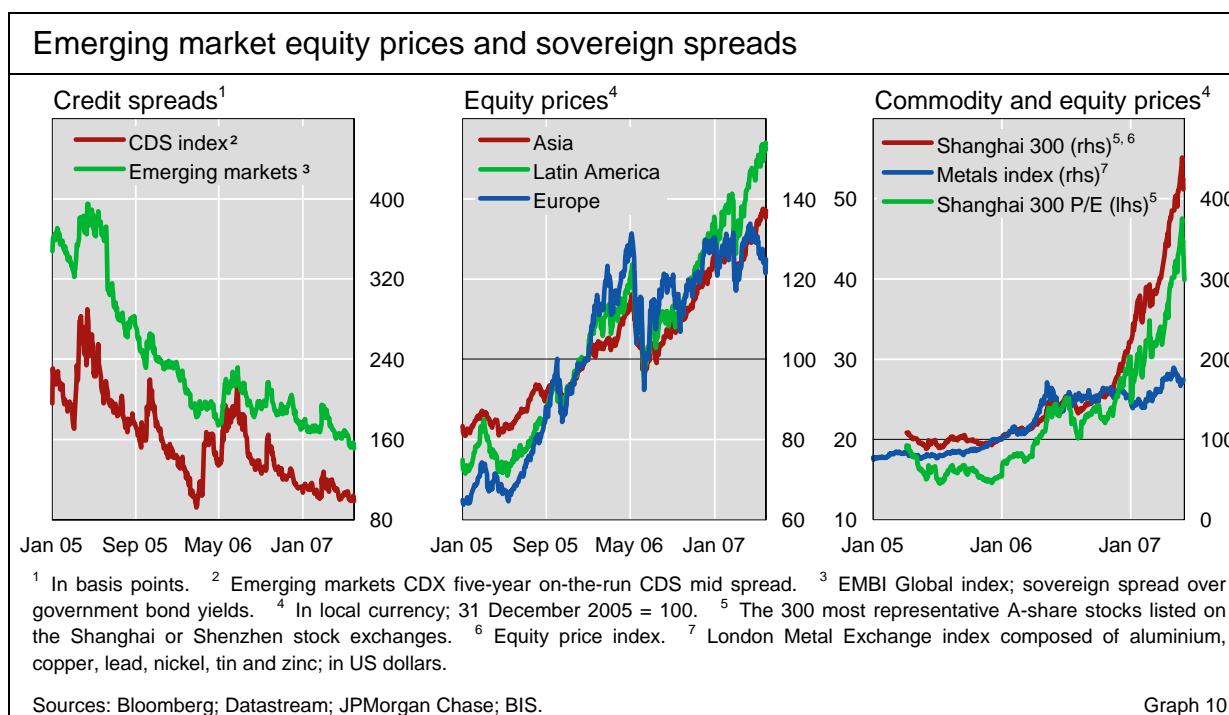
Robust issuance of CDOs and other structured products also helped to support valuations in the broader credit markets. Overall, global issuance of CDOs in the first quarter of 2007, at \$251 billion, was the strongest on record. While the total issuance of US dollar cash CDOs slowed, issuance of those backed by ABSs reached \$58 billion in the first quarter compared to \$48 billion in the previous one. Even more significantly, issuance of investment grade synthetic CDOs, or CDOs backed by CDSs, hit a record \$121 billion in the first quarter, up from \$92 billion in the previous one. Synthetic CDOs generate returns by selling protection in the CDS market, most commonly on investment grade names. Issuance of these instruments has, since mid-2006, coincided with a decoupling of CDS premia and spreads on comparable corporate bonds in both the US dollar and euro markets. After the sell-off in credit markets in March 2005, investment grade CDS spreads tightened almost continuously up to mid-February 2007, whereas comparable corporate bond spreads changed little overall.

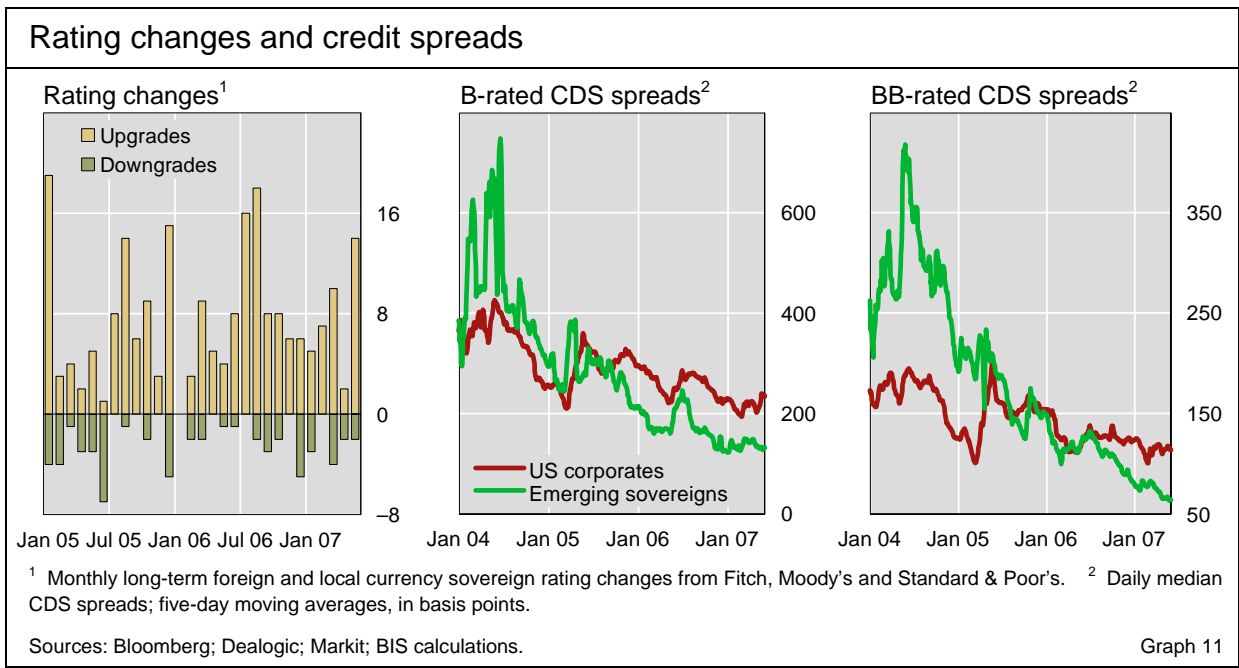
### Emerging markets quickly rebound after sell-off

Emerging market spreads reach new lows

Continuing a trend seen for some time, emerging markets spreads tightened to new historical lows and equity prices climbed further during the period under review (Graph 10, left-hand and centre panels). The EMBI Global spread index fell from 175 to around 150, while emerging market CDS spreads also declined somewhat. Meanwhile, the MSCI Emerging Market equity index rose by 7%, bringing the total increase to 10% since end-2006.

Although the overall trend in emerging markets was positive during the past three months, these markets also sold off in late February and early





March. Both bond and CDS spreads rose by 20–25 basis points in the week following 26 February, and equities fell about 10% during this period. While the main underlying factor behind this sell-off was probably related to concerns about the US economy, one of the immediate triggers seemed to be a 9% drop in the Shanghai stock index on 27 February. This, in turn, was due to heightened fears among investors that the authorities were about to take steps to cool down what some had described as bubble-type conditions in Chinese equity markets. Signs of overvaluation were clear from estimated P/E ratios, which reached historically high levels (Graph 10, right-hand panel). The introduction in mid-May of measures aimed at cooling the economy – including a hike in interest rates, increased reserve requirements and a widening of the currency band – did little to dent the confidence of investors, who instead pushed the Shanghai stock index up to new all-time highs in the second half of May. Renewed efforts to curb speculation in the market, in the form of a tripling of the stamp duty on share trades, did, however, bring the Shanghai stock index down by almost 7% on 30 May, and the index saw further declines in the following days.

While any concerns arising from the market sell-off in February–March were quickly brushed aside by investors, China remained very much on the minds of market participants. The Chinese economy continued to expand at a rapid pace, with GDP growth accelerating to 11% in the first quarter of 2007. This strong performance was largely welcomed by investors, who saw both this development and rapid growth in India and other emerging economies as counterbalancing to some extent the slowdown in the United States. Moreover, continued rapid Chinese growth was viewed as positive for a number of emerging economies, notably producers of commodities demanded by China. This was particularly evident for producers of metals such as nickel, tin and lead, prices of which reached new highs during the period under review (Graph 10, right-hand panel). Accordingly, the release of the Chinese GDP

Effects of the sell-off fade quickly

Buoyant Chinese growth positive for emerging markets

figures in late April resulted in rising equity prices in South Africa, commodity-producing countries in Latin America and a number of other countries.

In general, investors' outlook for emerging markets remained upbeat, as their economic performance continued to be positive and fiscal positions remained strong. Moreover, positive rating changes continued to outnumber negative ones (Graph 11, left-hand panel), further supporting asset prices in these markets.

As in the recent past, isolated bouts of local turbulence in individual countries had little impact on asset prices in emerging markets as a whole. In Turkey, equity prices plummeted, yields jumped and the currency weakened in late April as investors' worries about the political situation increased, following unrest linked to the process of selecting a new president. Venezuelan spreads rose as plans for the country to withdraw from the IMF were made public, which led to concerns among investors about the possibility of a technical default on Venezuelan bonds. Yet, episodes such as these led to no significant spillovers abroad and had little impact on emerging markets more generally.

While better economic performance contributed to the favourable developments in emerging markets over the past couple of months, investors' high risk tolerance also appeared to play an important role. Even when compared to the buoyant conditions in credit markets of advanced economies, the performance of emerging market debt was remarkable. CDS spreads on emerging market sovereigns continued to trade at tighter levels than US corporate CDS spreads within the same rating category, and this difference widened further during the period under review (Graph 11, centre and right-hand panels). While this could be due to changes in investors' assessment of the relative riskiness of emerging market credit vis-à-vis US corporate credit, it is possible that a comparatively strong appetite for emerging market credit risk may have been part of the story. The quick recovery of emerging market asset prices after the sell-off suggested that the willingness of investors to take on emerging market risk remained robust, and that market confidence was not easily dislodged, even by sharp moves in asset prices.

High risk tolerance  
in emerging  
markets ...

... not shaken by  
the sell-off